



Foundations · Educational evidence summary

How missing data should be represented in medication evidence tools

This foundation article explains how missing data should be represented in medication evidence tools.

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Missingness is part of the evidence model

A medication evidence tool does not become complete merely because every cell contains a number. Completeness requires that each displayed finding has a defensible source. When no verified value exists, the missing state is scientifically meaningful information that should survive the entire workflow.

This includes the database, medication profile, comparison display, Ask response and any exported summary. A gap preserved in storage but silently converted to zero in a chart or sentence has still been lost. The representation needs to remain faithful from the original observation to the reader's interpretation.

Separate the value from the evidence state

A numerical value answers "What did the source publish?" An evidence state answers "What kind of finding is this?" A source-version field answers "Which document supplied it?" Combining these roles in a single overloaded number makes errors difficult to detect.

The [UnifiedACB public observations](#) retain a score and a rating state. Explicit zeros are marked as published zeros. Concepts can also exist without public observation rows, allowing the system to preserve provenance without inventing a numerical finding. These are different record states and should have different explanations.

An unavailable value should not be encoded as a special large or negative score that might later enter an arithmetic calculation. Similarly, the text "not listed" should not be interpreted as a numerical zero by a downstream component. The intended state must be preserved explicitly rather than inferred from a display convention.



Distinguish why information is unavailable

A medication can be outside a source's scope, absent from a particular version, unresolved at the identity level or unavailable for public redistribution. These reasons lead to different next steps. A route exclusion calls for a scope explanation. An uncertain match calls for identity review. A reuse restriction calls for a clear boundary around the public material.

The [KABS development methods](#) provide a concrete scope example because topical agents were excluded from the candidate list. That absence should not be treated like a laboratory measurement of no activity. A transparent tool should preserve the distinction even when both situations would otherwise leave a visually blank cell.

Sometimes the reason is unknown. The correct representation then states that no verified observation is available and avoids speculating about why. Inventing a reason can be as misleading as inventing a value, especially when historical supplements are incomplete or inconsistent.

A provenance-only record can be useful

The current [quinupramine concept](#) has no public medication-list observations, but it carries a documented source anomaly. The record communicates that relevant main-text information exists while avoiding the creation of a missing scale-list row. Searchability and public scoring are therefore separate properties.

This is useful for auditability. Without the provenance record, a reader might assume the project had never encountered the medication. With an invented score, the reader might assume the missing row had been verified. A provenance-only record preserves what is known and identifies the unresolved boundary.

Comparisons need visible coverage denominators

When comparing scales, distinguish the medicines present in both sources from those present in only one. Agreement among shared entries is not agreement across the entire medication set. A reader needs to know which denominator is being used and why.

For a regimen, report the covered and uncovered portions of the list. A total based on a subset should not be presented as a complete assessment of every exposure. The same applies when routes, doses or actual use are unknown: the calculation's input boundary should be stated before the result is interpreted.

No imputed source score is proposed here. Imputation in a research analysis would require a defined model, justified assumptions and appropriate sensitivity analyses. It would remain an analytic estimate, not a newly discovered source-native observation. A public directory should not blur that distinction.



Language can preserve or erase missingness

“No verified public value from this source version” accurately describes a gap. “No anticholinergic effect” makes a pharmacological claim. “Not in this selected overlay” describes supplemental coverage. “Safe in older adults” makes a much broader clinical claim. These pairs are not interchangeable.

Ask responses should carry the same distinctions as the table. If a question requests a source that has no public row, the answer should state that limitation before discussing other available sources. It should not substitute a different scale’s value simply to produce a numerical response.

Exports need the same discipline as the visible page. A blank spreadsheet cell, a null field and a literal zero can be interpreted differently by downstream software. The exported evidence state and source identifier should make the intended meaning explicit so that a later analysis does not accidentally recode uncertainty as an observed value.

Updating a gap requires a traceable change

When new evidence resolves an uncertainty, record the document, version, locator and mapping decision. A newly verified observation should be distinguishable from an editorial explanation of an older gap. Historical source findings should remain identifiable so earlier analyses can be reconstructed.

The preserved [KABS anomaly notes](#) show why this matters: a missing supplement row cannot be reconstructed from a category count, and a main-text table may not match the supplement. A later correction should explain which boundary was resolved rather than silently replacing the earlier uncertainty.

A trustworthy empty cell

An empty cell is useful when its meaning is clear. It tells the reader where the evidence stops, which comparison is possible and what information would improve the assessment. The aim is not to make missing data invisible. It is to make the missingness precise enough that it cannot be mistaken for reassurance or numerical evidence.

References

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Explore the evidence

[Ask UnifiedACB](#) about a medication or source, browse the [Medication Library](#), or read the [methodology](#).

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Educational evidence summary. This content does not provide patient-specific medical advice and does not replace clinical judgment, medication reconciliation, or prescribing guidance.