

Is DAIR Associated with Poor Outcomes in Fungal Periprosthetic Joint Infection?
A Systematic Review and Meta-analysis of 1,025 Cases

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Summary

- Fungal PJI remains difficult to treat: pooled treatment success was 67.2%; failure, reinfection, and mortality were 35.7%, 18.2%, and 9.6%.
- Exchange arthroplasty had more favorable descriptive outcomes than DAIR: success was 68.8% with one-stage exchange, 69.7% with two-stage exchange, and 13.3% with DAIR.
- Findings are descriptive, not comparative: studies were mostly retrospective and non-comparative, definitions varied, and treatment groups could overlap.

Table with 5 columns: Metric, Value, and Subtext. Metrics include included studies (160), fungal PJI cases (1,025), pooled treatment success (67.2%), pooled reinfection (18.2%), and pooled mortality (9.6%).

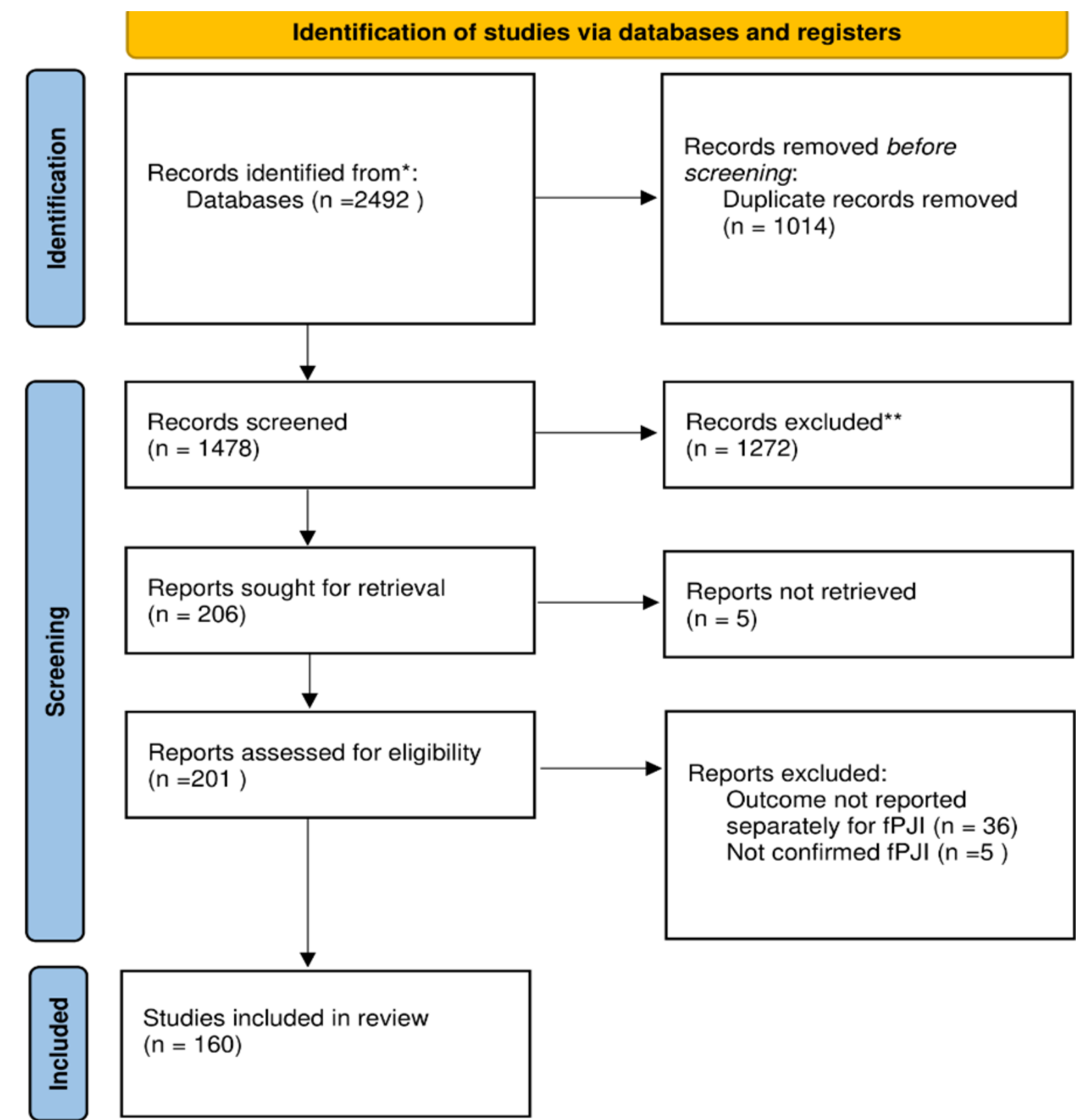
Background & Objective

- Fungal organisms cause ~1% of PJIs and create difficult biofilm-associated infections.
- Management strategies and outcome definitions vary widely across published studies.
- Objective: estimate outcome proportions for fungal PJI across reported strategies.

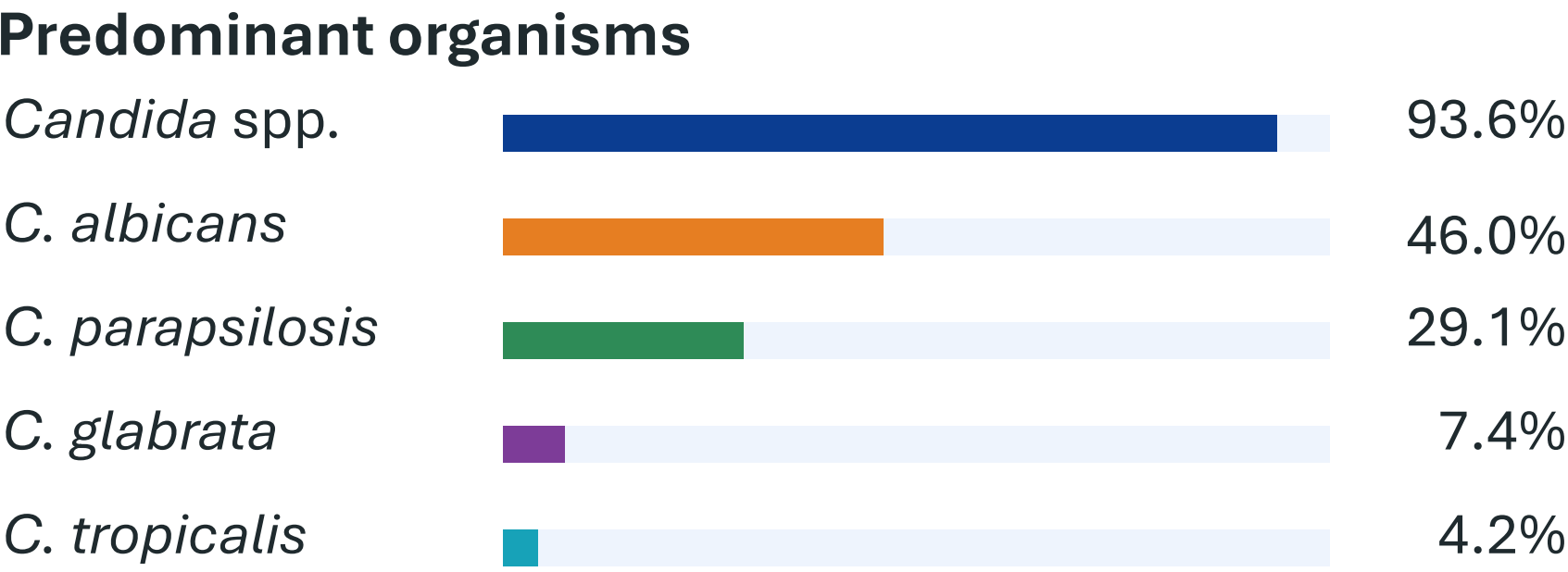
Methods

- PRISMA systematic review/meta-analysis.
- Search: MEDLINE, Embase, Scopus, and Cochrane Central through Nov 18, 2025.
- Adults with fungal PJI; cohorts with ≥5 cases entered meta-analysis.
- Random-effects GLMM; outcomes used study-specific definitions.

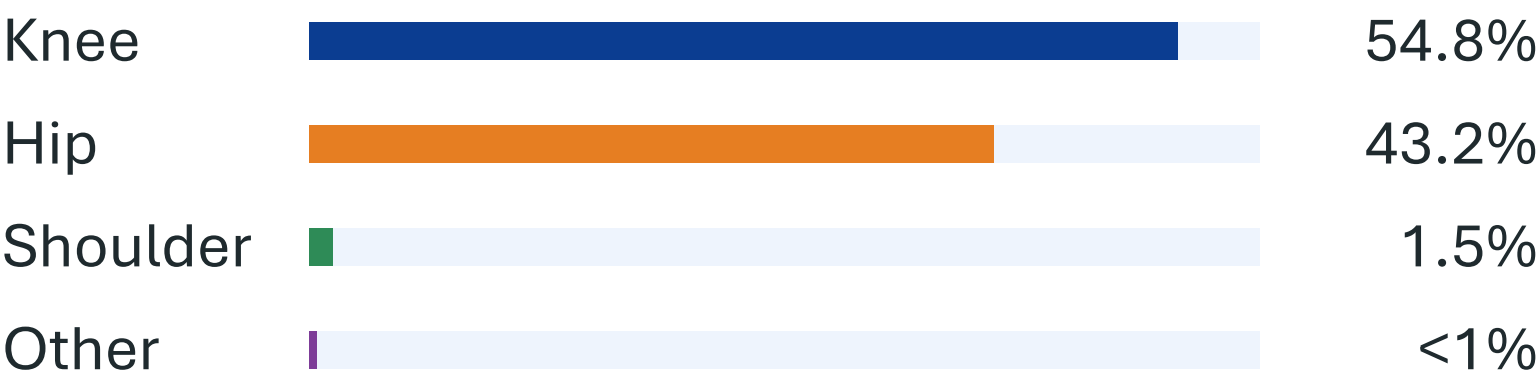
Study Selection



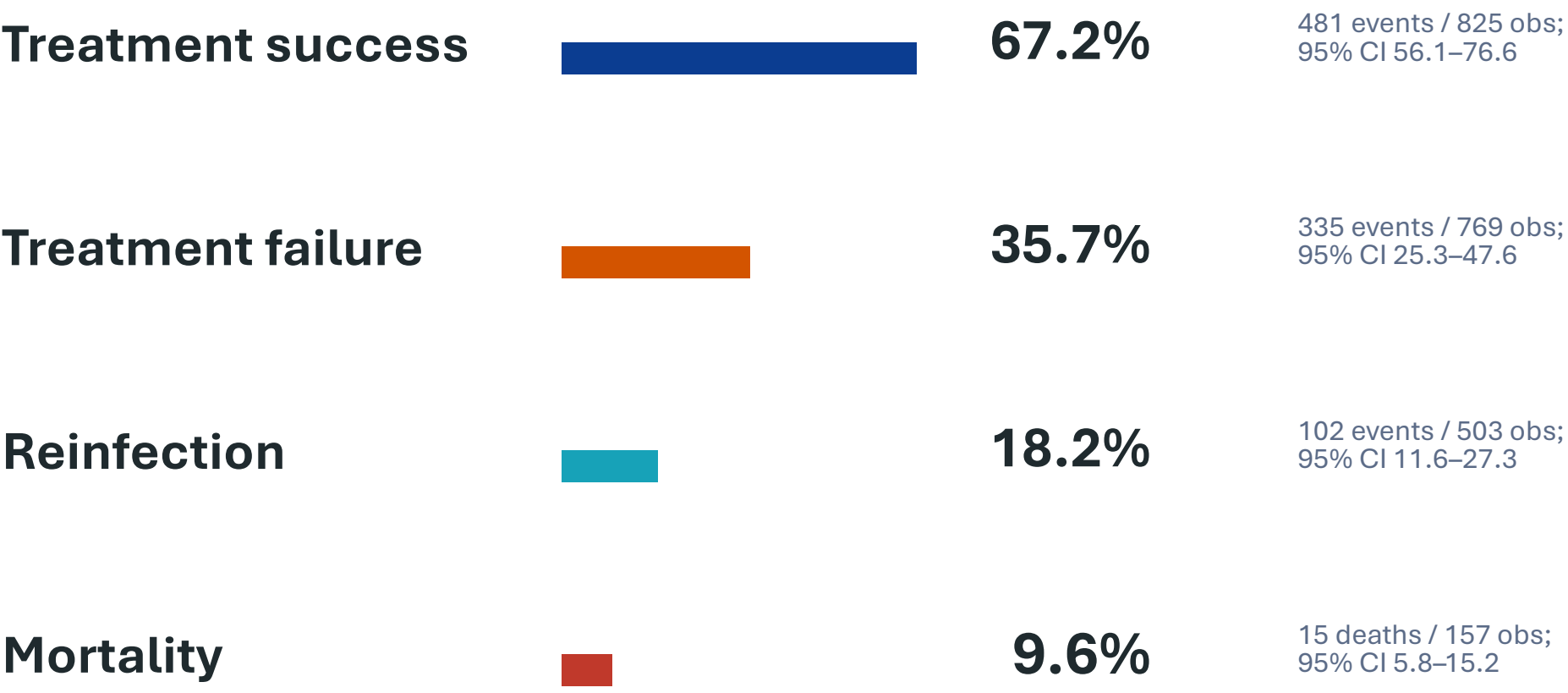
Microbiology & Affected Joints



Affected joints



Pooled Outcomes



Success and failure were analyzed independently and should not be expected to sum to 100%.

Surgical Strategy: Descriptive Only

Table with 4 columns: Strategy, Success, Failure, and Reinfection. Rows include One-stage, Two-stage, and DAIR.

Subgroups are procedure-level and may overlap; do not interpret as treatment ranking.

Discussion

- Fungal PJI is mainly Candida-associated and usually involves hip or knee arthroplasty.
- Exchange arthroplasty dominates the literature; evidence does not establish superiority of one-stage vs two-stage exchange.
- Less favorable DAIR estimates may reflect patient selection and confounding by indication.
- Mortality was incompletely reported and should be interpreted as all-cause mortality during follow-up.

Limitations

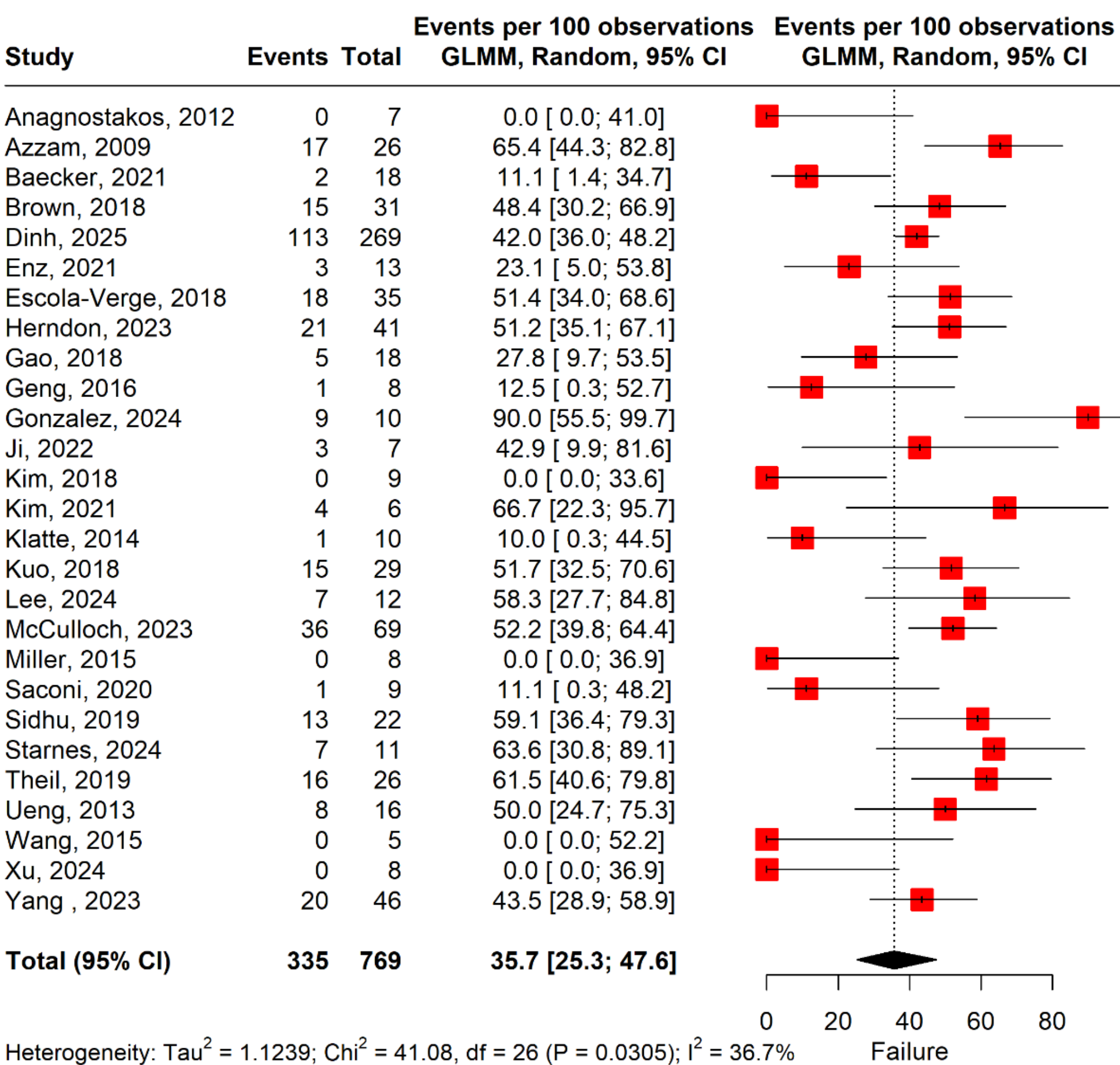
- Most cohorts were retrospective and non-comparative.
- Diagnostic criteria and outcome definitions varied.
- Antifungal regimen, route, and duration were inconsistently reported.
- Treatment groups were not mutually exclusive at the patient level.

Conclusions

- Fungal PJI has moderate pooled treatment success but substantial failure, reinfection, and mortality.
- One-stage and two-stage exchange had broadly similar descriptive estimates; DAIR studies reported less favorable estimates. Current data do not prove comparative effectiveness or equivalence.
- Future studies should standardize diagnostic criteria, outcome definitions, and antifungal reporting.

Meta-analysis Results

Figure 2. Forest plot of pooled treatment failure rates for fungal PJI (overall)



Abbreviations: DAIR, debridement, antibiotics, and implant retention; fPJI, fungal periprosthetic joint infection; GLMM, generalized linear mixed model; PJI, periprosthetic joint infection. No funding received.

Figure 3. Forest plot presents descriptive estimates of treatment failure rates stratified by reported treatment strategy among patients with fungal PJI

