LAKANA SSI Public Research Suite v2.0

Concise Evidence Summary and Reviewer Navigation Map

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1. Purpose of this summary

This concise summary is the front-page guide to a four-document public research suite. It is designed for reviewers, institutional partners, preprint readers, and technical evaluators who need the complete argument without first reading the full technical supplement. It does not introduce new numerical results. It maps the whole-frame main manuscript, the female-lane companion manuscript, and the engineering technical supplement into one navigable evidence stack.

The suite evaluates deterministic human structural-health monitoring under bounded-telemetry release. The central question is whether a simulator-internal safety policy can shift retained time, burden allocation, terminal-proxy behavior, event-history structure, sensitivity behavior, and public evidence governance without converting safety evidence into unrestricted raw-subject surveillance.

2. Claim boundary

The suite reports a simulator-internal evaluation. It does not claim clinical validation, field validation, injury-prevention proof, return-to-play authority, regulatory readiness, hardware validation, formal privacy, differential privacy, anonymity, de-identification, no-reidentification risk, or independent reimplementation from public materials alone. The public evidence package is designed for claim traceability and reviewability, not for device deployment or clinical use.

2A. Reader orientation: what this suite proves and does not prove

The suite is simulation-bound: it evaluates declared simulator-internal pathway behavior, not field outcomes. Analysis provenance is separated from formal prospective registration; this package does not claim that the final public reporting structure was a trial registry. SSES is LAKANA-born but proposed as a portable post-run evidence-governance methodology for other simulations and quantitative studies. Transportability requires future field pilots with adjudicated outcomes and governed access. Bounded-telemetry release is a custody and public-release abstraction, not a formal privacy proof.

Reader question	Where to look
What is the main retained-time result?	Main manuscript.
What is the female-stack result?	Companion manuscript.
What is the math/model stack?	Technical supplement.
What is SSES portability?	Main manuscript and technical supplement.

What are the limits and future validation needs?	Main manuscript, companion manuscript, and technical supplement.

3. Document map

Document	What it contains	What it does not claim
Main manuscript	Whole-frame B=390 simulation, retained-time results, burden visibility, comparator-policy framing, event-history and sensitivity summaries, and SSES overview.	Clinical or field effectiveness.
Companion manuscript	B=180 female-stack interpretation for source-labeled women's basketball, female soccer, and softball; managed-burden transparency and anti-extractive governance.	Demographic validation or whole-frame ownership.
Technical supplement	State-space mechanics, TSARO/NICOLE, comparator-policy abstractions, model families, theorem boxes, SSES proof layers, and reproducibility boundary.	Production implementation or formal privacy proof.
This summary	Navigation and synthesis.	New results.

4. Architecture and public evidence-release boundary

The main architecture separates four layers: the subject-time simulator, the deterministic policy abstraction, the TSARO/NICOLE governance boundary, and the SSES post-run evidence-governance stack. The important design decision is separation. Simulation outputs are not automatically public claims. SSES determines whether a reported value is source-linked, claim-bounded, denominator-eligible where required, and safe to release as aggregate public evidence.

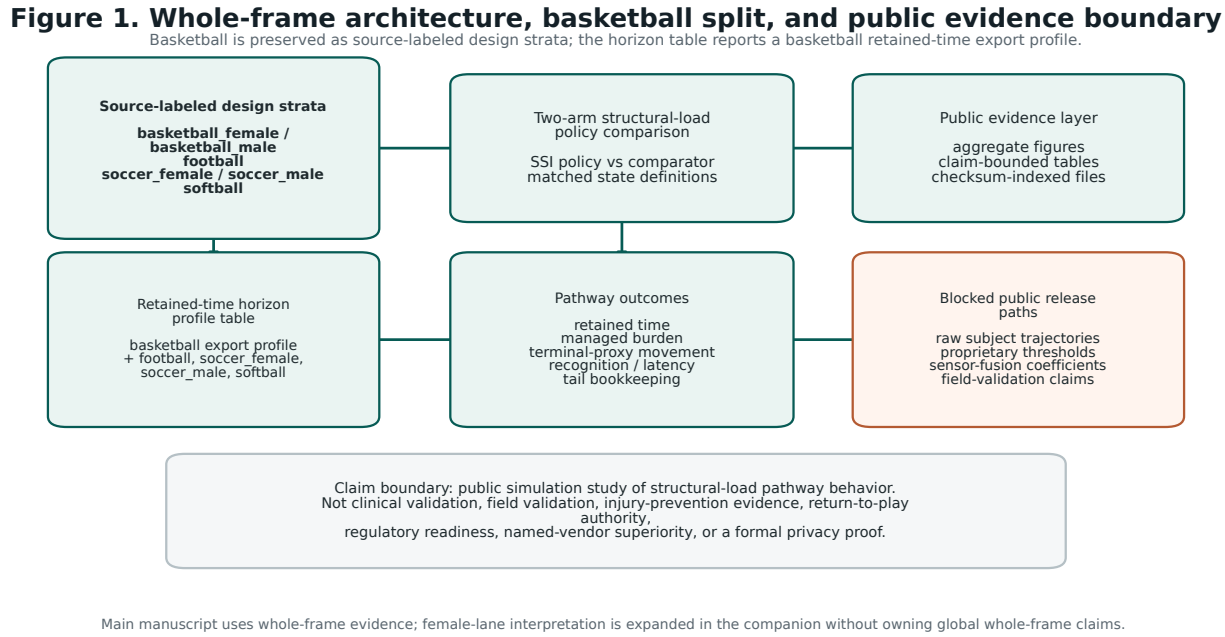

Figure 1: Whole-frame architecture and public evidence-release boundary.

5. Primary whole-frame result

Retained-time deltas were positive in all five sport profiles at 90 and 365 simulator days. These are not field survival estimates. They are simulator-internal retained-time contrasts under the declared model.

Sport profile	90-day delta	365-day delta	90-to-365 shift
Basketball retained-time profile	+0.247574	+0.255039	+0.007465
Football	+0.214367	+0.224717	+0.010350
Female soccer	+0.210225	+0.218515	+0.008290
Male soccer	+0.201622	+0.210103	+0.008481
Softball	+0.134529	+0.145092	+0.010563

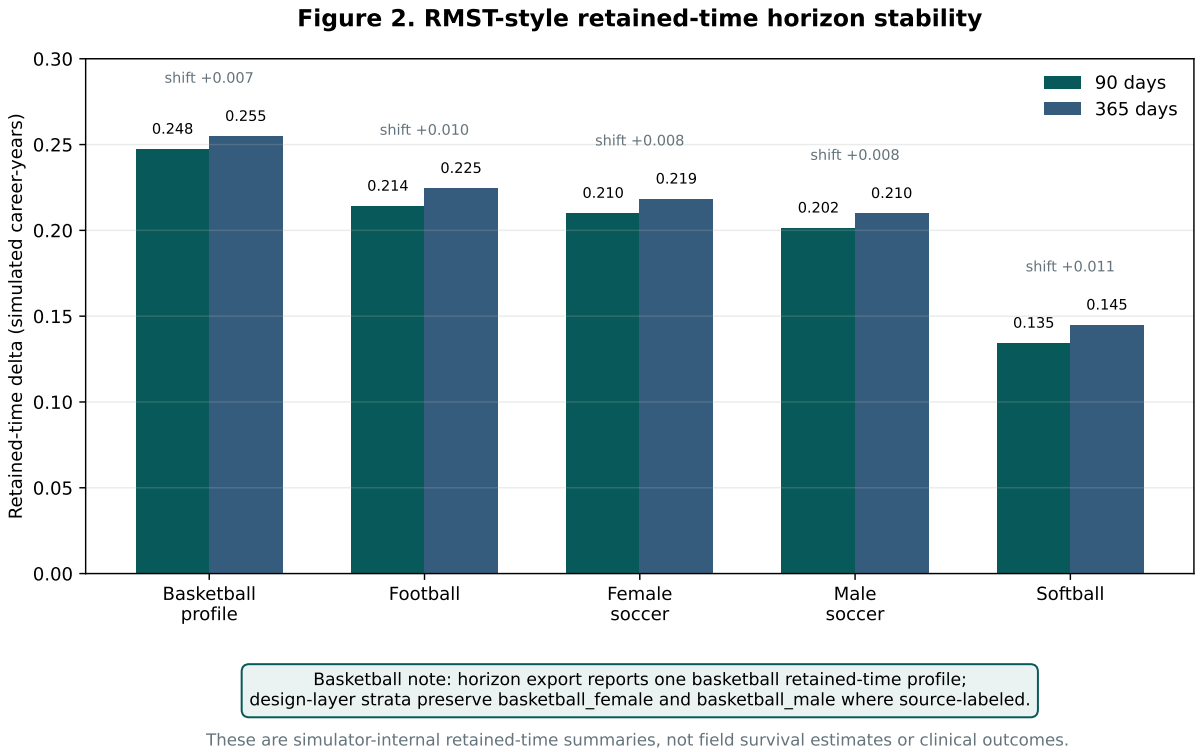

Figure 2: RMST-style retained-time horizon stability across five sport profiles.

6. Burden and evidence-governance summary

The whole-frame block-level burden-delta precision interval is [953,444.21, 1,205,922.71] across B=390 effective block units. This does not prove field burden reduction. It shows that the simulator-internal block-level burden-delta sign remained stable under the declared MEBVB precision rule.

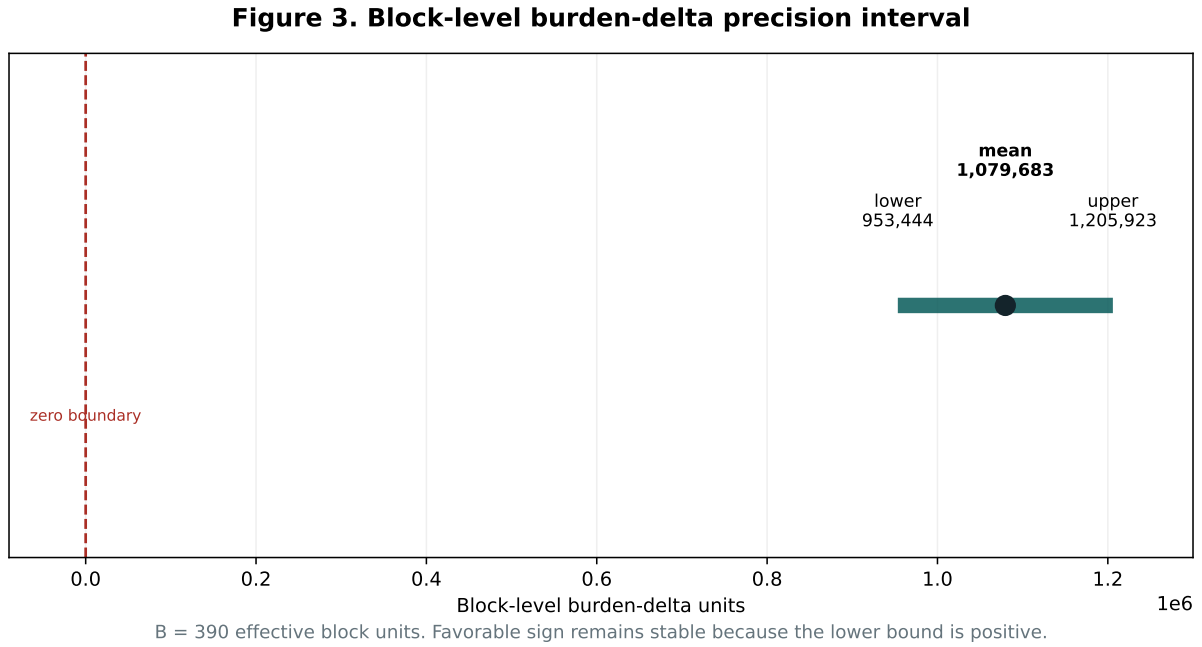

Figure 3: Block-level burden-delta precision interval.

Public evidence-governance results also support reviewability: SAFE-N adjusted = 0.7886 and ELCI = 0.9185. These are release-governance and lineage-completeness scores. They are not privacy proofs or evidence-strength scores.

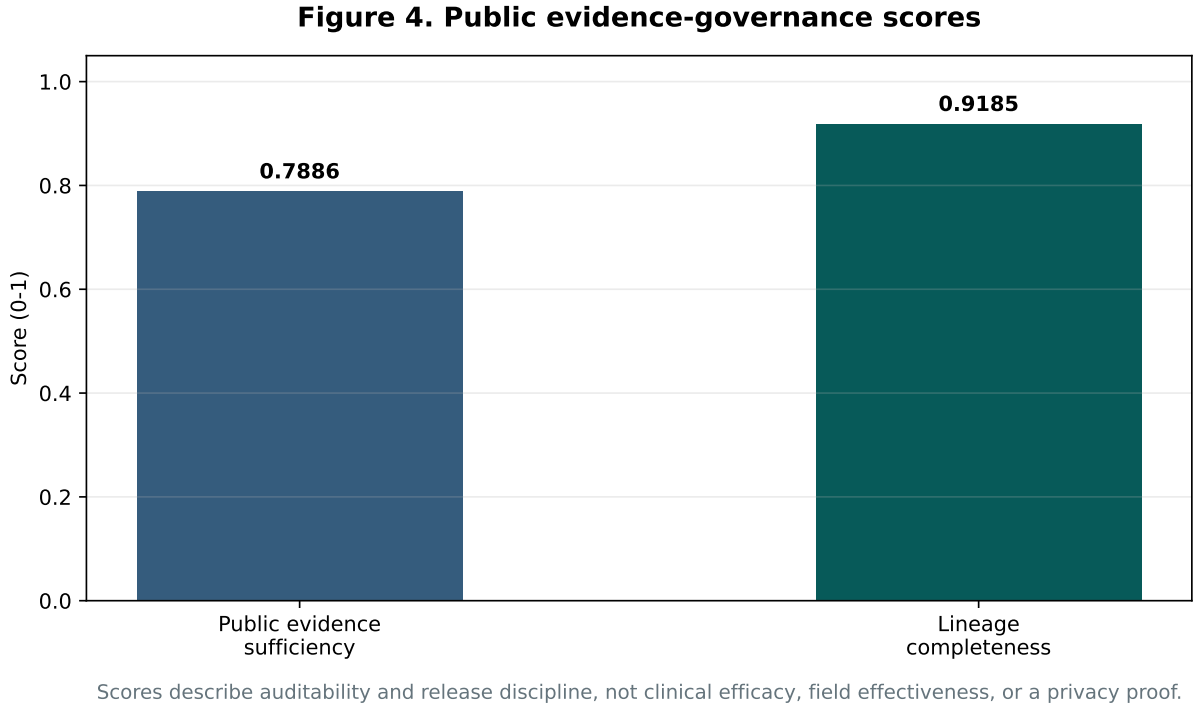

Figure 4: Public evidence-governance scores.

7. Female-stack result summary

The companion manuscript preserves source-labeled women's basketball, female soccer, and softball lanes. The point is lane integrity, not sex-comparison rhetoric. Female-stack SSES reports B=180 effective precision blocks, a simulator-internal MEBVB interval of [2,280,391.93, 3,111,841.08] burden-delta units, and RET-BURD classification of 162 dominant favorable and 18 managed-burden tradeoff blocks. These values are simulation evidence, not demographic validation.

Lane	Delta missed days	Delta ACL-family proxy	Delta modeled time-years
Women's basketball	-77.79	-1.280	+0.256
Female soccer	-68.31	-1.187	+0.220
Softball	-38.43	-1.004	+0.149

8. Comparator-policy framing

The comparator is a policy-abstraction family, not a named system. The suite distinguishes external-load, internal-recovery, ACWR-style, hybrid-SOTA, and industry-ablation policy families so reviewers can see what SSI changes. SSI differs not only by the state variables it reads but by its saturation-bounded projection, burden-visibility requirement, TSARO physics plausibility, NICOLE custody/decision accountability, and SSES post-run evidence discipline.

Comparator family	What it represents	Boundary
External-load	Motion/exposure/player-load style policy.	Not a named device.
Internal-recovery	Recovery/readiness/HRV-like policy.	Not HRV validation.
ACWR-style	Acute/chronic workload-ratio logic.	Not ACWR endorsement.
Hybrid-SOTA	Combined internal and external monitoring abstraction.	Still simulation-only.
Industry-ablation	Monitoring with weaker evidence-governance boundary.	Not a vendor attack.

9. SSES portability

SSES is introduced through LAKANA SSI but can be applied to other simulations. It takes source artifacts, claim registers, model outputs, sensitivity summaries, denominators, and release rules as inputs; it returns claim eligibility, lineage completeness, sensitivity-to-claim leverage, tail-denominator eligibility, burden/retained-time classification, and release sufficiency.

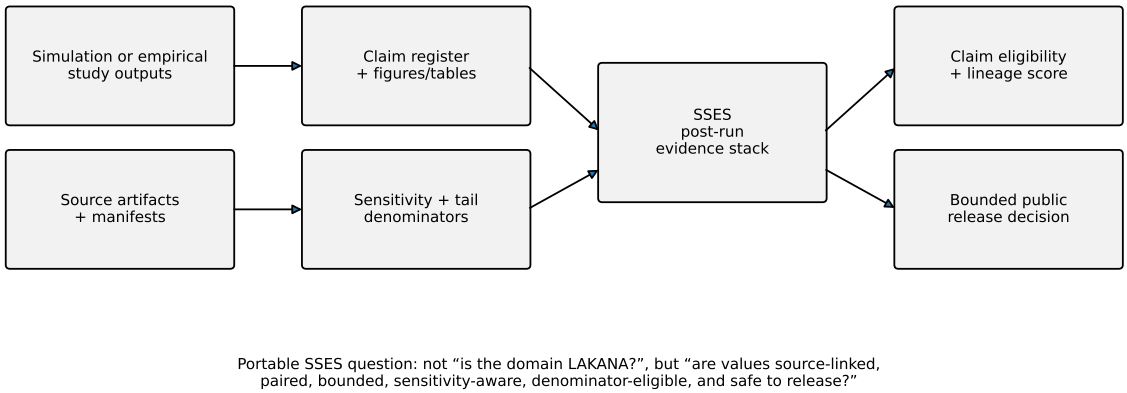

Figure 5: SSES as a portable post-run evidence-governance pattern.

For a peer-reviewed survival or competing-risk paper, SSES would not re-prove the clinical result. It would check whether the public claim matches the estimand, whether the table and figure horizons agree, whether denominators are present, whether sensitivity is linked to claims, and whether the abstract overstates the model. The proof function is claim admissibility and reviewability, not domain truth.

10. Where to read next

Read the main manuscript for the whole-frame retained-time and burden story. Read the companion for female-lane interpretation and managed-burden transparency. Read the technical supplement for formal model definitions, theorem boxes, TSARO/NICOLE mechanics, SSES proof layers, and reproducibility boundaries.

1 11. Journal-candidate interpretation

For preprint release, the full V2 suite is intended to preserve the complete public evidence stack. For journal review, the main paper should be read with the technical supplement as online supplementary material rather than as a standalone monograph. The main inferential spine is retained-time delta, burden-delta precision, managed-burden visibility, and claim-governed evidence release. Event-history, sensitivity, tail, and SSES outputs provide coherence and auditability rather than uncorrected confirmatory claims across every displayed model family.

A journal package should include a claim registry, event-history specification file, run descriptor, public-table-to-figure scripts, and SHA256 manifest. Those artifacts would support machine-verifiable public claims while preserving the trade-secret boundary around coefficients, thresholds, trigger logic, fusion weights, and raw subject trajectories.