



Healthcare Operations Benchmarking & Risk Monitoring

Analytics & Decision Support Case Study

An anonymized healthcare operations analysis showing how structured data rules, validation, benchmarking, and monitoring can support operational review and decision-making.

THE DOMAS GROUP LLC

Analytic need

Weight monitoring: Use recurring weight data to identify clinically meaningful change and monitoring gaps. Comparable measures across communities help show where weight-change prevalence, event frequency, or longer weigh-in intervals warrant closer operational review.

Incident monitoring: Use fall-related event data to assess repeat falls, event frequency, and time between incidents. Normalized benchmarks support fairer community comparisons, help distinguish broad resident involvement from repeated events among smaller groups, and identify locations that may warrant follow-up.

Data Overview

Dataset	Type	Records
Weights	Time-series	De-identified event data
Falls	Event-based	De-identified incident data

Key Business Rules Applied:

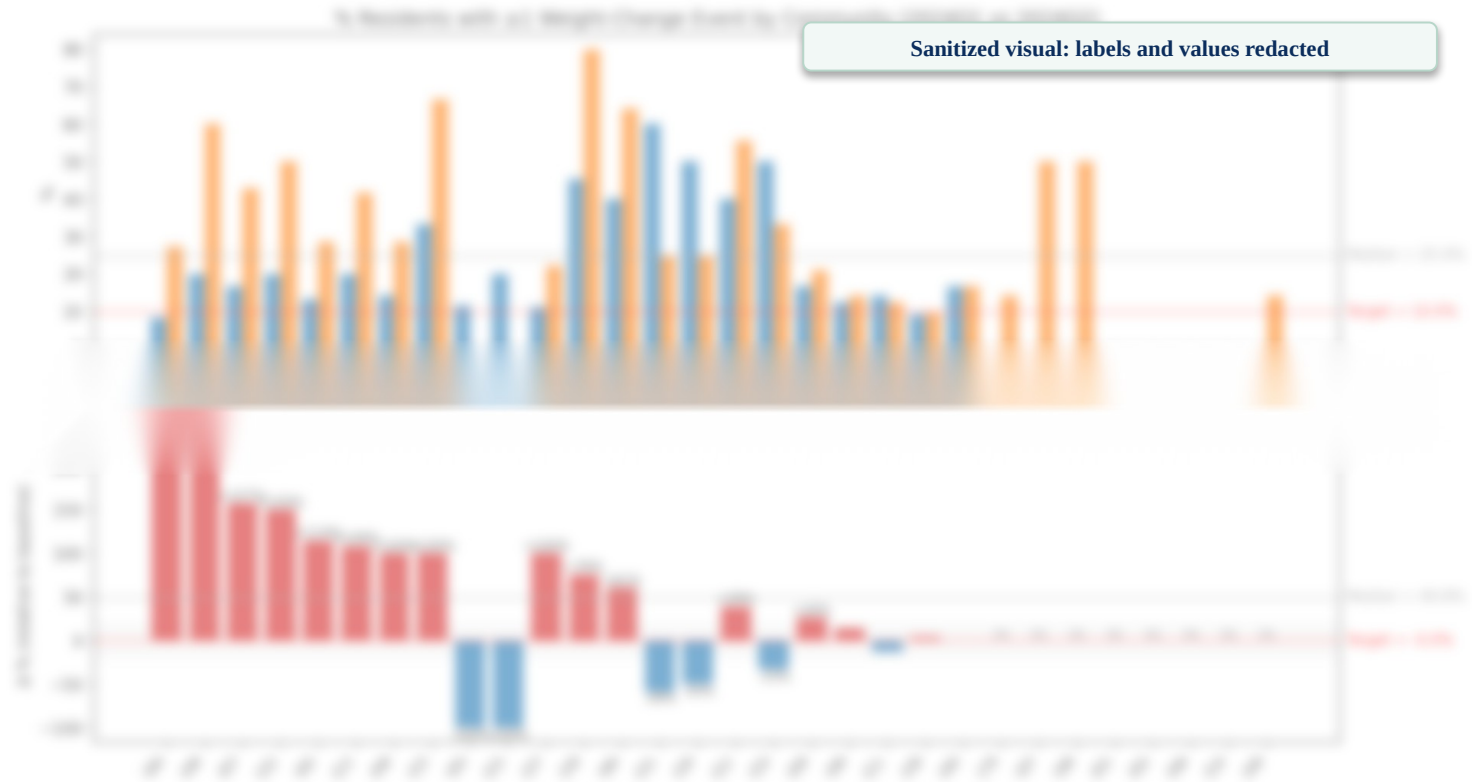
- Each weight record represents a single, valid measurement per resident per day.
- Implausible weights (< 70 lbs / > 450 lbs) were excluded to ensure realistic clinical ranges.
- Only the most recent weight per day was retained for accurate trend modeling.
- Monitoring intervals and threshold events ($\pm 5\%$ / $\pm 10\%$) were calculated consistently across communities.
- Fall-related incidents were isolated using a standardized 'is_fall' flag.
- Days-between events were calculated per resident, then summarized using resident-median $\rightarrow$ global median.
- Repeat-fall rates were based on the minimum interval between consecutive falls.
- Community-level rates (e.g., incidents per 100 residents) were normalized using unique resident counts.

Weight benchmark definitions

	Benchmark	What It Captures	Why It Matters
1	% of Residents with ≥ 1 Weight-Change Event ($\geq \pm 5\%$ / 30 d or $\pm 10\%$ / 180 d)	Prevalence of residents showing clinically meaningful change in body weight.	Signals the proportion of residents potentially at nutritional or health risk; high values may indicate unstable populations or measurement inconsistency.
2	Weight-Change Events per 100 Residents	Frequency of threshold-crossing events normalized to population size.	Allows comparison across communities regardless of census; rising rates suggest recurring instability among monitored residents.
3	Median Days Between Weigh-Ins	Typical cadence of resident weight monitoring.	Reflects adherence to expected monitoring schedules; longer intervals reduce ability to detect early risk.
4	% Residents with > 30 Days Between Weigh-Ins	Share of residents exceeding recommended weigh-in frequency.	Highlights monitoring gaps that may delay detection of weight-related health decline or safety risk.

Weight-change prevalence

A subset of communities showed increases in the proportion of residents with clinically meaningful weight-change events, flagging areas for closer monitoring and data-quality review.



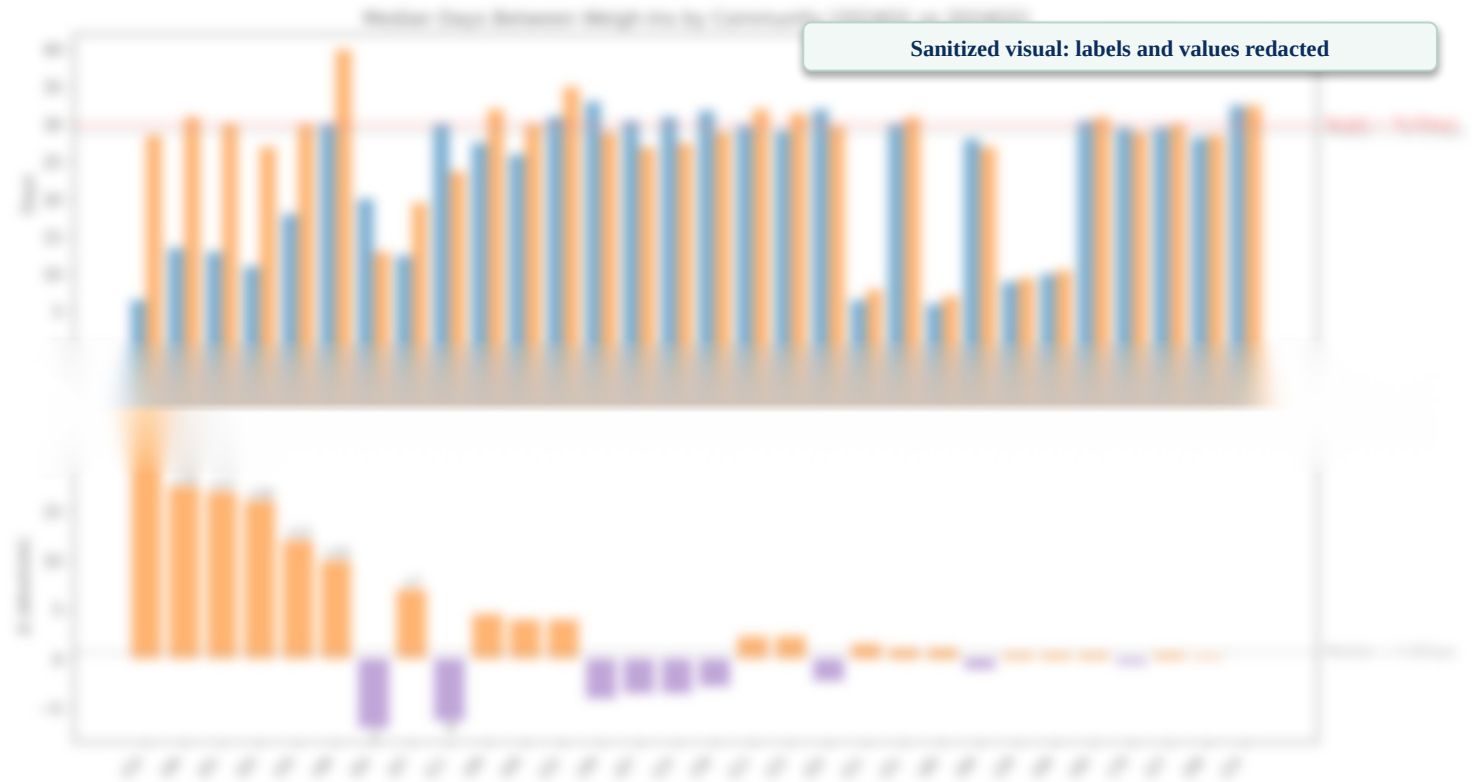
Weight-change events per 100 residents

Event frequency varied across communities after normalizing by resident count, helping distinguish broad resident involvement from repeated events among smaller groups of residents.



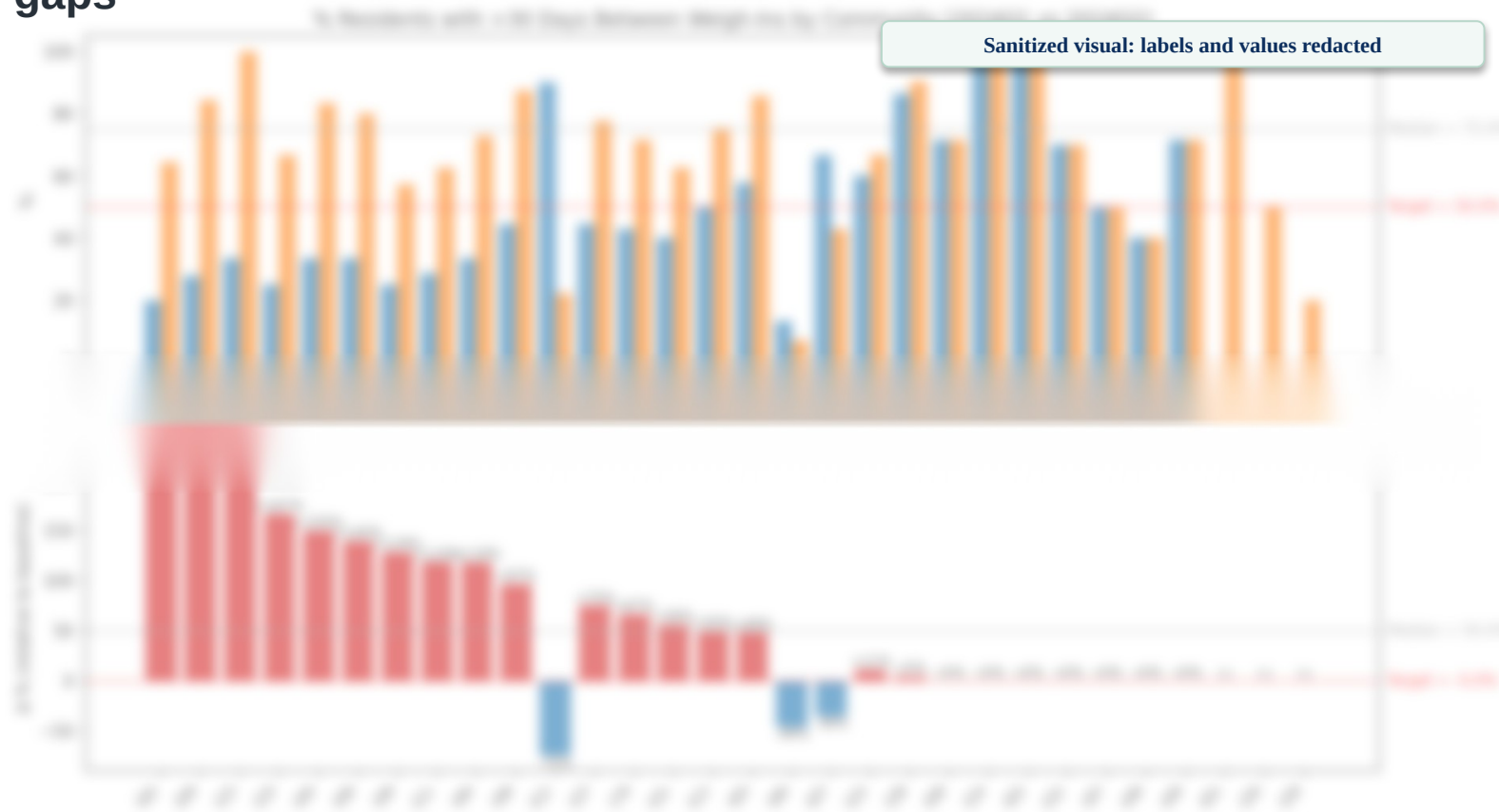
Monitoring cadence

Several communities showed longer intervals between weigh-ins, potentially delaying detection of early weight changes and weakening routine monitoring cadence.



Monitoring gaps

Many communities had residents exceeding the expected monthly weigh-in cadence, underscoring the risk of missed early warning signs when monitoring frequency declines.

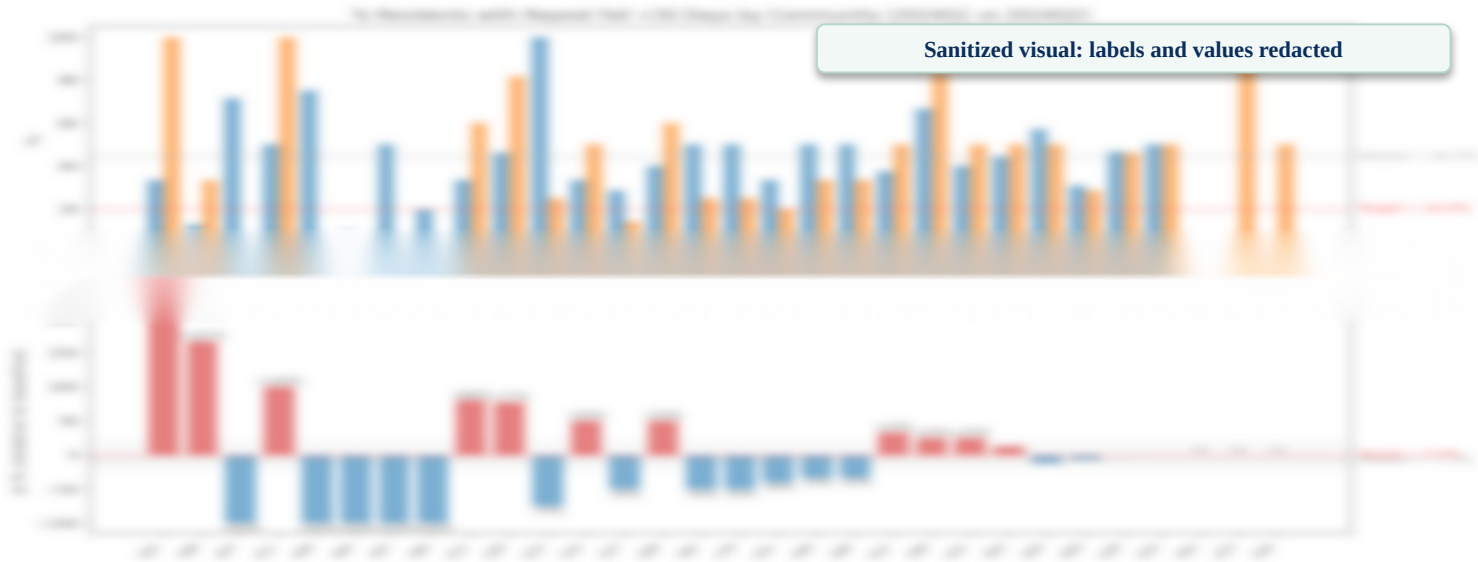


Incident benchmark definitions

	Benchmark	What It Captures	Why It Matters
1	% Residents with Repeat Fall <30 Days	Share of residents falling again within 30 days.	Rapid recurrence indicator; mirrors readmission-style quality triggers.
2	Falls per 100 Residents	Frequency of fall incidents normalized to population size.	Core safety metric; rising rates flag environments or workflows needing review.
3	Median Days Between Falls	Typical interval between repeat falls (among residents with >1).	Shorter intervals imply unresolved risk or insufficient recovery after events.
4	Fall-to-Weight-Event Ratio	Relationship between fall frequency and weight-change events.	Tests whether physiological instability precedes adverse safety events.

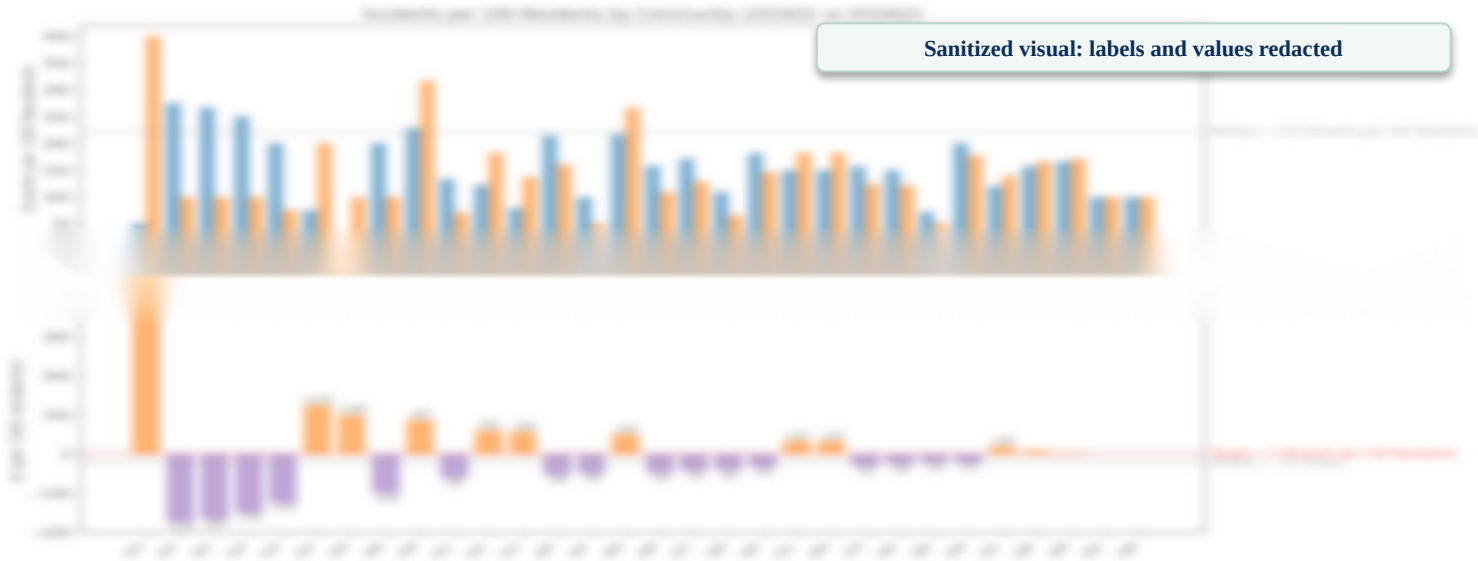
Repeat-fall rate

Repeat falls increased across many communities, with several showing notable spikes that warrant closer review.



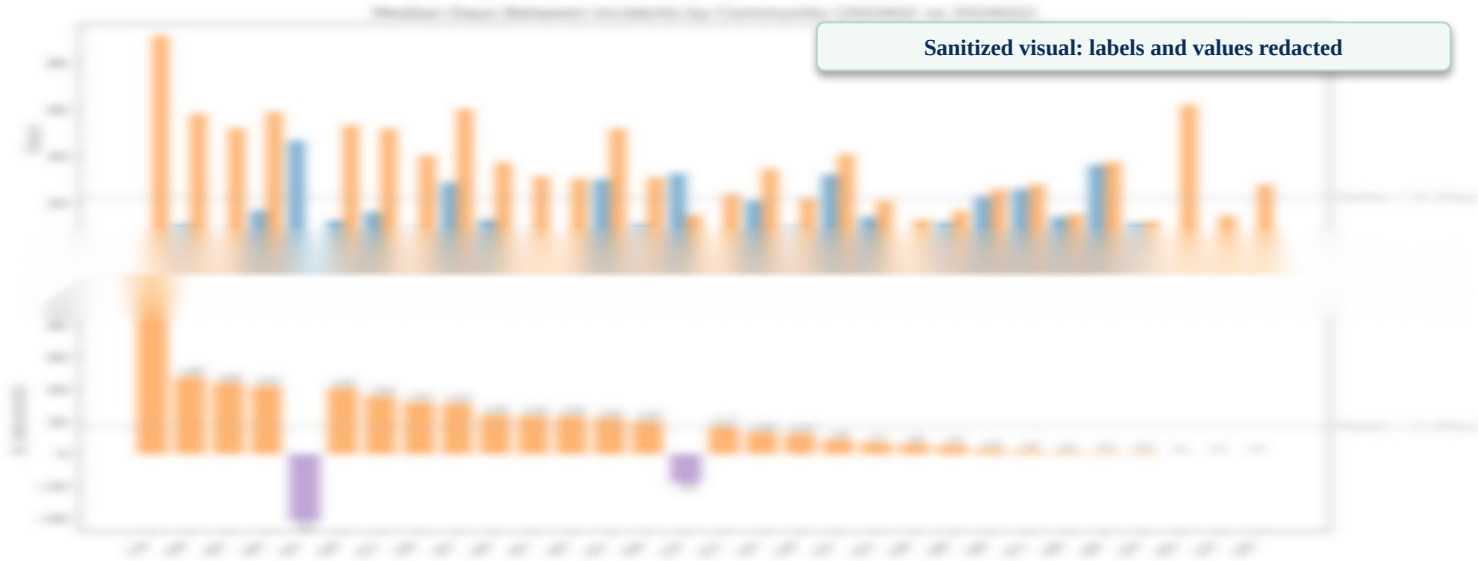
Falls per 100 residents

Incidents per 100 residents increased in some communities, while most remained relatively stable or decreased.



Median days between falls

Median days between incidents increased across most communities, with some showing substantial increases in time between events.



Recommendations

For operational follow-up, prioritize communities showing multiple signals across weight-monitoring and incident benchmarks, such as:

- High share of residents with at least one weight-change event or fall incident, or high events per 100 residents
- Median weigh-in intervals greater than 30 days or a high share of residents exceeding the 30-day weigh-in threshold
- High repeat-fall rates within 30 days or sharp decreases in median days between incidents

Additional Hypotheses & Analytic Opportunities

1. Hypothesis: Communities that weigh residents or document incidents less frequently may appear “stable” simply because events aren’t recorded.

Confirm the true resident denominator per quarter to assess missingness, under-reporting, and census-driven distortion of event rates.

2. Hypothesis: Communities with inconsistent weigh-in patterns may also show higher fall rates or shorter intervals between incidents.

Assess communities with unusually low measurement frequency as potential under-detectors rather than low-risk sites.

3. Hypothesis: Spikes in events may align with specific operational changes, staffing patterns, or seasonal/holiday periods.

Analyze whether spikes in incidents or weight events align with staffing changes, new processes, or seasonal factors.

4. Hypothesis: Weight changes and fall risk vary by BMI range, hydration status, diagnoses, or acuity scores rather than operational issues.

Incorporate height/BMI, hydration-related flags, diagnoses, or acuity indicators to test whether variation reflects case-mix rather than operational inconsistency.



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Meagan Foster, MPS · Founder