

When Life Gets in the Way: How Social Barriers Reshape Patient Journeys

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ASA DataFest 2026 • University of Missouri

Question

How do social determinants of health — transportation access, housing stability, food security, and financial strain — shape the way patients navigate the Stormont Vail Health (SVH) system over time? We moved beyond the static snapshot to map actual patient journeys and uncover where the system fails its most vulnerable patients.

Approach

We analyzed 7.7 million encounters across 948,000 patients (2022–2025), linking encounters into patient journeys — sequences of visits connected by a common diagnosis (DiagnosisValue). We built a composite social risk score from 7 screening domains (transportation, food, housing, finance, stress, utilities, depression) and tested its relationship to journey outcomes. Methods included Mann-Whitney U tests, Kruskal-Wallis, Spearman correlation, logistic regression, and chi-square tests. All results were confirmed with age-stratified analysis to rule out confounding. All findings significant at $p < 0.001$.

Key Findings

- 1. Social barriers drive emergency care.** Patients with housing instability have 364% more ER visits; transport barriers cause 281% more. Logistic regression identifies transportation as the #1 predictor of high ER use (OR = 2.21). The effect holds across every age group (18–34: +216%, 35–49: +407%, 50–64: +363%, 65+: +233%), ruling out age as a confound.
- 2. Your first visit predicts your destiny.** Patients whose first encounter is the ER average 4.73 total ER visits over four years versus 1.17 for office-first patients (+306%). On Sundays, 43% of first visits are ER because clinics are closed — weekends force patients onto a costlier trajectory for years.
- 3. The system identifies vulnerable patients, then loses them.** 76.4% of high-risk patients have no follow-up visit within 90 days of social screening. Nearly 1 in 3 high-risk patients (28.8%) return to the ER within 30 days. The screening works; the follow-up does not.
- 4. Telemedicine is not reaching rural patients.** Only 5.6% of rural patients (60+ km) have used telemedicine versus 10.7% urban. However, MyChart acts as a shield: rural users have 38% fewer ER visits and 52% fewer hospitalizations. Digital engagement is a lifeline, not a convenience — but it is not reaching those who need it.

5. The cost is massive. Transport-barrier patients alone account for an estimated \$76.3M in excess emergency costs over four years (HCUP 2023: \$2,200/ER visit, \$13,600/hospitalization). Smoking compounds social risk multiplicatively — smokers with 3+ social risk factors average 5.12 ER visits versus 1.06 for non-smokers with no risk.

Recommendations

Transportation-first triage: A \$20 ride-share partnership prevents a \$2,200 ER visit. **Weekend clinic access:** Redirect the 43% of Sunday ER entries. **MyChart as clinical necessity:** Target rural and high-risk patients for digital onboarding. **Post-screening follow-up:** Build intervention for the vanishing 76%. **Compound risk protocol:** 3+ social factors = 4.0 ER visits vs 1.1 — act on the signal.

Limitations

Observational study (correlation, not causation). Social screening began Q4 2024 with 22% patient coverage. Cost estimates use national averages, not SVH-specific. Rural census blocks with <11 patients are masked. Future work: propensity-matched causal analysis, SVH-specific cost data, prospective intervention evaluation.

References

[1] SVH de-identified data, ASA DataFest 2026. [2] AHRQ HCUP 2023. [3] Healthy People 2030 SDOH Framework. [4] SVH CHNA 2024. [5] U.S. Census TIGERweb 2020.

Code: github.com/AkbarDevop/datafest-2026 • Dashboard: tigerx-datafest.netlify.app • Python (pandas, scipy, sklearn, plotly, matplotlib)