



# Financial Friction

*Markov Analysis of Patient Journeys*

Kat Craig and Sam Adamczeski



# METHODS

PREP

- Linking encounters to financial strain of patients (categorized by “Strain” or “No Strain”)
- Reducing 18 visit types into 5 simplified "Care States" (Inpatient, Outpatient, etc.)



ANALYSIS

- Calculate transition probability matrices for the 5 states for each strain category
  - Subtract matrices to find difference in journeys between strain statuses

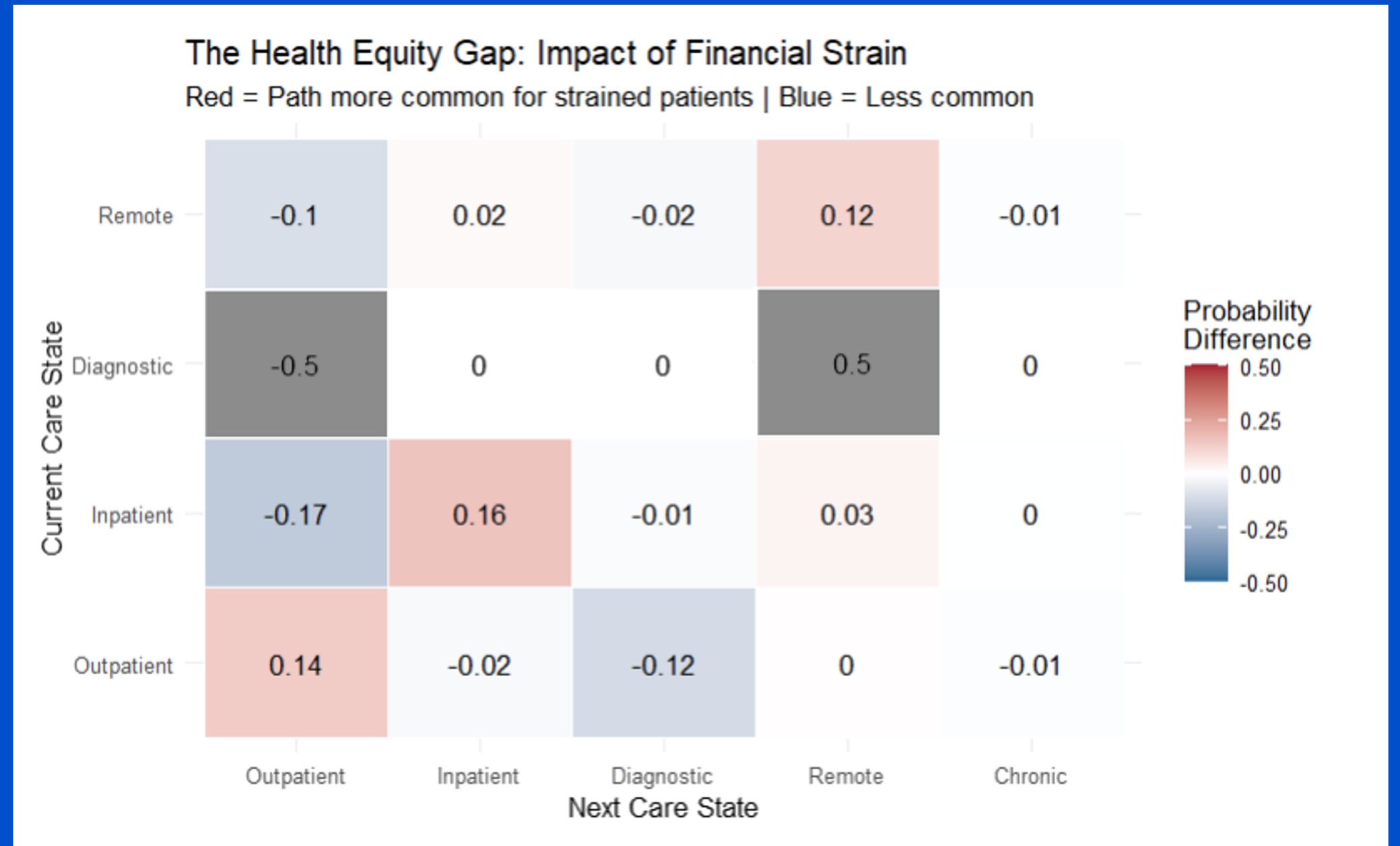


ACTION

Assess values of matrix and brainstorm policy changes

# RESULTS

- **Interpreting these results:** Consider the Inpatient → Outpatient square (-0.17). Strained patients are 17% less likely to attend an Outpatient visit right after an Inpatient stay (compared to their non-strained counterparts).
- **Loops:** Lack of access to diverse types of care (whether short on time, money, or transport), leads strained patients to loop within one type of care. These each have unique setbacks.
- **Outpatient Deficit:** In any case, strained patients are less likely to attend casual outpatient visits after other types of visits (that typically would warrant follow-up). Again, each case has their own setbacks (and solutions)



\* Note: Only 2 transitions from the Diagnostic category; excluded from conclusions

# POLICY SUGGESTIONS

Transition Fix	<u>Inpatient → Inpatient</u> (+0.16) <u>Inpatient → Outpatient</u> (-0.17)	<u>Outpatient → Outpatient</u> (+0.14) <u>Outpatient → Diagnostic</u> (-0.12)	<u>Remote → Remote</u> (+0.12) <u>Remote → Outpatient</u> (-0.10)
Recommendation	Automatic transportation voucher, co-pay waiver for first follow-up appointment.	Display "Total Out-of-Pocket" estimate clearly if Diagnostic visit recommended	Expand accessibility to resources and implement mobile care.
Business Perspective	Spending <\$100 on a ride and a copay for a checkup is cheaper than the \$15,000+ cost of inpatient readmission (+0.16)	Reducing price uncertainty of next step encourages patients to move forward in the journey rather than looping in unproductive routine visits.	Bring the "Outpatient" care to them, preventing the patient from simply dropping out of the system until they eventually crash back into the "Inpatient" state.

**QUESTIONS?**