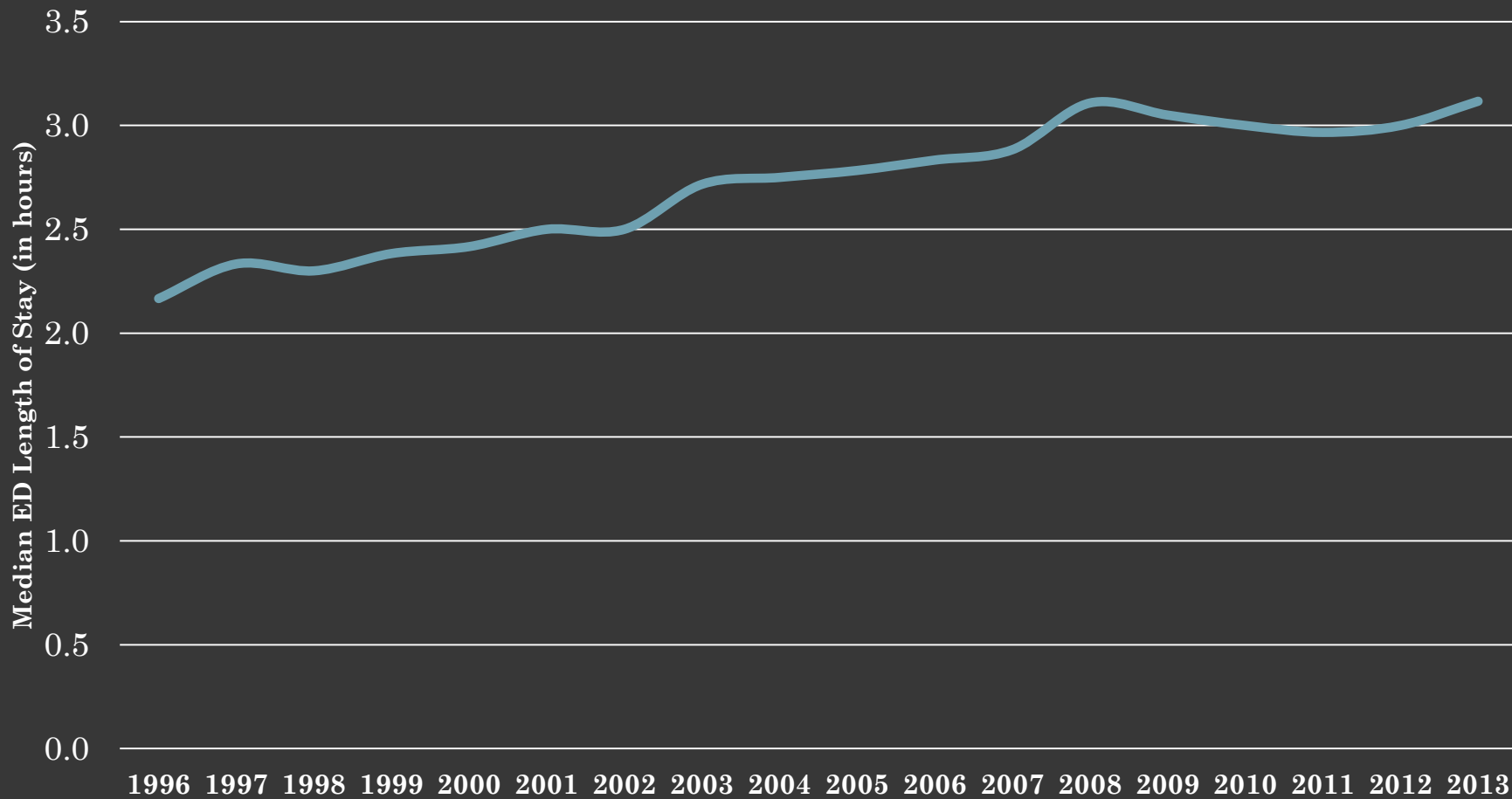




Emergency department (ED) length of stay (LOS) of transfer patients

Zeyno Nixon



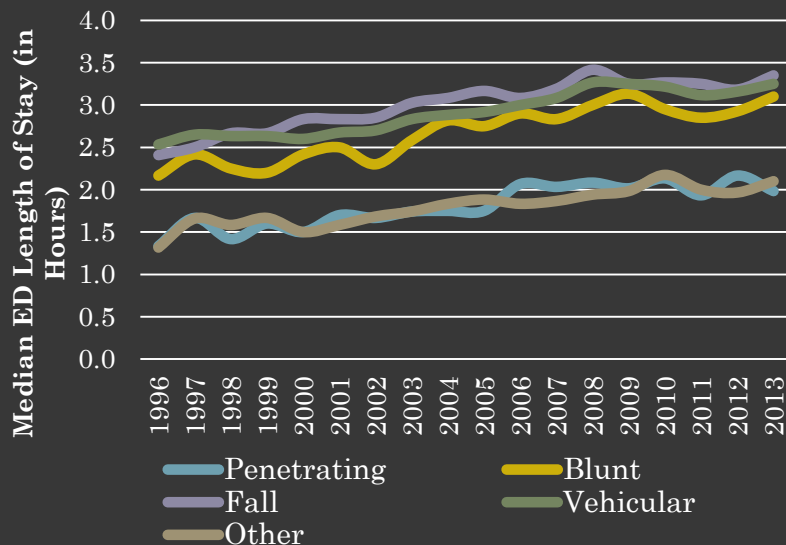
Since 1996, median ED LOS of transfer patients has risen from 2.2 hours in 1996 to 3.1 hours in 2013

(Department of Health criteria, ED transfers)

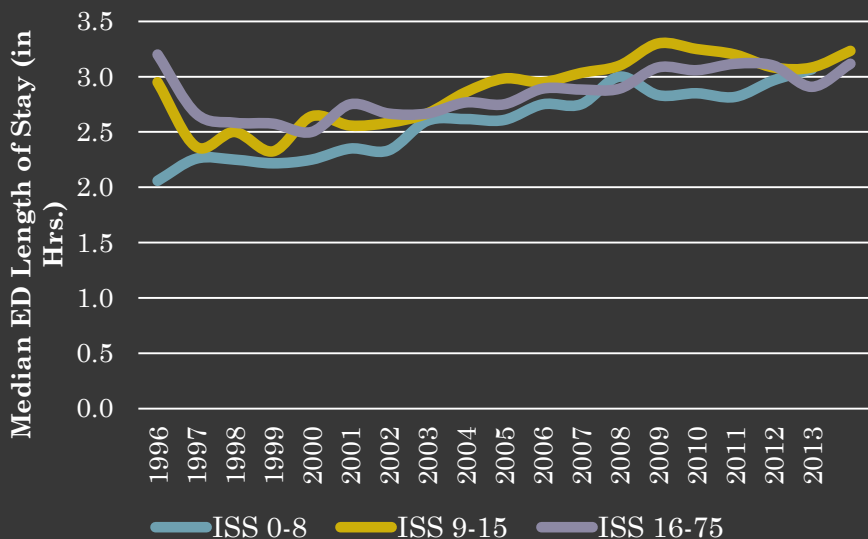
Main Findings:

- Median ED LOS of transfer patients is on the rise in all:
 - ISS groups.
 - Mechanism of injury.
 - Age groups even though the elderly (55-plus) tend to stay the longest in the ED

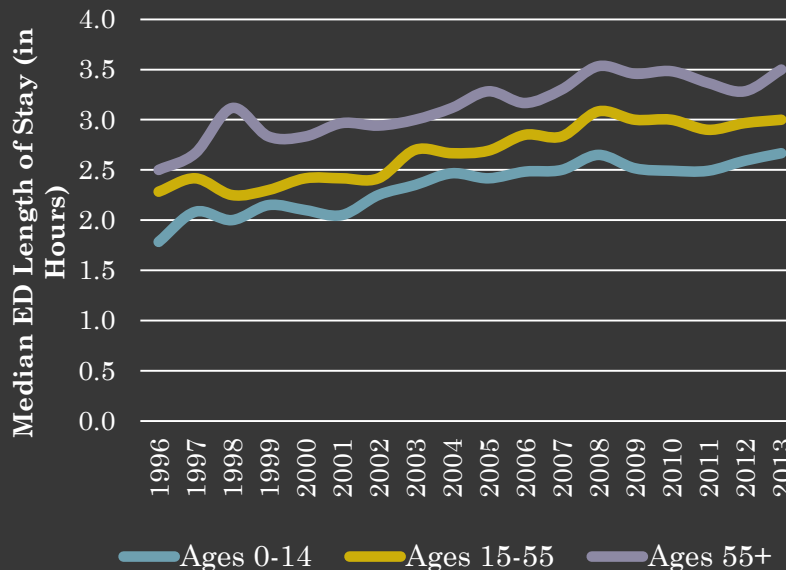
ED LOS Trends by Mechanism of Injury



ED LOS Trends By ISS



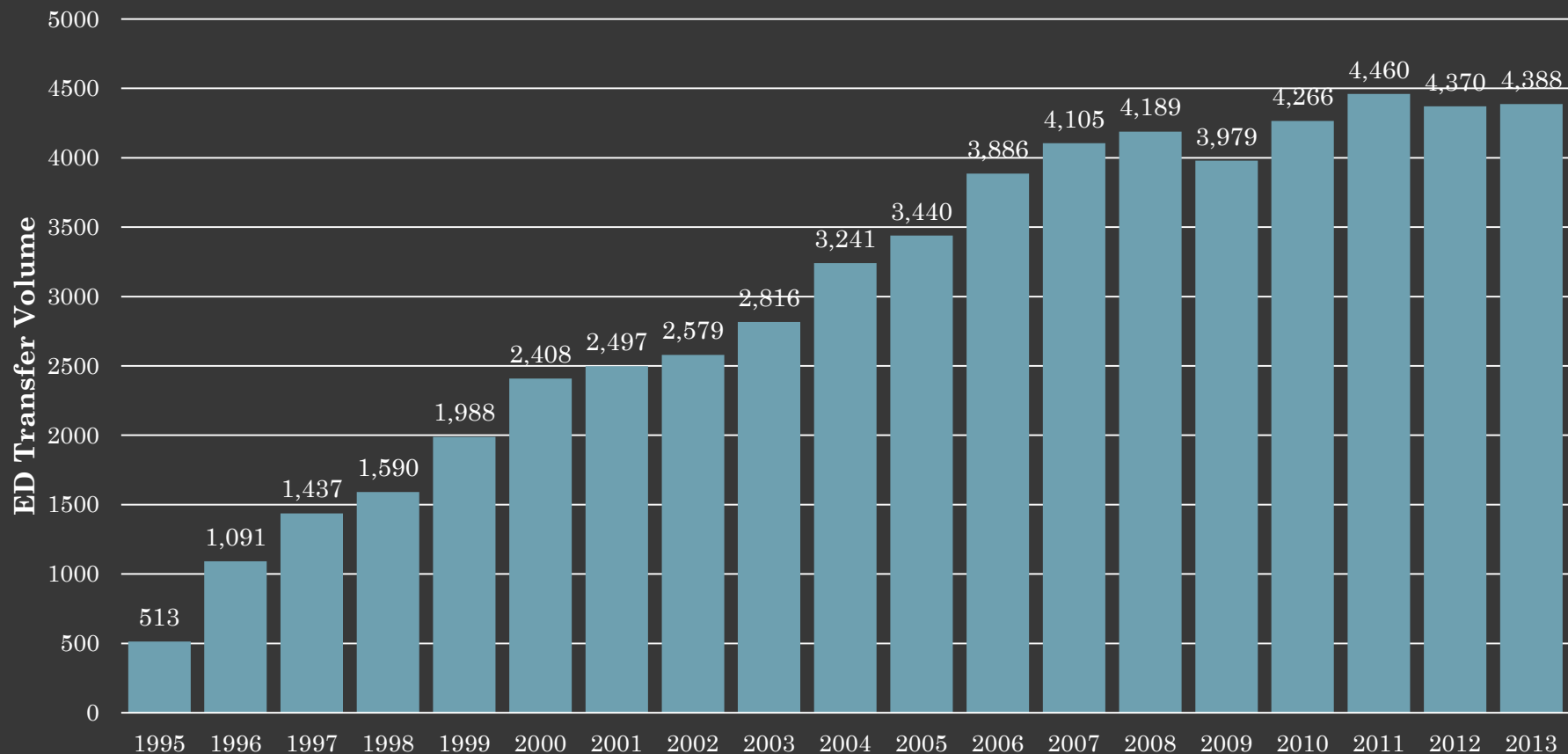
ED LOS Trends by Age Groups



Median ED LOS of Transfer Patients
 (Department of Health Criteria, Transfers only, 1995-2013)

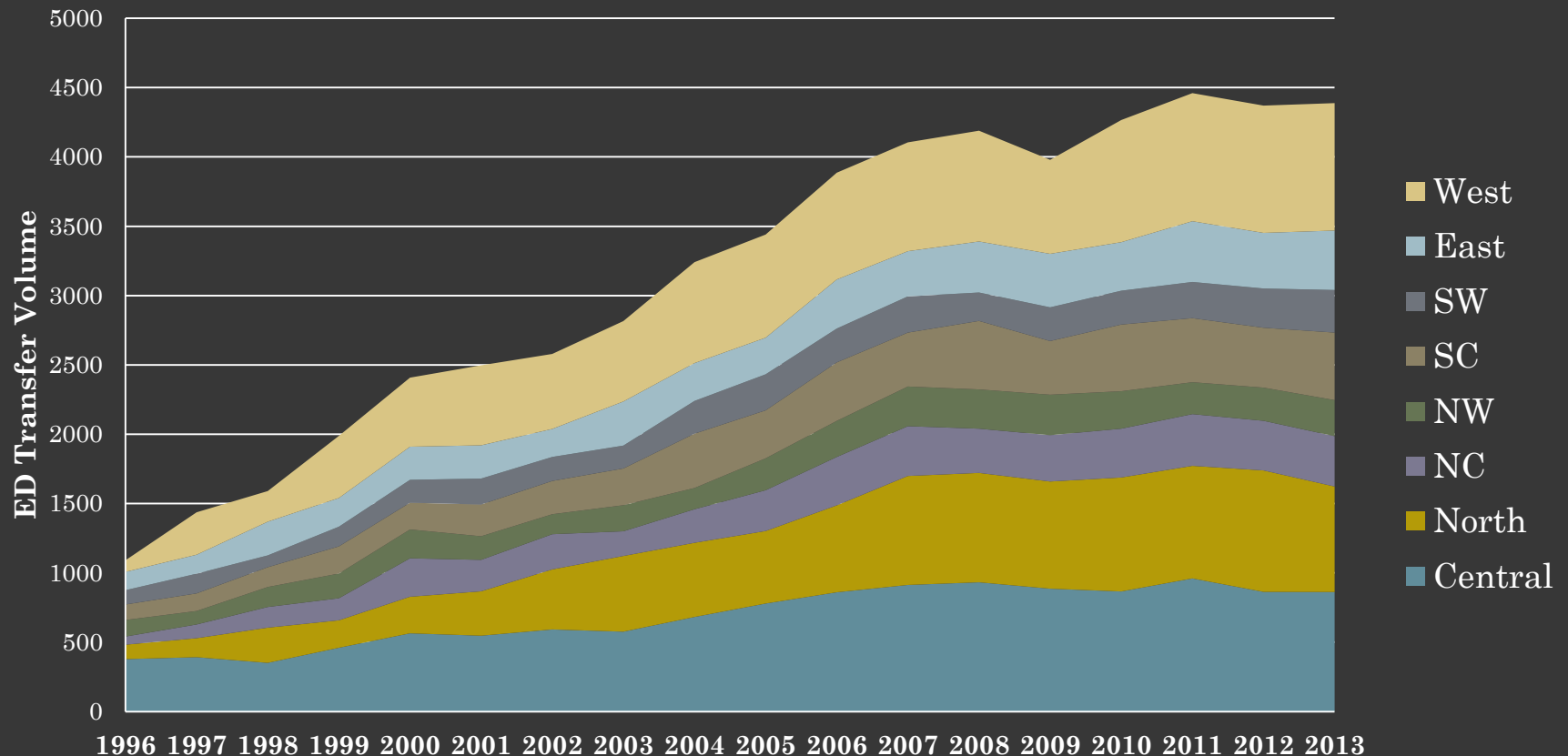
The number of patient transfers from the ED increased drastically since the inception of the trauma system (1995 – 2013, Department of Health criteria, ED transfers)

The Number of Acute Care Transfers From the ED



**Most ED transfers originate in the west, north and central regions.
Reducing the ED length of stay in these regions will create the
biggest effect on the state average**
(1995 – 2013, Department of Health criteria, ED transfers)

ED Transfers by Sending Region

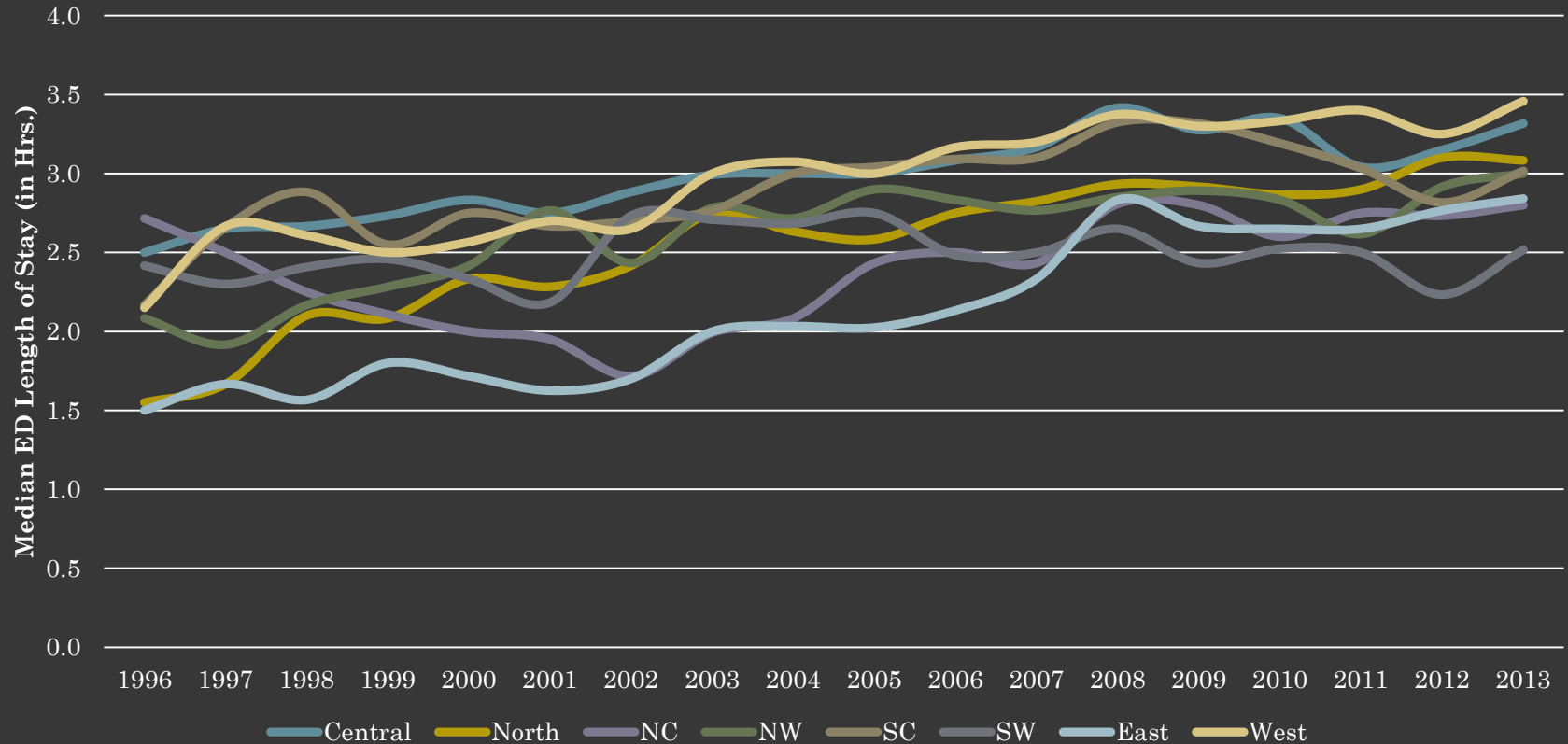


ED length of stay of transfer patients by EMS and trauma regions

(2011 – 2013, Department of health criteria, ED transfers)

	Median (hours)	Mean (hours)	Standard Deviation (hours)	Minimum (hours)	Maximum (hours)
Central	3.2	3.6	2.0	0.3	40.1
North	3.0	3.3	1.7	0.0	18.6
North Central	2.8	3.1	1.7	0.2	25.7
Northwest	2.9	3.1	1.6	0.0	11.4
South Central	3.0	3.2	1.6	0.0	16.7
Southwest	2.4	2.7	1.5	0.1	14.2
East	2.8	3.0	2.0	0.0	35.0
West	3.4	3.7	1.9	0.0	24.6
State	3.0	3.3	1.8	0.0	40.1

Median ED Length of Stay of Transfer Patients by EMS Regions



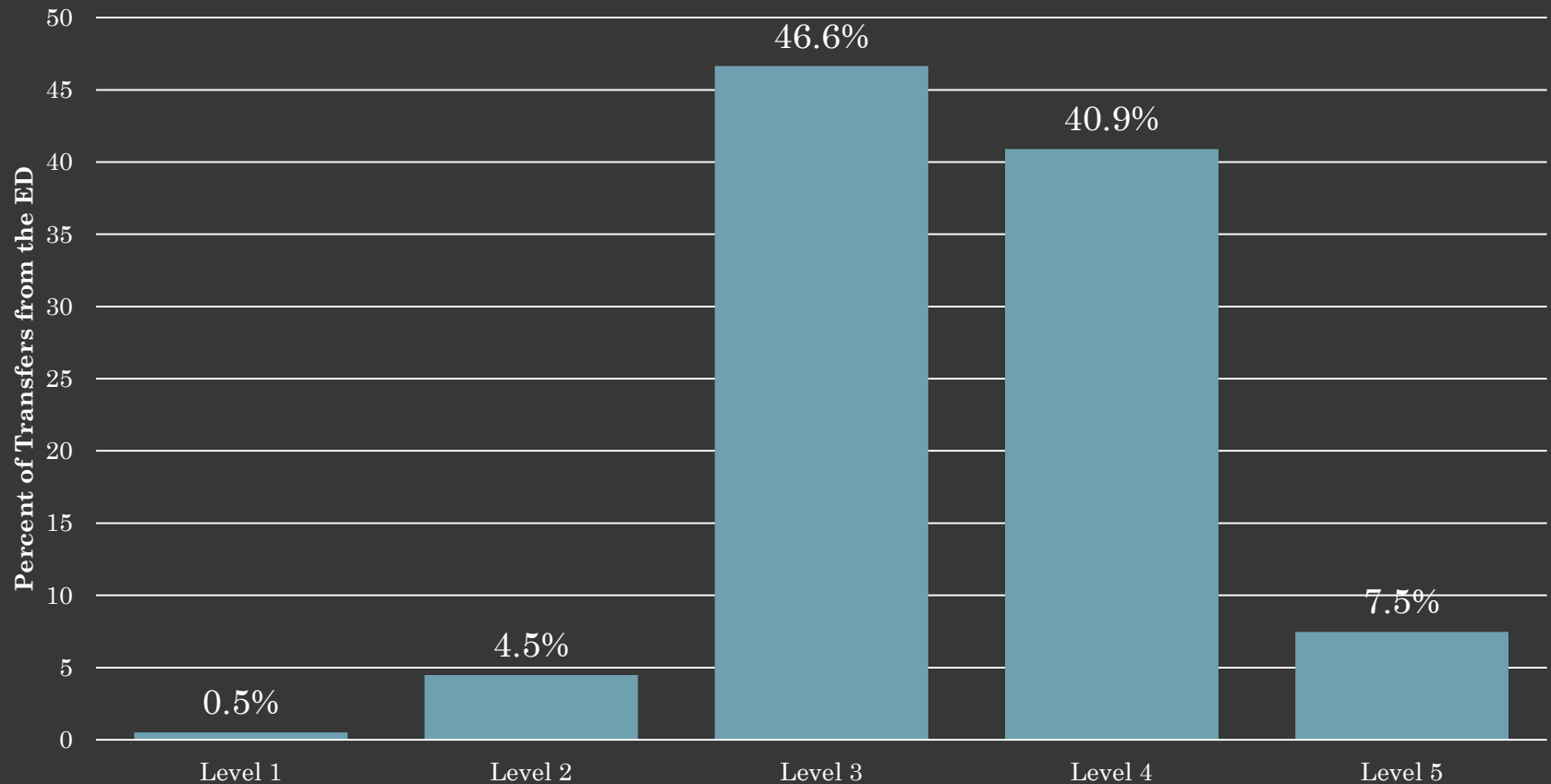
The Central and West Regions Currently Have the Longest Median ED Length of Stays for Transfer Patients

(Department of Health criteria and transfer patients only)

Levels 3 and 4 have the highest percentage of ED transfers in Washington

(2009 – 2013, Department of Health criteria, ED transfers)

Acute Care Transfers From the ED by Level of Trauma Service, 2011-2013

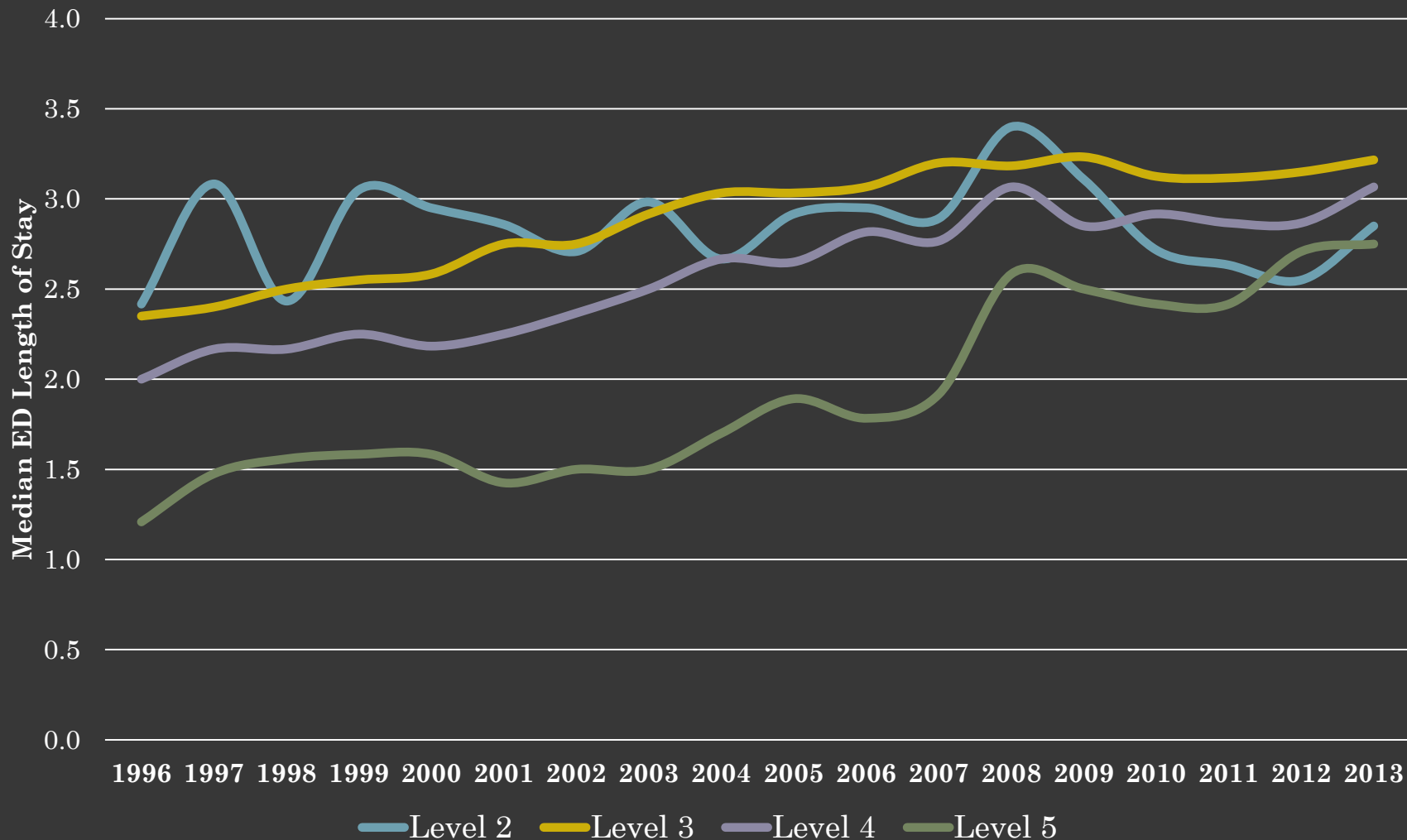


ED length of stay of transfer patients by EMS and trauma regions

(2009 – 2013, Department of Health criteria, ED transfers)

	Median (hours)	Mean (hours)	Standard Deviation (hours)	Minimum (hours)	Maximum (hours)
Level 2	2.7	3.1	2.0	0.2	24.6
Level 3	3.2	3.5	1.8	0.0	40.1
Level 4	2.9	3.2	1.7	0.0	25.7
Level 5	2.7	3.1	2.3	0.0	35.0
State	3.0	3.3	1.8	0.0	40.1

Median ED length of stay for transfer patients is the longest in Level 3s, and Level 3s have the most ED transfers in the state.

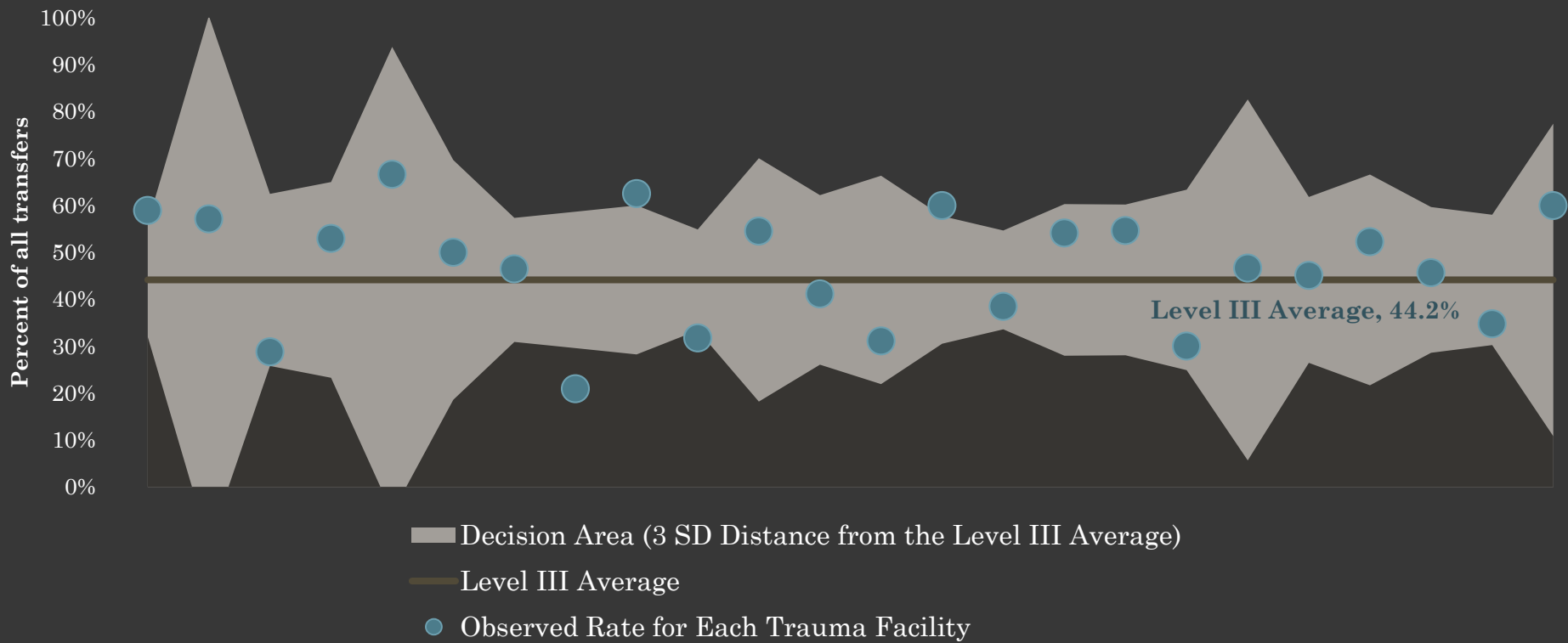


During 1996-2013, median ED length of stay increased in levels 3, 4, and 5 while it remained stable in the level 2 services
 (Department of health criteria and transfer patients only)

ED Length of Stay of Transfer Patients, Level IIIs

The Percentage of WTR Patients Who Stayed in the ED Less Than Three Hours Before a Transfer

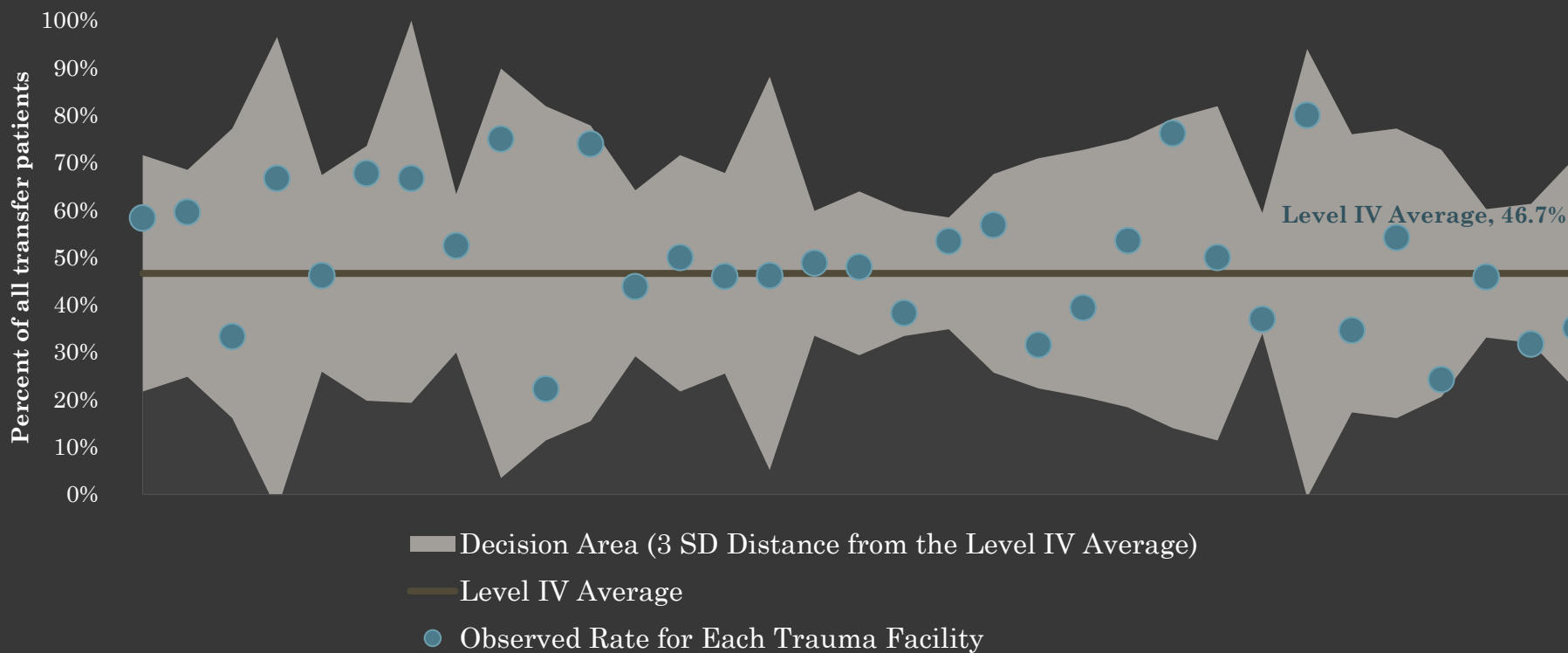
(WTR inclusion criteria, excluding isolated hip fractures for age 65+, facility level III, CY 2013, and transfer patients only)



ED Length of Stay of Transfer Patients, Level IVs

The Percentage of WTR Patients Who Stayed in the ED Less Than Three Hours Before a Transfer

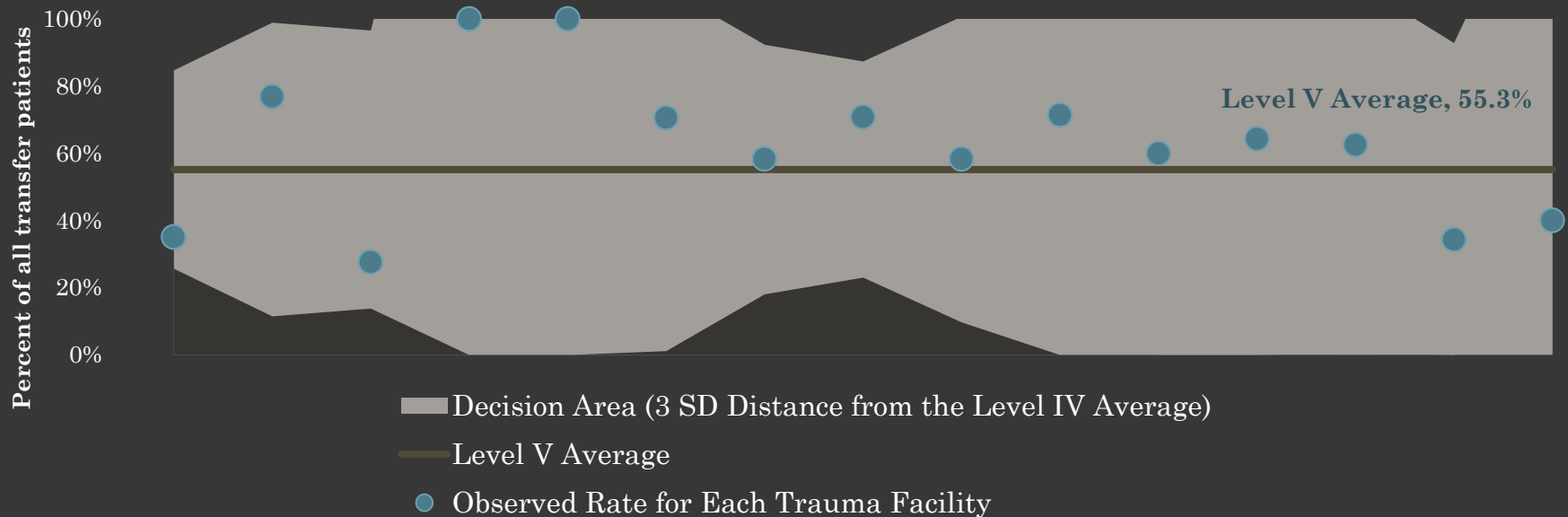
(WTR inclusion criteria, facility level IV, CY 2013, and transfer patients only)



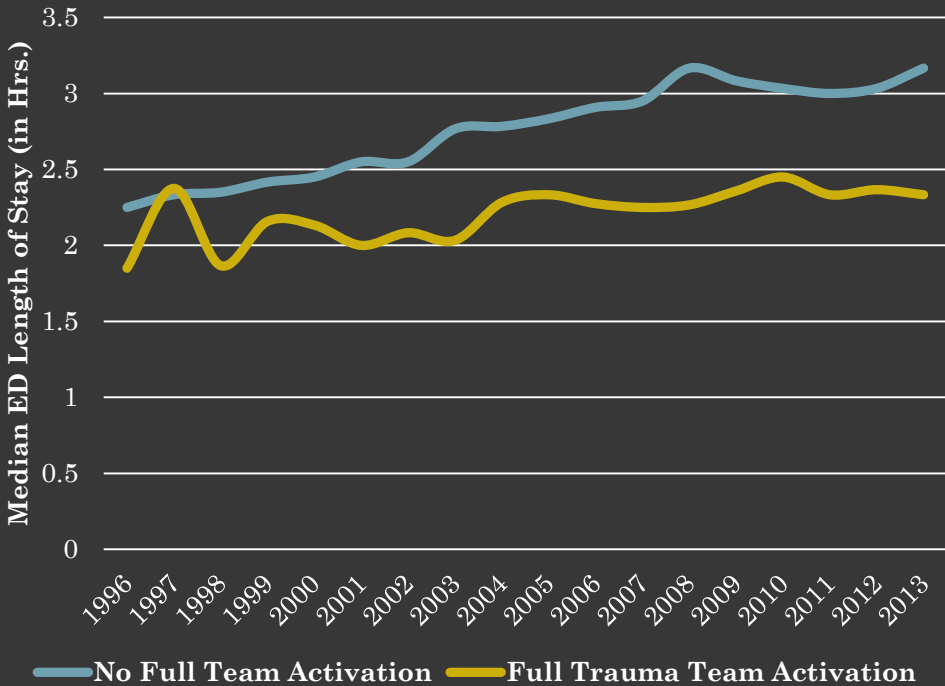
ED Length of Stay of Transfer Patients, Level Vs

The Percentage of WTR Patients Who Stayed in the ED Less Than Three Hours Before a Transfer

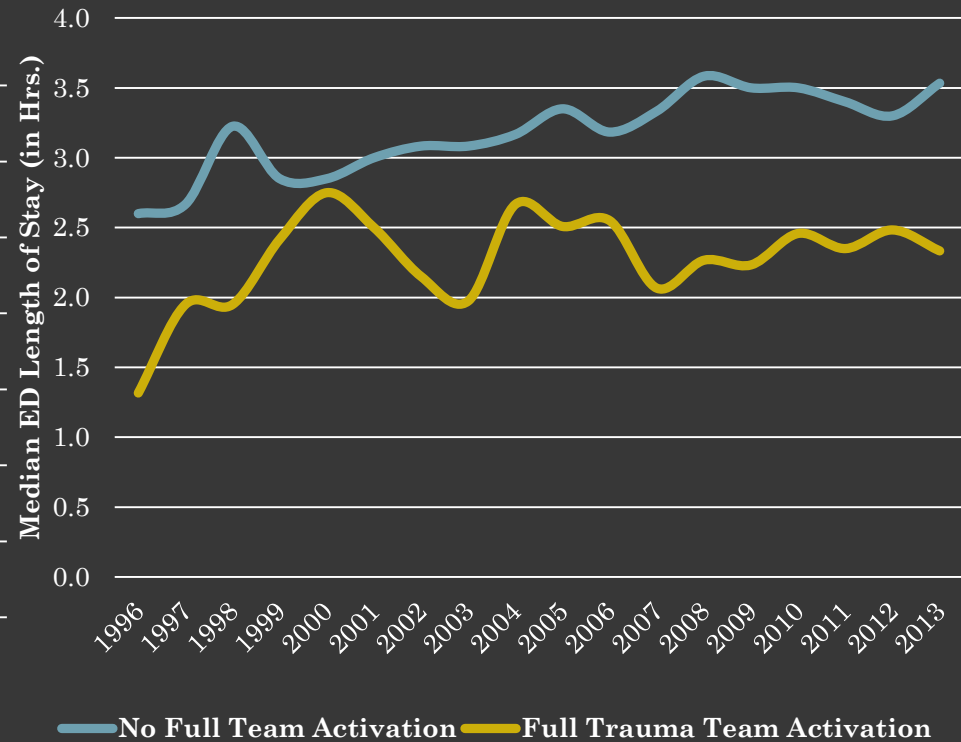
(WTR inclusion criteria, facility level V, 2013, and transfer patients only)



All Trauma



Ages 55-plus

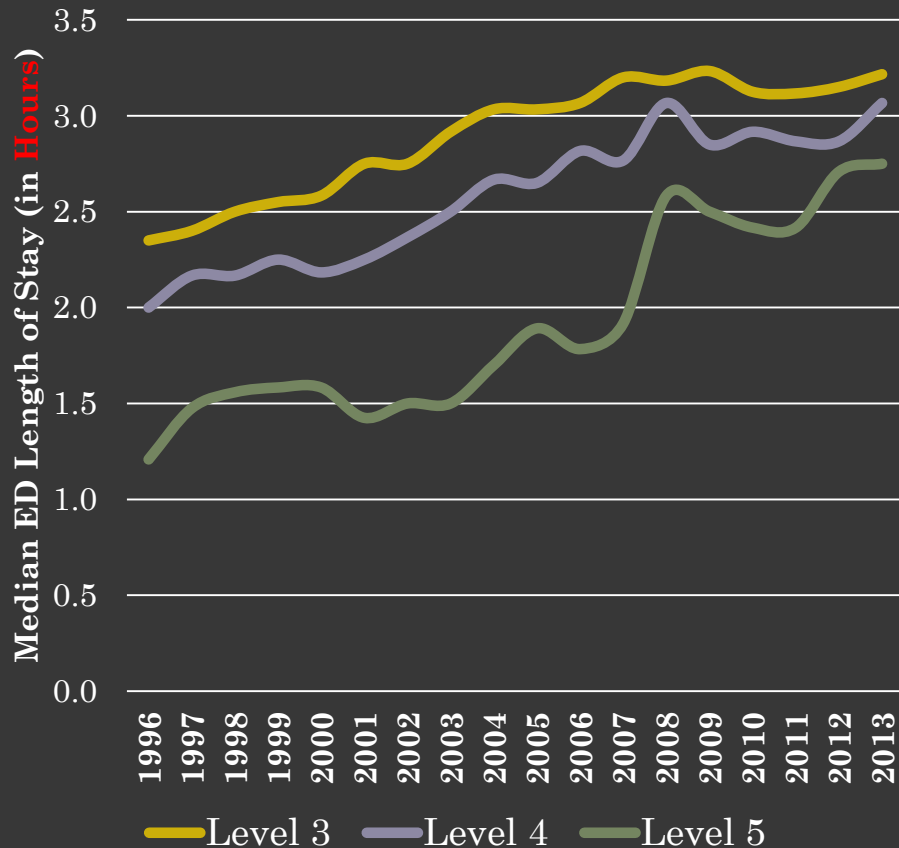


The patients who receive full trauma team activations tend to have shorter ED length of stay regardless of age
 (Department of Health criteria and transfer patients only)

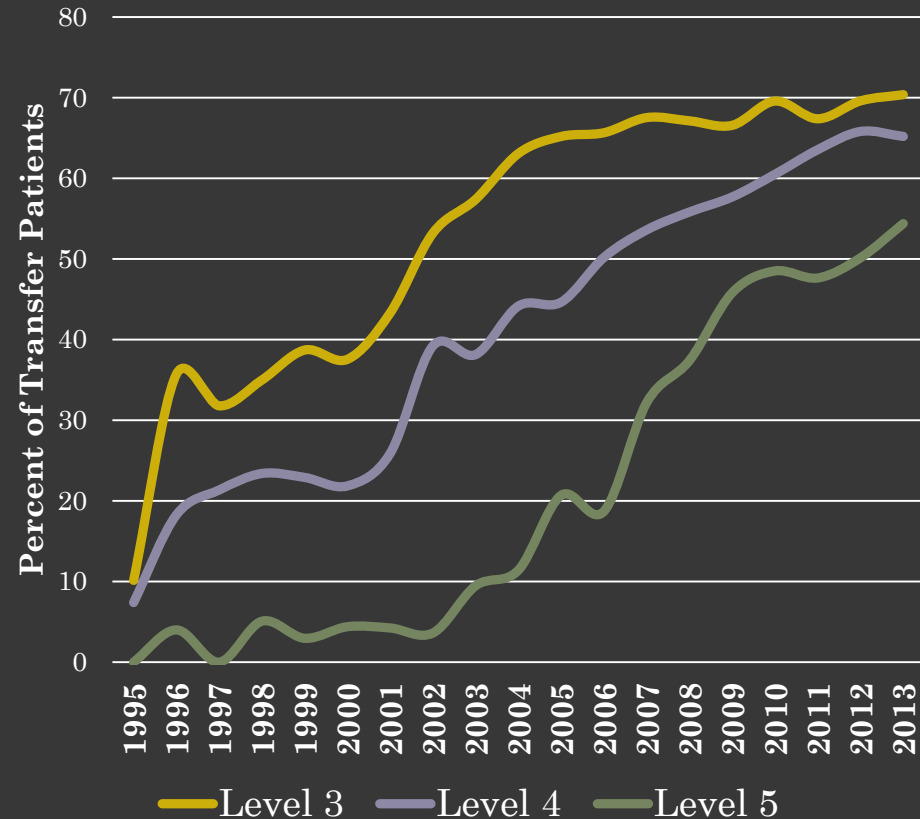
After studying several factors, we noticed a possible correlation between CT use and ED length of stay for transfer patients in levels 3, 4, and 5

(Department of Health criteria and transfer patients only)

Median ED Length of Stay by the Level of Designation Level



Transfer Patients Receiving CT Scans Before Transfer



Who is more at risk for longer ED length of stay prior to a transfer to higher level?

- **Study period:** 2000-2013
- **Data source:** Washington Trauma Registry
- **Patient inclusion criteria:** Adult (ages 15-plus) patients who are transferred out.
- **Multiple linear regression analysis**
 - **Dependent variable:** ED LOS
 - **Independent variables:** Charlson Comorbidity Index, Age, Heart Rate, ED Admit Day of Week, ISS, Lowest Systolic BP in the ED, EMS and Trauma Region, Trauma Response, Serious Head Injury, Mechanism of Injury, Intubation in the ED, CT Scan Done, MRI Done, Blood Products Given in the ED, Fluid Resuscitation in the ED, Baseline Blood Work in the ED, and X-Ray Done in the ED.

SELECTED RESULTS

ED Length of Stay	Beta Coefficients	Std. Err.	t	P>t	95% Conf. Interval	
Full Trauma Response	-60.19	22.43	-2.68	0.01	-104.151	-16.2296
Modified Trauma Response	-41.41	14.14	-2.93	0.00	-69.1234	-13.7046
Falls	55.42	26.02	2.13	0.03	4.42	106.43
Motor Vehicle Related Injuries	73.93	26.04	2.84	0.01	22.90	124.96
CT Scan	34.47	13.39	2.58	0.01	8.23	60.70

IN SUM:

- Since 1996, median ED LOS of transfer patients is on the rise in all:
 - ISS groups.
 - Mechanism of injury – especially falls and motor vehicle-related injuries having the longest median ED stays.
 - Age groups – especially the elderly fall patients having the longest median ED stays before a transfer.
- We found that the greatest increase in median LOS of transfer patients occurred in the west and central regions, and in the level 3 and 4 trauma services.
- Increased use of CT scans and other diagnostics before a patient transfer to a higher level of trauma service appear to be a factor negatively affecting ED LOS of transfer patients.



Thank you!

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