

ED Transfers from Trauma Facilities to Non-Trauma Facilities: A preliminary look at Washington Trauma Registry (WTR) data

June 2014

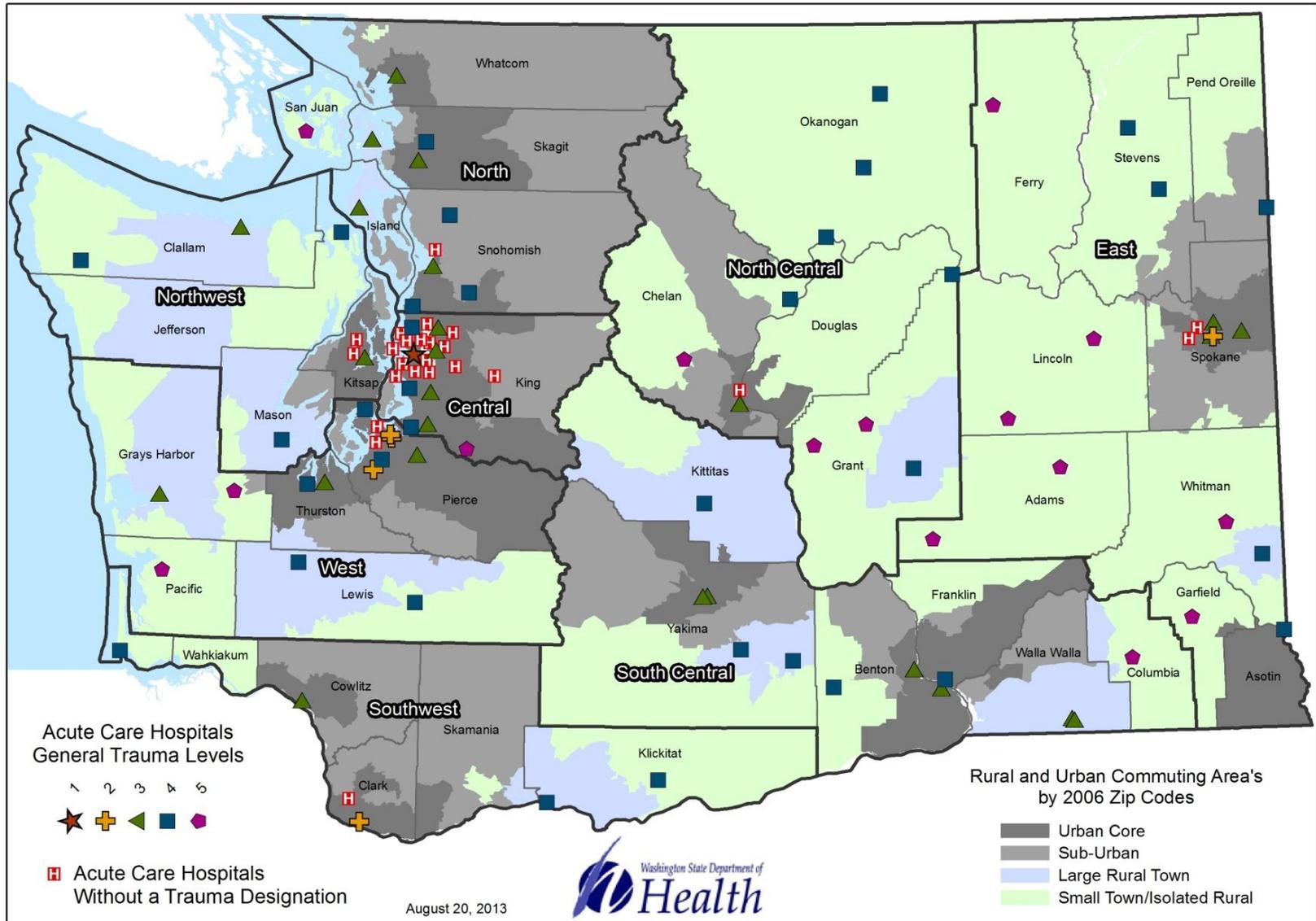


"HMMM... SO YOU THINK YOU MAY
HAVE BROKEN YOUR FOOT."

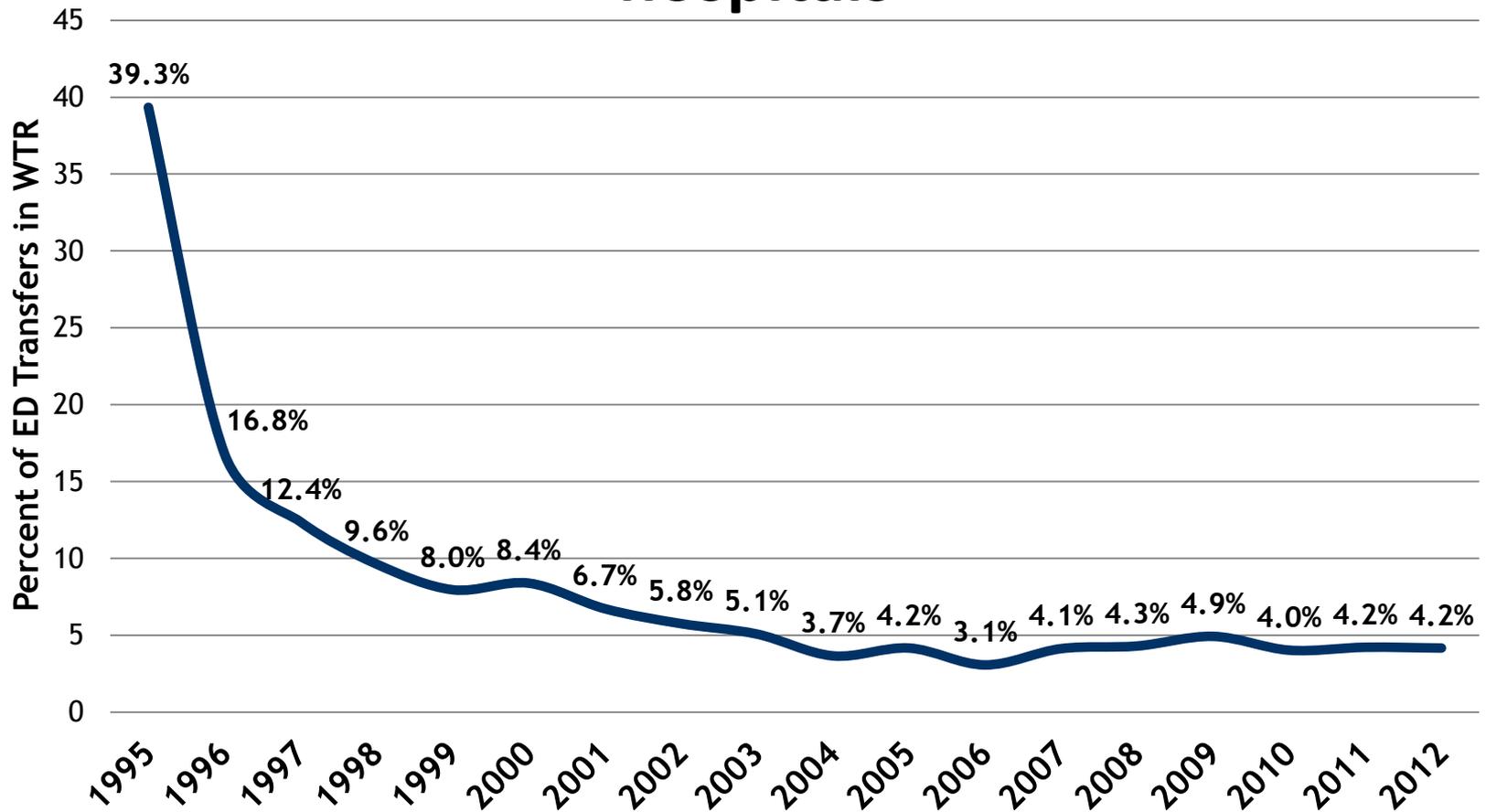
Purpose

- To determine whether adult WTR patients ages 15 and older are transferred from the EDs of trauma hospitals to non-trauma hospitals.
- If transferred, determine:
 - Who these patients are
 - Types of injuries they sustain
 - Locations/regions where these transfers are initiated
 - Non-trauma hospitals that receive transfers from trauma hospitals
 - The role of existing or newly emerging affiliations and partnerships within larger hospital systems

Locations of trauma and non-trauma acute care hospitals, 2013

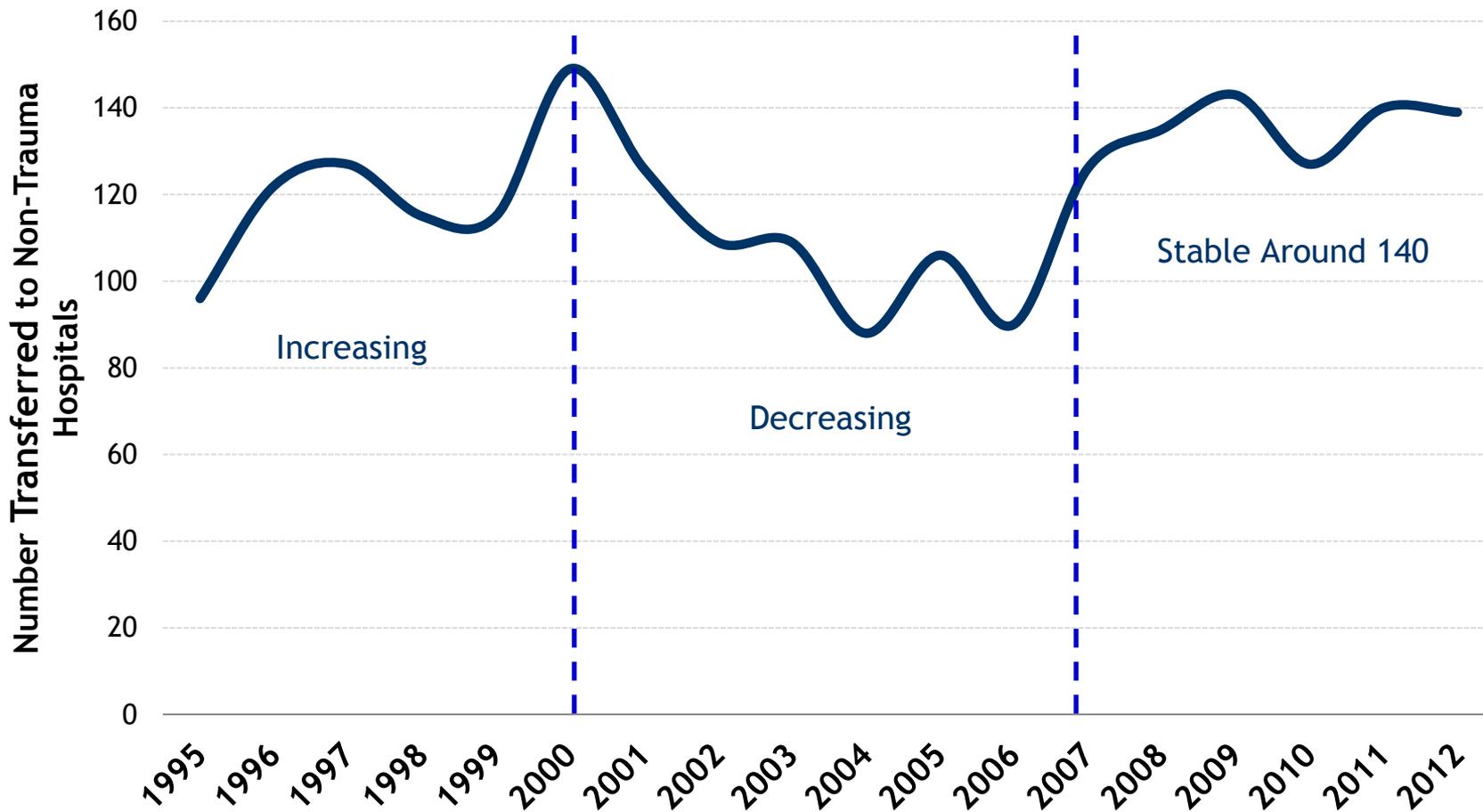


Percent of ED transfers of adult trauma patients (age 15+) from trauma hospitals to non-trauma hospitals



- Decrease of 35 percentage points from 1995 to 2012

Number of ED transfers of adult patients ages 15+ from trauma hospitals to non-trauma hospitals by year



Affiliations among Washington's acute care hospitals, as of March 24, 2014

Providence/Swedish

Providence Centralia
Providence Holy Family
Providence Mount Carmel
Providence Everett
Providence Sacred Heart
Providence St. Joseph's
Providence St. Mary
Providence St. Peter
Swedish Edmonds
Swedish Ballard*
Swedish Cherry Hill*
Swedish First Hill*
Swedish Issaquah*

Confluence

Wenatchee Valley*

Group Health

Virginia Mason †
Group Health Seattle †

Peacehealth

Peacehealth Peace Island
Peacehealth St. John
Peacehealth St. Joseph
Peacehealth Southwest
United General † (30 yr contract)
Ocean Beach † (management contract)

The UW

Harborview Med Center
Northwest Hospital
Valley Medical Center
Seattle Cancer Care Alliance*
The UW Med Center*
Seattle Children's †

Community Health Systems

Deaconess Hospital
Valley Hospital
Toppenish Comm. Hospital
Yakima Regional

Franciscan

Harrison Med Center
Highline Med Center
St. Anthony
St. Clare
St. Elizabeth
St. Francis
St. Joseph
Regional Hospital For Respiratory and Complex Care* (pending)

MultiCare Health Systems

Mary Bridge Children's
MultiCare Auburn
MultiCare Good Samaritan
Tacoma General
Allenmore Hospital*
MultiCare Covington*

* Non-trauma hospital
† Soft affiliation

Distribution of ED transfers of adult patients (age 15+) by receiving non-trauma hospital

	1995-2000		2001-2006		2007-2012	
Virginia Mason	129	17.8%	177	28.2%	227	28.0%
Group Health Seattle	101	14.0%	28	4.5%	60	7.4%
Group Health Eastside	118	16.3%	112	17.8%	50	6.2%
Swedish Medical Center (First Hill)	84	11.6%	96	15.3%	159	19.6%
Providence Seattle (Swedish Cherry Hill)	50	6.9%	11	1.8%	54	6.7%
University of Washington	120	16.6%	97	15.6%	77	9.5%
Seattle Children's	7	1.0%	16	2.6%	68	8.4%
Unknown	48	6.6%	17	2.7%	53	6.5%
VA Seattle	31	4.3%	45	7.2%	40	4.9%
US Naval Bremerton	4	0.6%	7	1.1%	5	0.6%
Eastern State Hospital	3	0.4%	1	0.2%	4	0.5%
VA Tacoma	3	0.4%	-	0.0%	3	0.4%
Swedish Med Center (Issaquah)	-	0.0%	-	0.0%	2	0.3%
Shriners Hospital Spokane	-	0.0%	-	0.0%	1	0.1%
Fifth Avenue Med Center	-	0.0%	-	0.0%	1	0.1%
VA Spokane	2	0.3%	1	0.2%	1	0.1%
Puget Sound Hospital	3	0.4%	-	0.0%	-	0.0%
Allenmore Tacoma	11	1.5%	5	0.8%	-	0.0%
Western State Hospital	3	0.4%	2	0.2%	-	0.0%
US Naval Whidbey	7	1.0%	13	2.1%	-	0.0%
Total	724	100%	628	100%	810	100%

ED transfers of adult patients ages 15+ to non-trauma hospitals by EMS and trauma region, 1995-2000

	Central N(%)	North N(%)	NC N(%)	NW N(%)	SC N(%)	SW N(%)	East N(%)	West N(%)	Total N(%)
Swedish	63 (11)	7 (14)	2 (6)	7 (22)	2 (18)	0 (0)	2 (11)	1 (4)	84 (12)
Providence	43 (8)	2 (4)	0 (0)	2 (6)	1 (8)	0 (0)	0 (0)	2 (8)	50 (7)
Virginia Mason	104 (19)	9 (18)	1 (3)	10 (31)	2 (18)	0 (0)	0 (0)	3 (13)	129 (18)
Seattle Children's	6 (1)	0 (0)	0 (0)	0 (0)	1 (9)	0 (0)	0 (0)	0 (0)	7 (1)
Group Health Central	100 (18)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (4)	120 (17)
Puget Sound Hospital	2 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (4)	3 (0)
University of WA	108 (19)	4 (8)	2 (6)	2 (6)	1 (9)	0 (0)	3 (17)	0(0)	120 (17)
Allenmore Tacoma	2 (0)	1 (2)	1 (3)	1 (3)	0 (0)	0 (0)	0 (0)	6 (25)	11 (2)
Group Health Eastside	100 (18)	14 (29)	0 (0)	2 (6)	0 (0)	0 (0)	0 (0)	2 (8)	118 (16)
Western State Hospital	1 (0)	0 (0)	0 (0)	1 (3)	0 (0)	0 (0)	0 (0)	1 (4)	3 (0)
Eastern State Hospital	0 (0)	0 (0)	1 (3)	0 (0)	0 (0)	0 (0)	2 (11)	0 (0)	3 (0)
US Naval Whidbey	0 (0)	7 (14)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	7 (1)
US Naval Bremerton	0 (0)	1 (2)	0 (0)	3 (9)	0 (0)	0 (0)	0 (0)	0 (0)	4 (1)
VA Tacoma	2 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (4)	3 (0)
VA Seattle	18 (3)	3 (6)	2 (6)	3 (9)	0 (0)	0 (0)	0 (0)	5 (21)	31 (4)
VA Spokane	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (11)	0 (0)	2 (0)
Unknown	5 (1)	1 (2)	23 (72)	1 (3)	4 (36)	4 (100)	9 (50)	1 (4)	48 (7)
Total	554 (100)	49 (100)	32 (100)	32 (100)	11 (100)	4 (100)	18 (100)	24 (100)	724 (100)

All ED transfers of adult patients ages 15 and older to non-trauma hospitals by EMS and trauma region, 2007-2012

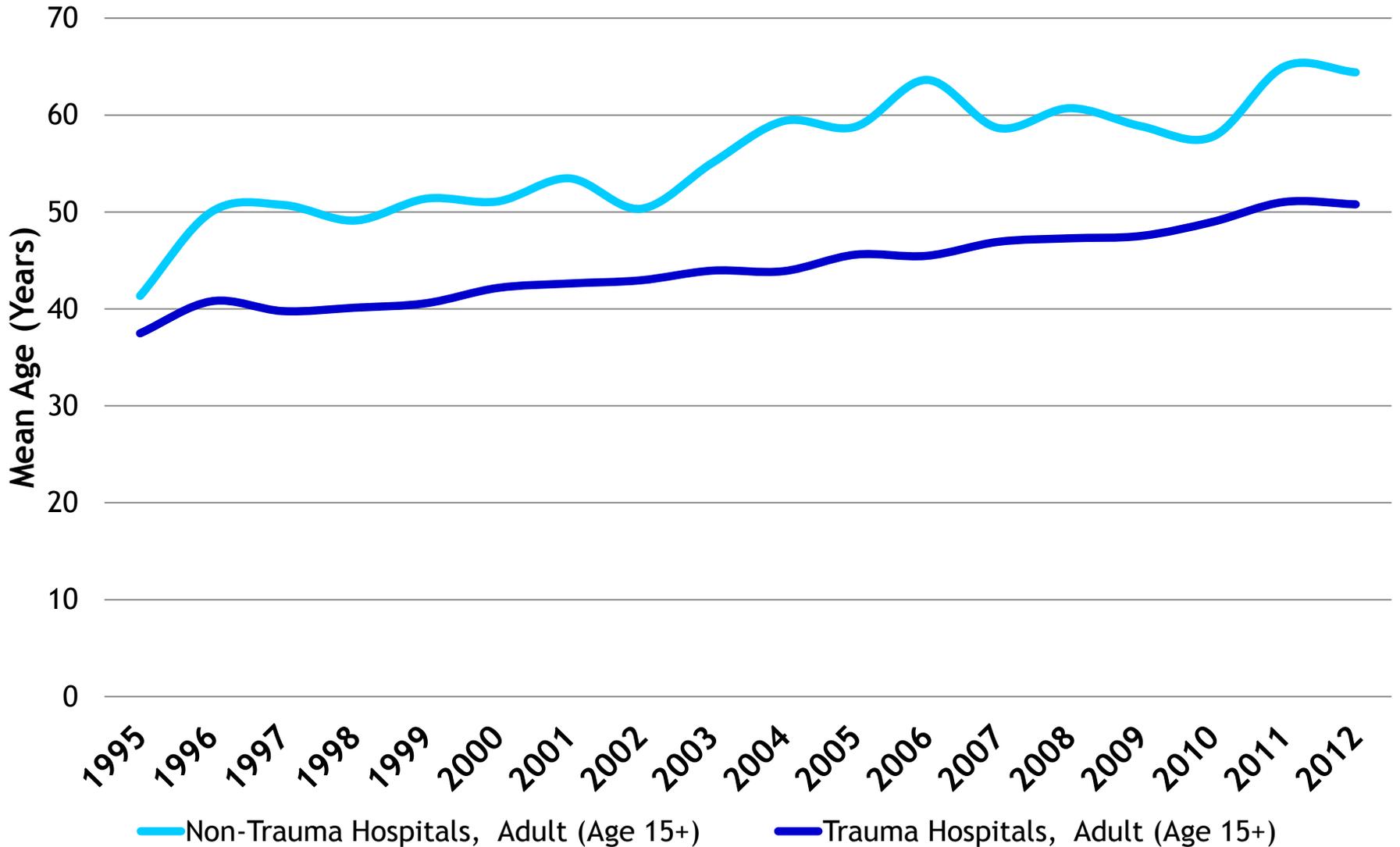
	Central N(%)	North N(%)	NC N(%)	NW N(%)	SC N(%)	SW N(%)	East N(%)	West N(%)	Total N(%)
Swedish	62 (13)	32 (32)	4 (21)	8 (19)	11 (52)	0 (0)	0 (0)	12 (27)	161 (20)
Providence	6 (1)	42(21)	1 (5)	2 (5)	1 (5)	0 (0)	0 (0)	2 (5)	54 (7)
Virginia Mason	183 (38)	8(8)	1 (5)	14 (33)	1 (5)	0 (0)	1 (25)	12 (27)	227 (28)
Seattle Children's	36 (8)	28 (14)	0 (0)	2 (5)	1 (5)	0 (0)	0 (0)	1 (2)	68 (8)
Group Health Central	34 (7)	25 (13)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (2)	60 (7)
Shriners Spokane	0 (0)	0 (0)	1 (5)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)
University of WA	60 (13)	7 (4)	1 (5)	2 (5)	2 (10)	0 (0)	0 (0)	5 (11)	77 (9)
Fifth Avenue Med Center	0 (0)	0 (0)	0 (0)	0 (0)	1 (5)	0 (0)	0 (0)	0 (0)	1 (0)
Group Health Eastside	36 (8)	12 (6)	0 (0)	0 (0)	1 (5)	0 (0)	0 (0)	1 (2)	50 (6)
Eastern State Hospital	0 (0)	0 (0)	4 (21)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	4 (0)
US Naval Bremerton	0 (0)	0 (0)	0 (0)	5 (12)	0 (0)	0 (0)	0 (0)	0 (0)	5 (1)
VA Tacoma	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (5)	3 (0)
VA Seattle	29 (6)	4 (2)	0 (0)	2 (5)	1 (5)	0 (0)	0 (0)	4 (9)	40 (5)
VA Spokane	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (25)	0 (0)	1 (0)
Unknown	29 (6)	2 (1)	7 (37)	7 (17)	2 (10)	4 (100)	2 (40)	4 (9)	57 (7)
Total	477 (100)	200 (100)	19 (100)	42 (100)	21 (100)	4 (100)	4 (100)	44 (100)	811 (100)

Patient Demographics

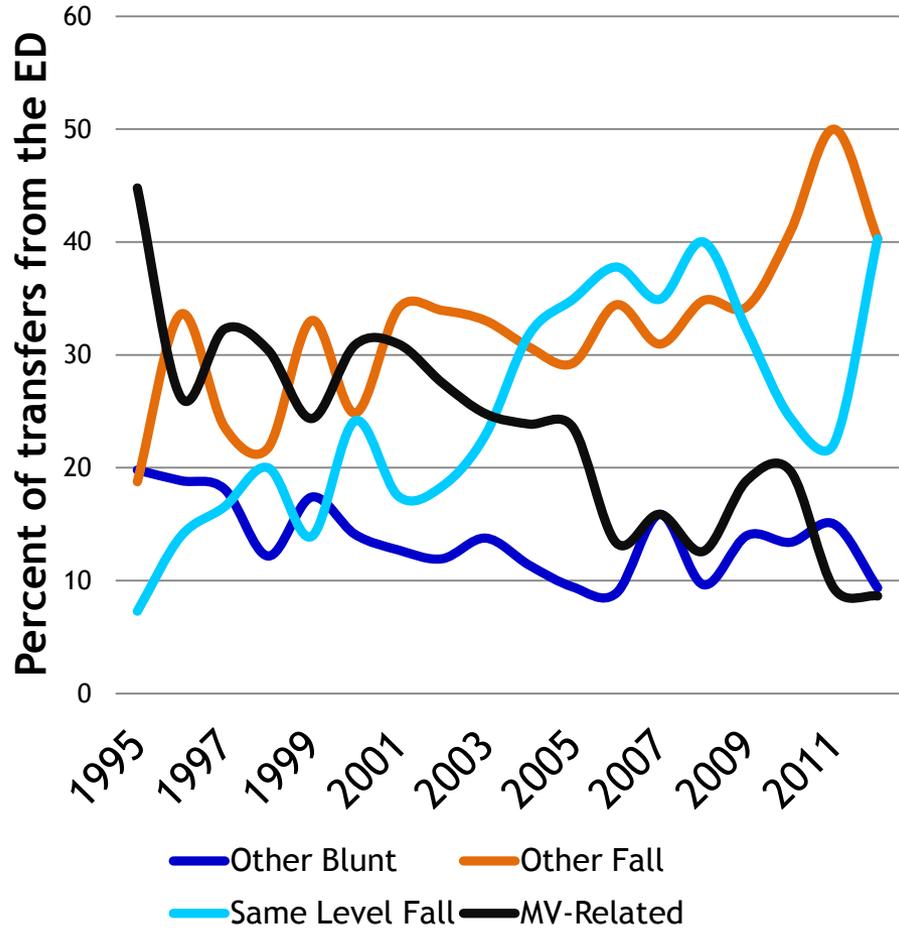


"Turns out that whole 'when God closes a door he opens a window' thing isn't so helpful on the fourteenth floor."

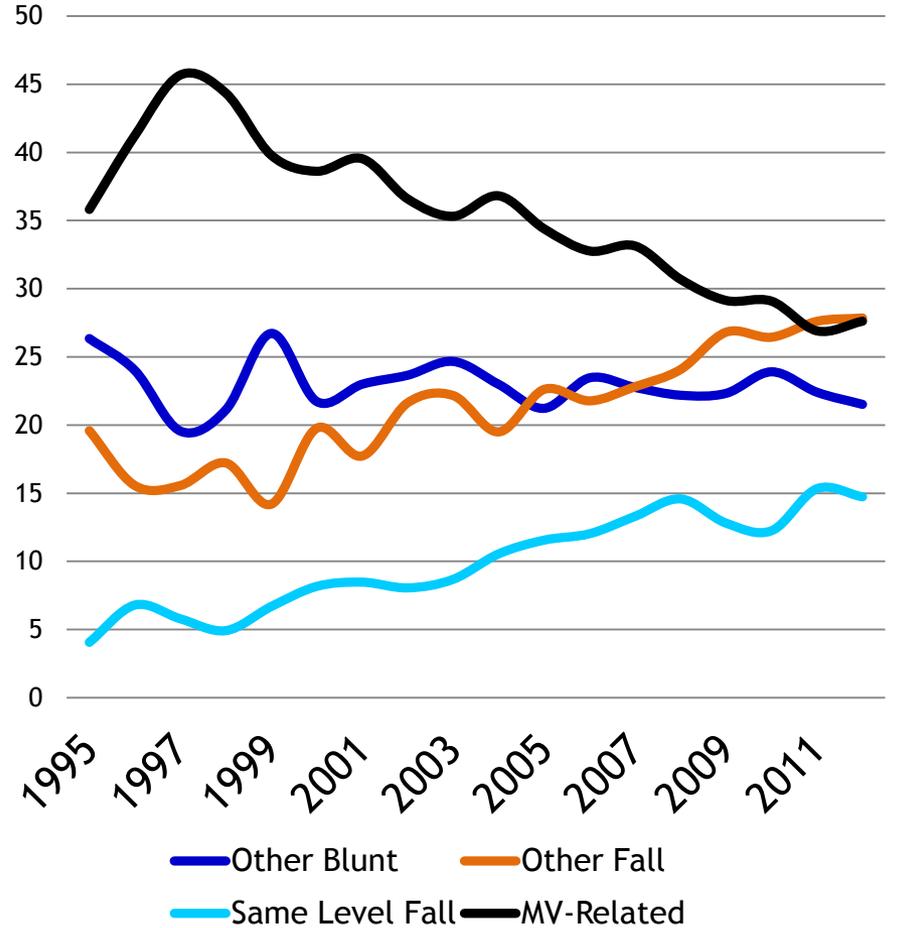
Mean age of ED transfers by trauma designation of receiving hospital, age 15+



ED Transfers to Non-trauma Hospitals, Age 15+

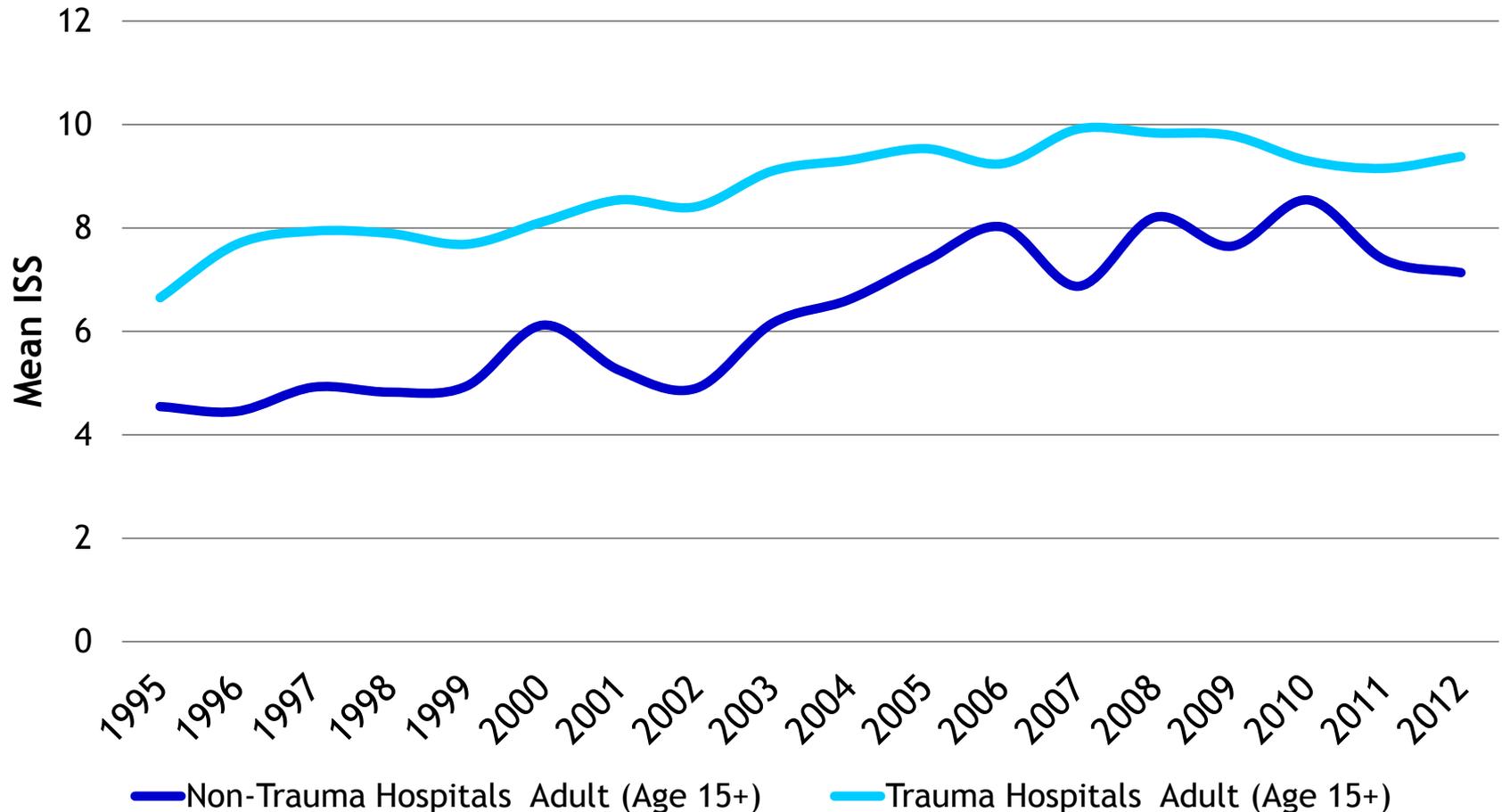


ED Transfers to Trauma Hospitals, Age 15+



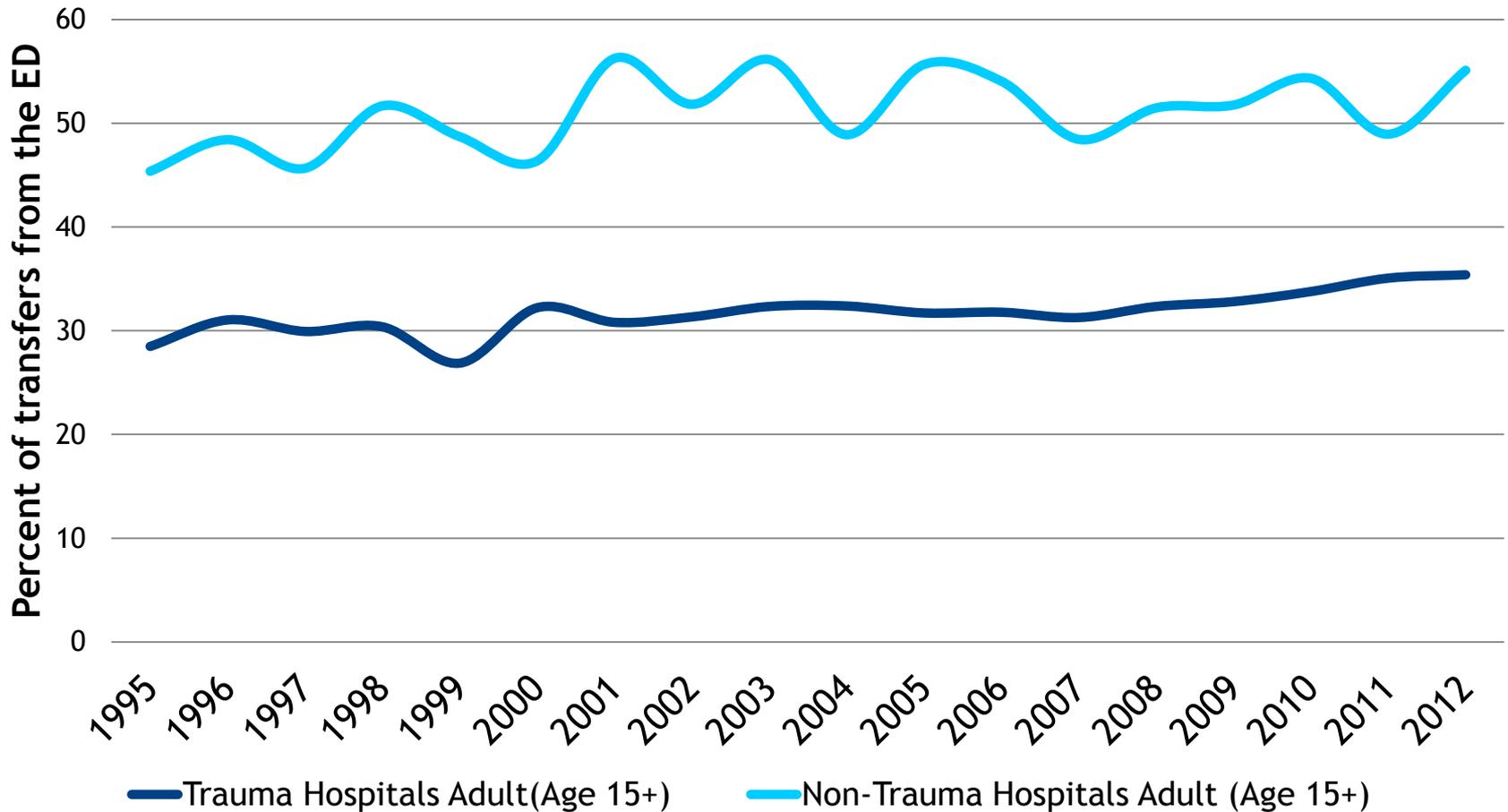
- Patients transferred to non-trauma hospitals are more likely to sustain falls than patients transferred to trauma hospitals

Mean ISS of ED transfers by trauma designation of receiving hospital



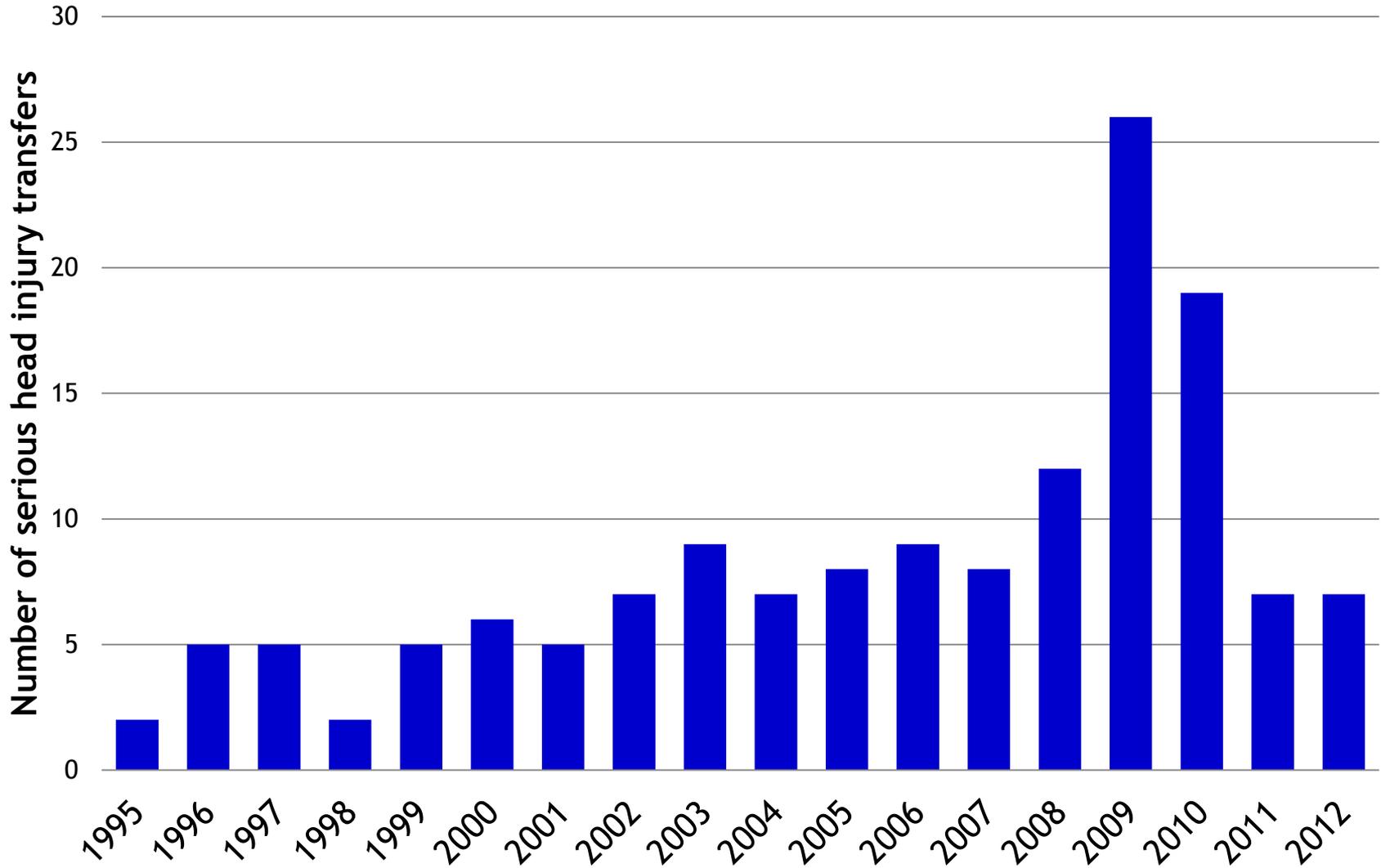
- Adult trauma patients transferred to non-trauma hospitals from EDs of trauma hospitals tend to have lower injury severity scores (ISS) than patients transferred to trauma hospitals

The percentage of females transferred out by trauma designation of receiving hospital



- Adult trauma patients who are transferred to non-trauma hospitals from the EDs of trauma hospitals are more likely to be females

Number of ED transfers to non-trauma hospitals with max head Abbreviated Injury Scale (AIS) of 3+, adults age 15+



Injury severity by receiving non-trauma hospital, age 15+, 2007-2012

	ISS 16-75		Head AIS ≥3	
	N	Hospital Specific %	N	Hospital Specific %
Swedish Medical Center	34	21	33	21
Providence Seattle (Swedish Cherry Hill)	6	11	6	11
Virginia Mason	36	16	30	13
VA Seattle	3	8	1	3
Group Health Eastside	3	6	1	2
Seattle Children's	1	2	1	1
University of Washington	3	4	1	1
Group Health Central	1	2	0	0
Shriners Spokane	0	0	0	0
Fifth Avenue Med Center	0	0	0	0
Eastern State Hospital	0	0	0	0
US Naval Bremerton	0	0	0	0
VA Tacoma	0	0	0	0
VA Spokane	0	0	0	0

Injury severity by receiving non-trauma hospital, age 15+, 1995-2000

	ISS 16-75		Head AIS ≥3	
	N	Hospital Specific %	N	Hospital Specific %
Swedish Medical Center	4	4.8	3	3.6
Virginia Mason	10	7.8	9	7.0
Providence (Swedish Cherry Hill)	3	6.0	2	4.0
VA Seattle	3	9.7	2	6.5
Group Health Eastside	5	4.2	3	2.5
University of Washington	4	3.3	1	0.8
Group Health Central	2	2.0	1	1.0
US Naval Whidbey	1	14.3	0	0
Allenmore, Tacoma	0	0	0	0
Eastern State Hospital	0	0	0	0
Western State Hospital	0	0	0	0
US Naval Bremerton	0	0	0	0
VA Tacoma	0	0	0	0
VA Spokane	0	0	0	0

Trauma hospitals that transferred head injury (Head AIS 3+) patients from their EDs to Swedish (First Hill) and Providence Seattle (Swedish Cherry Hill), age 15+, 2007-2012

	Central	North	NW	SC	West	Total
Level III, affiliated with another system	5					5
Level III, no known affiliation	3					3
Level III, no known affiliation	2					2
Level IV, affiliated with another system	1					1
Level IV, affiliated with another system	1					1
Level IV, affiliated with another system	1					1
<i>Level III, affiliated</i>		1				1
<i>Level IV, affiliated</i>		13				13
Level IV, no known affiliation		1				1
Level III, no known affiliation			1			1
Level III, affiliated with another system			1			1
Level IV, no known affiliation				4		4
Level IV, no known affiliation				1		1
Level III, affiliated with another system					4	4
Total	13	15	2	5	4	39

Let's put these 13 patients under the microscope.



Hospital discharge dispositions of the 13 head injury patients transferred to Swedish from affiliated hospital in the northern region

Gender	Age	Final Hospital Discharge Disposition From CHARS	Injury Severity Score
Female	62	Transfer to psychiatric hospital or psychiatric distinct part unit of a hospital	16
Male	81	Skilled nursing facility	16
Female	79	Skilled nursing facility	17
Male	81	Skilled nursing facility	16
Female	85	Died	16
Female	93	Died	17
Female	91	Died	17
Male	49	Left against medical advice	16
Female	73	Home	16
Female	72	Home	20
Female	76	Home	16
Male	37	Home	16
Female	87	Home with Assistance	16

Trauma hospitals that transferred head injury (Head AIS 3+) patients from their EDs to Virginia Mason, age 15+, 2007-2012

	Central	North	NW	West	Total	
Affiliated with another system	2	← 1 self-pay with charity care, 1 HMO			2	
Affiliated with another system	2	← 1 Medicare, 1 HMO			2	
Affiliated with another system	3	← 1 Medicare, 1 HMO, 1 Other Government Sponsored			3	
No known affiliation	5	← 3 Commercial, 1 Self-pay, 2 HMO			5	
Affiliated with another system	4	← 1 Labor & Industries, 1 Medicare, 1 HMO, 1 Unknown			4	
No known affiliation	1	← 1 HMO			1	
Affiliated with another system	2	← 1 Commercial, 1 Unknown			2	
Affiliated with another system	2	← 1 Medicare, 1 HMO			2	
Affiliated with another system		1	← 1 Medicare		1	
Affiliated with another system				4	← 2 HMO, 2 Medicare w. HMO second payer	4
No known affiliation				2	← 2 HMO	2
Affiliated with another system				2	HMO →	2
Total	21	1		6	2	30

More than half of serious (AIS 3+) head injury patients transferred to Virginia Mason from trauma designated hospitals belong to an HMO (most likely Group Health). When serious trauma patients are transferred to non-trauma designated hospitals, financial affiliations between sending trauma and receiving non-trauma hospitals might be as significant as affiliations by ownership

Discharge disposition of ED transfers (age 15+) with head injuries (AIS 3+) that received definitive care in Swedish or Virginia Mason vs. trauma hospitals, 2007-2012

	Non-Trauma, Hospital Discharge Data (CHARS) N(%)	Trauma, WA Trauma Registry (WTR) N(%)
Home	22 (32)	2000 (44)
Home with Assistance	5 (7)	155 (3)
Skilled Nursing Facility	24 (35)	933 (20)
Died	8 (12)	549 (12)
Rehab	4 (6)	686 (15)
Other	6 (9)	236 (5)
	69 (100)	4,559 (100)

Summary

- During 1995-2012: did not see a rise in the percentage of transfers (age 15 and older) from trauma hospitals to non-trauma hospitals
- Transfers from trauma hospitals to non-trauma hospitals are no longer a dominantly central region issue
 - During 2007-2012, there was an increase in the number of patients transferred to non-trauma hospitals in the north region
- More importantly, a trauma designated hospital in the north region was sending its serious head trauma (head AIS 3+) patients to a non-trauma hospital in the central region with which it is affiliated
- As Washington's hospitals continue to consolidate among themselves, it is possible that we might see an increase in the number of transfers to non-trauma hospitals in other regions

Summary cont...



- In general, most transfers to non-trauma hospitals are older females with falls, and they tend to have relatively low injury severity scores
 - It is possible that these transfers might be, in some cases, requested by the patients themselves
- It is concerning to see that some patients with serious injuries or head injuries were transferred to the hospitals outside of the trauma system
 - These are the patients who can benefit from the resources and expertise available in the trauma system
- We did not find any significant differences in the case-fatality of head injury patients transferred to Swedish or Virginia Mason, and to trauma hospitals from 2007-12
 - This finding may be deceptive since we could not risk-adjust the results due to small numbers.