

THIRTY YEARS OF TRAUMA: THE EVOLUTION OF THE TRAUMA PATIENT IN THE SAN DIEGO COUNTY TRAUMA SYSTEM

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PRESENTER DISCLOSURES



Joshua Smith

The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

No relationships to disclose

BRIEF HISTORY OF THE SAN DIEGO COUNTY TRAUMA SYSTEM



Date	Trauma System Related Activity
1983	Trauma Advisory Task Force – San Diego County Board of Supervisors
August 1, 1984	Major trauma victims in San Diego County began bypassing community hospitals in favor of designated trauma centers.
1993	Trauma System treated its 50,000 th patient
1999	Trauma System treated its 100,000th patient
2002	Comprehensive review of the trauma system: Single Registry
2006	First Hospital makes the switch to the current registry
2009	Trauma System treated its 200,000 th patient
2010	Last Hospital makes the switch to the current registry
2014	Trauma System turns 30 years old, treating its 250,000 th patient

THE SAN DIEGO COUNTY TRAUMA SYSTEM



Five Adult Trauma Centers

- 1. University of California, San Diego Medical Center (Level 1)
- 2. Scripps Mercy Hospital (Level 1)
- 3. Scripps Memorial Hospital (Level 2)
- 4. Palomar Medical Center (Level 2)
- 5. Sharp Memorial Hospital (Level 2)

One Pediatric Trauma Center (ages 14 and younger)

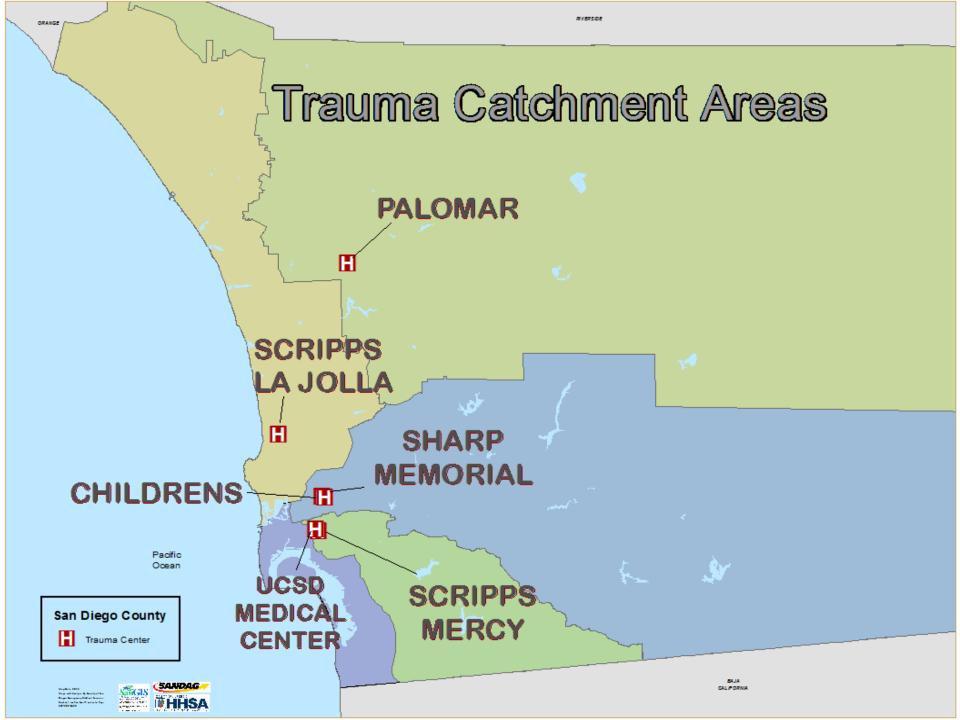
1. Rady Children's Hospital (Level 1)

SAN DIEGO COUNTY TRAUMA SYSTEM



With five adult trauma centers and one pediatric trauma center, how are trauma patients delivered to the most appropriate hospital?

- All pediatric trauma patients 14 and younger: Rady Children's Hospital
 - May involve helicopter transport or inter-facility transport from another hospital
- Adult trauma patients: Trauma Catchment System
 - Based on population distribution and transport times
 - Trauma patients may not request destination as other EMS patients are allowed
 - Trauma patients are not necessarily taken to nearest Trauma Center
 - Healthcare Insurance does not play an role in trauma transport



30 YEARS OF THE TRAUMA SYSTEM AND THE TRAUMA PATIENT



What changes have we seen in...

- > Trauma Volume?
- > Cause of Injury?
- > Trauma Outcome?

TRAUMA VOLUME



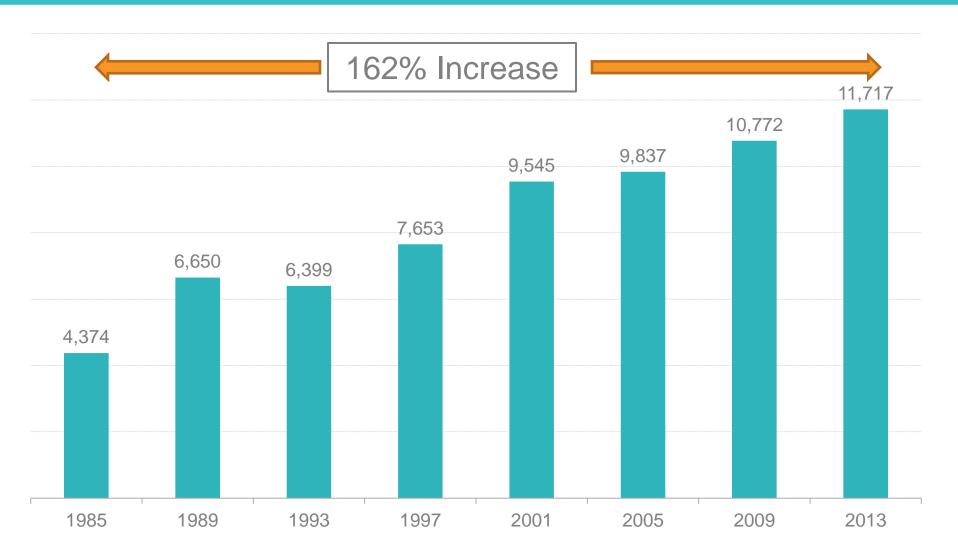
What are the potential external factors affecting **Trauma Volume**?

- 1. Increasing population
- 2. Higher percent of injuries diverted to trauma centers
 - Injured patients do better when they are sent to a trauma center
 (This may be considered and internal factor).

TOTAL PATIENTS TREATED OVER THE YEARS

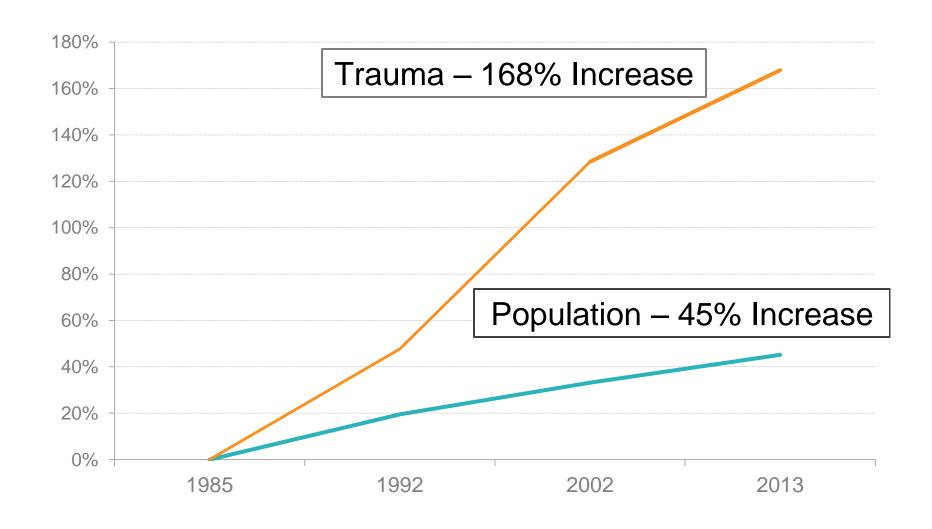






TRAUMA PATIENTS VS. GENERAL POPULATION





INCREASE IN TRAUMA VOLUME



How can an increase in *trauma volume* (potentially) affect the system?

- 1. Increased burden on the system
- 2. Increased need for staffing
- 3. Increased need for ambulance/EMS
- 4. Increased bypass
- 5. Poorer outcomes?

CAUSE OF INJURY



What are the potential external factors affecting cause of injury?

- Trauma-related legislation
 - Laws
 - Safety improvements
 - Technology

Aging population

TRAUMA-RELATED LEGISLATION



January 1986: Secondary seat belt law

July 1987: California Motorcyclist Safety Program implemented

1987: Bicycle helmets required for riders under 5 years

1989: Roberti-Roos Assault Weapons Control Act of 1989 (Semi-automatic assault weapons control)

January 1990: 0.08% blood alcohol concentration limit and administrative license suspension laws implemented

January 1992: motorcycle helmet law

January 1993: primary seat belt law

January 1994: Bicycle Helmet Law (riders under 18 years)

January 1994: Illegal for anyone to ride in back of a pickup on a public highway

January 1994: "Zero tolerance" alcohol law: illegal for anyone under 21 years to drive with BAC of 0.01% or greater

1994: Brady Handgun Violence Prevention Act (5-day waiting period, background check)

July 1998: Brady Jared Teen Driver Act: Graduated licensing system for under age 18

January 2002: Child safety restraints required until children reach 6 years or 60 lbs. (previously 4 years and 40 lbs.)

January 2002: Bicycle helmet law expanded to include non-motorized scooters, skateboards, roller skates, and in-line skates

January 2003: All handgun buyers required to obtain safety license

2004: Assault weapons registration requirements

2005: Ban on certain semiautomatic weapons

2005: Child safety booster seats recommended for children up to 80 lbs

October 2013: Restrictions on those with mental illnesses owning firearms

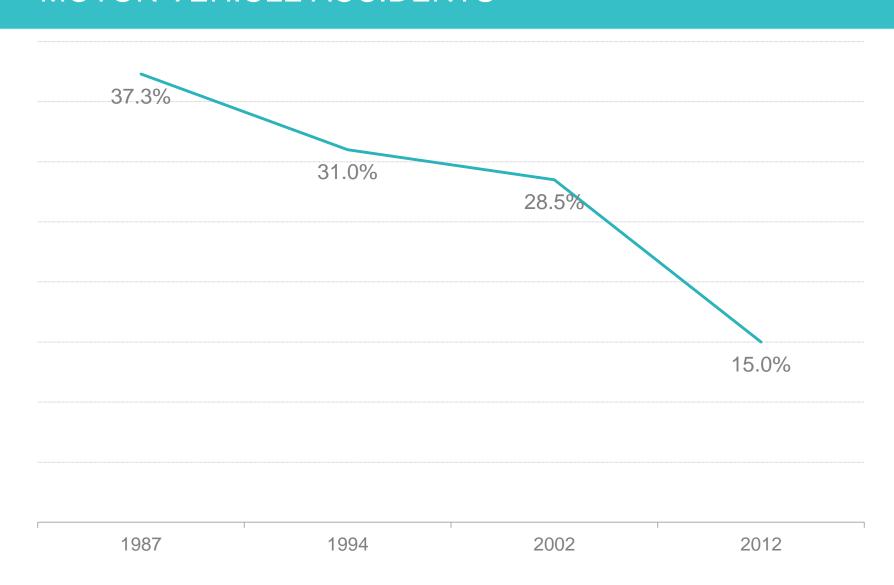
MOTOR VEHICLE SAFETY



- Seatbelts
- Airbags
- Laminated windshields
- Crumple zones
- Anti-lock braking systems
- Tire pressure monitoring
- Traction control systems
- Driving under influence of alcohol laws
- Child car seats and safety restraints

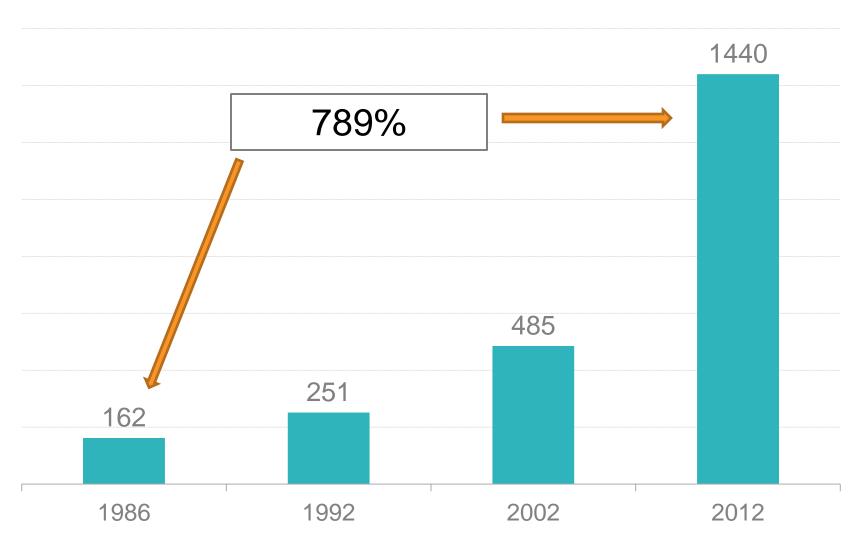
PERCENT OF TOTAL TRAUMA – MOTOR VEHICLE ACCIDENTS





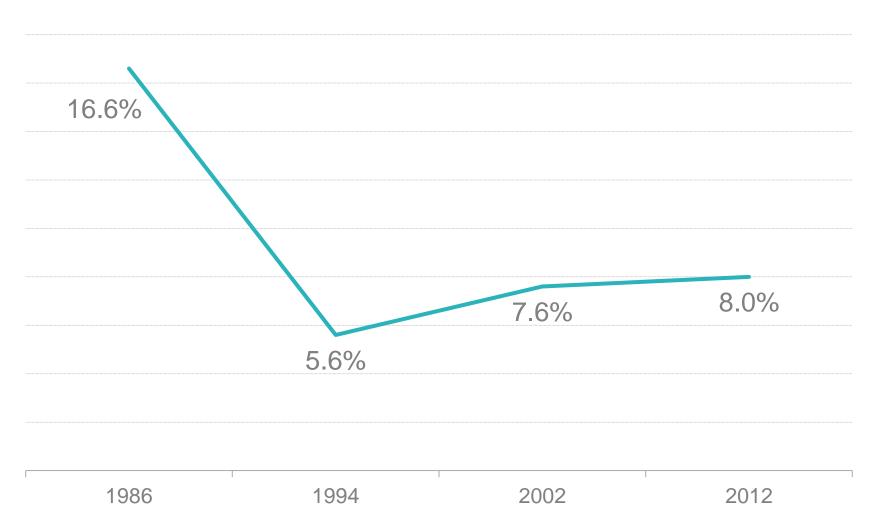
TOTAL FALL-RELATED TRAUMA ADMISSIONS





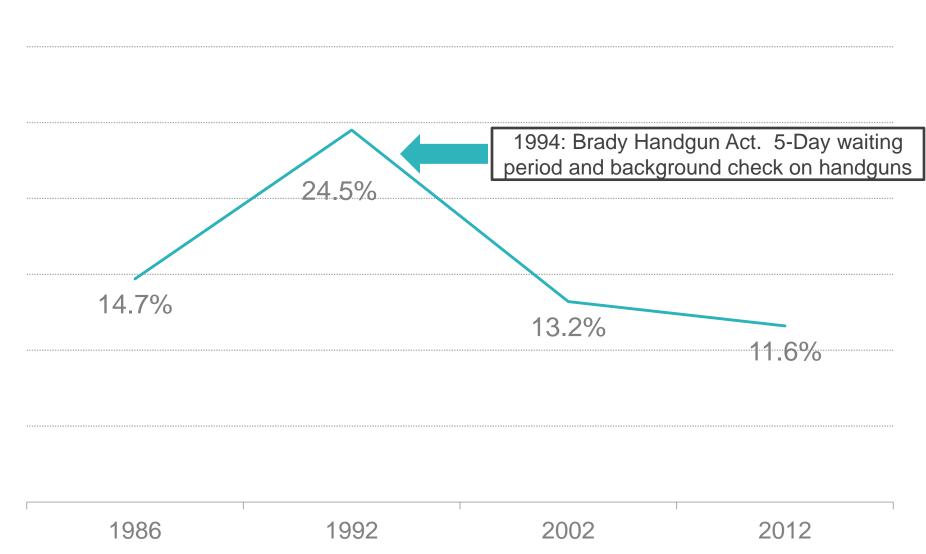
PERCENT OF TOTAL TRAUMA - MOTORCYCLES





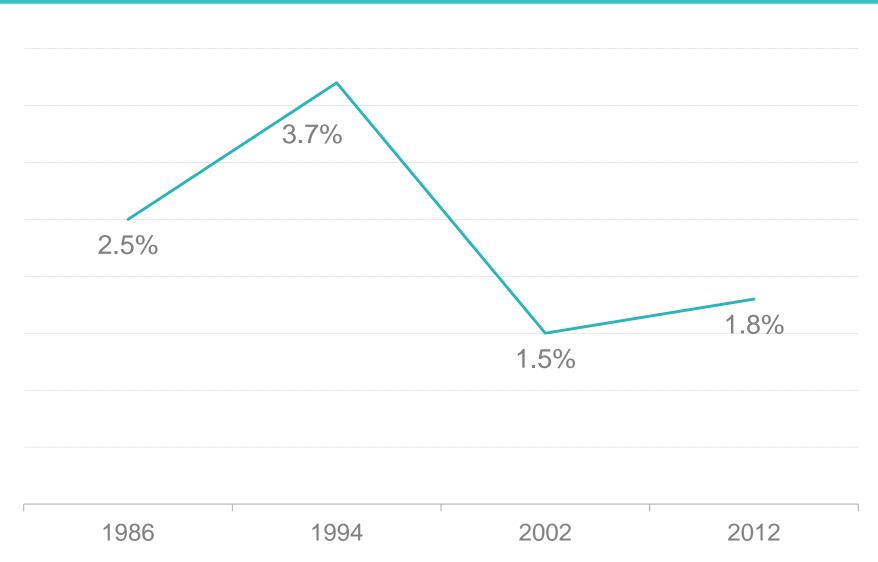
PERCENT OF TOTAL TRAUMA - ASSAULTS





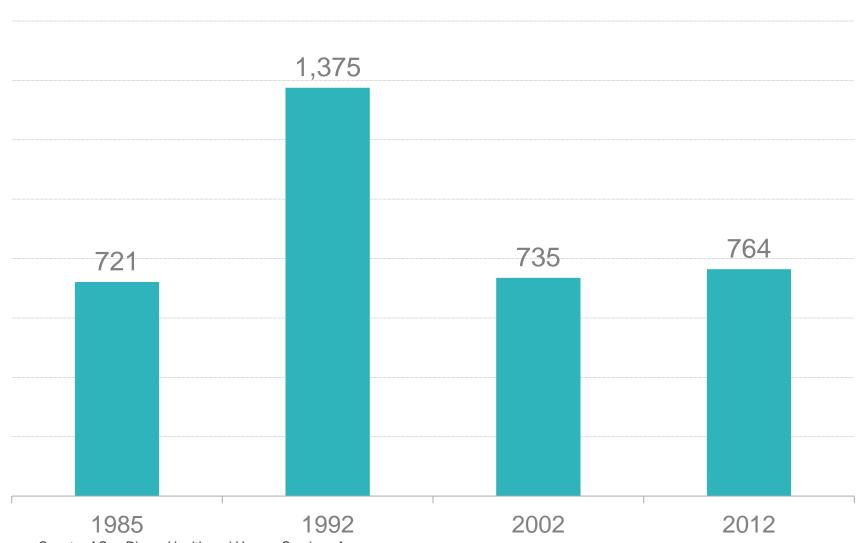
PERCENT OF TOTAL TRAUMA – SELF-INFLICTED INJURIES





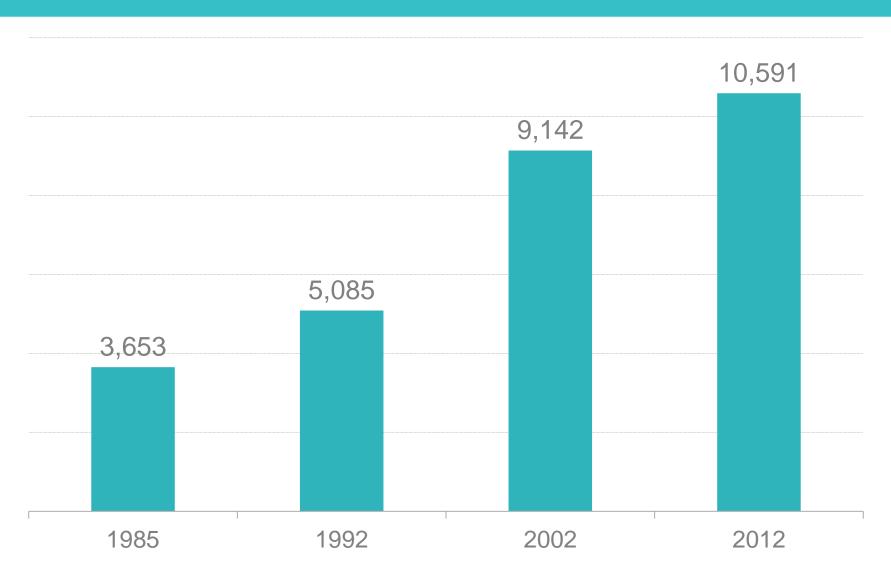
PENETRATING INJURIES





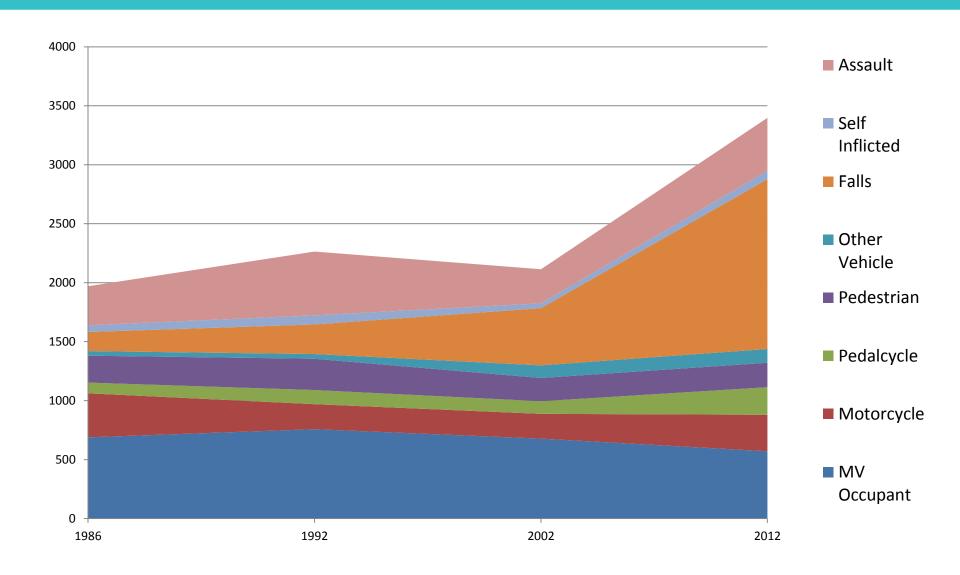
BLUNT INJURIES





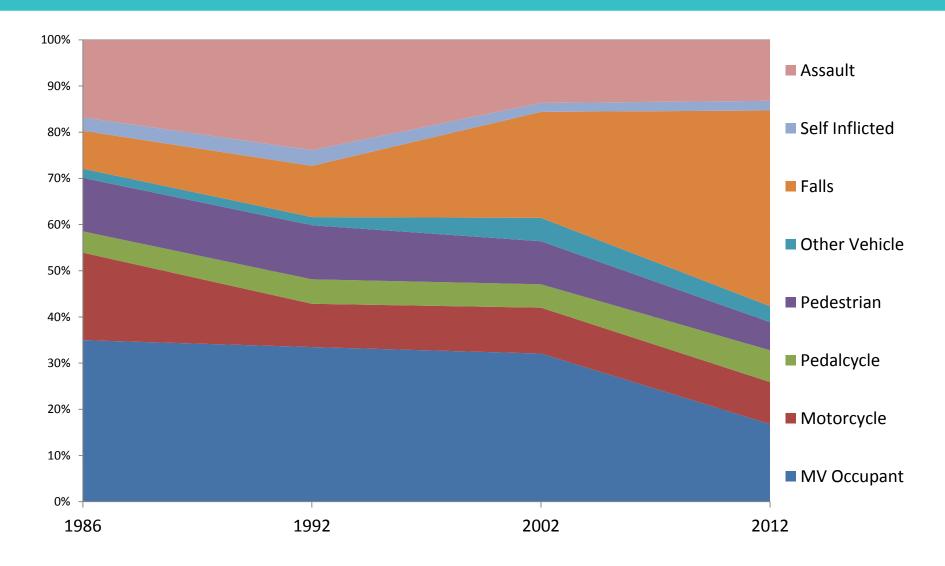
TRAUMA VOLUME BY CAUSE OF INJURY (ISS > 14)





CAUSES OF INJURY, PERCENT OF TOTAL (ISS > 14)

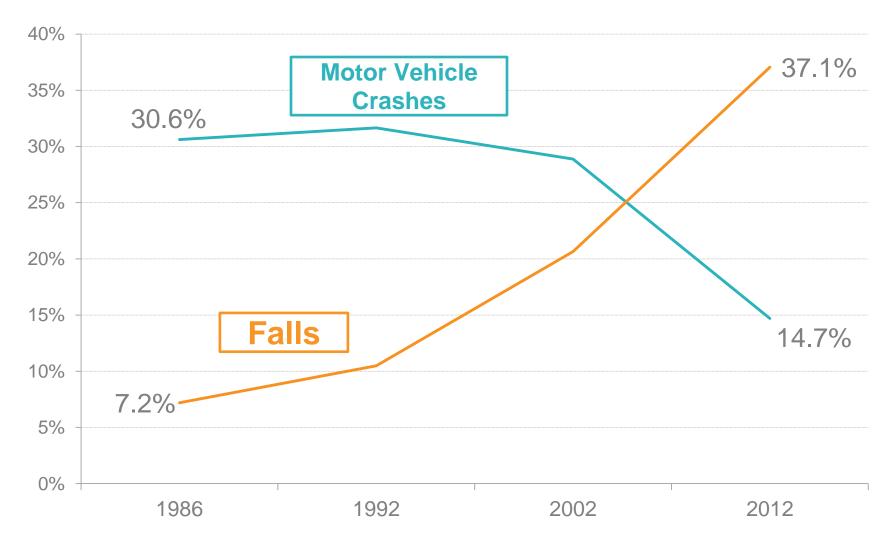




MAJOR CHANGES IN CAUSE OF INJURY







TRAUMA PATIENTS OUTCOMES

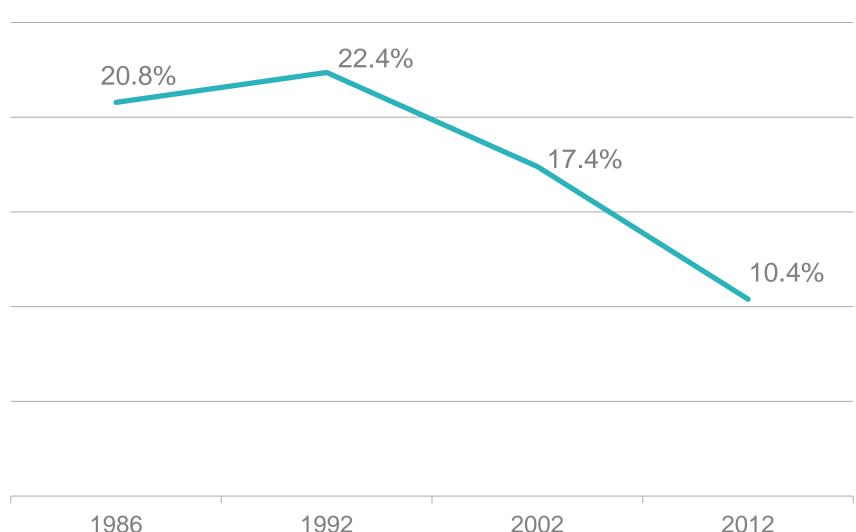


What are the potential factors affecting trauma patient outcome?

- Improved trauma care
- Improved Emergency Medical Services
- Trauma-related regulations and laws?
- Changing causes of injury?
 - Limitation to this study: Too many databases!

MORTALITY RATE - INJURY SEVERITY SCORE 15 OR GREATER





30 YEARS OF TRAUMA



- Trauma volume has continually increased and we can expect this to continue
- Motor vehicle safety laws and an aging population have shifted the majority of trauma victims from car crashes to falls
- Penetrating injuries and assaults peaked in the early 90's but have steadily decreased since then

Most importantly...

 The mortality rate for the most severely injured trauma patients has been cut in half over the life of the San Diego County Trauma System



THANK YOU

