

# **SAMUR-PROTECCIÓN CIVIL**

## **Traffic Accidents: Time-Dependant event**

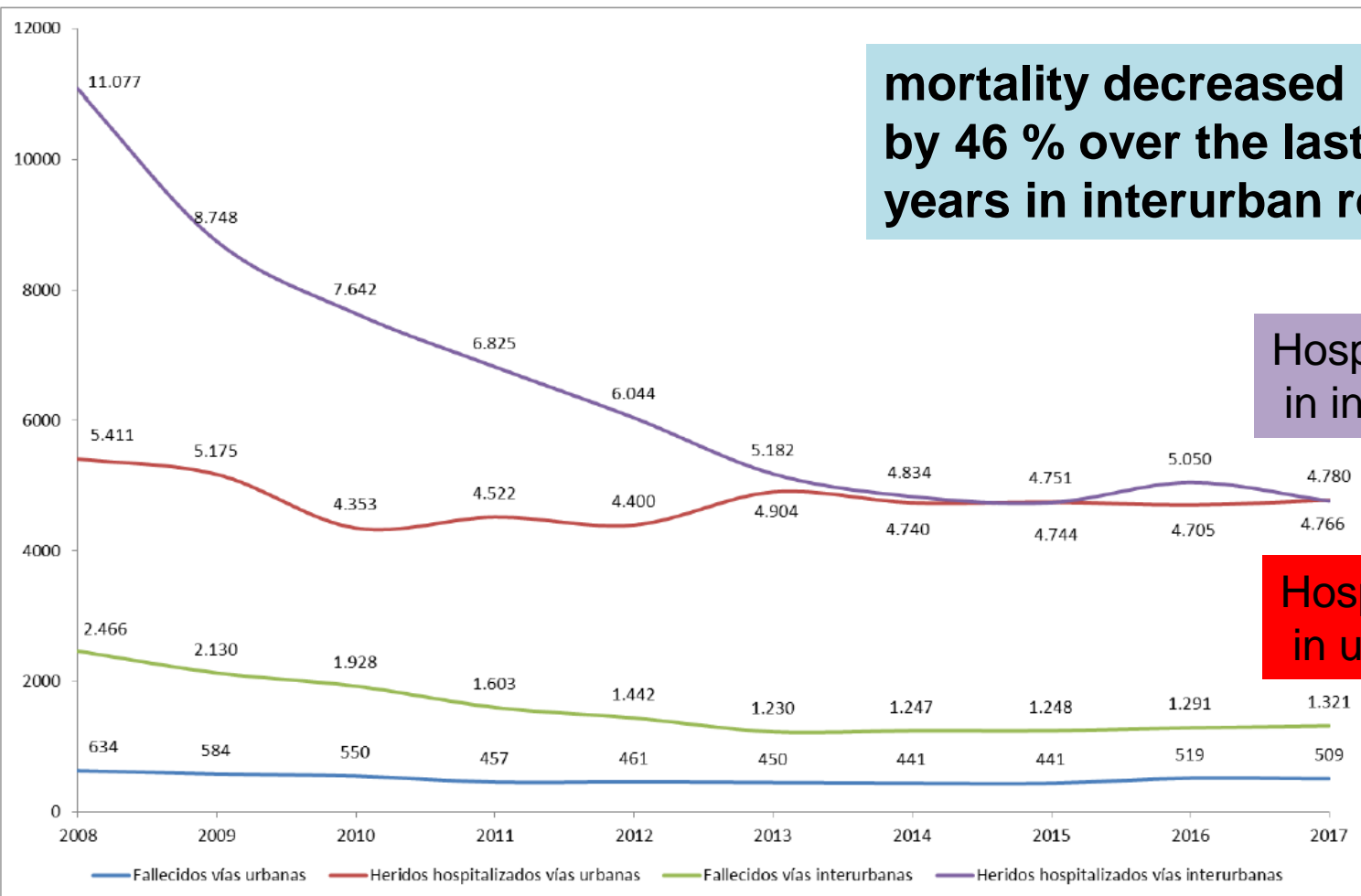
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SAMUR – Protección Civil*

- Urban reality in Spain: improvement objectives
  - SAMUR-PC traffic accident data
- What is SAMUR-PC?
  - Objectives
  - Strategy for traffic accidents
  - Procedures: assistance and coordination
  - Survival outcomes

# Epidemiology of the Traffic accident

Urban reality in Spain

# Evolution of the deceased and hospitalized injured in interurban and urban roads (2008-2017)



**mortality decreased  
by 46 % over the last 10  
years in interurban roads**

Hospitalized injured  
in interurban roads

Hospitalized injured  
in urban roads

Deceased in  
interurban roads

Deceased in  
urban roads



# Traffic accidents in the cities

- **Average Mortality Accident profile:** pedestrian (49%†), motorcycle (21% †), between 75 and 84 years old, on weekdays, on the street;
- Average hospitalized age: between 25 and 44 years old.
- **Traffic accidents in big cities:** 30 % of accident with injured in Madrid and Barcelona
  - 11 % of the deceased and 25 % hospitalized

# City of Madrid

- 2007- 2010: 1st Road Safety Plan  
Target achieved (decrease in 50% of mortality)
- 2009-2013: Strategic Plan for road safety of motorcycles and mopeds
- 2008: Bicycle Mobility Director Plan:  
272 km of bicycle lane network
- 2012-2020: 2nd Road Safety Plan  
Target achieved (decrease in 50% of mortality)

# Road safety objectives in Madrid (2012-2010)

Objectives	Indicators	Value 2010	Objetives 2015	Meta value 2020
Reduce fatalities from traffic accident to <b>less than 50%</b>	Number of deaths from accident traffic	33	25	17
Reduce the rate of victims in every thousand people by 30%	Rate of victims in a thousand	2,29	1,95	1,60
<b>30 % reduction</b> in pedestrian deaths	Number of dead pedestrians	20	17	14
Reduce accidents due to alcohol	Breath test rates undergone by population	4,87 %	4 %	4 %

# SAMUR-PC traffic accident statistics





Total activity **2001-2018 (october)**

2.088.903 ambulance movements



**Traffic Accident Activity 2001-2018 (october)**

298.922 ambulance movements



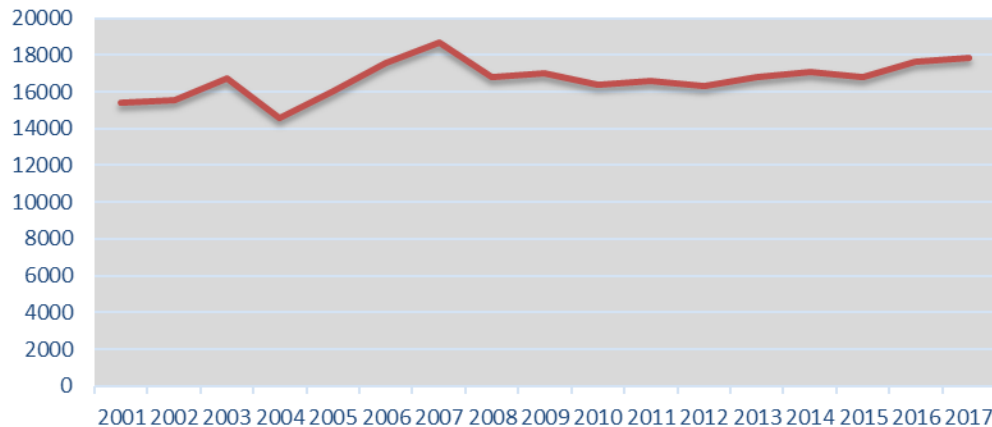
14.31%

# Activity breakdown

n = 298.922



## ACTIVITY BY YEARS



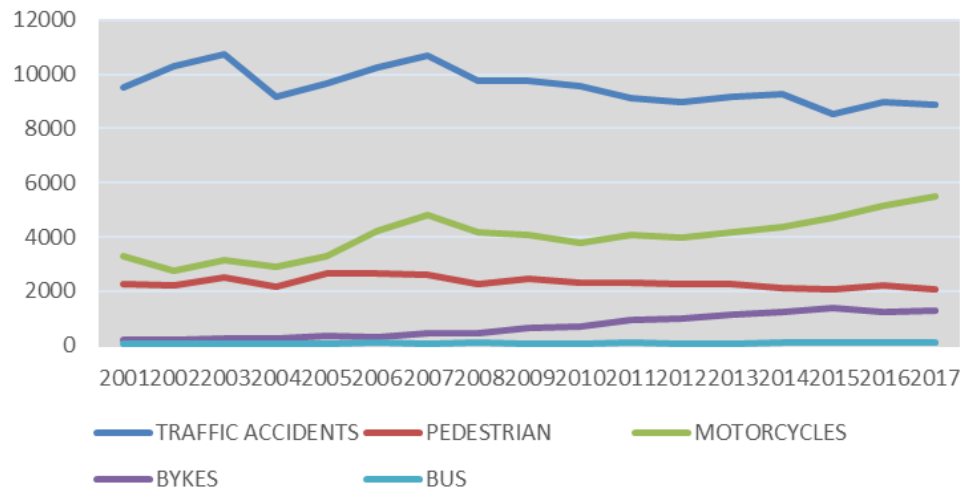
**SVA**

**83.580**

**SVB**

**215.412**

## TYPES OF ACCIDENTS



TRAFFIC ACCIDENTS	170129	56,9 %
PEDESTRIAN	41305	13,8 %
MOTORCYCLES	73241	24,5 %
BIKES	12907	4,3 %
BUS	1410	,5 %

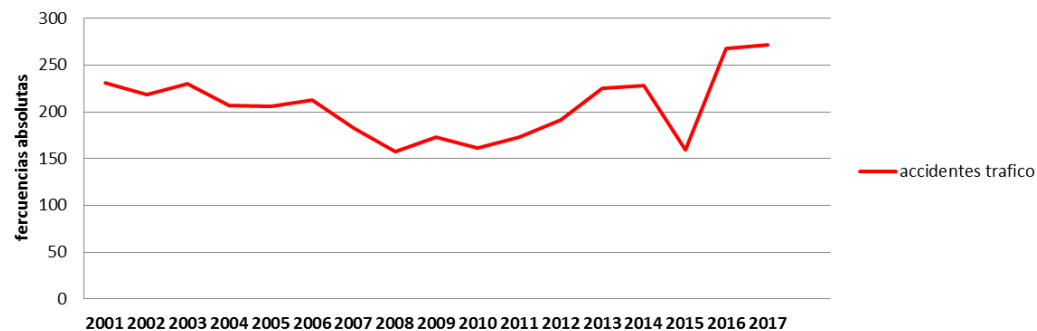
**Evolution in time  
of the types of traffic accidents**

**Critical Patients**  
**n= 3.733**

**SEVERITY RATE: 1.25%**

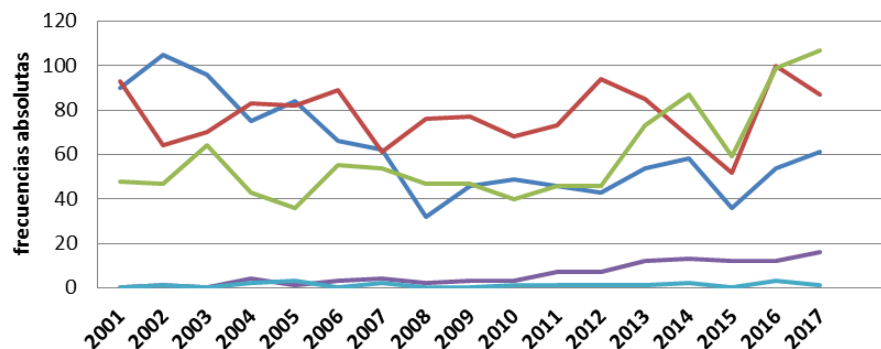


## CRITICAL PATIENTS BY TRAFFIC ACCIDENTS

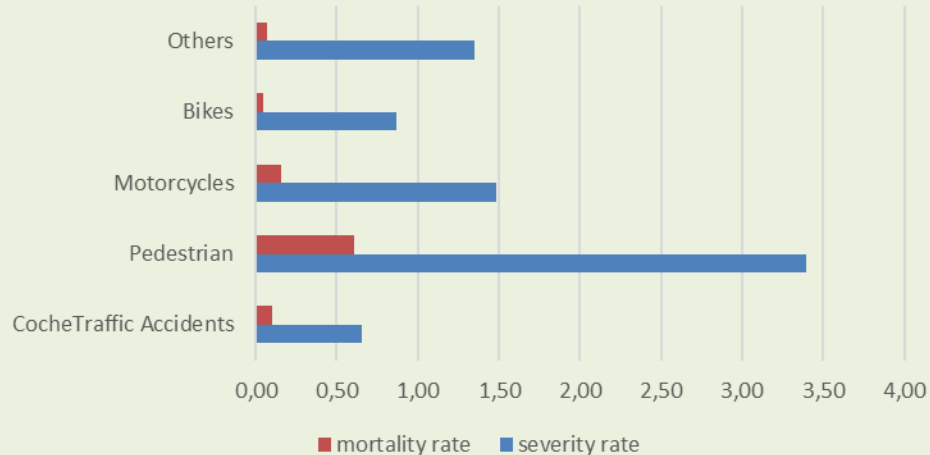


## CRITICAL PATIENTS BY EVENT /YEAR

**n=3.733**



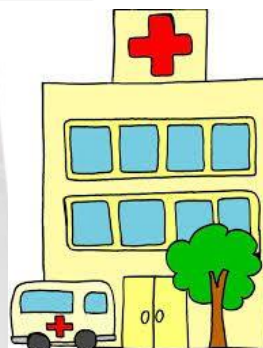
## SEVERITY AND MORTALITY RATIO BY EVENT





**77,5 %**

**75 % < 53 years**



**11-14 % activity**

**40.5 %** are transferred  
to the hospital

**1.15 to 2.15 %**  
Critical patients

**0,2 % Mortality**  
in 7 days



**37.6 %**  
Critical patients



**39.1 %**  
Critical patients





# What is SAMUR-PC?



**COMUNITY OF MADRID**

**8.025 km<sup>2</sup>**

**CITY OF MADRID**

**604 Km<sup>2</sup>**

**COMUNITY OF MADRID**

**6.436.996 Inhabitans**

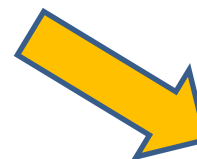
**CITY OF MADRID**

**3.141.991 Inhabitans**

**48,8%**



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# Characteristics



**ALS**



Two-tier  
assistance



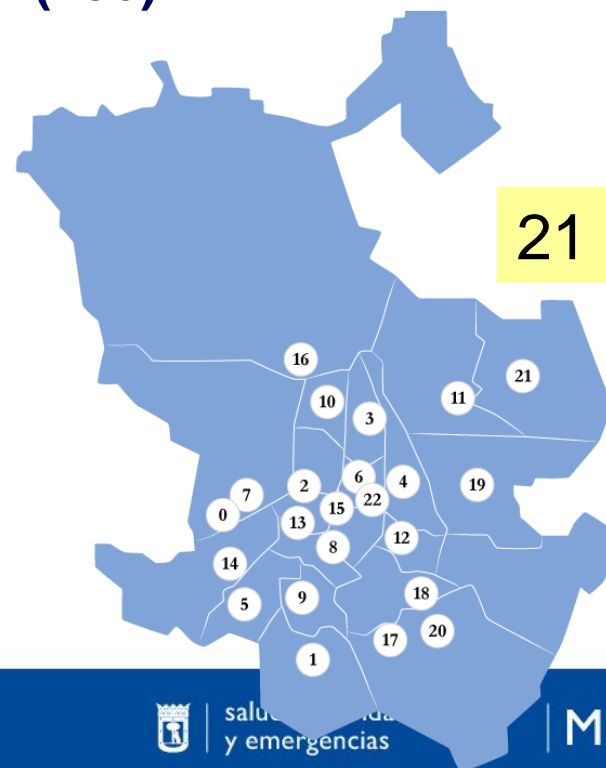
**BLS**

- Mixed service with volunteers (1.500) and staff (730)



**CISEM**

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**21 Bases**

# Strategy for severe Trauma care in SAMUR

- **Objectives:**

- Decrease mortality of traumatic patients
- Reduce morbidity
  - Patient wellbeing



- **Based on:**

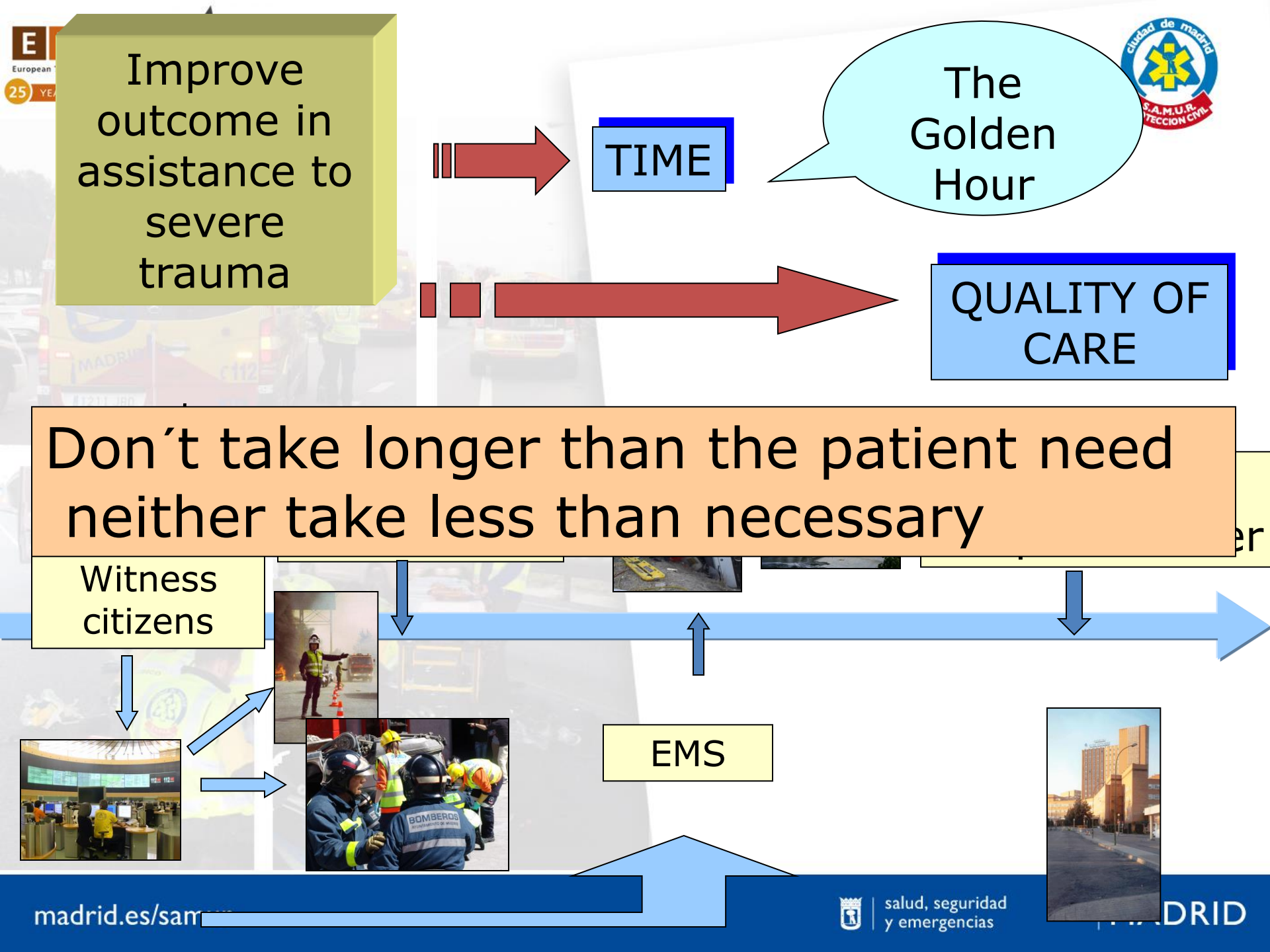
- Time Dependant Pathology

It's patient's vital risk is what marks time;;

- Specific management
  - dependant on techniques

- **First peak:** Immediate mortality "in situ" (50%). **Prevention.**
- **Second peak:** Premature mortality, 3-4 hours at 2-3 days (30%). **System of Integral attention to the trauma patients.**
- **Third peak:** Late deaths, days-weeks (20-30%). **Quality and speed of initial resuscitation measures**





Improve  
outcome in  
assistance to  
severe  
trauma



TIME

The  
Golden  
Hour



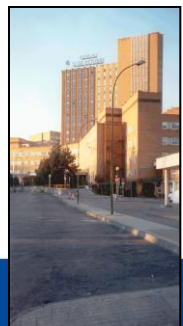
QUALITY OF  
CARE

Don't take longer than the patient need  
neither take less than necessary

Witness  
citizens



EMS



# Global assistance to the traumatized

- Prevention
- Immediate and universal access to assistance
- Early and quality out-hospital assistance on the scene
- Quick transfer to the "useful Hospital"
- Protocolized Hospital Care
- Early patient rehabilitation



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## Single access number

## Early and quality out-hospital assistance on scene

- Based on established assistance and operational **procedures**
- With a response time **less than 9 min**

Committed in our  
charter of services

## Quick transfer to "useful Hospital"



# Tools for improving patient care

- Trauma assistance **procedures** based on ATLS /BTLS
- Own **triage system** on the scene: **STARS**
- Specific **training** in severe trauma for all our professionals
- **Training citizens** on First aid
- **New technologies** applied to out-of-hospital trauma patients and in the working environment and transfer





# New technologies in Severe Trauma



• Capnómetr. Portátil  
• Mochila Pediátrica

Pulsioxímetro  
Capnómetro  
Combinado

Mochila  
NRBQ

Ecógrafo  
Portátil  
Titán

1994

1995

1997

1998

2001

2004

2005

2006

2007

2008

DESA

• Bomba  
Perfusión  
• Analizador  
i STAT



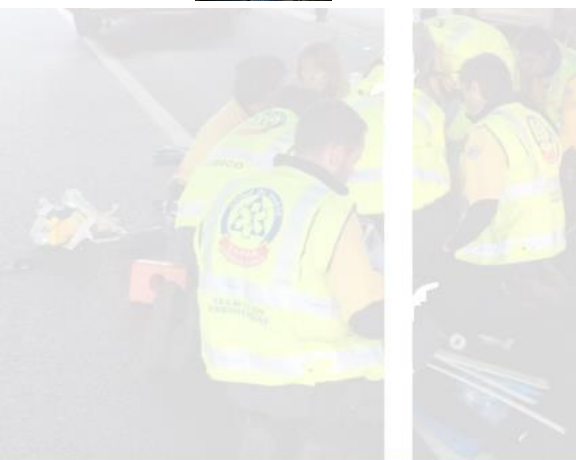
Pistola io

Desfibril.  
Acceso  
Público

• Monitor  
Desfibril  
MRx QCPR  
• Cooxímetro  
• Taladro  
intraóseo



- ULTRASOUND
- BLOOD ANALYTIC
- PELVIC BELT
- TRANEXAMIC ACID
- EMERGENCY THORACOTOMY
- Hemostatic Patches



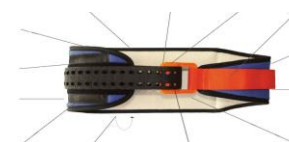
Sierra  
esternotomía

2009



Analizador EPOC  
Tablero espinal

2010



Cinturón pélvico

2011

2013



Suero  
Hipertónico  
Parches  
hemostáticos





# How do we know if we're doing it well?



- Evaluation on scene of the care process
- Retrospective Evaluation of the care process
  - Hospital monitoring of patients (6h, 24 h and 7 days)
  - **Trauma Register Data**. Classified by severity (ISS, TRISS)
  - Setting **indicators** (process and outcome)
  - Preventable mortality in **medical audit**

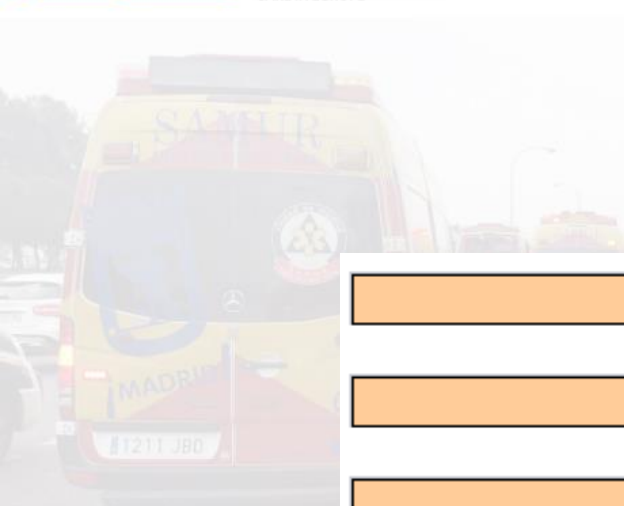
# Quality Care Objectives



Trauma care Process	Indicator	Objetives
	Intubation in GCS < 9	100 %
	Capnography in intubated	100 %
	Pre-intubation analgesia	> 90 %
	Blood analytical in severe trauma	> 80 %
	Analgesia en Severe trauma	> 90 %
	Second vein in severe trauma	> 70 %

Indicator	Objetives
Abdominal Ultrasound in unstable Abdominal trauma (Sistolic Blood Pressure < 90 mmHg)	> 50%
Vasoactives in unstable patients after fluid therapy (20 ml/kg)	> 50 %
Pneumothorax with SO2 < 90% with thoracostomy	100 %
Dismissed in < 24 h	< 10 %
EB < - 5 y lactato > 5 mmol without fluid therapy	< 10 %
Transfer to useful Center (CODE 15 – Trauma)	100%





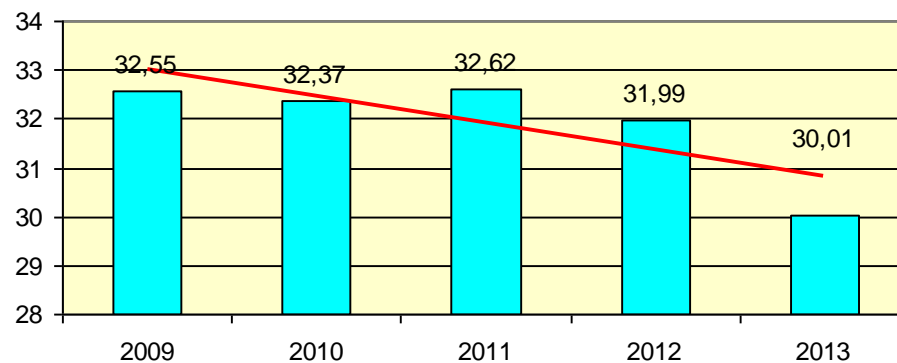
IOT en GCS < 9	101 de 104	97%
Analgesia en IOT previa al SIR	96 de 104	92%
Nº Analíticas en trauma grave	248 de 251	99%
Analgesia en PTM grave	245 de 250	98%
2ª vía en paciente Trauma Grave	209 de 222	94%
Ecografía abdominal en Tr. Abdomen inestable (TAS < 90 mmHg)	30 de 174	17%
TAS < 90 mmHg refractarias a volumen (20 ml/kg) con vasoactivos	39 de 40	98%
Neumotórax con SO <sub>2</sub> < 90 % con toracostomía	98 de 104	94%

# Quality Care Objectives: support time



Indicator	Objetives
Time on the scene	< 30 min
Out of hospital time (includes transfer)	< 45 min

Tiempo asistencia en el lugar C3\_C4



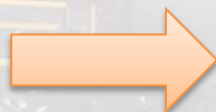
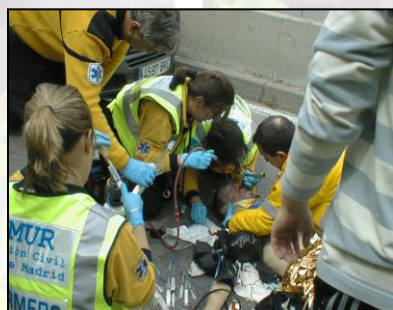
# Prehospital-hospital coordination



- Joint procedure (CODE 15) to:
  - **Avoid interruptions** in the care process.
  - Establish **transfer criteria**. Classify, categorize
  - Determine the **minimum patient information to provide** by EMS.
  - establishing **direct communication** in advance notice. Get a direct transfer between the SAMUR emergency physician and the doctor responsible for the Hospital.
  - **Analyse joint procedure** to improve coordination



# Impact of the implementation of the **CODE 15** in traffic accident



## 182 critical patients

### Pre CODE 15

SEVERE TRAUMA  
(ISS>25)

**82**

### CODE 15

SEVERE TRAUMA  
(ISS>25)

**100**

Similar groups in age, GCS, SHOCK Index, severity (ISS) and times

### Mortality at 7days follow up

**68.3%**

**59%**

**Increase of 9.3% survival at 7 days follow-up with CODE 15**



# Thank you for your attention

[www.madrid.es/samur](http://www.madrid.es/samur)