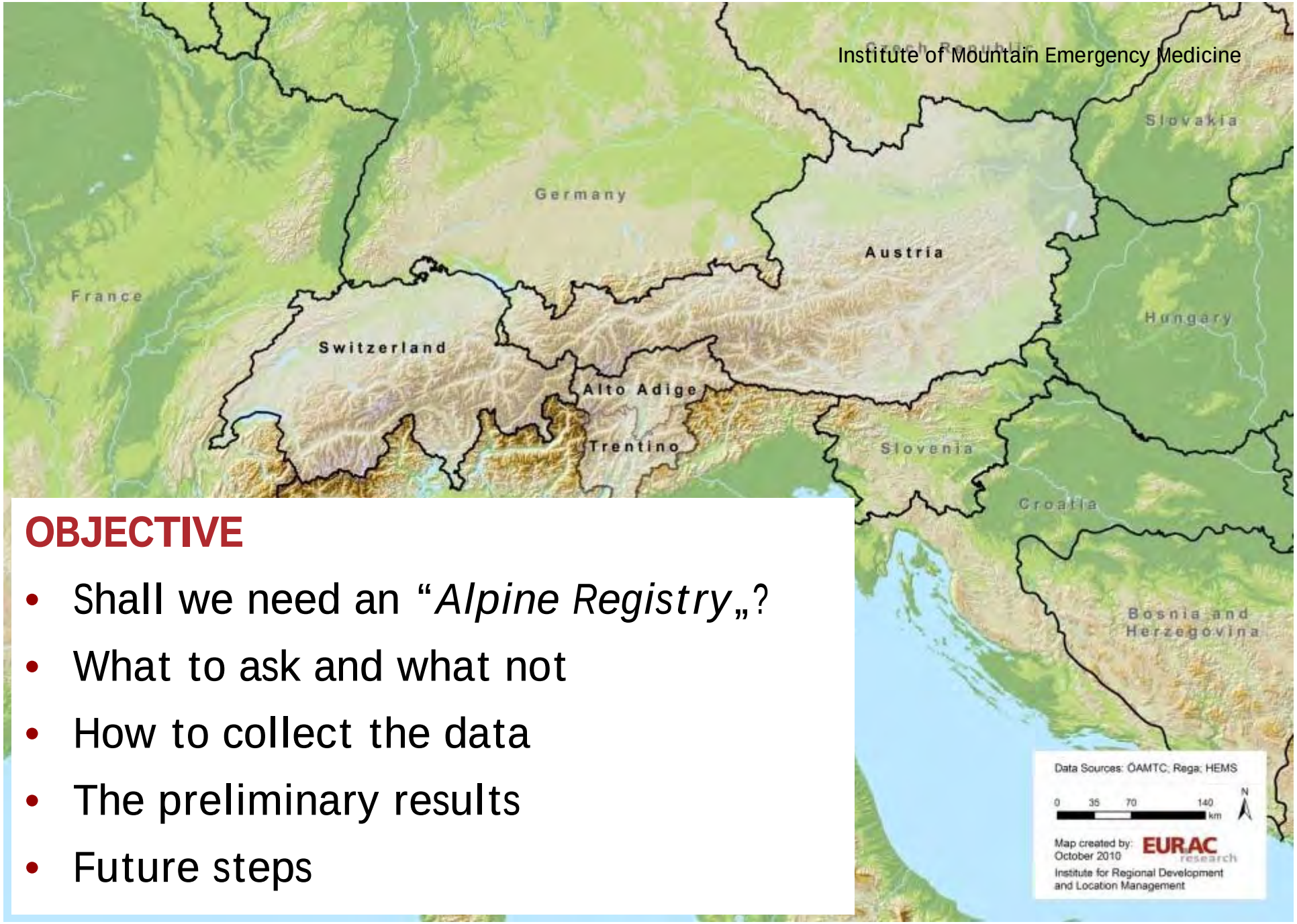
Alpine Trauma Registry

Giacomo Strapazzon MD PhD

EURAC Institute of Mountain Emergency Medicine, Italy
CNSAS Italian Alpine and Cave Rescue Team, Italy

ICAR-CISA General Assembly
Bol, Croatia 2013


Institute of Mountain Emergency Medicine
Germany
Austria
France
Switzerland
Alto Adige
Trentino
Slovakia
Hungary
Slovenia
Croatia
Italy
Bosnia and Herzegovina
Adriatic Sea
Ligurian Sea
Data Sources: ÖAMTC; Rega; HEMS
0 35 70 140
km
N
Map created by:
October 2010
EURAC research
Institute for Regional Development and Location Management

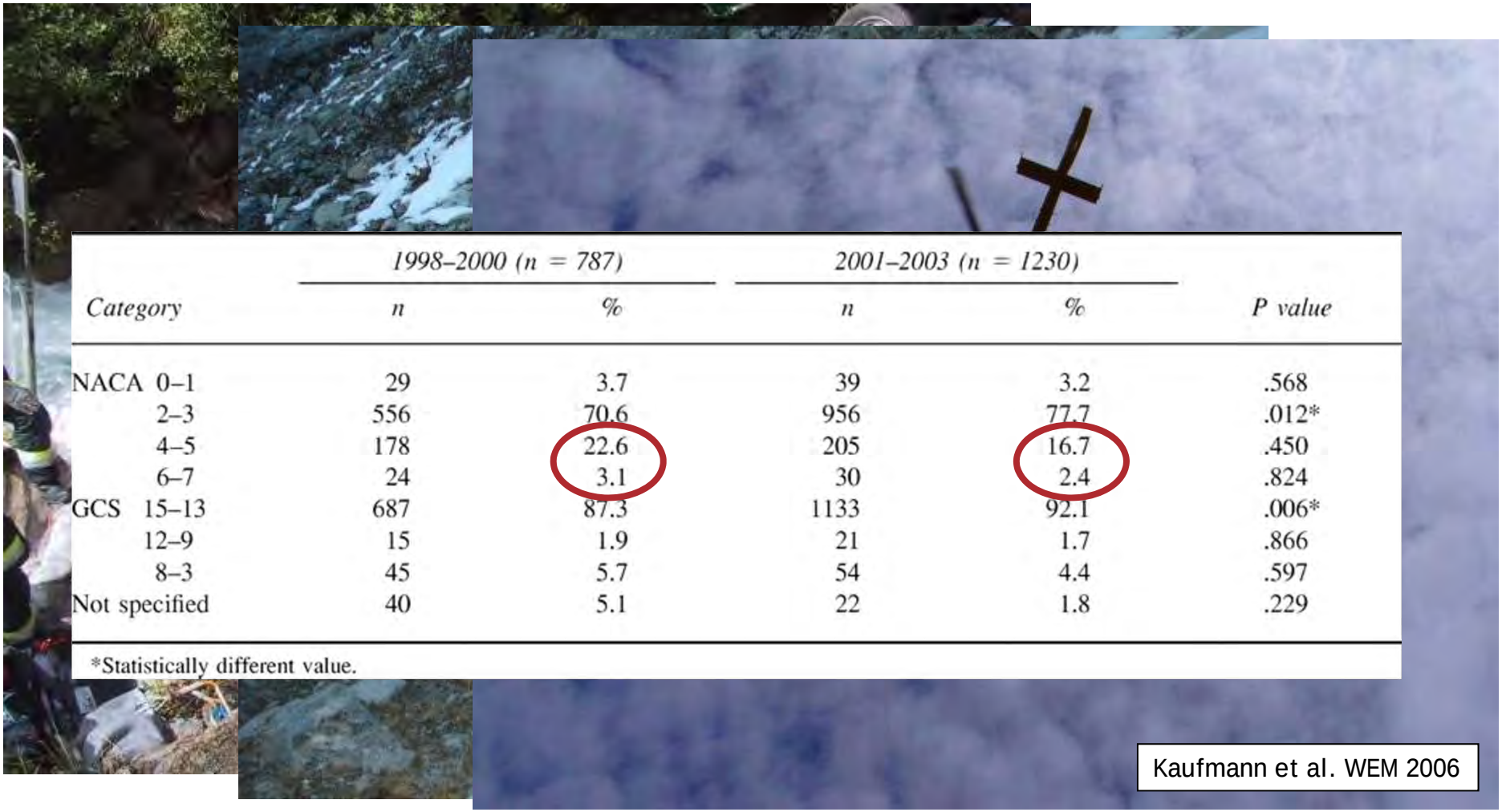


OBJECTIVE

- Shall we need an "*Alpine Registry*„?
- What to ask and what not
- How to collect the data
- The preliminary results
- Future steps

HEMS service in a mountain region

HEMS service in a mountain region



Category	1998–2000 (n = 787) n	1998–2000 (n = 787) %	2001–2003 (n = 1230) n	2001–2003 (n = 1230) %	P value
NACA 0–1	29	3.7	39	3.2	.568
2–3	556	70.6	956	77.7	.012*
4–5	178	22.6	205	16.7	.450
6–7	24	3.1	30	2.4	.824
GCS 15–13	687	87.3	1133	92.1	.006*
12–9	15	1.9	21	1.7	.866
8–3	45	5.7	54	4.4	.597
Not specified	40	5.1	22	1.8	.229

*Statistically different value.

Kaufmann et al. WEM 2006

International Alpine Trauma Registry

a prospective observational multicentre study

Inclusion/Exclusion Criteria

Inclusion criteria

- Pre-hospital NACA score ≥IV
- Injury Severity Score (ISS) >15
- Accident occurred in extra-urban, mountainous or remote areas not readily accessible by regular Emergency Medical Services

Inclusion/Exclusion Criteria

Inclusion criteria

- Pre-hospital NACA score ≥IV
- Injury Severity Score (ISS) >15
- Accident occurred in extra-urban, mountainous or remote areas not readily accessible by regular Emergency Medical Services

Exclusion criteria

- Patients already in cardiac arrest upon arrival of rescue team at the scene
- Victims of drowning
- Burn patients (burn is the predominant injury or patients is treated in a specialized burn unit)

ELSEVIER

Resuscitation 42 (1999) 81–100

RESUSCITATION

www.elsevier.com/locate/resuscitation

Recommendations for uniform reporting of data following major trauma — the Utstein style

A report of a Working Party of the International Trauma Anaesthesia and Critical Care Society (ITACCS)

W.F. Dick [a,*], P.J.F. Baskett [b,1]

[a] *Klinik fur Anaesthesiologie, Johannes Gutenberg Universitat, Langenbeckstrasse 1, D-6500 Mainz, Germany*
[b] *Department of Anaesthesia, Frenchay Hospital, Bristol, UK*

Accepted 21 July 1999

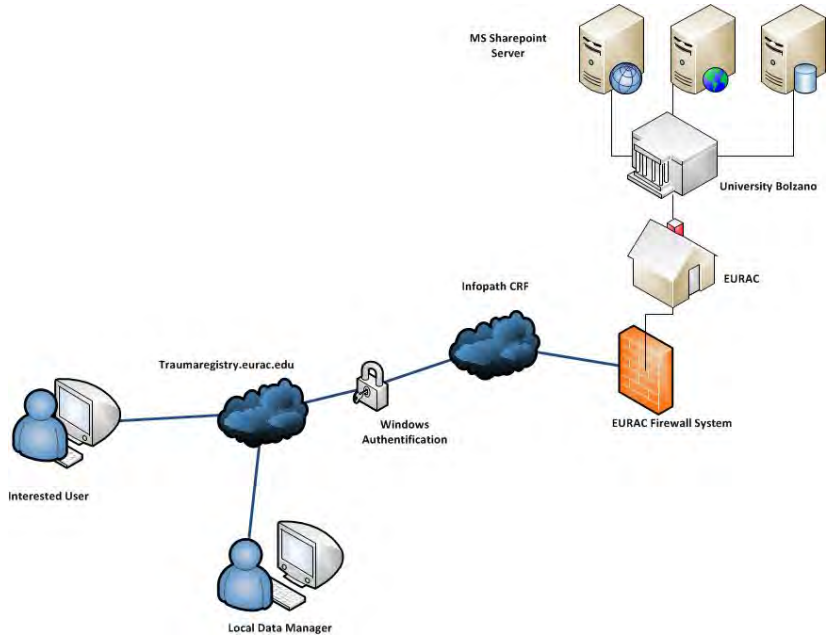
Dick et al. *Resuscitation* 1999

International Alpine Trauma Registry

Case report form

1. Patient record & case history
2. Prehospital medical data
3. In-hospital medical data
4. Outcome & survival status

General system information



International Alpine Trauma Registry

Filter criteria in Bolzano dispatch center

The following parameters MUST be met in the rescue operation:

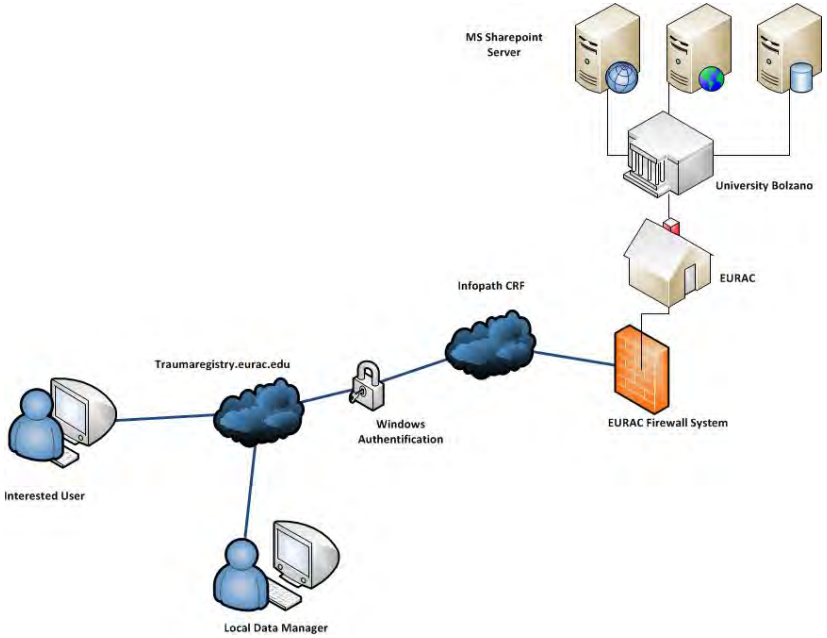
NACA ≥4
terrain accessibility ≥3
suspected pathology on site (TRAUMA or HYPOTHERMIA)
type of rescue operation

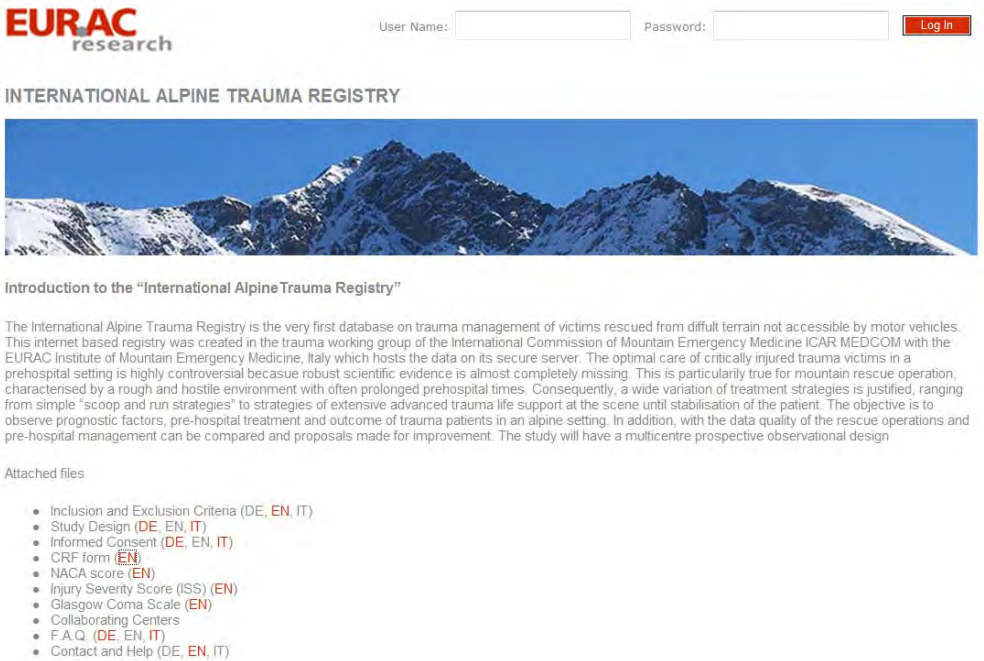
+

If the above parameters are met, Local Data Managers will be allerted if one or more of the following additional items are met:

time between alarm and hospital admission >60 min
OR
evacuation involved winch, fixed rope or hoovering
OR
mountain rescue service involved in rescue operation

General system information





EURAC research

Institute of Mountain Emergency Medicine

Case Report Form

http://sptest2.scientificnet.org/Lists/alpine_trauma_registry_CRF1/LDM.aspx

International Alpine Trauma Registry

Progress bar

Patient´s records & case history

Infotext Infotext Infotext InfotextInfotext InfotextInfotext InfotextInfotext InfotextInfotext InfotextInfotext Info InfotextIInfotextInfotext Infotext Infotext

Patient ID:

Hospital:

Logged in as: gstrapazzon

Last modified by

Last modification on:

Patient data

Date of Birth:		Gender:	☐ Male ☐ Female
ASA classification			

Accident characteristics

Date / Time of accident	Date: Time:
Date / Time of first emergency call	Date: Time:

Type of activity	

Preliminary results

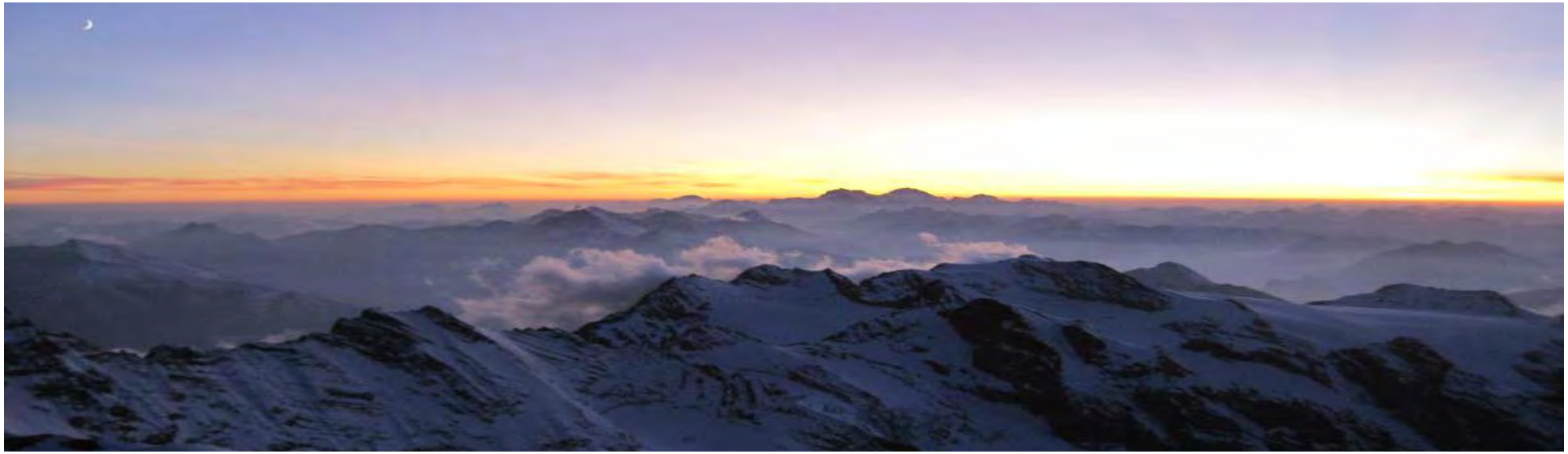
South and North Tyrol region

1st January 2011- 30th September 2013

Patient record & case history (I)	
Total no. (N *vs.* S)	104 (63 *vs.* 41)
Age (median) [years]	46 (7-86)
Male victims [%]	85%
ISS > 15	100%
RTS (median)	11 (3-12)
Blunt trauma	100%

Type of activity	
Ski/snowboarding	31 [29.8%]
Hiking	21 [20.2%]
Mountaineering	14 [13.5%]
Climbing	9 [8.7%]
Aviation	7 [6.7%]
Other	22 [21.2%]

Patient record & case history (II)	
Prehospital time [min]	80 (47-1047)
Mixed rescue [%]	48%
Easy terrain [%]	21%



Prehospital medical data	
Intubation	49 (47%)
Unconscious (GCS ≤ 8)	38 (37%)
Shock (BP ≤ 90 mmHg)	31 (30%)
Analgesia	81 (80%)
Surgical intervention	torachostomy 4 (4%) none 100 (96%)

Prehospital medical data	
Intubation	49 (47%)
Unconscious (GCS ≤ 8)	38 (37%)
Shock (BP ≤ 90 mmHg)	31 (30%)
Analgesia	81 (80%)
Surgical intervention	torachostomy 4 (4%) none 100 (96%)

Trauma care - AB

Intubation → Unknown 8 (8%)

Yes in 49 victims

abnormal RR 23 (47%)
normal RR 18 (37%)
unknown RR 8 (16%)

Trauma care - AB

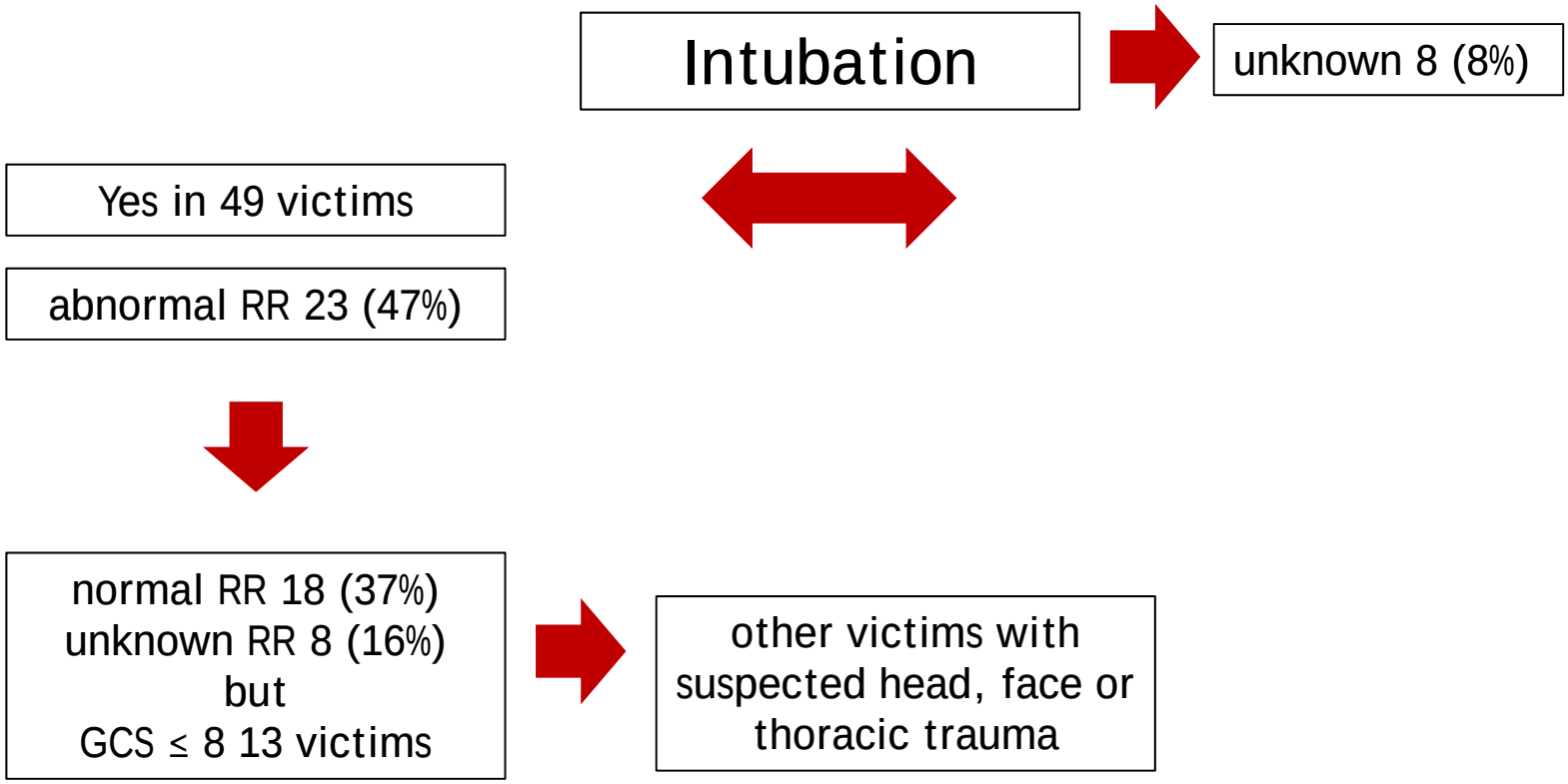
Intubation → unknown 8 (8%)

Yes in 49 victims

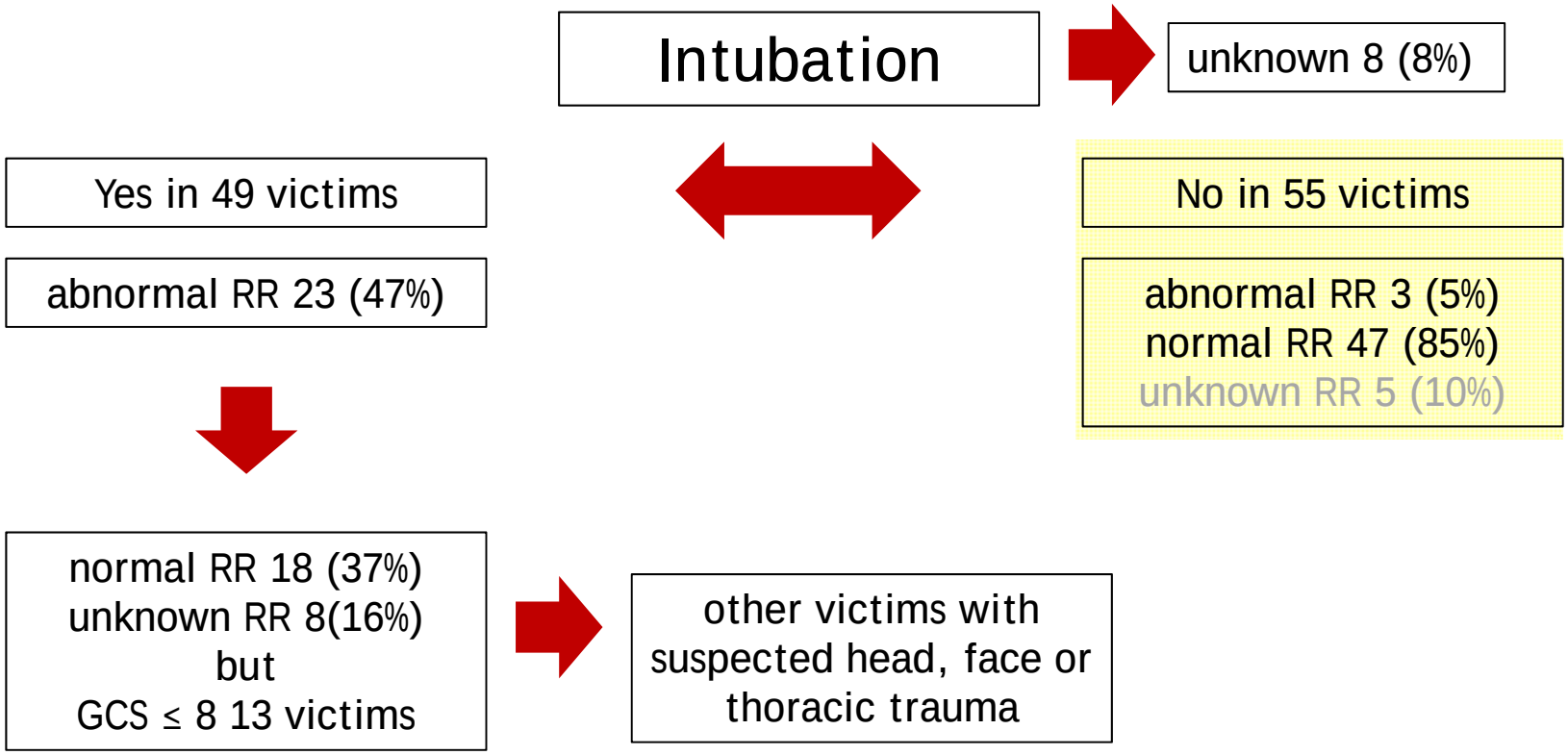
abnormal RR 23 (47%)

normal RR 18 (37%)
unknown RR 8 (16%)
but
GCS ≤ 8 13 victims

Trauma care - AB

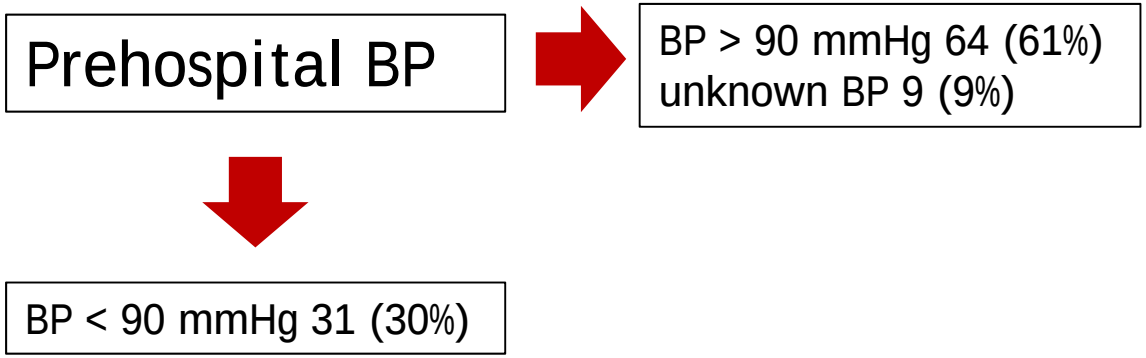


Trauma care - AB



Prehospital medical data	
Intubation	49 (47%)
Unconscious (GCS ≤ 8)	38 (37%)
Shock (BP ≤ 90 mmHg)	31 (30%)
Analgesia	81 (80%)
Surgical intervention	torachostomy 4 (4%) none 100 (96%)

Trauma care - C



Trauma care - C

Prehospital BP

BP > 90 mmHg 64 (61%)
unknown BP 9 (9%)

BP < 90 mmHg 31 (30%)

Volume replacement

Yes in 23 victims

In-hospital BP

BP > 90 mmHg 14 (61%)
BP < 90 mmHg 7 (30%)
1 pre-hospital died
1 unknown

Trauma care - C

Prehospital BP → BP > 90 mmHg 64 (61%)
unknown BP 9 (9%)

BP < 90 mmHg 31 (30%)

Volume replacement

Yes in 23 victims

In-hospital BP

BP > 90 mmHg 14 (61%)
BP < 90 mmHg 7 (30%)
1 prehospital died
1 unknown

P < 0.05

No in 7 victims

In-hospital BP

BP > 90 mmHg 1 (14%)
BP < 90 mmHg 5 (71%)
1 unknown

Prehospital medical data	
Intubation	49 (47%)
Unconscious (GCS ≤ 8)	38 (37%)
Shock [BP ≤ 90 mmHg)	31 (30%)
Analgesia	81 (80%)
Surgical intervention	torachostomy 4 (4%) none 100 (96%)

In-hospital medical data	
Tranfer to a higher level hospital (in 24 h)	yes 11 (11%) no 91 (87%) died in prehospital 2 (2%)

Trauma care - Hypothermia

Core temperature

Prehospital

T_c > 35° C 3 (3%)
Tc < 35° C 6 (6%)
T_c unknown 95 (91%)

Trauma care - Hypothermia

Core temperature

Prehospital	Intra-hospital
T_c > 35° C 3 (3%) Tc < 35° C 6 (6%) T_c unknown 95 (91%)	T_c > 35° C 20 (19%) Tc < 35° C 35 (34%) T_c unknown 49 (47%)

Trauma care - Hypothermia

Core temperature is undermeasured both at pre- and in-hospital level
unknown in 97% and 47% of patients, respectively
despite 3/9 (67%) of prehospital victims and 35/55 (64%) of in-hospital victims
were hypothermic (core temperature < 35°C)

Hypothermia Swiss Stage I 27 (77%)
Hypothermia Swiss Stage II 3 (9%)
Hypothermia Swiss Stage III-IV 5 (14%)

Trauma care - ISS

ISS 16-24	10 (10%)
ISS 25-49	64 (60%)
ISS 50-75	23 (23%)
ISS unknown	7 (7%)

In-hospital vs. suspected injury in the field

AIS region	In-hospital diagnosis
Head	68 (65%)
Face	28 (27%)
Neck	3 (3%)
Thorax	72 (69%)
Abdomen	24 (23%)
Spine	38 (36%)
Arms	24 (23%)
Pelvis	21 (20%)
Legs	27 (26%)

In-hospital vs. suspected injury in the field

AIS region	In-hospital diagnosis	Missed in the field (%)
Head	68 (65%)	15%
Face	28 (27%)	68%
Neck	3 (3%)	100%
Thorax	72 (69%)	40%
Abdomen	24 (23%)	42%
Spine	38 (36%)	55%
Arms	24 (23%)	50%
Pelvis	21 (20%)	52%
Legs	27 (26%)	30%

Outcome & survival status	
Survived (at discharge)	86 (83%)

RTS and survival in severe alpine trauma

			survived		Total
			no	yes	
rts	<=8	Count	9	14	23
		% within rts	39.1%	60.9%	100.0%
	>8	Count	4	57	61
		% within rts	6.6%	93.4%	100.0%
Total		Count	13	71	84
		% within rts	15.5%	84.5%	100.0%

P < 0.001

Conclusion (I)

During its two and half year of life,
the registry showed a good to moderate completeness
for most of the variables

Important information on the prehospital management are being collected in order to evaluate ist impact on the survival and outcome of the victims

Conclusion (II)

Application of the AB in alpine trauma care seems appropiate

There is a positive impact of volume replacement performed during a rescue in an alpine trauma setting on BP

Core temperature measurement, despite the great risk of secondary hypothermia, seems to be underevaluated both at pre- and intra-hospital level

Conclusion (III)

The survival rate seems lower compared
to trauma registries in other environments

The average injury pattern of patients with a severe alpine trauma is being depicted, but a wider database will be needed to confirm the preliminary results

Aknowlegments


JOIN US for
ALPINE TRAUMA REGISTRY
Autopulse/LUCAS2 in HEMS