

**Physician staffed helicopter emergency
medical systems can provide
advanced trauma life support
in mountainous and remote areas**

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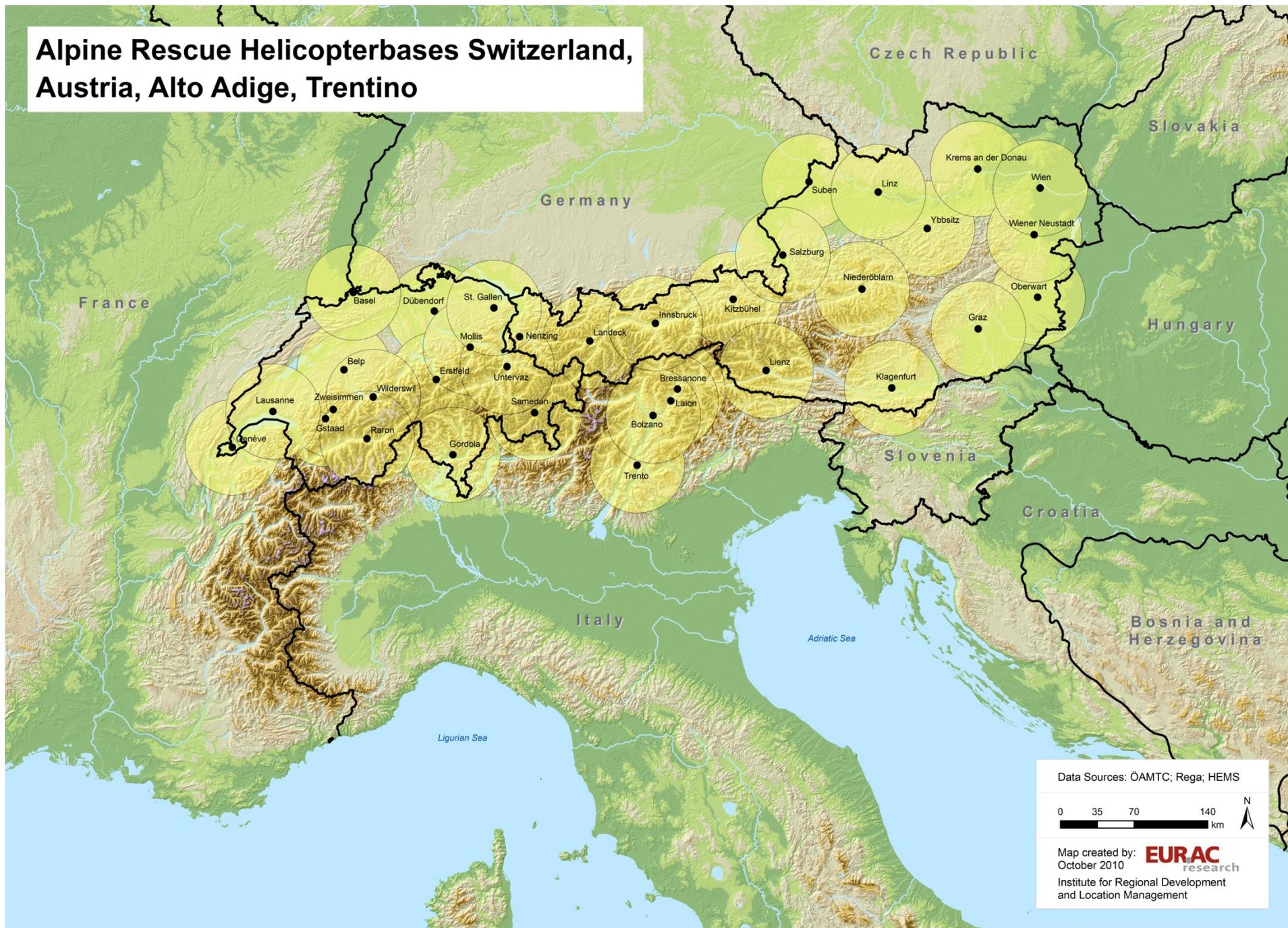
ICAR Congress 2016
Borovets, Bulgaria, 22 October

Disclosure of any Financial Relationships

I have not had any financial relationship
or conflict of interest to disclose



Alpine Rescue Helicopterbases Switzerland, Austria, Alto Adige, Trentino

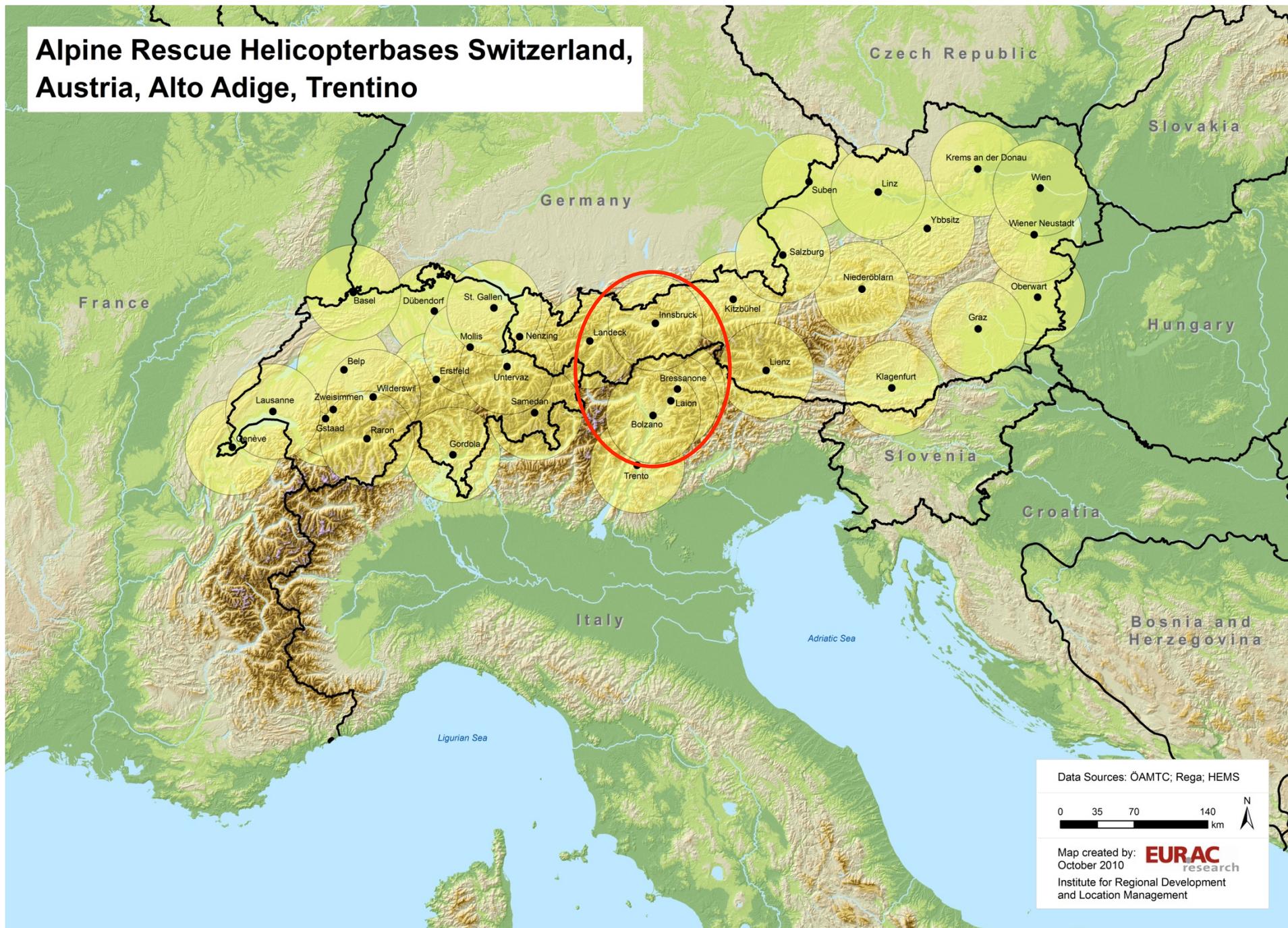


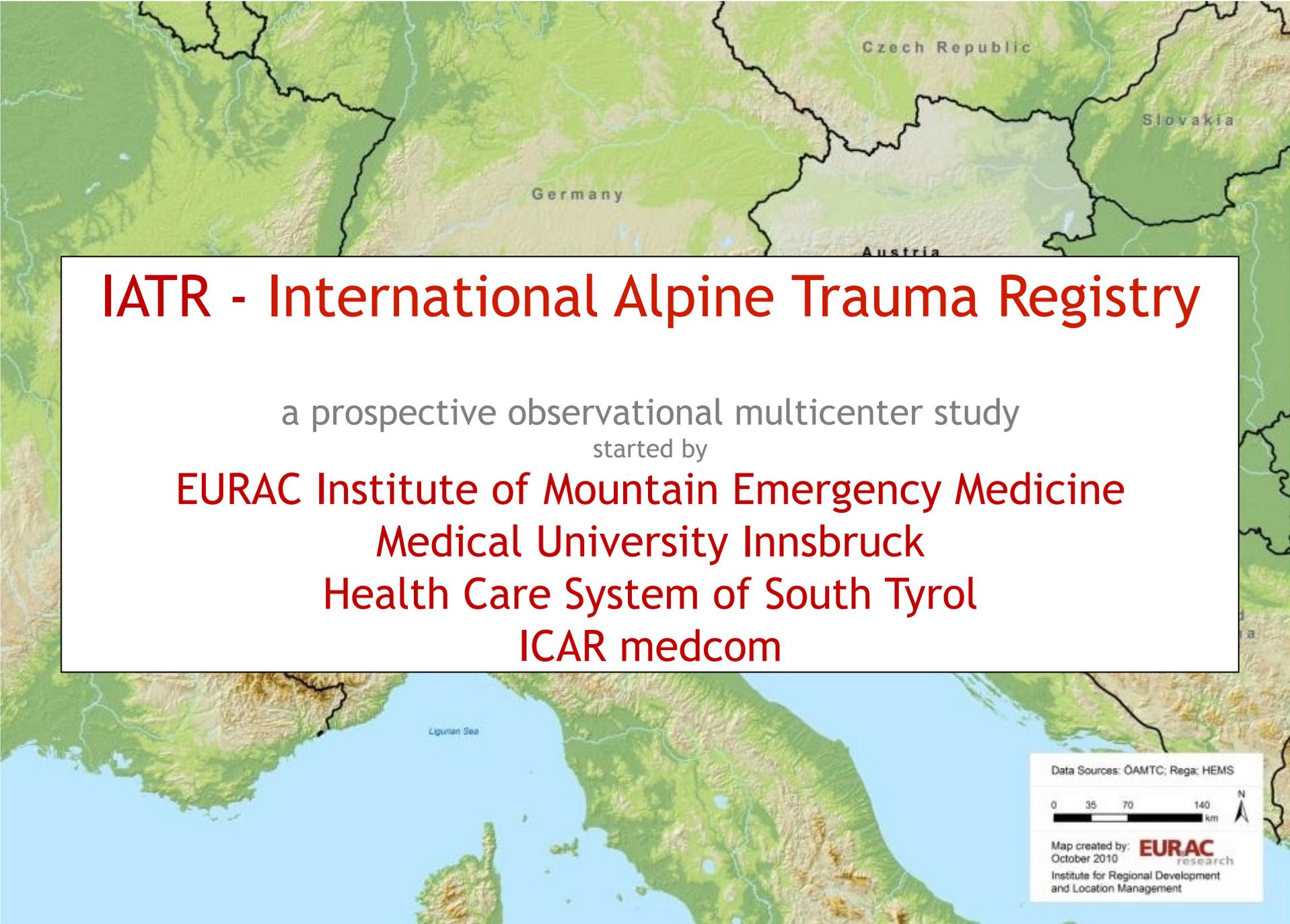
Data Sources: ÖAMTC; Rega; HEMS

0 35 70 140 km

Map created by: **EURAC** research
Institute for Regional Development and Location Management

Alpine Rescue Helicopterbases Switzerland, Austria, Alto Adige, Trentino





IATR - International Alpine Trauma Registry

a prospective observational multicenter study
started by

EURAC Institute of Mountain Emergency Medicine
Medical University Innsbruck
Health Care System of South Tyrol
ICAR medcom

Data Sources: ÖAMTC; Rega; HEMS

0 35 70 140 km

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IATR - Inclusion Criteria

Major trauma in remote and mountainous areas
not accessible to medical motor vehicles

IATR - Inclusion Criteria

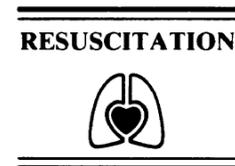
Major trauma in remote and mountainous areas
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+

Medical inclusion criteria for the IATR are
an ISS ≥ 16 ; and/or systolic blood pressure < 90 mmHg; and/or
respiratory rate < 10 or > 30 , at the scene of the incident



Resuscitation 42 (1999) 81–100



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)

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Accepted 21 July 1999

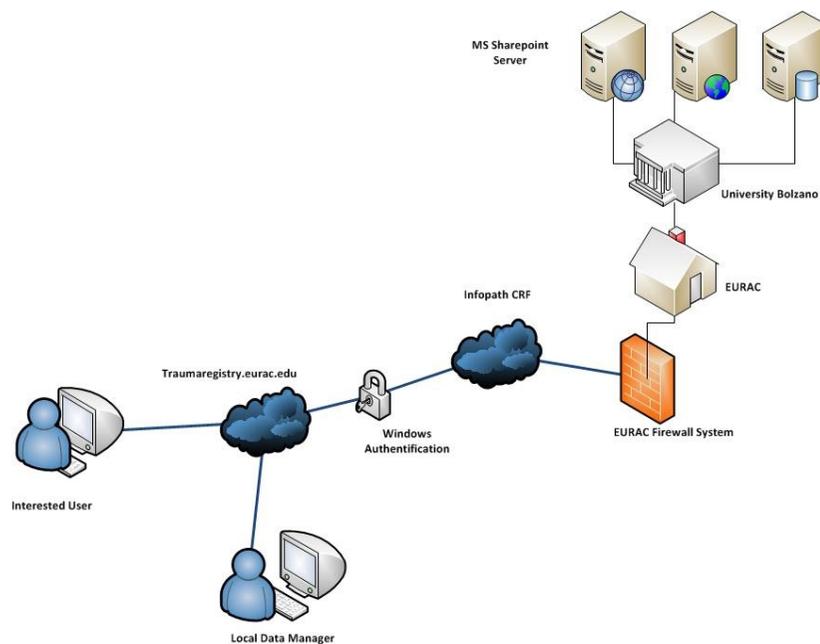


IATR – Data Collection

Case report form

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

IATR – Data Collection



User Name: Password:

INTERNATIONAL ALPINE TRAUMA REGISTRY



Introduction to the "International Alpine Trauma Registry"

The International Alpine Trauma Registry is the very first database on trauma management of victims rescued from difficult terrain not accessible by motor vehicles. This internet based registry was created in the trauma working group of the International Commission of Mountain Emergency Medicine ICAR MEDCOM with the EURAC Institute of Mountain Emergency Medicine, Italy which hosts the data on its secure server. The optimal care of critically injured trauma victims in a prehospital setting is highly controversial because robust scientific evidence is almost completely missing. This is particularly true for mountain rescue operations, characterised by a rough and hostile environment with often prolonged prehospital times. Consequently, a wide variation of treatment strategies is justified, ranging from simple "scoop and run strategies" to strategies of extensive advanced trauma life support at the scene until stabilisation of the patient. The objective is to observe prognostic factors, pre-hospital treatment and outcome of trauma patients in an alpine setting. In addition, with the data quality of the rescue operations and pre-hospital management can be compared and proposals made for improvement. The study will have a multicentre prospective observational design.

Attached files

- Inclusion and Exclusion Criteria (DE, EN, IT)
- Study Design (DE, EN, IT)
- Informed Consent (DE, EN, IT)
- CRF form (EN)
- NACA score (EN)
- Injury Severity Score (ISS) (EN)
- Glasgow Coma Scale (EN)
- Collaborating Centers
- F.A.Q. (DE, EN, IT)
- Contact and Help (DE, EN, IT)

Study – Recruitment Period

North Tyrol region

1st January 2011- 31st December 2013

Study - Inclusion Criteria

Major trauma in remote and mountainous areas
not accessible to medical motor vehicles

+

Medical inclusion criteria for the IATR are
an ISS ≥ 16 ; and/or systolic blood pressure < 90 mmHg; and/or
respiratory rate < 10 or > 30 , at the scene of the incident

but

**Patients who suffered accidents
on resort prepared ski slopes were excluded**

Patient record & case history

Total no. (North)	58 (out of 65)
Mean age \pm SD (yrs)	49 \pm 15
Male victims (n)	47
Median ISS \pm IQR (n)	34 \pm 18

Recreational activities ($n = 58$).

Activity	Number of patients
Hiking, mountaineering	$n = 19$ (33%)
Rock climbing	$n = 17$ (29%)
Off-piste and Backcountry skiing/boarding	$n = 13$ (22.5%)
Paragliding	$n = 7$ (12%)
Mountain biking	$n = 2$ (3.5%)

Patient record & case history

Total no. (North)	49 (out of 65)
Mean age \pm SD (yrs)	49 \pm 15
Male victims (n)	47
Median ISS \pm IQR (n)	34 \pm 18

Distribution of 72 life-threatening injuries ($AIS \geq 4$) over body regions in 54 patients admitted to hospital alive.

Body region	Number of injuries \geq AIS 4 (%)
Head/neck	$n = 25$ (35%)
Face	$n = 3$ (4%)
Chest	$n = 27$ (37%)
Abdomen	$n = 5$ (7%)
Extremities	$n = 12$ (17%)
External	None

Distribution of 72 life-threatening injuries ($AIS \geq 4$) over body regions in 54 patients admitted to hospital alive.

Body region	AIS 4 (%)
Head/neck	<div style="border: 2px solid red; padding: 10px; text-align: center;"> <p>31 (53%) patients suffered critical impairment of at least one vital function (systolic blood pressure <90 mmHg, GCS <10, or respiratory rate <10 or >30).</p> </div>
Face	
Chest	
Abdomen	
Extremities	
External	



Patient record & case history

Pre-hosp. time \pm SD (min)	80 \pm 55
Difficult terrain (%)	62
Winch/hoist operations (%)	69
HEMS + TMRS op. (%)	18

Total pre-hospital time ($n = 54$).

Total pre-hospital time	Number of patients
≤ 90 min	$n = 29$ (54%)
91–120 min	$n = 14$ (26%)
> 120 min	$n = 10$ (18%)
Unknown ^a	$n = 1$ (2%)

^a Time of accident unknown as accident was not witnessed.

Patient record & case history	
Pre-hosp. time \pm SD (min)	80 \pm 55
Difficult terrain (%)	62
Winch/hoist operations (%)	69
HEMS + TMRS op. (%)	18

Prehospital medical data	
Adv. airway management	23 (39%)
Unconscious (GCS \leq 9)	19 (33%)
Shock (BP \leq 90 mmHg)	48 (83%)
Analgesia	31 (53%)
Surgical intervention	torachostomy 2 (3%)

Prehospital medical data	
Advanced airway management	22 (20%)
<div style="border: 2px solid red; padding: 5px;"> No major complications of endotracheal intubation were reported </div>	
Shock (BP \leq 90 mmHg)	48 (83%)
Analgesia	31 (53%)
Surgical intervention	torachostomy 2 (3%)

Prehospital medical data

Adv. airway management	23 (39%)
Unconscious (GCS \leq 9)	19 (33%)
Shock (BP \leq 90 mmHg)	48 (83%)
Analgesia	31 (53%)
Surgical intervention	torachostomy 2 (3%)

ATLS interventions at scene ($n = 58$ patients).

Intervention	Patients (%)
iv line	$n = 57$ (98%)
Volume resuscitation	$n = 48$ (83%)
Volume resuscitation ≤ 500 ml	$n = 26$ (45%)
Volume resuscitation 500–1000 ml	$n = 12$ (21%)
Volume resuscitation > 1000 ml	$n = 10$ (17%)
iv analgesic drugs	$n = 31$ (53%)
Endotracheal intubation	$n = 21$ (36%)
Laryngeal tube/mask	$n = 2$ (3%)
Tube thoracostomy	$n = 2$ (3%)

Abbreviations: ATLS, advanced trauma life support; iv, intravenous.

Prehospital medical data	
Adv. airway management	23 (39%)
Unconscious (GCS \leq 9)	19 (33%)
Shock (BP \leq 90 mmHg)	48 (83%)
Analgesia	31 (53%)
Surgical intervention	torachostomy 2 (3%)

Prehospital medical data	
Advanced airway management	22 (30%)
U	Opioids or ketamine or a combination of both were used
Shock (BP \leq 90 mmHg)	48 (83%)
Analgesia	31 (53%)
Surgical intervention	torachostomy 2 (3%)

Prehospital medical data	
Adv. airway management	23 (39%)
Unconscious (GCS \leq 9)	19 (33%)
Shock (BP \leq 90 mmHg)	48 (83%)
Analgesia	31 (53%)
Surgical intervention	torachostomy 2 (3%)



ATLS interventions in rope rescue operations

BLS interventions	10 (25%)
ALS interventions	30 (75%)

ATLS interventions in rope rescue operations

PLS interventions

10 (25%)

All (75%) had an intravenous line inserted,
23 patients (58%) received analgesic drugs
and/or volume resuscitation,
and 5 patients (13%) had an ETI

Prehospital medical data	
Advanced airway management	22 (38%)
U	4 (6.9%) of 58 patients died prior to hospital admission
Shock (BP \leq 90 mmHg)	48 (83%)
Analgesia	31 (53%)
Surgical intervention	torachostomy 2 (3%)

Prehospital medical data	
Advanced airway management	22 (38%)
U	
4 (6.9%) of 58 patients died prior to hospital admission	
Shock (BP < 90 mmHg)	49 (82%)
in-hospital mortality equalled 10.3% (n = 6)	
Analgesia	31 (53%)
Surgical intervention	torachostomy 2 (3%)

Conclusions

The frequent combination of prolonged pre-hospital times,
with critical impairment of vital functions,
supports the need for early prehospital ATLS
in HEMS rescue operations in mountainous and remote areas.

Conclusions

Prehospital airway protection with endotracheal intubation is possible with a high success and low complication rate, and can be accomplished in the majority of patients with severe brain trauma.

Conclusions

Prolonged pre-hospital hypotension remains an unresolved problem in half of all patients with brain injury and indicates the difficulties to increase pressure to a desired level in a mountain rescue scenario.

Conclusions

Despite technical considerations,
for an experienced emergency care provider
ATLS is also feasible in the majority of rope rescue operations.

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for an experienced emergency care provider
ATLS is also feasible in the majority of rope rescue operations.

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Physician staffed helicopter emergency medical systems can provide advanced trauma life support in mountainous and remote areas

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Thanks for the attention

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