



Winter season in Innsbruck: neurosurgical implications of snowsport-related TBI

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INTRODUCTION

The university hospital of Innsbruck is the main Trauma Centre of Tirol and receives all cases of severe traumatic brain injury (TBI) that require neuromonitoring.
We collected information of 64 patients with snowsport-related TBI that required neurosurgical treatment in ski season (nov.-April) of 2022 in Tirol.

METHODS

64 patients with TBI required neurosurgical treatment during ski season of 2022. Patients were transferred directly from the ski area (severe TBI) or secondarily from smaller hospitals (if more intensive treatment was necessary). Maps of Tirol point out where ski areas and hospitals are located.

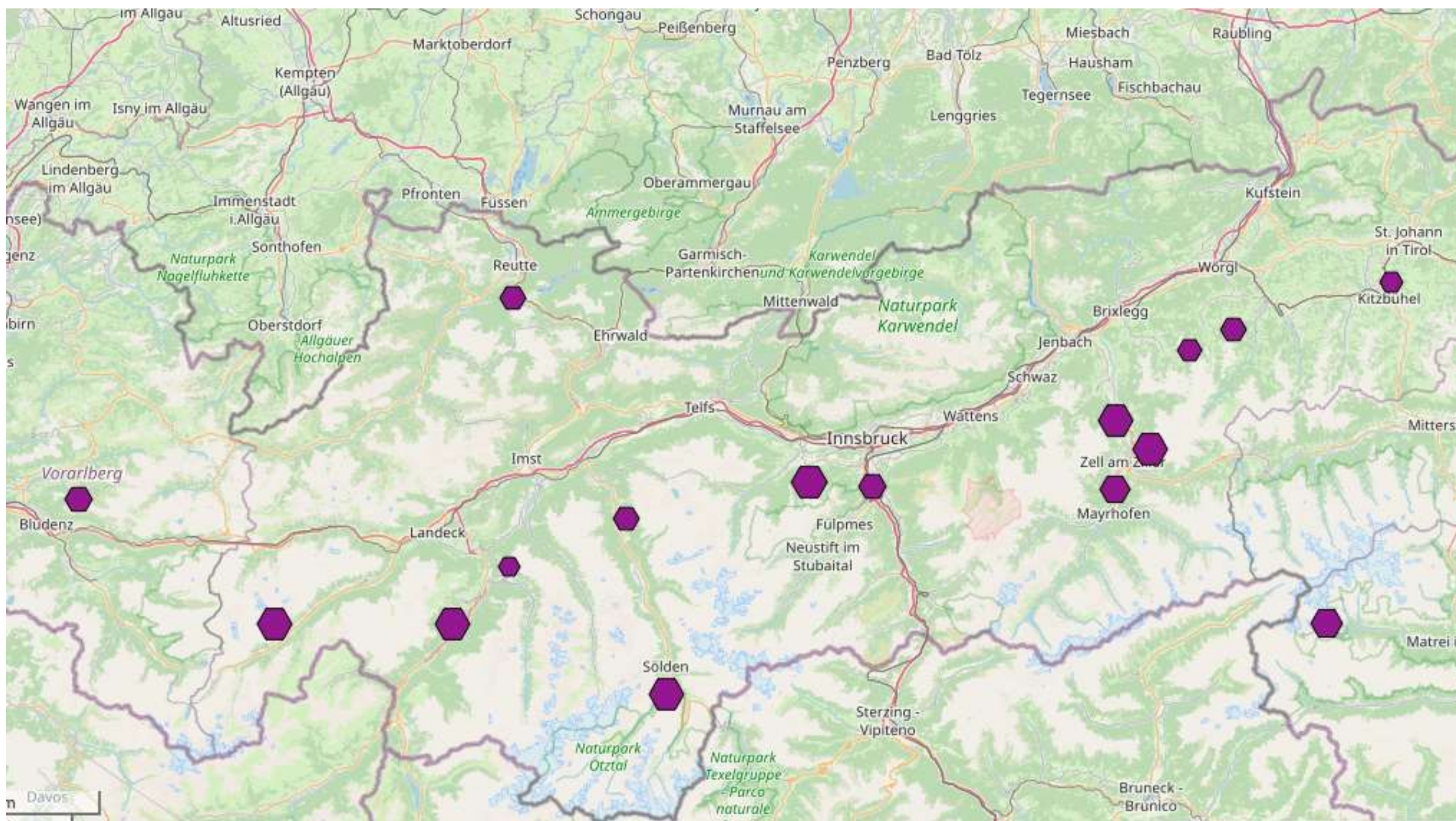


Fig. 1: Ski areas in Tirol.

Most directly-transferred patients came from Sölden, Ischgl, Zillertal und Serfaus

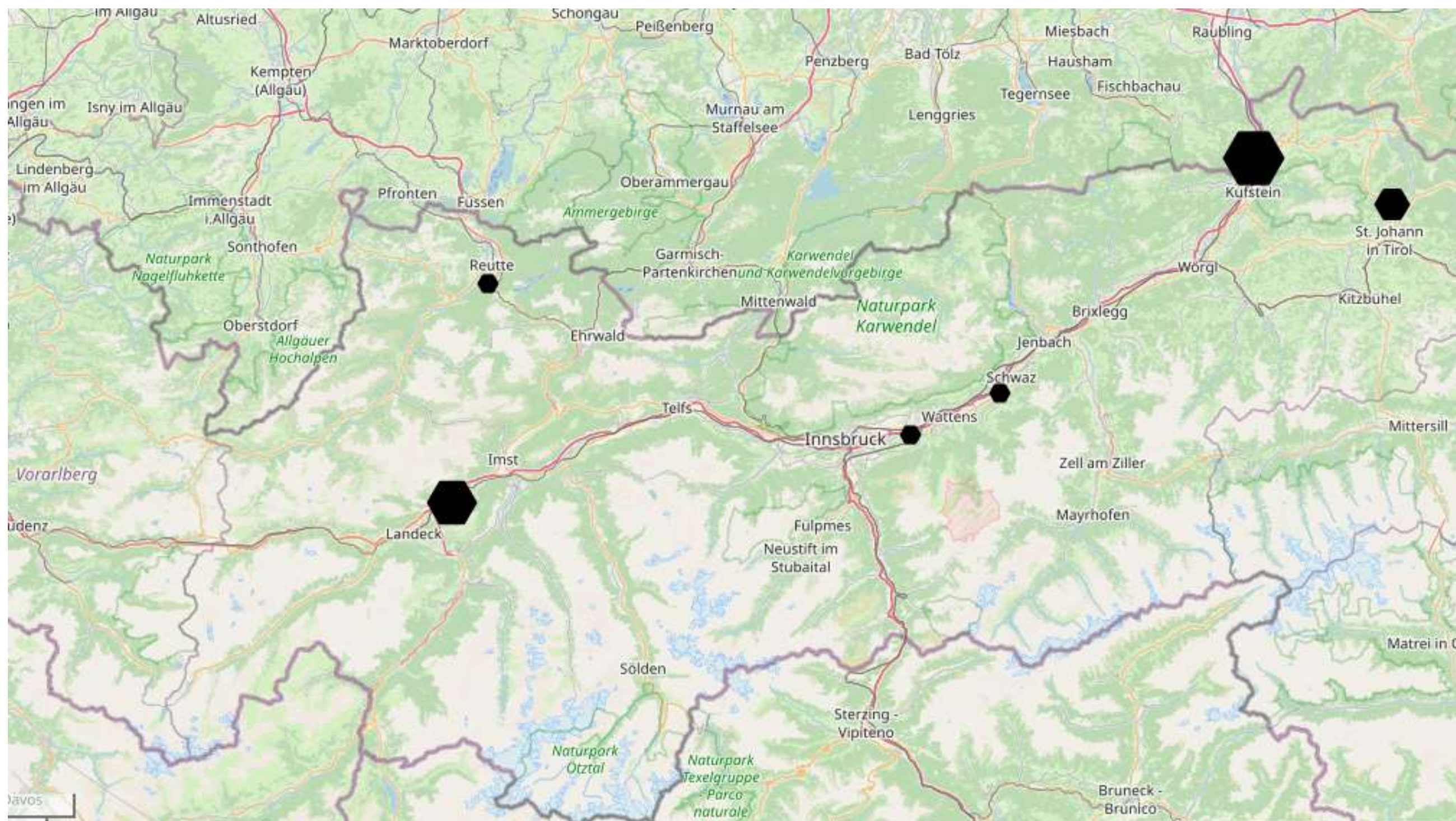


Fig. 2: Referring hospitals in Tirol

St. Johann in Tirol, Zams, Kufstein, Schwaz, Reutte and Hall in Tirol

RESULTS

Population:
75% male
>55% adolescents or seniors
60% tourists (Germany, The Netherlands, ...)

Very accurate assessment of emergency doctor:
Direct transfers to Innsbruck: severe TBI (44% intubated).
Secondarily transfers: moderate TBI (23% intubated).

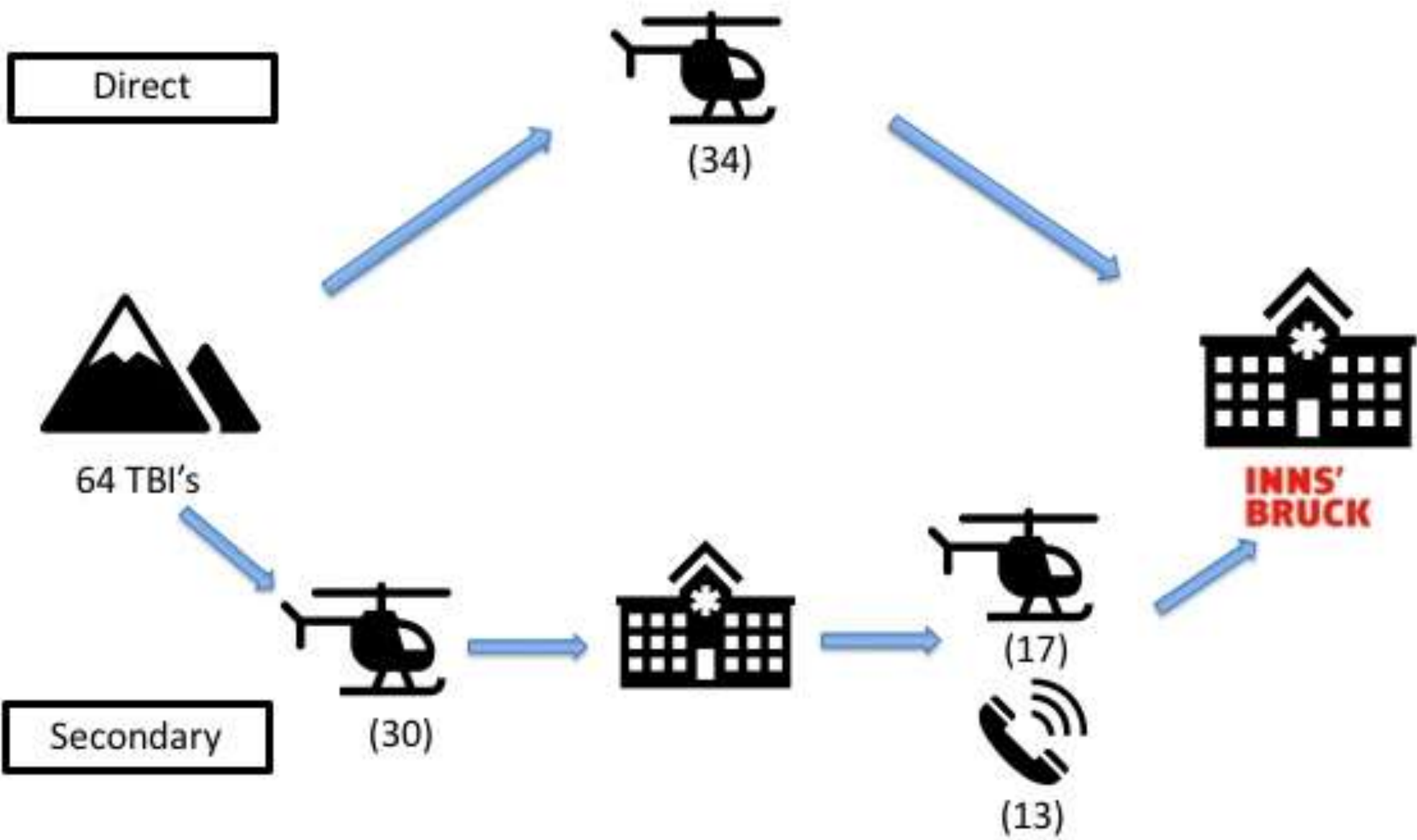


Fig. 3: Groups of directly vs secondarily transferred patients:
Emergency doctor decides (based on trauma mechanism and clinical status of patient) if patients are transferred to Innsbruck.
Helicopter is main mode of transportation.

tSAB	aSDH	Contusion	ICH	Ventricular Hem.	Clivus hematoma	cSDH
38	25	16	9	3	2	2

Fig. 4: Overview and number of intracranial lesions after TBI (in the first post-traumatic CT scan).
Most frequent lesions are traumatic subarachnoid hemorrhage (tSAB), acute subdural hematoma (aSDH) and contusions. 154 CT scans were done in 64 patients.

Controversial: Indication for angiography (CTA) of cervical and cranial region in every patient (1, 2).
25/34 directly transferred patients received a CTA of brain/cervical spine. All were negative...

MRI grading system	No DAI	DAI grade I	DAI grade II	DAI grade III
Total	6	5	2	9
Outcome:				
Bad	2	0	1	3
Transfer	0	2	0	2
Good	4	3	1	4

Table 1: Link between diffuse axonal injuries on MRI (DAI) and clinical outcome.
There is no clear cut relationship. DAI can't be used to define outcome with certainty.

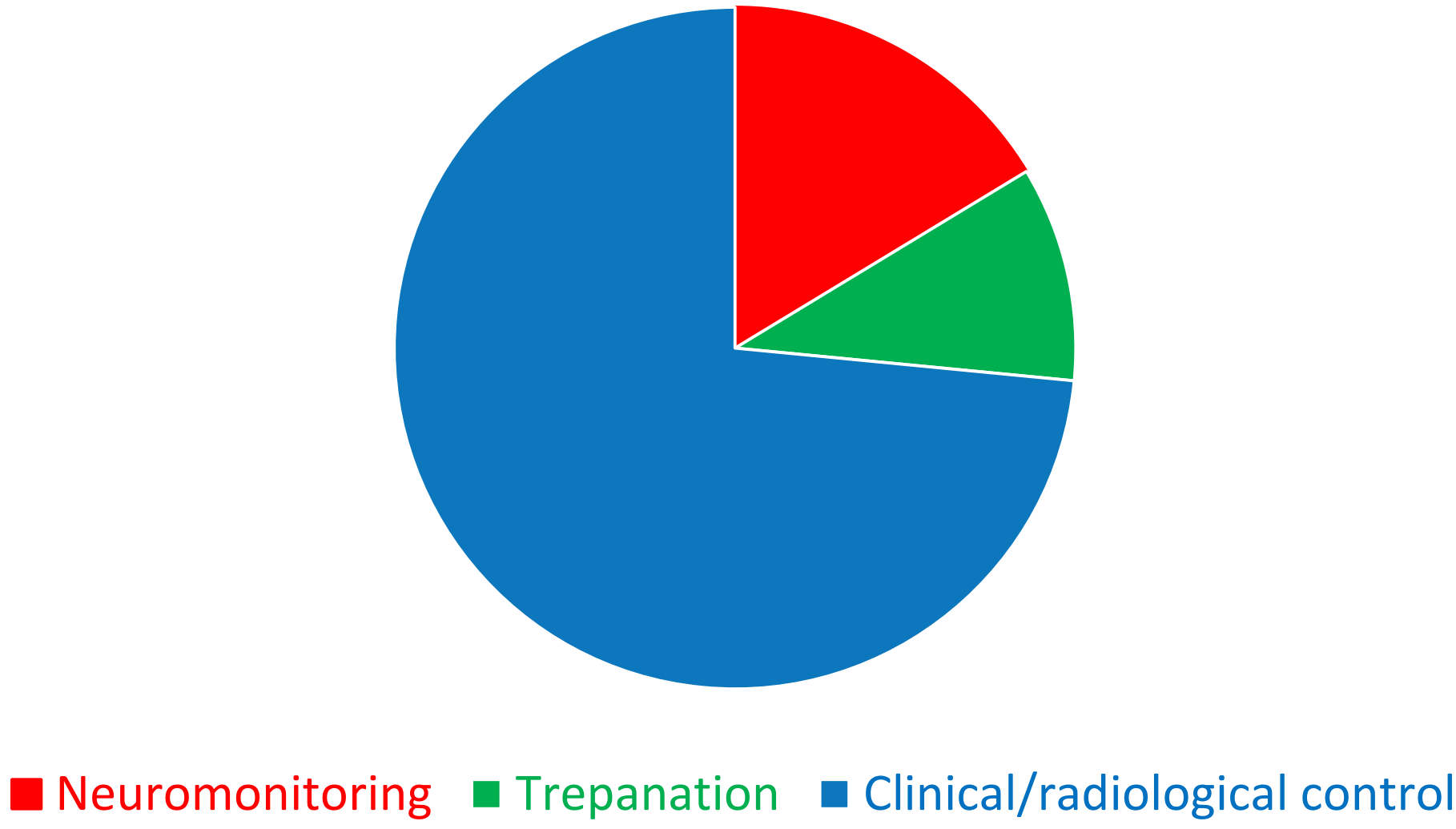


Fig. 5: Neurosurgical treatment.
Most patients were monitored on the ICU.
8 patients received ICP-monitoring.
5 patients underwent craniotomy for aSDH.

CONCLUSIONS

- Typical victims are male tourists. Risk behaviour (inexperience, alcohol, ...) remains import risk factor.
- Vulnerable groups: adolescents (<18y) or seniors (>65y).
- Successful triage: Most severe TBI patients are directly transferred to larger trauma centre (with intensive care unit).
- Cervical angiography is useful in high-velocity trauma. Cerebral angiography has a very low yield and is questionable.
- High amount of facial fractures (should helmets be redesigned?).
- MRI and radiological diagnosis of DAI to estimate prognosis in prolonged coma remains controversial.