

# TOXICOLOGY IN EMERGENCY ROOM IN THE VALAIS HOSPITAL

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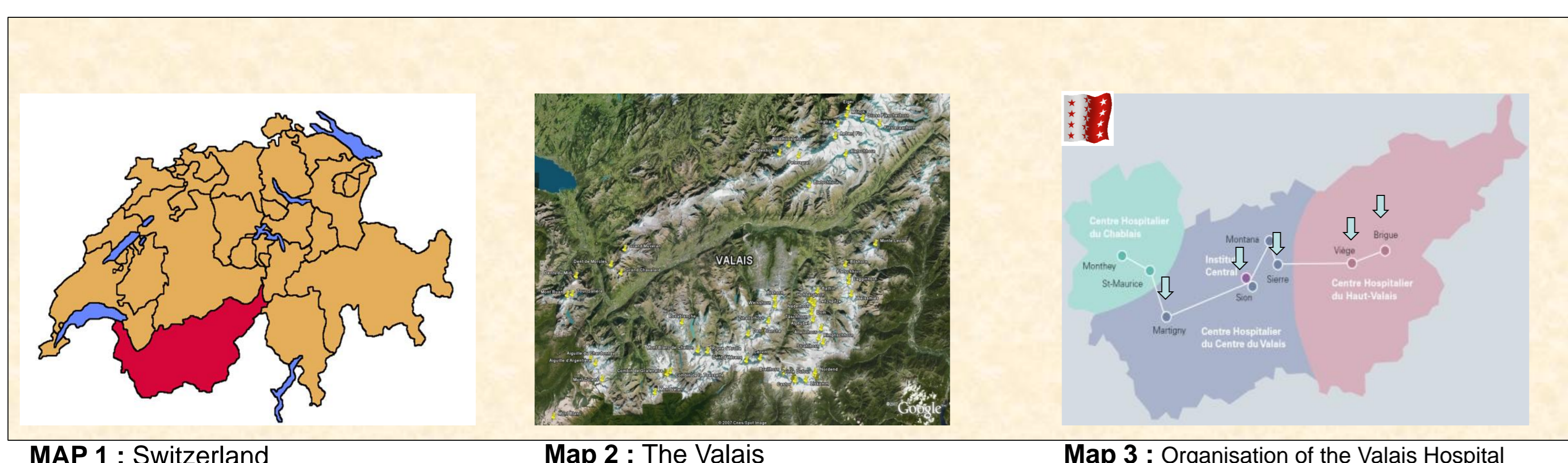
## INTRODUCTION

The 1<sup>st</sup> of January 2004, the Valais Hospital has been created for the implementation of cantonal hospital planning in Valais. The Valais is a montain canton in the south of Switzerland, whose most important industries are wine production, agriculture, hydroelectric power production (*Europe's tallest gravity dam is located at Grande Dixence in Valais*) chemistry factories, aluminium factories and tourism. People (300'000 people) in Valais speaks an old German in the part called Haut Valais and French in the part called Bas Valais.

## AIMS

This study presents drug-related visits to Valais Hospital emergency departments (EDs) for 2007 and 2008, based on data from the Central institute laboratory and from the Valais Health Observatory (OVS). This study is realized in accordance to the model of the "Drug Abuse Warning Network, 2006 (DAWN)"<sup>[1]</sup> which presents US national estimates of drug-related visits to hospital emergency departments for 2006.

A second aim is to observe the situation of young people in Valais in emergency departments with a drug related-visits. As we know, addiction is a brain disease<sup>[2]</sup>, which seems to start between the age of 15 and 25. Note that in Switzerland, it's forbidden to sell all types of alcoholic beverages to children below 16. For young people between 16 and 18 it's authorized to sell "light containing alcohol" beverage (like beer or wine). This underline the importance of obtain information about young people, which were divided in three groups : under 18 is the first group observed in the context of the swiss law for the sale of alcohol, under 21 is the second group observed to allow a comparison with the DAWN study and under 25 is the third group observed in the context of the addiction.



MAP 1 : Switzerland

Map 2 : The Valais

Map 3 : Organisation of the Valais Hospital

## METHODS

All the patients entered into the Emergency Department (ED) during 2007 and 2008, in the Valais Hospital's sites of Brig, Visp, Sierre, Sion (ED pediatric also) and Martigny (see map 3) were considered. In case of suspicion of intoxication or particular symptoms, toxicological investigation are demanded. The toxicological answer is constituted of two kinds of analyses in the laboratories of each sites : a screenings of drugs of abuse (DOA: acetaminophen, amphetamine, methamphetamine, barbiturates, benzodiazepines, cannabinoids, cocaine, methadone, opiates, PCP and TCA) by immunological test (Triage® TOX Drug Screen, Biosite) in urine. A measurement of ethanol in serum with colorimetric method (Cobas 6000 Roche® in Sion and Cobas Integra 400 plus, Roche® in the others sites). The result for DOA test are qualitativ (positiv / not detected) and for alcohol the result are a quantitative result (mmol/L and g/kg).

## Blood Alcohol Concentration (BAC)

In 2007, the mean blood alcohol concentration is 2.07 g/kg (0.15 – 5.15 g/kg). The mean blood alcohol concentration (BAC) for people under the age of 18, of 21 and of 25 is :

Age	age interval	N	Mean [g/kg]	Min [g/kg]	Max [g/kg]
< 18	12 - 17	51	1.75	0.27	2.80
< 21	12 - 20	149	1.84	0.21	4.20
< 25	12 - 24	269	1.81	0.16	5.15

In 2008, the mean blood alcohol concentration is 2.05 g/kg (0.14 – 5.47 g/kg). The mean blood alcohol concentration for people under the age of 18 , of 21 and of 25 is

Age	age interval	N	Mean [g/kg]	Min [g/kg]	Max [g/kg]
< 18	6 - 17	70	1.66	0.17	3.42
< 21	6 - 20	171	1.83	0.17	5.47*
< 25	6 - 24	294	1.85	0.17	5.47*

The maximum BAC concentration (5.47 g/kg\*) has been quantified by a 20 years person. Among the studied population positiv for BAC people under 25, represents 23% (N= 269) in 2007 and 24 % (N=295) in 2008.

Table 5 : Type of drugs by people under 25

Age	2007						2008					
	BENZO	THC	COC	MTD	OPI	PARA	BENZO	THC	COC	MTD	OPI	PARA
2							1				1	
11												1
13						1						2
14			1			1						1
15	1	1					2					3
16						1	3	2		1		
17	1	1					2	2		1		3
18		3				6	5					2
19			2	1			1					3
20	3						1	2	2			3
21	2						3	3	1	1		3
22	2	3					1	1				
23	3	2				1	2	2			1	
24	3	3	1				4	2	2	2	2	1
25	1						4	2			1	2
Total	16	16	3	0	3	12	28	19	5	5	5	23

## REFERENCES

[1] Drug Abuse Warning Network, 2006: National Estimates of Drug-Related Emergency Departments Visits. U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration (SAMHSA, <http://DAWNinfo.samhsa.gov>) August 2008.

[2] Drug Addiction, Jordi Camí, M.D., Ph.D., and Magí Farré, M.D., Ph.D. N Engl J Med 2003;349:975-86

## RESULTS

In 2007, Valais Hospital has delivered a total of 64'720 emergency departments (ED) visits. We observed that 1904 analysis were associated with drug misuse or abuse : 276 demands for DOA and 1646 demands for alcohol. Among these demands 1286 cases were positiv for alcohol and for DOA.

In 2008, Valais Hospital has delivered a total of 66370 emergency departments (ED) visits. We observed that 1788 analysis have been associated with drug misuse or abuse : 353 demands for DOA and 1706 demands for alcohol. Among these demands 1351 cases were positiv for alcohol and for DOA.

EMERGENCY DEPARTMENTS	2007	2008
Brig	3724	3254
Visp	11'841	12'860
Sierre	8'464	8'975
Sion	23'971	24'294
Sion Pediatric unit	5'120	4'948
Martigny	11'600	12'039
TOTAL VALAIS HOSPITAL	64'720	66'370

Table 1 : numbers of visits in ED in differentes sites in 2007 and 2008 in Valais Hospital

	2007	%	2008	%
Emergency departments visits	64'720	100	66'368	100
Associated with drugs misuse or abuse	1'904	2.94	1'978	2.98
Positiv results of drugs or alcohol	1'286	1.99	1'351	2.04

Table 2 : numbers of case associated and numbers of positiv cases

Table 3 : Drug misuse and abuse in ED visits in the Emergency Room in Valais Hospital, by type of drug involvement 2007 and 2008.

Drug involvement	2007		2008	
	calculated visits	% of visits	calculated visit	% of visit
All types of Drug misuse or abuse	1286	100	1351	100
Illicit drugs only	19	1	14	0.7
Alcohol only	1138	89	1201	89
Alcohol (age < 21)*	238*	(21) *	265*	(22)*
Pharmaceutical only	67	5.2	74	5.5
Combination				
Illicit drugs with alcohol	5	0.4	3	0.2
Pharmaceutical with alcohol	10	0.8	18	1.3
Illicit drugs with pharmaceutical	21	1.6	33	2.4
Illicit drugs with alcohol and pharmaceuticals	9	0.7	3	0.2

\* in the group of alcohol only, 21 % (n= 238) were < age 21 in 2007 and 22 % (n= 265)

Table 4 : Type of drugs detected in 2007 versus 2008

	2007 (n=276)		2008 (N= 353)	
	Positive Results	% POS	Positive Results	% POS
AMPHETAMINES	0		0	
METAMPHETAMINES	1		0	
CANNABIS	32	12	39	11
COCAINE	10	4	10	3
METHADONE	3	2	11	3
OPIATES	20	7	15	4
PHENCYCLIDINE	0		0	
BARBITURATES	4	1	2	1
BENZODIAZEPINES	80	29	93	26
PARACETAMOL	29	11	43	12
TRICYCLIQUE ANTIDEPRESSANTS	7	3	8	2

## Drug of abuse (DOA)

In 2007, 276 test have been demanded. 47.5 % (N=131) were positives for differentes drugs (Table 5). The two most common drugs found are benzodiazepines (29 %; N= 80) and THC (12 %; N=32). Among people under the age of 25, benzodiazepines and THC are the most frequent drugs detected (Table 4).

In 2008, 353 test have been demanded. 41.1 % (N=145) were positives for differentes drugs (Table 5). Like in 2007, the two most common drugs found are benzodiazepines (26 %; N= 93) and THC (11 %; N=39). Among people under the age of 25, benzodiazepines is the most frequent drugs detected, before the THC (Table 6).

Often associated with suicide, acetaminophen is 23 times detected in 2008, by people under age of 25.

## CONCLUSION

In Valais Hospital, less than 3 % of emergency visits has been associated with drugs misuse or abuse. 2 % present a positiv results for alcohol or a DOA. One person in four ,positiv for alcohol, is under the age of 25.

The mean blood alcohol concentration has stood stable in the two year study. When emergency visits has been associated with drugs, alcohol has been the most frequently drug investigated and found.

The two most common drugs detected in emergency are drugs of the benzodiazepines family and THC.