SANITÄTSDIENST

THE IMPORTANCE OF THE ANALYSIS OF TOOTH SURFACES FOR IDENTIFICATION IN CASE OF LARGE-SCALE CATASTROPHIC EVENTS

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BUNDESWEHR

DISCLAIM:

I HAVE NOTHING TO DISCLOSURE

OBJECTS

Forensic dentistry needs comparison…

Identification by dental status

Forensic norms and algorithms,

Process of identification

INTRODUCTION

- Need of identification
- The role of dentistry in identification
- The importance of the dental findings
- The speciality of the dental status

INTRODUCTION

- Moral aspects[1].
- Starting by Romans[2].
- Teeth are very resistible

[1] Sopher, 1972

[2]Sweet D., Why a dentist for identification? Dent Clin North Am. **2001** Apr;45(2):237-51. Review.

INTRODUCTION

Social aspects[1].

Globalisation increases[2].

Mass catastrophes[3].

Terror attacks like in Berlin and in Barcelona…

[1] Sopher 1972.

[2] Lindemaier et al 1993

[3] Vale 2004; Bux, Heidemann, Enders und Bratzke 2006, Brkic et al 2000, Petju 2007

INTRODUCTION

Social aspects[1].

Globalisation increases[2].

Mass catastrophes[3].

Terror attacks like in Berlin and even in Barcelona.

Flight MH 17

[1] Sopher 1972.

[2] Lindemaier et al 1993

INTRODUCTION

The famous forensic triad[1]

The principle of identification is to compare findings…

[1] Sopher 1972; Chomdej et al 2005; Petju et al 2007; Schuller-Götzburg 2007; Tan 2005; Vale 2004, Bux Heidenmann, Brkic et al 2000

INTRODUCTION

Forensic triad[1]:

1. Legal medicin

[1] Sopher 1972; Chomdej et al 2005; Petju et al 2007; Schuller-Götzburg 2007; Tan 2005; Vale 2004, Bux Heidenmann, Brkic et al 2000

INTRODUCTION

Forensic triad[1]:

1. Legal medicin

2. Dactylosopy

[1] Sopher 1972; Chomdej et al 2005; Petju et al 2007; Schuller-Götzburg 2007; Tan 2005; Vale 2004, Bux Heidenmann, Brkic et al 2000

INTRODUCTION

Forensic triad[1]:

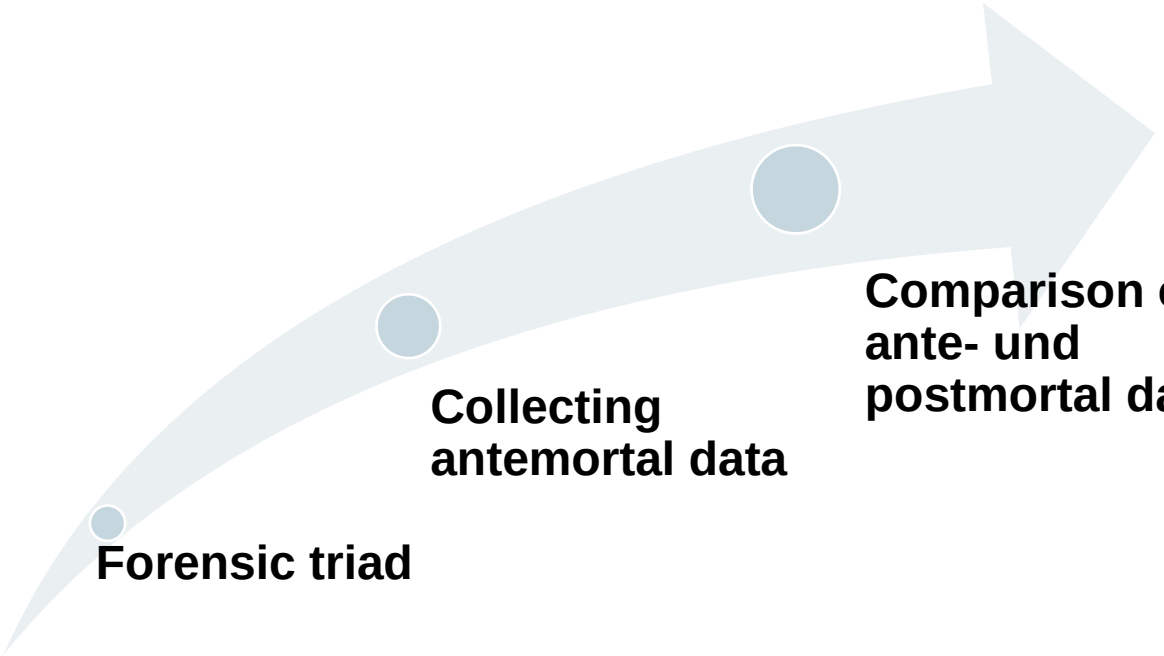
1. Legal medicin

2. Dactylosopy

3. Dental findings

[1] Sopher 1972; Chomdej et al 2005; Petju et al 2007; Schuller-Götzburg 2007; Tan 2005; Vale 2004, Bux Heidenmann, Brkic et al 2000

THE PROCESS OF IDENTIFICATION:



Incident

THE DENTAL FINDING:

✓Very precise[1]
✓Easy to aquire, x-ray ist standard[2]
✓Quick and easy
✓Directly available
-High level qualität of toothcolored restaurations[4]
-Limited in the use for children and edentoulos
-No standardised processes[3]
-Often bad antemortal documentation[5]
-Without restaurations identification will be difficult[6]
-Change in treatment (no more gold e. g.)[7]

[1]KayserNielsen 1966, [2]Lee2004, [3] Kvaal 2006, [4]Bux Heidemann 2006

[5]Chomdej et al 2005, Emenc und Rener 1999, Solheim 1999, Brkic 2000

[6]Nelson2007, [7]Albertini 1997

THE AIM OF MY STUDY WAS TO GET CLEARNESS ABOUT:

- Is it sufficient to examine the whole tooth?
- Does it pay to examine all characteristics?
- Does the detailed status progress identifications?
- The role of used materials.

THE AIM OF MY STUDY WAS TO GET CLEARNESS ABOUT:

Examples:

- 1 Tooth missing:
  32^2 combinations
- 24 teeth with 15 filled surfaces:
  $120!/(120-15)!=120!/115!\approx 6{,}2\times 10^{30}$
  reduced:

  $120!/(15! * (120-15)!) = 4{,}73 \times 10^{18}$

1024 Probands of both sexes, anonymous capture. Six age groups:

	Female	Male	All
Age group 1 (bis 20 years)	5	13	18
Age group 2 (21 - 30 years)	83	406	489
Age group 3 (31 - 40 years)	24	266	290
Age group 4 (41 - 50 years)	7	163	170
Age group 5 (51 - 60 years)	1	49	50
Age group 6 (61 years and elder)	2	5	7

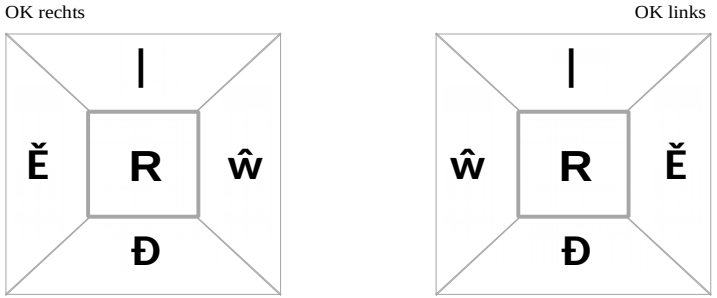
CATALOGUING

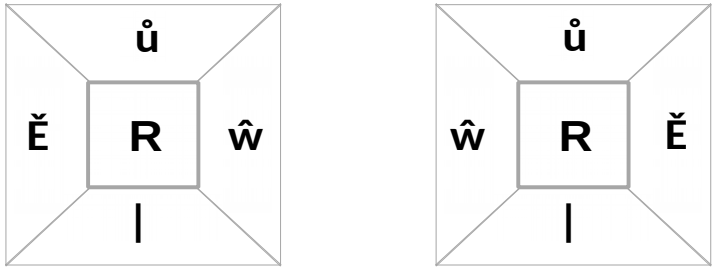
FDI-System

18 17 16 15 14 13 12 11	21 22 23 24 25 26 27 28
55 54 53 52 51	61 62 63 64 65
85 84 83 82 81	71 72 73 74 75
48 47 46 45 44 43 42 41	31 32 33 34 35 36 37 38

The surfaces:

maxilla





mandibular

d = distal
v = vestibular
m = mesial
p = palatinal
o = occlusal
l = lingual

The two different systems:

General dental code

Description	Variable
0	Sound
1	Decay
2	Insufficient restauration
3	Missing
4	Filling
5	Crown
6	Pont or parture tooth
7	Implant
8	Part. Crown
9	Retained tooth

Detailed dental code:

Description	Variable
1	Sound
2	Decay
3	Missing
4	Amalgam
5	Resin
6	Ceramics
7	Gold
8	Other material

Generell dental code:

„4“ (Filling) and „0 0 4 4 2 1“

Special dental code, here:

Toooth 46: 04000

The whole sequenze from tooth 22-27:
00000000044005550044400020000

Two kind of codes:

1024 codes with 32 numbers (general status) and

1024 codes with 160 numbers (detailed status)

Statistic analysis and comparison of the prevalence and the different findings

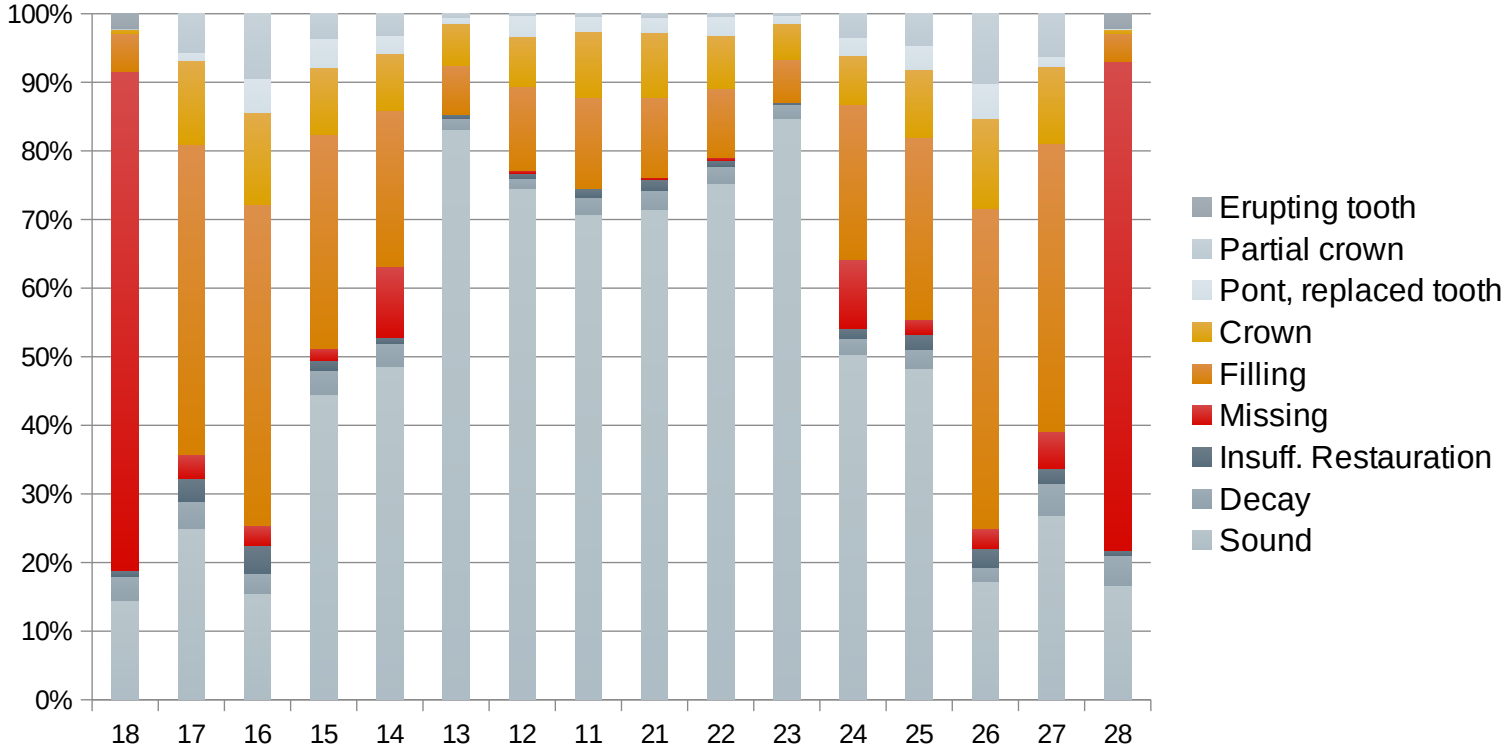
RESULTS

1024 probands: in toto 32.768 teeth and 163.840 surfaces were examined.

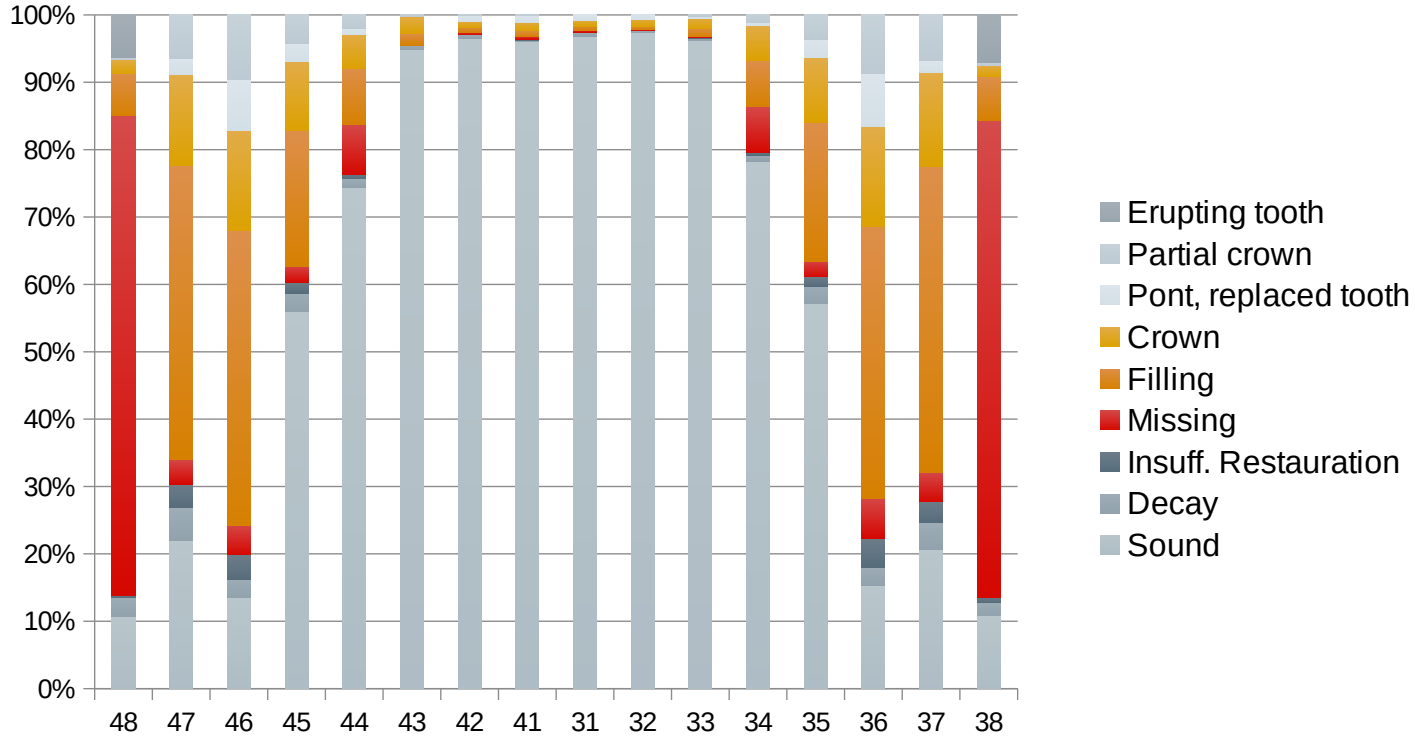
The age groups:

Minimum	**18,13**
Maximum	**67,53**
Median	**29,57**

Maxilla:


100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
18
17
16
15
14
13
12
11
21
22
23
24
25
26
27
28
Erupting tooth
Partial crown
Pont, replaced tooth
Crown
Filling
Missing
Insuff. Restauration
Decay
Sound

Mandibula:


100%
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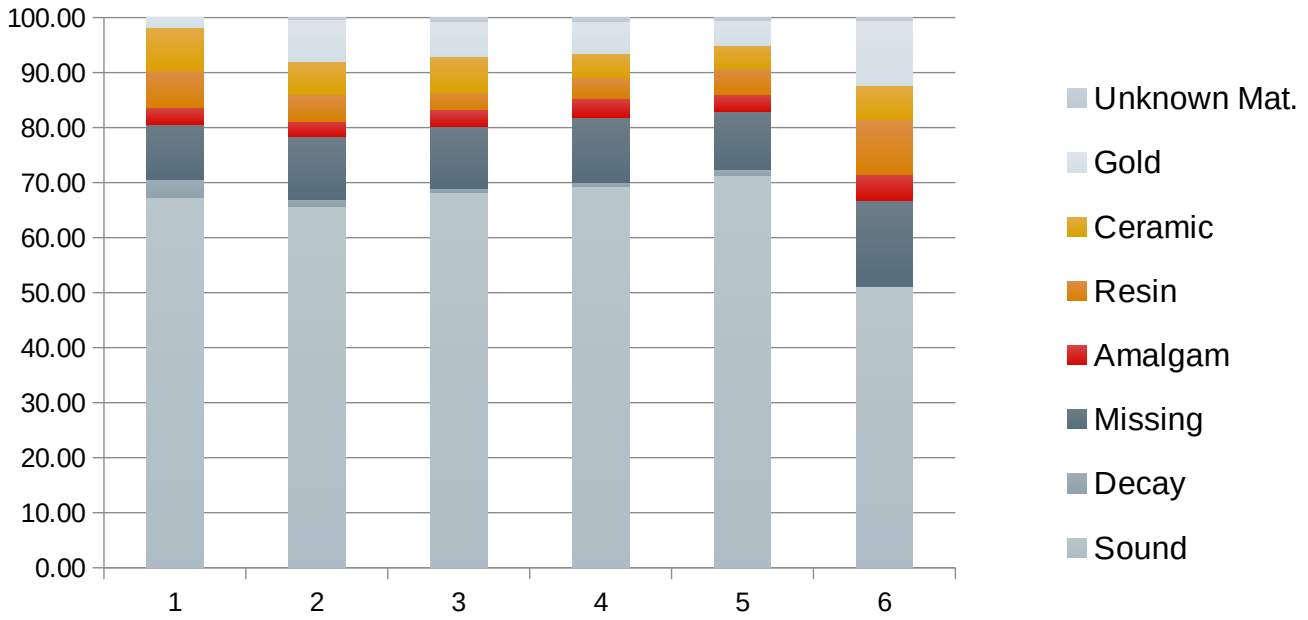
Erupting tooth
Partial crown
Pont, replaced tooth
Crown
Filling
Missing
Insuff. Restauration
Decay
Sound

Findings in age group:



Identifications by generell status :

1024 probands:

-977 individual dental status,
-47 without multiple dental status (= 4,58 %).

-Excluding wisdom teeth:
100 individual dental status, 47 without multiple dental status (= 9,76 %).

Identifications by special status :

1024 probands:

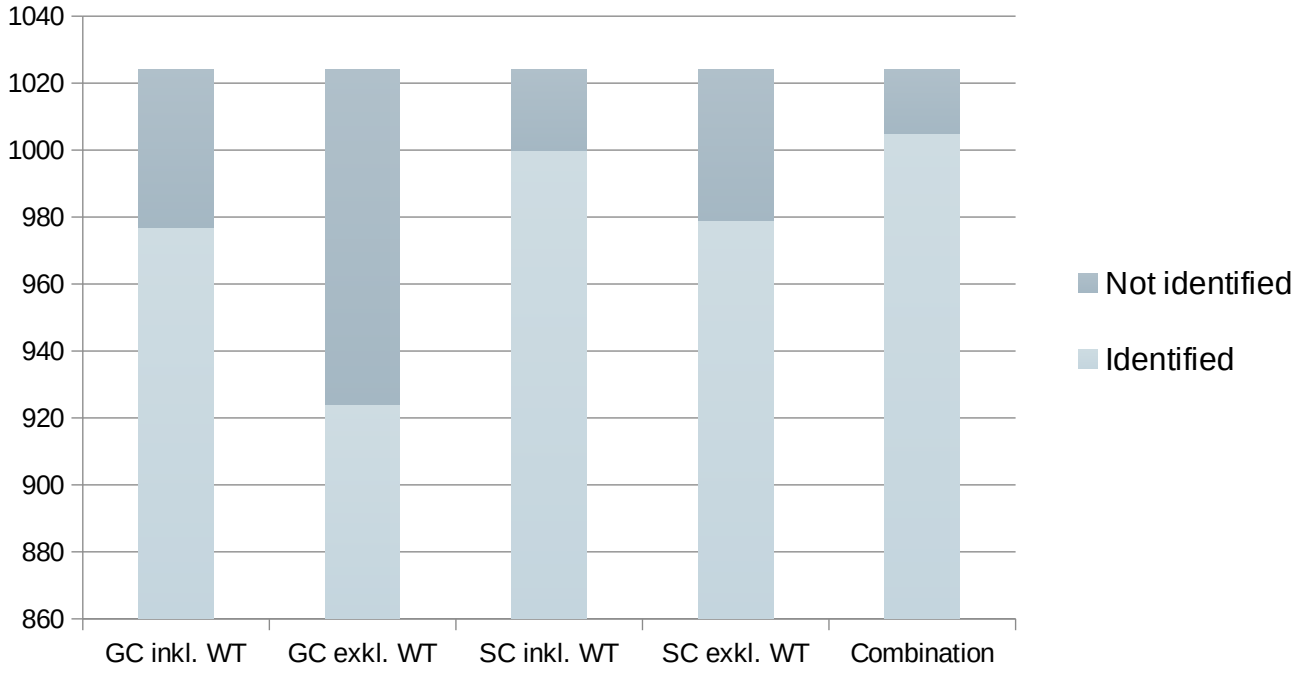
-1000 individual dental status,
-24 without multiple dental status (= 2,34 %).

-Excluding wisdom teeth:
979 individual dental status, 45 without multiple dental status (= 4,39 %).

Combination:

1005 individual dental status, 19 without multiple dental status (= 1,85 %).

RESULTS


1040
1020
1000
980
960
940
920
900
880
860
GC inkl. WT
GC exkl. WT
SC inkl. WT
SC exkl. WT
Combination
Not identified
Identified

DISCUSSION/EVALUATION

- **High individuality**
- **Need of individual characteristics[1].**
- **100% identification is not possible, some nonindividual cases:**

  example: 30000000000000033000000000000003

  (means: missing withdom teeth = 3,the rest was sound = 0)

- **Young people often have nonindividual findings[2].**

[1] Keiser-Nilsen, 1966; Phillips 1983
[2] Albertini 1997

CONCLUSION

- High rate of identification
- Use all information of dental status to minimise the nonindividual status.
- Combination of all processes
- ➢ Cataloguing all teeth surfaces is senseful and required.

„… even little things count in life“

Johann Heinrich Pestalozzi

BUNDESWEHR

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