

SREBRENICA MISSING: THE 2007 PROGRESS REPORT ON THE DNA-BASED IDENTIFICATION BY ICMP

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I. BACKGROUND INFORMATION

In February 2007, Helge Brunborg, the demographic expert for the Prosecution in the POPOVIĆ ET AL. case, presented to the Trial Chamber two demographic expert reports:

- Report 1: Helge Brunborg, Ewa Tabeau and Arve Hetland, 2005: Missing and Dead from Srebrenica: The 2005 Report and List. Expert report for the case of VUJADIN POPOVIĆ et al. (IT-05-88), 16 November 2005. (ERN 0501-6180-0501-6209, Exhibit No. P02413).
- The lists of victims associated with the above-mentioned report were the following:
 - (1.1) SREBRENICA MISSING: Persons Reported Missing and Dead after the Take-Over of the Srebrenica Enclave by the Bosnian Serb Army on 11 July 1995. The Hague, 16 November 2005. (ERN 0501-5985-0501-6177; Exhibit P02414).
 - (1.2) SREBRENICA MISSING: Possible Survivors Excluded from Persons Reported Missing and Dead after the Take-Over of the Srebrenica Enclave by the Bosnian Serb Army on 11 July 1995. The Hague, 16 November 2005. (ERN 0501-6178-0501-6179; Exhibit P02415).
- Report 2: Helge Brunborg, Ewa Tabeau and Arve Hetland, 2005: Identified Persons among the Missing and Dead from Srebrenica. An Addendum to the Expert Report: Missing and Dead from Srebrenica: The 2005 Report and List, 21 November 2005. (ERN R089-6474-R089-6490; Exhibit No. P02416).
- The lists of victims associated with this report were as follows:
 - (2.1) SREBRENICA IDENTIFIED: Identified Persons (ICMP) Included among Those Reported Missing and Dead after the Take-Over of the Srebrenica Enclave by the Bosnian Serb Army on 11 July 1995. The Hague, 16 November 2005. ERN R089-6406-R089-6469; Exhibit P02417).
 - (2.2) SREBRENICA IDENTIFIED: Identified Persons (ICMP) not Included among Those Reported Missing and Dead after the Take-Over of the Srebrenica Enclave by the Bosnian Serb Army on 11 July 1995. The Hague, 16 November 2005. ERN R089-6470-R089-6473; Exhibit P02418).

Report 2 and the two lists associated with this report contained an analysis of data on the DNA-based identification of Srebrenica victims provided to the OTP on 9 September 2005 by the International Commission for Missing Persons in Sarajevo (ICMP). This data represented the state-of-the-art of the DNA identification process of Srebrenica victims accomplished by the ICMP at that time. The September 2005 records became quickly outdated due to the rapidly growing number of identifications obtained by the ICMP every month. Thus, after the September 2005 update, the OTP requested and received from ICMP several next updates, the latest being from 4 October 2007 (ERN: D000-2146-D000-2146).

The 4 October 2007 data on the identified individuals provided by ICMP was analyzed by the Demographic Unit, OTP, which - as in 2005 - prepared an overview of the latest statistics on the progress in the DNA-based identification of Srebrenica victims, and accordingly updated the 2005 OTP list of missing and dead persons related to the fall of Srebrenica. The analysis was conducted using the previously applied methods and following the same standard procedures for data matching and duplicate checks. As part of this latest analysis, the 2005 OTP list of Srebrenica Missing (list 1.1) had been integrated with the latest 4 October 2007 ICMP records of the identified from Srebrenica (equivalent to list 2.1 but more recent). As a result, one integrated list became available: the 2005 OTP list of Srebrenica Missing with details of the exhumation gravesites and the ICMP DNA identification reports inserted for individuals that have been identified so far through the DNA analysis.

Thus, the present report (hereafter: the 2007 report) should be seen merely as an update of the 2005 demographic expert report on the identified persons from Srebrenica (P02416) and the relevant lists of victims (P02417 and P02418). The methodology used in the 2007 report remains the same as in the 2005 report. A frequent reference is therefore made here to the 2005 report instead of repeating a full explanation of details.

The 4 October 2007 data was also presented by Dean Manning, the OTP witness on exhumations of Srebrenica related mass graves, in his research report of 27 November 2007 (ERN 0614-8656-0614-8680; P017126) and subsequent testimony of 10-12 December 2007. Manning's results are referred to in this report, mainly in explaining differences in our and his analytical approach.

The 2007 report on the DNA-based identification of Srebrenica missing comprises the following sections:

1. Background information
2. Executive summary of updated statistics
3. Data used: The 4 October 2007 ICMP Update
4. Data cleaning and new items
5. Data matching
 - 5.1 Matching of the October and February ICMP updates
 - 5.2 Matching of the 2005 OTP List of Srebrenica Missing with the October 2007 ICMP List of Srebrenica Identified
6. Results
 - Annex 1. Note on Corrections in the ICMP Update of 4 October 2007 on the Identified Persons Related to Srebrenica" (ERN R064-6798-R064-6801)
 - Annex 2. Srebrenica Missing. The 2007 Progress Report on the DNA-Based Identification by ICMP (ERN D000-2200-D000-2200)

As part of the 2007 report, the integrated 2005 OTP list of missing and dead persons related to the fall of Srebrenica is attached (Annex 2). The same list was prepared in November 2007 as part of materials related to Dean Manning's testimony on 10-12 December 2007. It is now resubmitted in exactly the same form, subject to one correction of the introductory text. Thus, the last paragraph of page ii (R091-9553) which now reads as follows:

"Gravesites from the ICMP List were cross-referenced with Srebrenica-related gravesites known and accepted by the OTP. The minimum number of individuals identified via DNA analysis by ICMP in mass graves known and accepted by the OTP to contain only individuals executed following the fall of Srebrenica is 4,010. This number consists of 3,252 DNA profiles matched to a missing person and 758 unique DNA profiles."

The correction reflects Manning's removal of seven "N.KAS" records from the list of identified individuals exhumed from the Nova Kasaba gravesite (1996 exhumation).

2. EXECUTIVE SUMMARY OF UPDATED STATISTICS

As of 4 October 2007, there were 4,263 unique main cases, i.e. records of different individuals identified through the DNA analysis, and 2,346 reassociations, i.e. bone-to-bone DNA matches, reported in the October 2007 update on the DNA-based identifications of Srebrenica victims (cleaned data).¹ The total number of records in the ICMP update is 6,609. Each ICMP record represents the identification of one individual but due to the presence of reassociations included in the ICMP data, the overall number of records in the ICMP file contains duplicate cases. The analysis presented in this report is based on records of unique main cases (4,263); all reassociations (2,346) were excluded.

Of the unique main cases about 90% (i.e. 3,837 out of 4,263 individuals) are found in the 2005 OTP List of Srebrenica Missing. The remaining 426 records (out of 4,263; about 10% of the ICMP list) remain either unmatched (165 individuals) or represent less certain matches (261 individuals). The unmatched records (165) can be seen as new and additional to the 2005 OTP list of missing and dead persons related to Srebrenica. Noting that the 2005 OTP list of Srebrenica Missing contains records of 7,661 individuals, the new ICMP records increase the number of Srebrenica victims (i.e. missing and dead persons) to 7,826 persons. This number is increasingly approaching the 8,100 figure which has recently been mentioned by the ICMP as their estimate of the Srebrenica Missing (ICMP statement of 30 November 2007; ERN 0614-8923-0614-8923).

The less certain matches (261) were obtained based on names only as date of birth (DoB) was in most of these cases missing in the ICMP or ICRC data (or both). A majority of less certain matches relate to records with multiple names, in which cases as a rule DoB is not reported by ICMP.

All statistics mentioned above were obtained from the ICMP records of the identified persons whose names and other personal details are known (hereafter: "with names"). In addition to the records "with names", the ICMP has in their databases an additional list of records "without names" (hereafter: "without/no name records"). A "no name" record represents a DNA profile obtained from a bone sample taken from the exhumed remains, which has not yet been matched with a DNA profile of this person's relatives. Thus, personal details are yet unavailable. The unique profiles represent different individuals whose names will become available in a later time. These currently nameless individuals may and should be regarded, however, the same as the victims with names.

There are in total 816 unique profiles provided by the ICMP on October 8, 2007 (ERN D000-2189-D000-2189). The exhumation gravesite is known for all unique profiles. For the gravesites that Dean Manning considers as Srebrenica-related in his 27 November 2007 report, the list of unique profiles comprises 758 records (out of 816). The list can be analysed jointly with the records with names. The "no name" records can be added to the records with

¹ Details of the initial assessment and cleaning of the ICMP update of 4 October 2007 are available from Annex I: Note on Corrections in the ICMP Update of 4 October 2007 on the Identified Persons Related to Srebrenica (ERN R064-6798-R064-6801).

names and adjusted new statistics can be produced. The resulting overall number of identified persons is then 5,021 (4,263+758).

Taking into account that the minimum number of individuals identified via the DNA analysis by ICMP in mass graves known and accepted by the OTP to contain only individuals related to the fall of Srebrenica is 3,259 (Manning's 2007 report), and by additionally including 758 unique DNA profiles, a more conservative minimum number of Srebrenica identified becomes 4,010 (3,252+758). Dean Manning presented this number in his 27 November 2007 report.

The minimum number produced by Manning, i.e. **4,010** persons, is more conservative than any other number of Srebrenica Identified as it is based on the identification of the remains from the gravesites he considers as exclusively Srebrenica related (with no additional remains from other conflict incidents). The ICMP records of the identified, i.e. the latest data from October 2007 and also earlier versions of this data, indicate however, that Srebrenica victims were found as well in gravesites which do not entirely relate exclusively to the fall of Srebrenica. Therefore another minimum number of Srebrenica identified can be obtained from all data provided by ICMP, disregarding whether a gravesite was exclusively related to the fall of Srebrenica or contained mixed remains. We showed that this second minimum number equals **5,021** individuals (4,263+758), of whom 3,837 persons (out of 4,263 cases with names) are also listed in the 2005 OTP List of Srebrenica Missing and 758 are unique DNA profiles. Both these numbers (5,021 and 4,010) will further increase in the future according to the identification progress made by ICMP.

In order to illustrate the present day status of the DNA-based identification of Srebrenica Missing we attach in Annex 2 the latest October 2007 ICMP data on the identified as part of the 2005 OTP list of Srebrenica Missing. The 2005 OTP list is exactly the same as that presented by Brunborg et al. in 2005 (P02414). It contains 7,661 cases of Srebrenica Missing. The ICMP records are only those that have been matched with the 2005 OTP list, thus include 3,837 cases of Srebrenica Identified confirmed on both lists. The unmatched cases (165) and less certain matches (261) are listed separately in part 2 of the list in Annex 2. The unique DNA profiles with no names (758) are excluded altogether.

3. DATA USED: THE 4 OCTOBER 2007 ICMP UPDATE

The data items provided by ICMP are generally the same as those available from the previous updates (e.g. February 2007 or September 2005) and the ICMP Notice. An excerpt from the 4 October 2007 ICMP update on the Srebrenica identified is attached below in Table 1. (It represents a closed case in ICMP data). For a more detailed description of these items, we refer the reader to the Brunborg et al. report of 21 November 2007, Sections 3.1 and 3.2. New in the October 2007 update are three items: "type of report", and date and place of disappearance (DoDis and PoDis, respectively). "Type of report" points out whether a given report is the main case or a re-association. Negative reports are excluded from the October 2007 update. The availability of this item makes cross-referencing of the October 2007 update with any additional data from the ICMP Notice unnecessary. The DNA reports marked as main cases represent different individuals and can be directly used in analysis.

Table 1. Overview of data items provided in the October 2007 update of ICMP on DNA-based identifications of Srebrenica victims

ICMP Items	Example of Data
Name	Malagic (Ramiz) Muhamed
DoB	4-Sep-72
Protocol Id	1935/03
Case Id	GL5-065BPZ
ID ICMP	12142
Site Name	Glogova
Site Coordinates	CP615964
Jurisdiction	BiH/Federation Commission
Date of Submission	4-Jun-03
D(ate) of Dis	11-Jul-95
P(lace) of Dis	Forest
type of report	Main Case

Date and place of disappearance are both related to the fall of Srebrenica. DoDis has one value for all identified persons related to the fall of Srebrenica "11 July 1995" disregarding the actual date of disappearance or death of victims. We therefore did not use DoDis in any analysis. PoDis has two values "forest" or "Potočari" and represents the actual place of disappearance. We used these values in some analysis.

4. DATA CLEANING AND NEW ITEMS

In a related "Note on Corrections in the ICMP Update of 4 October 2007 on the Identified Persons Related to Srebrenica" (ERN R064-6798-R064-6801; see as well Annex 1) we discussed problems of consistency of the latest ICMP records. In this report we concentrate on matching and analysis of the ICMP data as required from the point of view of previously presented 2005 demographic expert reports and 2005 OTP lists.

No other data cleaning/corrections than what is described in the "Note on Corrections" were done. All data cleaning/corrections were related to Protocol IDs and in a few cases the type of report was modified.

In addition to that a number of searches for duplicated records were conducted on the main cases as indicated in the "type of report revised" (revision according to the Note on Corrections; ERN R064-6798-R064-6801). The criteria 1 to 8 from the Brunborg et al. report of 21 November 2007, Section 4, were used. No duplicates were found. Criterion 8 (duplicates on names: first, father's and family names) resulted in a list of 138 potential duplicates none of which was the true duplicate. Out of the 138 records, 112 were records with multiple names; each with a set of three unique IDs (Protocol ID, Case ID and ICMP ID), pointing out that these were all different persons. The remaining 26 records were pairs of unrelated individuals, each with a different ID and a different date of birth.

A few new data items were created based on the original information from the October 2007 update on the identified and on the links of the October update with the ICRC missing persons list (the 2005 edition and as reported in the 2005 OTP list of missing and dead from Srebrenica).

1. **“Type of Report Revised”**: same as the original item “type of report” except for 47 records of “stand-alone” reassociations (called by ICMP: Main Cases in Process).
2. **“Unique Main Cases”**: marking of unique main cases. Out of the 47 stand-alone reassociations, 31 were arbitrarily flagged by us as main cases. The flagging was based on the three IDs (Protocol ID, Case ID and ICMP ID) together with names and DoBs of the identified. Remaining records are as originally reported by ICMP
3. Sex (3 items; “Sex (Merged)” was used in analysis):
 - a. **“Sex(1)”**: As reported by ICRC (for matched records only)
 - b. **“Sex(2)”**: Frequency-based from the 1991 Census (for unmatched and unreported by ICRC records only)
 - c. **“Sex (Merged)”**: Original ICRC reports all taken first (for certain matches only); Rest as “Frequency-Based” in the 1991 Census
4. Age (3 items; “Age (Merged)” was used in analysis):
 - a. **“Age (ICMP Based)”**: 1995-YoB (YoB from original ICMP reports)
 - b. **“Age (ICRC Based)”**: 1995-YoB (YoB from ICRC reports for matched records only)
 - c. **“Age (Merged)”**: 1995-YoB (YoB as Reported by ICMP; Rest as reported by ICRC in matched records)
5. **“Match with Feb07”**: indication of whether a given record was included in the Feb07 update or is new in Oct07 update
6. **“BAZ ICRC (Merged)”**: The BAZ (ID) number of the ICRC (only for the records matched with the 2005 OTP List of Missing)

The above-mentioned items were created for use in analysis.

5. DATA MATCHING

5.1 MATCHING OF THE OCTOBER AND FEBRUARY ICMP UPDATES

We matched these two lists through all three IDs: the Protocol ID, Case ID and ICMP ID, and a few additional manual searches based on all information available from data. The result is that all but three records from the February update have been matched with the October update. The three unmatched records might be a result of a slightly different formulation of the selection criterion used by ICMP for the two updates. The three records are the following:

Table 2. Three records of identified persons reported in the ICMP February 2007 update and not in the October 2007 update.

Name	DoB	Protocol Id	Case Id	ID ICMP	Site Name	Site Coordinates
Arukovic (Osman) Seudin	12-Jul-71	6553/05	702-03-04-B	15899	Visegrad	N/A
Delic (Edhem) Enver	01-Jan-75	1958/03	HZ03B-074F	17086	Hodzici	CQ423174
Karic (Dzermal) Edin or Nedim		3417/04	ZJ5B-141H	9465 or 9469	Zeleni Jadar	CP641788

Records of Arukovic (Osman) Seudin and Karic (Dzermal) Edin or Nedim are not listed on the 2005 OTP list of Srebrenica missing and dead.² The record of Delic (Edhem) Enver is included in the 2005 list as a match with the February 2007 update of ICMP.

² More specifically, the name of Karic (Dzermal) Nedim is not on the OTP list. Karic (Dzermal) Edin is listed as a match with the ICMP update of October 2007 but the link goes through a different ICMP record (ICMP ID 9465), not the one reported in Table 2. The (two-name) record reported in Table 2 has been removed from the October 2007 update in consequence of the corrections we obtained from the ICMP (comp. “Note on Corrections”; ERN R064-6798-R064-6801).

5.2 MATCHING OF THE 2005 OTP LIST OF SREBRENICA MISSING WITH THE OCTOBER 2007 ICMP LIST OF SREBRENICA IDENTIFIED

Matching of these two lists was done in two steps:

- First, those records of the 2005 OTP List of Srebrenica Missing marked as matched with the February ICMP update were also marked as matched on the October 2007 ICMP list of identified. Links were moved through the ICMP ID. This was applied to both main cases and reassociations in the same step.
- Second, additional matches were created using comparisons of all names and DoBs in both lists. Matching criteria and additional checks in the 1991 Census were as discussed in the Brunborg et al. report of 21 November 2005 (Section 6). Generally, names always had to be identical or largely similar. Differences in DoBs were allowed (as the ICMP reports of DoB are often approximate only) but the maximum acceptable difference in YoBs was assumed to be 3 years.
- In the above procedure, the matches were created for main cases only and later were moved onto the reassociations related to these main cases.

The matching resulted in 3,837 records of the identified persons reported in the October 2007 ICMP update marked as matched with the 2005 OTP List of Missing Persons (7,661). This is about 50% of the 2005 OTP List of Missing from Srebrenica are reported now by ICMP as identified.

The matched records (3,837) comprise about 90% of the ICMP October update (in total 4,263 identified individuals).

Note that a high number of less certain matches, (261 out of the remaining 426 records); have not been accepted due to missing DoBs. 165 records were not matched at all and should be considered as new and additional individuals to the 2005 OTP list of Srebrenica missing and dead.

Together with the less certain matches (261), the matched records (3,837) comprise about 96% of the ICMP October update (in total 4,263 identified individuals).

Based on the matching of these two lists, we incorporated into the 2005 OTP list of Srebrenica Missing two items from the October 2007 ICMP list of Srebrenica Identified:

- name of the gravesite where the remains of a given identified person were exhumed,
- ICMP Protocol ID of the DNA identification report for this person.

The above-mentioned list is available from Annex 2. The 2005 OTP list of Srebrenica Missing contains 7,661 names, of which 3,837 are marked as already identified persons. In the same Annex, in part 2 of the same list, the ICMP cases representing unmatched records (165) and less certain matches (261) are listed. Regarding the ICMP cases included in part 2, we believe that unmatched records represent missing persons that are new with respect to the 2005 OTP list of Srebrenica Missing and that the less certain matches will be confirmed on the 2005 OTP list at some point in the future.

6. RESULTS

Our main findings from this section are summarized below:

- According to the ICMP list of 4 October 2007, there are **4,263** missing persons that have been identified so far as dead (through DNA matching).
- **3,837** cases of the ICMP identified persons match the 2005 OTP list of Srebrenica-related missing persons.
- In the 2005 OTP list of Srebrenica-related missing and dead persons, **2,054** persons have also been identified as dead by ICRC (closed cases; until 17 August 2005).
- **1,797** of the ICMP identified cases match the ICRC closed cases. The matched records are equivalent to **87.5%** of the Srebrenica-related ICRC closed cases (1,797 out of 2,054).
- A majority of the (matched) identified were men (99.3% of all identified), of which almost all were Muslim (87.9% of all identified).
- There were 30 youngsters (boys only) below 16 years of age among the identified and 360 elderly individuals older than 60 years (including one woman).

Detailed results of our analysis are discussed below.

Out of the overall number of 4,263 of Srebrenica Identified reported by ICMP as of 4 October 2007, exactly 3,837 cases have been confirmed on the 2005 OTP list of Srebrenica Missing (Table 3). This is about 50% of all 7,661 cases from the 2005 OTP list of Srebrenica Missing are now identified by DNA analysis (3,837 out of 7,661). A large number of these ICMP cases were reported as closed cases- deaths by ICRC already in mid-2005.

Table 3. Identified Persons Reported on the 2005 OTP List by ICRC Status from Mid-2005

Original ICRC Table	Number
Closed Cases Dead	1,797
Still Missing (1)	1,925
Still Missing (2)	110
PHR records	5
Total	3,837

Note:

Still Missing (1) - no info about death

Still Missing (2) - with info about death

Table 3 shows how the 3,837 ICMP cases of Srebrenica Identified were reported by ICRC in mid-2005. We can see that 1,797 cases were by then closed as known deaths by ICRC. This is about 47% of all 3,837 cases of the (matched) identified were closed by mid-2005. This percentage is most certainly much higher today.

Table 4 confirms that at least 99.3 % of all matched identified were men, while only 0.3 % were women; (at least) 87.9 % were Muslim men. (Sex and ethnicity come from the links with the 2005 OTP list). These results are highly consistent with the overall statistics we obtained from the 2005 OTP list of missing and dead persons, 99.1% men vs. 0.9% women, and (at least) 85.2 % Muslim men.

Table 4. Identified Persons Reported on the 2005 OTP List by Ethnicity and Sex

Absolute Numbers				
Ethnicity/New	Men	Women	Unk Sex	Total
Muslim	3,373	8	13	3,394
Other	23			23
Unknown	416	3	1	420
Total	3,812	11	14	3,837

Percentages				
Ethnicity/New	Men	Women	Unk Sex	Total
Muslim	87.9	0.2	0.3	88.5
Other	0.6	0.0	0.0	0.6
Unknown	10.8	0.1	0.0	10.9
Total	99.3	0.3	0.4	100.0

There are several similarities between the matched identified persons and the 2005 OTP list of missing and dead. The age and sex distributions of these two groups of records are the next example of such similarities (Table 5 and Figures 1 and 2), see the discussion below.

Table 5a confirms that among the identified men almost all were between 16 and 60 years of age (3,423 out of 3,812; i.e. about 90%). The same pattern holds true for Muslim men (about 90% of all identified Muslim men were 16-60 years old).

Table 5a. Identified Persons Reported on the 2005 OTP List by Sex and Age (Broad Intervals)

Age	Number			Percent			Total	Number		Percent Muslim men
	Men	Women	Unk Sex	Men	Women	Unk Sex		Muslim men	Percent	
0-15	30	0	0	0.8	0.0	0.0	30	24	0.6	
16-60	3,423	10	14	89.2	0.3	0.4	3,447	3,039	79.2	
61+	359	1	0	9.4	0.0	0.0	360	310	8.1	
Total	3,812	11	14	99.3	0.3	0.4	3,837	3,373	87.9	

Note:

Age is based on "Age(broad) (Merged)".

Table 5b. Identified Persons Reported on the 2005 OTP List by Sex and Age

Age	Number			Percent			Total	Number		Percent Muslim men
	Men	Women	Unk Sex	Men	Women	Unk Sex		Muslim men	Percent	
10-14	9	0	0	0.2	0.0	0.0	9	6	0.2	
15-19	351	0	3	9.1	0.0	0.1	354	306	8.0	
20-24	457	3	1	11.9	0.1	0.0	461	413	10.8	
25-29	389	0	3	10.1	0.0	0.1	392	348	9.1	
30-34	422	2	3	11.0	0.1	0.1	427	373	9.7	
35-39	400	2	1	10.4	0.1	0.0	403	361	9.4	
40-44	401	0	1	10.5	0.0	0.0	402	352	9.2	
45-49	351	2	1	9.1	0.1	0.0	354	317	8.3	
50-54	287	1	1	7.5	0.0	0.0	289	248	6.5	
55-59	331	0	0	8.6	0.0	0.0	331	291	7.6	
60-64	213	0	0	5.6	0.0	0.0	213	186	4.8	
65+	201	1	0	5.2	0.0	0.0	202	172	4.5	
Total	3,812	11	14	99.3	0.3	0.4	3,837	3,373	87.9	

Note:

Age is based on "Age(5) (Merged)".