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The National Crime Information Center (NCIC) Missing and Unidentified Persons System Revisited

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ABSTRACT: This report analyzes the dynamics that influence the reporting and handling of missing and unidentified persons and reviews the current capability of the National Crime Information Center (NCIC) Computer to provide accurate matches. Since its inception investigators have become aware of many problems with the missing and unidentified person component of NCIC. Major problems stem from lack of compliance by investigating agencies regarding information entered into the NCIC database and failures of the system itself. The major compliance issue is the low number of dental records that accompany missing entries (1.91% nationwide). Multiple remedies for these problems are offered. Law enforcement needs to establish sound operating procedures for handling missing persons, educate its users, and improve the quality of data entered into the system. Medical examiners and coroners would benefit from better terminal access to missing and unidentified person data. Both law enforcement and death investigation agencies should periodically validate their entries into the system. The NCIC system would be further improved if entry forms were refined to eliminate subjective choices. A system for evaluating the utility of the NCIC system should be implemented. Above all, changes are needed to increase the ability the NCIC system to achieve matches between unidentified and missing persons.

KEYWORDS: forensic science, missing and unidentified persons, NCIC, human identification, dental identification, missing persons reports, unidentified dead

NCIC and the Unidentified Person and Missing Person (UP/MP) Files: An Overview

The purpose of the National Crime Information Center (NCIC) missing person and unidentified person files is to provide information about: (1) identification of burned, decomposed, and skeletonized remains and other unidentified dead and living persons; (2) linkage of body parts recovered by multiple agencies; and (3) identification of victims in the event of a catastrophe [*1*,*2*,*3*].

The NCIC database provides 24 hour daily services to law enforcement jurisdictions of the United States, Puerto Rico, Virgin Islands, District of Columbia, and Canada via computer networks [*1*]. The Missing Person Files have been a part of NCIC since October 1, 1975. The Unidentified Person Files were implemented on June 30, 1983 by the authority of the Missing Persons Act of 1982 [*4*]. The intent was to add unique descriptive

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data such as blood type, broken bones, and dental characteristics that would facilitate comparison between missing persons and the unidentified dead. Much thought and preparation has been put into educating police and death-investigation agencies regarding use of the system. Packets that detail the necessary information for computer entry have been distributed nationwide. Many states have adopted statutes requiring formation of central repositories for missing and unidentified persons information.

Entry of a missing or unidentified person into the NCIC system is performed by the law enforcement agency that assumes jurisdiction of the missing person investigation. Information describing the missing person is entered into a local, regional, or state criminal justice computer system. Medical examiners/coroners usually do not have direct access to law enforcement agency computer terminals. This means they are dependent upon local law enforcement for entry of unidentified person information and for monitoring potential matches. Entry of data on the unidentified person takes place at various times after the discovery of the body. Timeliness of data entry is dependent on the judgment of the medical examiner/coroner or law enforcement agency of jurisdiction and the time required to develop identification information. Transfer of missing and unidentified person information from local and regional criminal justice computer systems into the NCIC system is made through a state-designated controlling terminal agency (CTA) by a controlling terminal officer (CTO). New entries, or modifications of previous entries, trigger a routine search of the NCIC Unidentified and Missing Persons Files to identify potential matches.

Figure 1 shows that success in NCIC's ability to match its information from the records of missing and unidentified persons with queries depends on the communication between five levels of participants: (1) the family member or other interested party reporting the missing person; (2) the law enforcement agency investigating the missing person case; (3) the medical examiner or coroner agency providing the law enforcement agency with the unidentified person's entry information; (4) the CTA transferring state and local entries to the NCIC Missing and Unidentified Person Files; and (5) the NCIC Missing and Unidentified Person unit.

The following discussion examines the interaction and the function of these agencies and the effectiveness of NCIC at identifying unidentified human remains from information in missing person records. Since its inception investigators have become aware of many problems with the missing and unidentified person component of NCIC and are implementing techniques to reduce their effects.

Citizen Reporting of Missing Persons

It should seem obvious, but persons must be missed before they can be reported missing. Many individuals who should be, simply are not missed. The quality and frequency of contact between the reporting party and the missing person and their geographic proximity contribute to awareness that a person is missing. Differences in victim lifestyles in two Northwest serial murder episodes demonstrate the impact of these factors. Missing person reports received during the Ted Bundy investigation had often been filed within hours of the victim's disappearance. The disappearances were noted quickly because the victims had a great deal of contact with friends and family; any disturbance of routine was quickly noticed. Missing persons from a population with little routine in their life and little stability with their environment, may often go missing for months or years without a report being filed. These victims may not have family members or friends who notice their absence. Green River serial murder investigators were often stymied by their victims' history of mobility, multiple aliases, and the anonymity of street life often associated with prostitution [5].

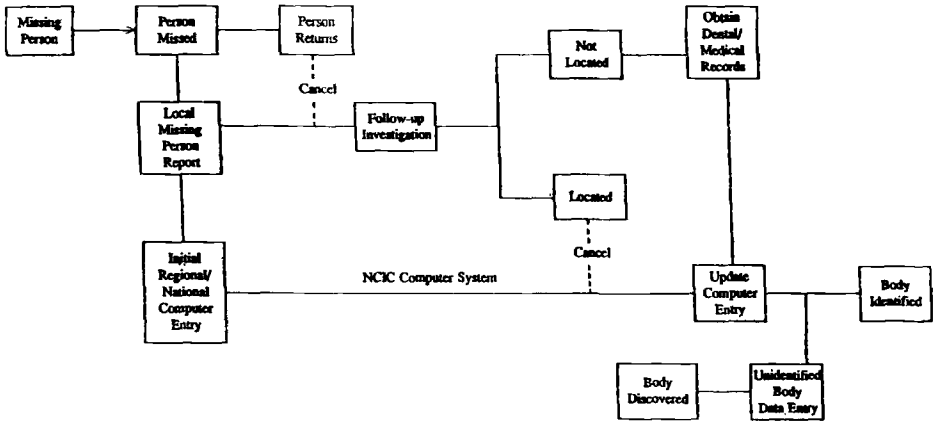


FIG. 1—*Identification of missing persons in an "ideal world."*

Police Investigation of Missing Persons

Reporting a person missing is the first step in involving law enforcement in the search. Often, there is inaction and ambiguity about agency responsibility. Families are sometimes forced to turn from one agency to another in a series of frustrating attempts to get a missing person report taken. Lack of staffpower and finances, not lack of awareness or interest on the part of law enforcement agencies, are commonly cited rationales for the poor way investigations are handled.

Police agency acceptance criteria also complicate the filing of a missing person report. Most common among these criteria are: (1) the requirement that the reporting party have a prescribed relationship to the missing person; (2) requirements relating to the jurisdiction of the missing person's residence versus the jurisdiction of the disappearance; and (3) circumstances of the disappearance, for instance, whether the missing person is considered endangered or a threat to themselves or others. Previous to November 1990, many law enforcement agencies applied a mandatory 24 hour waiting period or another minimum delay before a missing person report would be taken. Such criteria are still in effect for adult missing persons, however, the National Child Search Assistance Act of 1990 now prohibits law enforcement agencies from requiring a waiting period before accepting a report for a missing child.[2]

Once a missing person report is accepted, the spectrum of police reaction may range from complete follow-up to indifference. The quality of missing persons' investigations is agency dependent and conditioned by agency experience, administrative stance, and often, the local political climate. Attitudes of individual investigators also determine police agency response toward missing persons.

Reports of missing adults have traditionally been treated differently from those of missing juveniles. This is because it is not against the law for adults to be missing. Therefore, police interest in missing adults focuses on those who are disabled (EMD), endangered (EME) or involuntarily kidnapped or abducted (EMI). Society usually demands broader action when children are missing. Furgeson and Mascaro [*6*] comment that the ". . . criminal justice response to missing and exploited children has a tainted history, and even today, is filled with paradoxes."

[2]Public Law 101-647-November 29, 1990; Title XXXVII - National Child Search Assistance Act of 1990.

To better understand the nature and dimensions of the term "missing children," a recent study by the Office of Juvenile Justice and Delinquency Prevention looked at children missing for the following reasons: (1) abducted by family members; (2) abducted by non-family members; (3) runaway; (4) throwaway; and (5) missing because of injury or other reasons. The majority of missing children fall into the runaway category. Of all missing children categories, runaways are least likely to be taken seriously. Two reasons for this are the sheer magnitude of the numbers involved and their high rate of return. This acts to bias police perception of the urgency for agency reaction to runaways.

Standard Operating Procedures and Follow-up

Often jurisdictions do not develop standard operating procedures (SOPs) for handling missing persons until they are forced to by highly publicized homicides of missing persons in the media [*6*]. The variability in follow-up procedures is reflected in the percentage of NCIC missing persons on file that include dental information (Table 1). This varies from jurisdiction to jurisdiction. Dental documentation provided to NCIC by state ranges from 0 to 27%, with an average of less than 2% nationwide! Only seven states have a compliance rate greater than 5% for inclusion of dental records with missing person files shared with NCIC. The lack of dental records and other specific identifying information represents a major shortcoming of the present NCIC database system and failure of agency compliance is a major obstacle to obtaining matches.

These numbers must be examined with caution. One major Washington State police agency that attempts to retrieve dental records for all persons missing in excess of 30 days, has a success ratio of only 48%. There are many explanations for this low yield. An individual may never have seen a dentist, a family may not know the dental care provider, records may have been destroyed, or dental care may have been provided under an alias.

Unfortunately, the single most common reason for lack of dental records on file is that police or family do not attempt to collect them. Although many states have passed legislation requiring entry of missing persons information into the NCIC system, there is usually no penalty for non-compliance. Lack of, or poor quality follow-up of missing persons, is a common source of frustration to families and investigators alike.

The organizational placement of missing persons units within an agency can also affect the investigation of missing persons. For example, whether missing persons units are within the homicide division or other areas such as sex crimes or the juvenile division, can affect the manpower and attention they are given. Effective communication between data entry personnel and missing persons units is crucial.

How Can Police Handling of Missing Persons Be Improved?

The solutions to many of the problems experienced by users of the NCIC Missing Persons Files lie in the following actions by law enforcement: (1) simplify the process for filing missing person reports; (2) establish standard SOPs for the acceptance and follow-up of persons reported missing; (3) establish stricter compliance regulations for the collection and submission of dental and medical information, specific to identification; and (4) ensure responsible and accountable validation of NCIC requests for provision of missing data.

In order to improve the processing of missing persons information police agencies must implement effective SOPs. SOPs should include: (1) a stated acceptance policy that delineates under what circumstances a missing person report is taken; (2) a requirement for immediate data entry into state and national databases; (3) a follow-up policy that insures compliance with NCIC verification requests and that includes computer checks,

call-back to reporting parties, and a time limit after which dental records are collected and entered into NCIC; (4) a procedure for purging extraneous or outdated records that is predicated on reliable criteria for locating individuals, such as contact with the "located" person[3]; and (5) scheduled, periodic evaluations of compliance by system participants.

In order to facilitate collection of dental records, a standard request letter to dentists, with authorization for release of records signed by a family member, preferably at the time of the original report, should be implemented.[4] Following a designated interval, this letter should be sent directly to the missing person's dentist. The letter should specify that complete dental records consist of any and all chartings, X-rays, models, bills, and photos of the oral cavity, if available. Original X-rays should be provided at all times. This insures the best possible image and helps eliminate orientation errors. Privacy laws in some states may not allow police access to medical or dental records of missing persons. This problem may often be circumvented by working though the local medical examiner or coroner who usually has statutory access to medical/dental records.

Law enforcement agencies would also benefit from the assistance of pathologists, forensic dentists, or other persons trained to read and interpret medical and dental records. Individuals with such qualifications can often infer other treatments from records and point the way to additional records which would otherwise be overlooked [*1*].

The Death Investigation Agency and Unidentified Remains

Most problems associated with unidentified dead are resolved at the local level [*1*]. Positive identification of human remains is more frequent when they are found in the same jurisdiction where the missing person report was taken and when the interval between the date of disappearance and the date of body discovery is short. In general, human remains are more easily identified the sooner the body is discovered. As the postmortem interval becomes longer, most external identification markers with high recognition value, such as fingerprints, scars, tatoos, hair, and eye color are lost. When skeletal remains are involved, general identifiers, such as sex and race, and ranges of age and stature, must be used to generate clues to the identity. Theoretically, the NCIC system can bridge many of the traditional difficulties in identifying remains.

Primary interest in identification of the unidentified person usually lies with the medical examiner or coroner in possession of the remains. Natural, accidental, suicidal, and undetermined deaths comprise over 57% of NCIC's unidentified remains. These manners of death do not receive priority attention by police because no subsequent investigation on their part is involved. Homicidal deaths are an exception because identification is critical to solving the crime. The FBI estimates that approximately 86% of victims know their slayers and that stranger to stranger killings represent 14% of homicides. Solution of homicide cases involving unidentified victims appears to be relatively rare.[5]

[3]Three individual identifications in the Green River Murder Investigation were made for individuals previously reported to be "located." Two "locations" had relied on testimony of family members that the missing person had been seen or heard from since reported missing. A third individual was considered "located" when another person was fingerprinted and incarcerated using the missing individual's name as an alias. Following positive dental identification of a skeletal remains as being this "located" individual, it was determined that the incarcerated person had been fingerprinted under the alias of the dead person.

[4]A consent form for release of Medical Information is included in the National Crime Information Center Missing Person File Data Collection Guide.

[5]The Washington State Attorney General's Office maintains a computerized database for homicides. This system, Homicide Investigation Tracking System (HITS), indicates no solved homicide cases where the victim was unidentified for Washington State from 1980 to 1986, whereas 74 percent of cases for identified victims were solved).

TABLE 1—*U.S. missing and unidentified persons as represented on NCIC files.*

State	Total missing	Number of missing with dental records	Percent of missing with dental records	Total unidentifieds	Number of unidentifieds with dental records	Percent of unidentifieds with dental records
Alabama	506	7	1.38	23	17	73.91
Alaska	443	4	0.90	2	1	50.00
Arizona	2 015	23	1.14	48	17	36.17
Arkansas	389	1	0.26	10	2	20.00
California	17 839	220	1.23	715	432	60.42
Colorado	1 233	39	3.16	44	10	22.73
Connecticut	856	7	0.82	5	3	60.00
Delaware	84	5	5.95	1	1	100.00
Dist. of Columbia	381	—	0.00	1	—	0.00
Florida	5 531	132	2.39	226	128	56.6
Georgia	1 193	3	0.25	44	14	31.82
Hawaii	49	—	0.00	2	1	50.00
Idaho	145	5	3.45	8	3	37.50
Illinois	2 505	59	2.36	84	46	54.76
Indiana	960	5	0.52	12	5	41.67
Iowa	342	9	2.63	6	3	50.00
Kansas	576	23	3.99	14	8	57.14
Kentucky	420	14	3.33	25	6	24.00
Louisiana	1 158	6	0.52	11	4	36.36
Maine	78	3	3.85	1	1	100.00
Maryland	1 682	20	1.19	40	11	27.50
Massachusetts	2 111	9	0.43	13	3	23.08
Michigan	2 989	96	3.21	30	14	46.67

Minnesota	821	9	1.10	7	5	71.43
Mississippi	316	3	0.95	12	6	50.00
Missouri	1 009	6	0.59	11	4	36.36
Montana	96	19	19.79	11	9	81.82
Nebraska	188	4	2.13	5	4	80.00
Nevada	316	14	4.43	73	56	76.71
New Hampshire	106	14	13.21	2	2	100.00
New Jersey	2 804	37	1.32	133	72	54.14
New Mexico	683	4	0.59	17	5	29.41
New York	3 972	218	5.49	132	56	42.42
North Carolina	873	7	0.80	6	4	66.67
North Dakota	31	—	0.00	1	—	0.00
Ohio	2 125	20	0.94	27	9	33.33
Oklahoma	800	6	0.75	34	11	32.35
Oregon	1 898	36	4.01	22	13	59.09
Pennsylvania	2 085	10	0.48	39	28	71.79
Rhode Island	352	—	0.00	2	—	0.00
South Carolina	728	7	0.96	18	11	61.11
South Dakota	54	—	0.00	2	1	50.00
Tennessee	914	6	0.66	23	13	56.52
Texas	5 769	24	0.42	121	28	22.95
Utah	159	6	3.77	10	4	40.00
Vermont	60	7	11.67	3	2	66.67
Virginia	742	10	1.35	31	20	64.52
Washington	1 964	150	7.64	50	40	80.00
West Virginia	194	2	1.03	6	3	50.00
Wisconsin	801	41	5.12	18	9	50.00
Wyoming	37	10	27.03	6	3	50.00
Total	71 152	1360	1.91	2186	1148	52.50

When the Unidentified Person File of NCIC was established, extensive efforts were undertaken to educate of death investigation agencies about its value and uses. Presentations and appeals were made at meetings of the National Association of Medical Examiners and the College of American Pathologists. The latter organization sponsored publication of *The CAP Handbook for Postmortem Examination of Unidentified Remains* [3], which details the importance of documentation of identification features of unidentified human remains and how to develop information useful for identification.

There are a number of ways that the death-investigation agencies can increase the benefits they receive from the NCIC database. As a rule, death-investigation agencies do not have direct access to NCIC terminals. This poses a barrier to the flow of important information to death investigation agencies and results in dependence on law enforcement for entry of data, manipulation of data on missing and unidentified persons, and receipt of potential matches. Furthermore, communication between law enforcement and death investigators regarding potential computer matches of missing and unidentified persons is often inadequate. The expertise of forensic specialists such as pathologists, odontologists, and anthropologists are helpful in analysis and interpretation of dental and medical information if matches are to be properly evaluated.

The NCIC Unidentified Person Files would benefit from greater quality control for data entered on unidentified remains. To do this, effective communication between death investigation agencies and NCIC access terminals is essential. This would ensure that data entry is accurate and that potential matches are properly monitored. It would be beneficial if limited access to NCIC Unidentified and Missing Person Files by death investigation agencies was possible.

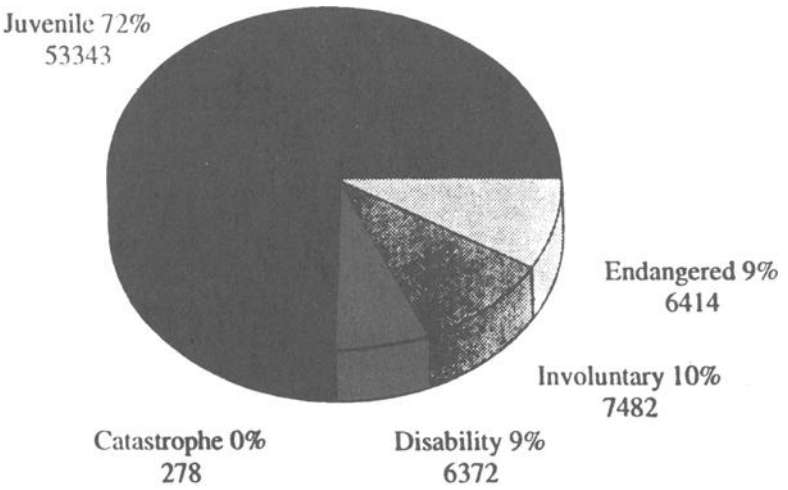
The NCIC Missing Person and Unidentified Person Database

As of December 1, 1991, the NCIC files contained 73 889 active missing person reports. A total of 42 048 (56.9%) were females and 31 841 (43.1%) were males. Table 1 indicates numbers of missing persons in NCIC files by State of origin. Figure 2 presents a breakdown of missing persons by entry category. Figure 2 shows that the majority of missing persons are juveniles. It is likely that the number of missing adults presently in NCIC files underrepresents the actual number missing. Only 1.91% of the total number of missing persons on file are accompanied by dental records.

As of December 3, 1991, the NCIC database contained 2189 unidentified persons. Of these, 2162 represented deceased persons, five were victims of catastrophe, and 22 were living. Skeletons represented 19.1% of unidentified files. Table 1 shows NCIC unidentified human remains by state of origin. A total of 59.5% had dental information on file. Data entered for unidentified persons appears fairly complete, but the number of unidentified persons entered is suspected by some users to be greatly under-represented. The quality of some of the information is also suspect.[6]

Six of the required parameters for "Unidentified Person Report For NCIC Record Entry" form are problematic. Five fields would provide more useful information if entered as ranges: (1) Estimated Year of Birth; (2) Estimated Date of Death; (3) Approximate Date of Death; (4) Approximate Height; and (5) Approximate Weight. Except for approximation of weight and height for fleshed remains, the use of a single approximation for any of these categories is unrealistic. Choices offered for race are: (1) Asian/Pacific Islander; (2) Black; (3) White; (4) American Indian; (5) Alaskan Native; and (6) Unknown.

[6]Personal communication of Karen Burns, Ph.D., Division of Forensic Sciences, Georgia Bureau of Investigation. Attribution of a Georgia skeleton as male resulted in misleading investigators and NCIC in their endeavor to identify a female homicide victim.



Source: NCIC Nov. 1991

FIG. 2—*Missing persons in NCIC by categories.*

It is not uncommon that skeletal characteristics are ambiguous as to race, but a specific mixture of race is suggested, for instance mixed race, probably white/Native American admixture. Also, racial categories need to be re-evaluated overall, for instance the absence of an Hispanic category is conspicuous for some regions of the country.

The "Body Part Status" needs refinement. The purpose of body status entries is to link records of incomplete bodies in cases where parts for the same body have been recovered by two or more different agencies. Presently, a diagram depicting 14 body parts is provided in the "Unidentified Person File Data Collection Entry Guide." Body parts are recorded as not recovered, recovered, or skeletal. For skeletal remains this is unrealistic. It is common that one bone of a forearm or lower leg is recovered or that the mandible or the cranium is recovered, but not both. In the latter situation, a cranium could be recovered and identification made through dental means and the corresponding missing person record dropped from NCIC. Subsequently the mandible could be recovered and if no association with the previously recovered and identified cranium were made, an already identified remains would be re-entered into the NCIC database. A similar criticism was made of the Canadian Police Information Computer system (CPIC) [7]. At minimum a "partially recovered" category is necessary.

The NCIC CTAs (controlling agencies) and CTOs (controlling officers) perform a crucial function in transferring missing and unidentified data from local systems into the NCIC system. They can determine the quality of information transferred by providing feedback on potential matches, providing validation of missing person and unidentified person entries, and informing agencies when entered data is incomplete or otherwise inadequate.

In an attempt to improve compliance, NCIC has instituted a quality control program. Thirty days after entry, each missing and unidentified person record is reviewed to determine the quality of entries in key fields such as dental characteristics, fingerprint classification, and blood type. If the entries are not complete, the entering agency is asked to obtain the missing information, if available, and update the record. These validations are taken on good faith with no means of enforcement.

Identification and NCIC

Unfortunately, successful identifications are poorly documented, and, to date, the number of assists in successful identifications by the NCIC system is unknown. Estimates are likely to under-represent the actual number of assists because there is no systematic reporting procedure once successful identifications have been accomplished. The specific nature of the assistance provided by NCIC is not usually known, for instance, whether the match was based on physical descriptors, dental information, or other means. These factors hamper the ability to measure the success of NCIC in making successful identification matches. Considering the cost and effort expended in development of NCIC Missing and Unidentified, there should be better means of showing if the system is effective.

Concerns with the NCIC system voiced by death investigators fall into three categories: (1) lack of participation in the system by local law enforcement agencies; (2) quality of data entered into the system; and (3) capabilities of matching or scoring unidentified persons. Underlying inadequate participation and quality of the NCIC database is lack of compliance with regulations for reporting of missing and unidentified persons and the completeness of information entered. As already discussed, the lack of dental information is a significant inadequacy of the NCIC missing person files. Although many states require missing person dental information to be submitted to a central directory within 30 days, a means to insure compliance and penalties for non-compliance are not in effect.[7] "Until agencies for both missing and unidentified persons enter dental data, the likelihood of identifying the unidentified, after local resources fail, is remote [*1*]."

In part, poor quality of NCIC dental data has been attributed to the dental entry form. Recently, over 1500 NCIC dental forms submitted to the Washington State CTA were rechecked for accuracy [*8*]. Comparisons of original dental chartings and X-rays with NCIC entries revealed many incorrect entries. Many of these errors stem from the subjective nature of decisions involved in completion of the NCIC form and the complexity of the form. The most common errors were: (1) incorrect identification of missing premolars and molars; (2) overinterpretation of X-rays regarding surfaces that are dentally restored; (3) over-reliance on dental X-rays while ignoring or incorrectly interpreting dental charts; (4) charting retained deciduous teeth as permanent teeth; (5) coding for dental restorations in teeth coded as absent; (6) overinterpretation of "other characteristics" codes; and (7) incorrect attribution of restoration materials.

The NCIC system allows for two types of searches for matches between unidentified and missing individuals: an off-line and on-line search. Off-line searches circumvent the routine search procedure and allow searches for individual dental characteristics and physical descriptors. Off-line searches can be made by special request to NCIC. Off-line is the search of choice when a specific characteristic and an "exact" match is sought. Unfortunately, most agencies rely on the on-line search routine that is activated when a unidentified or missing person record is entered or modified. The on-line search is proving to be ineffective in achieving matches between unidentified and missing persons. In order to understand this major failure, it is necessary to examine how matches between the two files are made:

> When records are examined, only points of positive comparison are counted. Mismatches are excluded to prevent errors in height, weight, eye color, and charting. For example, a

[7]For example the New Jersey Commission on Missing Persons published a *State Action Plan* in 1987–1988. This publication outlines the subject of unidentified and missing persons for that state and the nation in detailed historical review, announces the establishment of a New Jersey State Police Missing Persons Unit, provides statutes for educational awareness (N.J.S.A. 52:17B:9.6-ET-SEQ), establishes procedures for registration of unidentified bodies, and outlines recommendations for future awareness. Of New Jersey's 2804 missing person entries in NCIC, only 37 or 1.32 percent are accompanied by dental records!

> discrepancy found in the description of a restoration-bearing surface listed in the antemortem missing person and unidentified person charts will not result in an exclusion but one less point of positive comparison. Therefore, the greater the number of descriptors entered in each case file, the greater the probability a match will be made [*1*].

Matches are accomplished by a weighted score on personal descriptors and dental data [*9*]. Possible matching candidates are listed only if the comparison process achieves a certain threshold score. Physical descriptors receive more weight in the scoring than does dental information.

This is a major weakness of the system. A high percentage of unidentified remains are decomposed, skeletonized, or otherwise compromised so as to render fingerprinting and recognition of many physical descriptors impossible. At present, 51% of unidentified persons are entered without fingerprint classifications. Dental information is by far the most common means of identification in problem identification cases involving decomposed, disfigured, or skeletal remains. A total of 762 unidentified remains in NCIC do not have heads, hence, no dental information is available. For skeletonized remains, height and age are estimated as ranges. This may act to depress their scoring value. Documented physical descriptions for living persons are often unreliable [*10,11*].

Given the structure of the NCIC system, even if a perfect dental match between a missing and unidentified person were made, it is possible the match would not achieve a threshold score. Four real-time tests run on NCIC by Bell (1992), indicated that identical dental matches did not consistently score as a match. Bell's conclusion was that the NCIC's normal search routine should not be relied upon for generating accurate matches between missing and unidentified remains. Investigators often generate a plethora of hits, sometimes of impossible matches, when modifications and entries of unidentified and missing persons are made into NCIC. This results in frustration and loss of faith in the system itself, further weakening investigator resolve to participate.

Recognizing that the majority of NCIC Missing Person Files do not have dental information, potential matches must be made based on physical descriptors. One improvement would be to modify the search routine to allow matching based on dental descriptors alone for those files with dental information. This would maximize the effective use of dental information.

Conclusion

The NCIC Missing and Unidentified Person Files are the only central repository for missing and identified persons nationwide. This system potentially provides the single-most valuable tool for comprehensive linkage of investigative police agencies across the nation. Unfortunately, some members of the scientific forensic community are of the opinion that NCIC sorting algorithms do not produce reliable results. Investigators need more proof that the system works. Consequently, interest in compliance through the supply of data is low. Actions should be initiated to capitalize on the system's strengths and correct its weaknesses. Heightened community awareness of the need for reporting missing persons should be emphasized and the ability to report a person missing must be made easier. Other specific recommendations for improvement of the system follow.

Recommendations for Law Enforcement:

1. Establish sound SOPs for handling missing persons that include:
   a. a stated acceptance policy that delineates under what circumstances a missing person report is taken;
   b. a stipulation that data entry is to be made into state and national databases;

   c. a follow-up policy including computer checks, call-back to reporting parties, and guidelines for timely collection and data entry of dental records into the NCIC database;
   d. a procedure for purging extraneous or outdated records (location of missing individuals should be confirmed by reliable means such as personal contact); and
   e. a procedure for notification of NCIC for subsequent purging of NCIC records.
2. Increase communication by:
   a. facilitating reports to other agencies when a missing person report is attempted to an inappropriate agency. (One possibility is to establish a single regional number for reporting of all regional missing persons.);
   b. establishing routine communication with the medical examiner or coroner regarding high priority missing persons;
   c. informing key interfacing agencies with each change, because missing person staff change frequently; and
   d. formalizing exchange of unidentified and missing person information between adjacent states and regions.
3. Educate users by: heightening awareness of how the missing and unidentified system actually works: how missing persons are handled within the agency, how they are transferred to NCIC, and how potential hits are received, reviewed, and managed.
4. Improve quality of entered data by:
   a. increasing accuracy of the system by entering missing data, gathering medical and dental data, and updating and purging entries when appropriate; and
   b. using appropriately trained specialists for interpretation and coding of medical and dental information for data entry.

Recommendations for Medical Examiners and Coroners

1. Compensate for lack of direct NCIC terminal access by:
   a. establishing a dialogue with key individuals at Controlling Terminal Agencies and local law enforcement agencies;
   b. being informed of local law enforcement procedures regarding missing persons and increasing awareness of the network involved with NCIC;
   c. requiring that a hard copy of all unidentified person data entered into NCIC to be made available for review; and
   d. ensuring that the coroner or medical examiner responsible for the unidentified body is appraised of potential matches with missing persons.
2. Use appropriate experts such as forensic pathologists, odontologist, and anthropologists for evaluating identification features of the unidentified dead and for assessing identification of missing persons.
3. Provide a single contact for coordinating matches of unidentified and missing persons within the agency.
4. Do not rely solely on the current NCIC search routine to make identifications.
5. Develop a special file to permit easy entry and retrieval and periodic review of unidentified cases (that is, collateral files by race/sex/age).

Recommendations for CTAs and CTOs

1. Improve education and training to user agencies.
2. Establish policies and procedures to:
   a. remind both originating medical examiner or coroners and law enforcement agencies of potential matches;

   b. require periodic validation for all entries in the NCIC system; and
   c. remind users when inadequate entries are made.
3. Retain forensic dental expertise to review and ensure quality of dental data entries.
4. Encourage the use of a parallel data base with a proven search routine such as CAPMI (Computer-Assisted Postmortem Identification system).

Recommendations for NCIC Computer System Programming

1. Support increased, quality participation in the NCIC Missing and Unidentified Person databases by:
   a. establishing quality standards for users of the system; and
   b. considering the use of penalties for agencies consistently inattentive to purging already identified or located individuals from the system.
2. Revise entry forms to:
   a. simplify the dental entry form to eliminate forced subjective choices;
   b. refine body part inventories to allow for more accurate representation of skeletal remains; and
   c. include a "partially recovered" category.
3. Advise that feedback loops be established between CTA and those agencies without NCIC terminals. Routine communication should include furnishing hard copies of relevant data regarding potential matches to medical examiners and coroners.
4. Amend or replace the present dental search routine. Until this is accomplished make users aware of present limitations and encourage off-line searches. Allow search routines on dental data alone and increase awareness that off-line-searches are the most reliable means of making potential matches.
5. Ensure that the utility of the NCIC system is evaluated:
   a. for unidentified remains, this could include the reason for withdrawal of unidentified remains, and what specific assistance in the identification, if any, was provided by NCIC; and
   b. files for unidentified individuals should be flagged and retained when an individual's identification is based on partially recovered remains.

Potential matches between the NCIC Missing and Unidentified Person Files represent the single most important tool available for the identification of problem unidentified remains. Quality participation by the whole community would make this a more workable tool. Presently information in the system suffers from lack of participation. Specific problem areas are individual police agencies, the lack of quality information, such as dental and medical identifiers, and matching/scoring applications. These shortcomings can only be addressed by directing more attention to missing persons issues, improving two-way communication with agencies without terminals, heightening awareness of dental and medical criteria for identification, improving relationships between police and death investigation agencies, and reworking of the dental charting and matching component of NCIC search routine.

NCIC is slated for changes in the near future. According to a statement paper, *The NCIC 2000 System*. Congress appropriated $17 million to begin the system's improvement for the fiscal year 1990–1991. Changes slated for the Unidentified Person File and the Missing Person File are based on the inclusion of expert system technology to improve the cross matching process by compensating for missing data and lowering of possible match thresholds.

In an ideal world, a missing individual would be reported promptly, the agency taking the missing person report would accept it, and adequate follow-up would be done. Dental and other identifying information would be collected in a timely manner. The missing

person report would be entered into local, state, and national computers along with identifying information. When an unidentified person is discovered, the identifying information would be matched with that of the missing person in the computer database and a basis for identification would be achieved (Fig. 1). The vision in implementation of the unidentified and missing persons component of NCIC was intended to provide a solution toward bringing forth this "ideal world." That possibility still exists.

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