



**THE USE OF UNIQUE CLIENT IDENTIFIERS
IN STATE MENTAL HEALTH SERVICES:
NATIONAL SURVEY DATA**

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INTRODUCTION

The data standards for the Mental Health Statistics Improvement Program (MHSIP) address the general need for, and the use of a unique client identifier in mental health management information systems. As expressed in the 'Data Standards,' the idea behind a unique identifier seems simple, clear and commonly accepted; a unique identifier simply "enables the record to be identified and the data to be reliably associated with a particular individual (p39)."

The use of a unique identifier allows access to information about the same individual across episodes and service providers. Such an identifier is essential for managing clients' services, assuring continuity of care and monitoring linkage with other services. In terms of the general MHSIP framework, a unique identifier is also essential for linkage and access across the different MHSIP components. Thus, the existence of a reliable identifier permits large service systems to keep track of the number of unduplicated persons served, services provided to

them, outcomes of such services, and the resources expended over time. This information can be used as the basis for sound, data-based planning and budgeting processes.

In spite of the clear recognition of the importance of the unique client identifier (UCI), the MHSIP data standards do not prescribe a particular type of identifier nor a specific methodology or algorithm to generate it. Nor do the standards provide guidelines to the states regarding the issues to be considered when selecting a unique client identifier that would be appropriate for the state's need, relatively error free, easy to implement, and economically feasible. The selection of an identifier is left entirely to the state mental health or local authorities.

The purpose of the work described in this document was to collect state level information regarding the issues involved in selection, implementation and operation of an optimal client identifier. Our goal was to make information based on the cumulative experience of other State Mental Health Authorities (SMHAs) available to states in the process of starting a new management information system, revising an outdated one, or implementing new MHSIP components into an existing system.

To collect this information, a short survey form was developed, requesting all SMHAs to provide data on the client identifiers currently in use. One of the most striking findings was the apparent lack of common language regarding the uniqueness of a client identifier, its commonality across different components of the service system and the ability to use it to produce unduplicated counts of persons served over time and across different service providers. The lack of common terminology prompted our suggestion to develop a common terminology and include it in the MHSIP standards. Some suggestions for the scope and content of such a common language are provided in the results and discussion section of this document.

Responses to the survey indicated that the primary use of the unique client identifier varied among states and that the algorithm/method chosen was related to this primary goal, as well as to more "mundane" constraints such as available resources. The association between the purpose and type of UCI may be due to different requirements for error control. States using the client identifiers for clinical purposes, e.g., client tracking, would tolerate a lower error rate than states for whom the primary use was administrative, e.g., planning. This proposed a priori relationship between the main use and the type of the identifier may have been somewhat obscured by the fact that some states started using the unique identifier for one purpose, and changed, or added usages later on. Nevertheless, it was clear that decisions regarding the choice of algorithm, equipment, and method of generating a unique client identifier must take into account the intended use and the expected error tolerance of the identifier. The utility of such choices ; would be greatly enhanced, we believe, by empirical, rigorous testing of different algorithms in terms of error rate, or hit/miss ratio.

The survey also inquired about barriers to the implementation and to the ongoing use of the unique client identifier. We expected a lot of responses regarding political resistance and administrative, resource linked, barriers. While some concerns regarding protection of patient identity and confidentiality, and others regarding the financial resources needed to carry out the work involved were expressed, the number of concerns reported in this survey was much lower than expected.

It is bias unclear whether this paucity of reported concerns and barriers reflected a in our sample. Respondents were, after all, the people most involved with data management and therefore, perhaps, tended to minimize the opposition. On the other hand, these results could reflect the fact that most administrators, service providers, patient advocates and families have begun to appreciate the higher levels of accountability and improved management that are made possible by a sound MIS, incorporating an appropriate unique client identification.

METHODOLOGY

This project had its beginnings at a focus group discussion during the Fall, 1990, SMUG Regional Meeting in Nashville, Tennessee. The group discussed client tracking technologies, the use of unique client identifiers, and the need to have more systematic information.

The compilation of such information became the focus of a regional collaborative activity, funded in part by technical assistance funds from NIMH. Six states (Alabama, Florida, Georgia,

New Jersey, South Carolina, and Texas) participated actively in meetings, data collection, data analysis and interpretation of the results. Materials and additional information was received from California.

The specific goals for this project as well as the methodology to be used were discussed among representatives of the participating states during a first meeting of the work group in Atlanta, GA, on 7/29-30/91. Resource materials were reviewed (see reference list) and a work plan developed (Appendix A). Another product of this first meeting was a draft survey instrument, designed to collect information from all 50 states (+ Puerto Rico and Washington D.C.).

The group sought information regarding the:

- o Existence and scope of identifier: Is a unique client identifier (UCI) used and to what extent is it shared by different components of the service system (q. 1-3)?
- o Purpose and Priority of use: What are the primary and other reasons for using a UCI (q. 4)?
- o Classification of identifiers: What algorithms are applied, and which personal data items are most often used (q.5-6)?
- o Barriers: What technical and political problems are encountered during implementation and use of the UCI (q. 7-11)?

Most of the survey was composed of multiple choice questions, permitting checking of all items that apply and/or specifying additional items. Recognizing the potential richness and diversity among the states, questions regarding sources of resistance to, and main benefits realized through the implementation of a UCI were designed as open questions.

The first draft of the survey form was tested by the six states represented in the work group and by California. Following a few revisions, the final survey form was sent to all the states (see Appendix B) during November, 1991.

Responses kept coming in, helped along by phone calls from work group members, until 2/15/92. By March, 1992 responses were received from all states except Nevada and New Hampshire. With D.C. and Puerto Rico, the total number of respondents was 50. Following preliminary analysis of the multiple choice items and a content analysis of the open questions, the group met once more on 3/4-5/92 to discuss the results and prepare the outline for this report.

NIMH Technical Assistance funds supported the group's two meetings and the preparation of the report. Expenses related to the survey itself, including printing, dissemination, collecting the data and the data analysis were not supported by NIMH funds and represented in-kind contribution of the six states to this project.

RESULTS AND DISCUSSION

Of the 50 respondents, 39 (78%) reported use of some unique client identification. Eleven states (Arkansas, Idaho, Maine, Michigan, Mississippi, North Dakota, Puerto Rico, Tennessee, Vermont, West Virginia and Wyoming) did not have a current UCI at the time of the survey. Some of these eleven states were in different phases of planning or implementing a new MIS and/or a new client identifier. Data provided by the states not currently using a UCI were excluded from analyses regarding purpose, type, algorithms used, and technical problems.

However, comments regarding barriers to implementation were included in the discussion and in some of the analyses.

SECTION 1: COMMON LANGUAGE

The survey included three questions designed to elicit basic information on the use and scope of states' UCIs. The first question asked about the existence of a UCI in "all or part of your service system." The second question asked for specifics regarding the commonality of the UCI across community and institutional settings, and in three service fields: mental health, substance abuse and mental retardation. Finally, the third question asked whether the existing UCI enabled the state to produce a statewide, unduplicated count of clients (See survey form, Appendix B). It was expected that states responding "all" to question 1, and indicating (at least in the mental health field) both inpatient and community components sharing the same UCI would also answer question 3 in the affirmative.

The answers to the three questions indicated that the term "*Statewide Unique Client Identifier*" meant different things to different people. Some of the semantic confusion was probably due to badly phrased questions. We did not, for example, make it clear whether our main interest was in the mental health field, as could be surmised by the connection to the MHSIP project, or in any of the three fields mentioned in question 2. Similarly, we did not clarify whether the ability to produce a statewide unduplicated count in hospitals and community services was restricted to mental health field.

Some of the conflicting responses, presented in Table I, seem to indicate that a deeper source of misunderstanding may also have been at work. For example, three states (Kentucky, Louisiana, and New Mexico) reported the use of a UCI for their entire service system. Two of them answered "all" to question 1, and in response to question 2, the three

ID SYSTEM

TABLE 1

TERMINOLOGY CONFLICT IN REPORTING USE, COVERAGE
AND THE CAPACITY FOR UNDUPLICATED COUNTS

COMMUNITY INPATIENT STATEWIDE

REPORTED ----- UNDUPLICATING

STATE SCOPE NH MR SA MN MR SA CAPABILITY

EXISTING NUMBER (SSN)

Louisiana A 1 1 1 1 1 1 0

Florida P 0 0 0 1 0 0 1

Illinois P 0 0 0 1 1 1 1

New Mexico P 1 1 1 1 1 1 0

ASSIGNED NUMBER

Hawaii A 1 0 0 1 0 0 2

Washington A 1 0 0 1 0 0 2

S. Carolina A 1 0 0 1 0 1 2

Georgia A 1 1 1 1 1 1 2

Missouri A 1 1 1 1 1 1 2

Oregon A 1 1 1 1 1 1 2

Texas A 1 1 1 1 1 1 2

Rhode Istand P 0 0 0 1 0 0 1

Utah P 0 0 0 1 0 0 1

Iowa P 0 0 0 1 1 1 1

Virginia P 0 0 0 1 1 1 1

Alabama P 0 0 0 1 1 1 1

Indiana P 0 1 0 1 1 1 1

Connecticut P 1 0 0 1 0 0 1

New York P 1 0 0 1 0 0 2

D.C. P 1 0 0 1 0 0 2

Delaware P 1 0 1 1 0 1 0

CONSTRUCTED IDENTIFIER

New Jersey A 1 0 0 1 0 0 2

Oklahoma A 1 0 1 1 0 0 2

Wisconsin A 1 1 1 1 1 1 2

N. Carolina A 1 1 1 1 1 1 2

Alaska P 0 0 1 0 0 0 0

Colorado P 1 0 0 0 0 0 1

Massachusetts P 1 0 0 0 0 0 0

Minnesota P 1 0 0 0 0 0 0

S.Dakota P 1 0 0 0 0 0 0

Maryland P 1 0 0 1 0 0 1

Montana P 1 0 1 1 0 1 2

MULTIPLE UCIS

Kentucky A 1 1 1 1 1 1 0

Pennsylvania P 0 0 0 1 1 0 1

California P 1 0 0 1 0 0 1

Ohio P 1 0 0 1 0 0 1

Kansas P 1 0 0 1 1 0 2

Arizona P 1 0 1 1 0 0 2

Nebraska P 1 0 1 1 1 1 2

NO CURRENT UCI

Arkansas N 0 0 0 0 0 0 0

Idaho N 0 0 0 0 0 0 0

Michigan N 0 0 0 0 0 0 0

Mississippi N 0 0 0 0 0 0 0

Puerto Rico N 0 0 0 0 0 0 0

Tennessee N 0 0 0 0 0 0 0

Vermont N 0 0 0 0 0 0 0

West Virginia N 0 0 0 0 0 0 0

Wyoming N 0 0 0 0 0 0 0

Maine N 1 0 1 1 0 0 0

N. Dakota N 1 1 1 0 0 0 0

UNDUPLICATING CAPABILITY WAS CODED: 0=no capability;

1--inpatient settings only; 2=both inpatient and community settings

states reported using the (same?) UCI in all six service components (community MH, MR and SA as well as Inpatient MH, MR and SA). Nevertheless, when asked whether they had the capability of producing an unduplicated count of clients, the same states answered in the negative. Similarly, states that reported using the unique ID in both community and hospitals for at least one field (Delaware, Maryland, California, and Ohio), reported that unduplicated counts were feasible only for the hospital environment or not at all, thus shedding some doubt on the interpretation of their responses to question 2. One state (Colorado) indicated unduplicated count capability in one service component (hospitals) while reporting use of UCI in the other service component (community) only.

It became clear that states interpreted "all" the service system in question 1 to mean either "all the inpatient system" or "all the mental health system" or "all the human services system." They have thus answered "all" or "part" in ways that were not consistent with either our expectations or with their responses to the other two questions.

The most damaging misunderstanding was probably the one whereby states missed the implication of the wording "statewide" and "same" UCI. Thus states responded as if the use of any numbering system within any one component of the system was an instance of use of a UCI, sometimes even specifying the different UCIs used in the different service settings. As a result, we had the puzzling discrepancies between questions 2 and 3, where states reporting the "same unique identifier" in all or most of the service components, reported also their inability to produce an unduplicated count. (e.g., Connecticut, Delaware, Kentucky and New Mexico, in Table 1).

These findings point to a basic need for common language, perhaps starting with a glossary of terms with clear and agreed upon definitions, to be shared among the states. A glossary, defining terms such as "UCI", "unduplicated count", and "statewide", would be a very useful addition to the MHSIP standards document.

The definitions in this glossary should address the difference between a numbering system that is used in one service component, sometimes even by a single provider, and a unique identifier that is common to most or all of the service system components. States may still choose to implement a client identifier in one service setting only (i.e., the state hospitals), or to forego the use of a shared common statewide identifier altogether. But when asked about the uniqueness and coverage of a "statewide unique identifier" and the capability of providing unduplicated counts, or of tracking patients over time and across service components, states would be able to clearly understand and communicate their own limitations.

Clear, shared definitions were also missing regarding the typology of UCIs we used, which is discussed in detail in the next section. Most states seemed to understand the three types we presented in question 5, and no other types were suggested as alternatives by any of the responding states. Nevertheless, some states erred in assigning the type to their own UCI as could be ascertained from the description, also requested in question 5, or from follow-up phone conversations, carried out with states reporting the more puzzling cases.

SECTION 2: UCI TYPES

States were asked to classify their UCI into one of three types presented in question 5 (see Figure I and Appendix B) as follows:

- an EXISTING number such as social security number or a driver's license, usually generated by a state or federal agency outside of the mental health service system

- o an ASSIGNED, usually sequential number, centrally (and specifically;-) generated for the service system by a computer, and used in conjunction with several personal characteristics to assure uniqueness

- o a CONSTRUCTED identifier, usually generated locally either by a computer or manually, that uses and retains several personal characteristics such as initials, gender, and birth date

Results indicated that the ASSIGNED identifier was the most popular choice. Seventeen states (43.6% of the 39 states currently using a UCI) reported using this type. Eleven states (28.2%) reported using a CONSTRUCTED UCI and only four (10.2%) reported using an EXISTING number (SS#).

Seven states (17.9%) reported using more than one type of UCI. In some cases these states specified which component of the service system used which UCI. In others it was left unclear. Because of the difficulty in extracting which survey responses related to which of the several UCI reported, these states were kept as a separate group. Table 2 presents

FIGURE 1

IDENTIFIERS USED BY STATES

<p>EXISTINGSOCIAL SECURITY</p> <p>NUMBER: Generated by an outside source DRIVER'S LICENSE</p>
<p>ASSIGNED</p> <p>NUMBER Usually generated by a computer, usually 100001 sequential. There is no relationship between 100002 the number and the items used for verification. etc.</p>
<p>CONSTRUCTED IDENTIFIER</p> <p>Based on individual's characteristics. Shula Minsky Identifier retains connection to DOB 98/13/39 items used in construction. Can be generated manually or SMF081339 by computer. MNS06SA9</p>

A summary of the types of UCI reported by the states and the mental health service system components using them.

While the definition of the EXISTING UCI presented no problems for the states, the distinction between the ASSIGNED and CONSTRUCTED identifiers seemed somewhat blurred and may merit additional discussion. In both cases the UCI relies on several items of personal information. Enumeration of the data items used either to construct the identifier or to verify the UCI's association with one specific individual, showed substantial agreement about the data components used most frequently (see Table 3 and Appendix C, Table A). The personal characteristics most often chosen irrespective of UCI type, were birth date, last name, gender and first name, in that order.

The difference between the two UCI types lies in the way the personal information is used. A CONSTRUCTED identifier, as the name implies, is constructed from the individual

components and retains them in its final form. Thus, a UCI that is constructed from initials, gender and date of birth will have the form IIGDDMMYY (or some order permutation of this general form). An ASSIGNED sequential number using the same items for verifying a client identity, keeps no trace of these items in its own form, and has the general form of DDDDDD (D for digit).

Depending on the complexity of the construction algorithm, the CONSTRUCTED UCI may be generated manually or by computer. feasible, with appropriate training, to allow the different service sites to generate the CONSTRUCTED identifier locally (although this

TABLE 2
SYSTEM COVERAGE BY TYPE OF UCI IN USE

REPORTED

SYSTEM TYPE OF ID USED

COMPONENTS

COVERED NONE EXISTING ASSIGNED CONSTRUCTED MULTIPLE TOTAL

NONE 9 - - - - 9

MH INPATIENT ONLY - 2 6 - 1 9

MH COMMUNITY ONLY 1* - - 4 - 5

BOTH 1* 2 11 6 6 26

OTHER/UNDETERMINED - - - 1 - 1

11 4 17 11 7 50

*Maine and North Dakota reported on a UCI not currently in use

TABLE 3

ITEMS USED TO CONSTRUCT/VERIFY UNIQUE CLIENT IDENTIFIERS

EXISTING ASSIGNED CONSTRUCTED MULTIPLE TOTAL

ITEMS USED N % N % N % N % N %

N 4 17 11 7 39

Birthdate 2 50.0 15 88.2 10 90.9 6 85.7 33 84.6

Last name 1 25.0 14 82.4 9 81.8 7 100.0 31 79.5

Sex 1 25.0 13 76.5 8 72.7 7 100.0 29 74.4

First Name 2 50.0 12 70.6 8 72.7 4 57.1 26 66.7

Ethnicity/race 0 - 8 47.1 3 27.3 2 28.6 13 33.3

Tie Breaker 0 - 1 5.9 7 63.6 1 14.3 9 23.1

Maiden name 0 - 3 17.6 3 27.3 2 28.6 8 20.5

Medicaid number 1 25.0 2 11.8 1 9.1 1 14.3 5 12.8

County of residence 1 25.0 1 5.9 0 - 2 28.6 4 10.3

First admission 0 - 1 5.9 0 - 2 28.6 3 7.7

Clinic code 0 - 2 11.8 0 - 1 14.3 3 7.7

Mother's maiden name 0 - 0 - 0 - 1 14.3 1 2.6

practice will be a probable source of error). The ASSIGNED number, on the other hand, must be generated centrally. A central database and a fairly sophisticated system of verification algorithms must be in place to provide the needed assurance of unique identification of an individual.

In the following sections we will present the results of the survey regarding the primary use of the UCI, the major technical and other problems related to the implementation and use of the UCI and the desired changes in existing systems listed by respondents. Following these discussions we will return to the comparison of the UCI types, and summarize their strengths and weaknesses.

SECTION 3: WHY DO STATES USE UNIQUE CLIENT IDENTIFIERS?

Question 4 elicited information regarding the primary and other uses of the UCI. Nine possible uses were listed. The states were asked to identify which uses were primary, which secondary and which were not used by the state. Table 4 presents data on each of the specific uses listed (see Appendix C, Table B for more details). The data are presented separately for each UCI type group, and summed over all 39 respondents. Most respondents (92.3%) reported using the UCI for client tracking, although only 25 (64.1%) of the 39 states reported tracking as the primary purpose of the identifier.

At least half the respondent states reported some use of their identifier for all listed options, except fraud detection. This last use was never cited as primary and reported by 11 states (28.2%) only. Client tracking was most often (64.1%) reported as the primary use of the UCI. Unduplicated count was the second most often chosen primary use, but it was chosen by a substantially smaller proportion of states (30.8%).

TABLE 4

FREQUENCIES AND USAGE SCORES BY PURPOSE AND UCI TYPE

EXISTING ASSIGNED CONSTRUCTED MULTIPLE TOTAL * ANY USE

PURPOSE N % N % N % N % N % N %

N 4 17 11 7 39 39

CLIENT TRACKING

Primary use 1 25.0 15 88.2 6 54.5 3 42.9 25 64.1 36 92.6

Used 2 50.0 2 11.8 4 36.4 3 42.9 11 28.2

Mean usage 1.75 2.88 2.36 2.05 2.49

UNDUPLICATED COUNTS

Primary use 1 25.0 3 17.6 5 45.5 3 42.9 12 30.8 34 5.2

Used 2 50.0 10 58.8 6 54.5 - 57.1 22 56.4

Mean Usage 1.75 2.06 2.45 2.43 2.05

DECISION SUPPORT

Primary use 0 - 3 17.6 3 27.3 1 14.3 7 17.9 30 76.9

Used 2 50.0 9 52.9 6 54.5 6 85.7 23 59.0

Mean Usage 1.0 1.6 1.9 2.1 1.72

PLANNING/BUDGETING

Primary use 0 - 1 5.9 1 9.1 14.3 3 7.7 BC 6.;

Used 2 50.0 10 58.8 9 81.8 6 85.7 27 69.2

Mean usage 1.0 1.4 1.9 2.1 1.62

HEAVY USERS

Primary use 0 - 5 29.4 2 18.2 1 14.3 8 20.5 29 74.3

Used 3 75.0 8 47.1 5 45.5 5 71.4 21 53.8

Mean usage 0.5 1.8 1.5 1.9 1.69

CONTINUITY OF CARE/CON

Primary use 1 25.0 5 29.4 2 18.2 2 28.6 10 25.6 25 64.1

Used I 25.0 6 35.3 4 36.4 - 57.1 15 38.5

Mean usage 1.3 1.6 1.3 2.0 1.54

BILLING/CONTRACTING

Primary use 0 - 3 17.6 1 9.1 1 14.3 5 12.8 23 58.9

Used 2 50.0 6 35.3 5 45.5 4 57.1 17 43.6

Mean usage 1.5 1.2 1.2 1.6 1.26

RESEARCH

Primary use 0 - 3 17.6 0 - 0 - 3 7.7 23 58.9

Used 0 - 7 41.2 7 63.6 6 85.7 20 51.3

Mean usage 0.0 1.4 1.3 1.7 1.26

FRAUD DETECTION

Primary use 0 - 0 - 0 - 0 - 0 - 11 28.2

Used 1 25.0 3 17.6 2 18.2 5 71.4 11 28.2

Mean usage 0.5 0.4 0.4 1.4 0.56

NOTE: Mean usage scores are based on the following values: Primary use=3; Used=2; Not used=0. Thus the higher the mean, the higher the use of the UCI for the stated purpose.

* Eleven states reported no current use of a unique identifier.

Fifteen of the seventeen (88.2%) states using ASSIGNED UCI reported client tracking to be a primary use. Only three of these states (17.6%) reported unduplicated counts as a primary use. These proportions were substantially different in states using a CONSTRUCTED UCI. Six of the eleven in this group (54.5%) reported client tracking as primary use and four (45.5%) reported unduplicated counts as the primary use.

The project team divided the different purposes behind the UCIs' use in two: Clinical and administrative (see figure 2). Clinical uses included continuity of care/clinical case management and client tracking. Administrative uses included unduplicated counts, heavy user identification, billing, research, planning/budgeting and fraud detection. Decision support which could be interpreted as either a clinical or an administrative use was kept as a separate category.

Mean usage scores were calculated, taking into account both primary and secondary uses. For each use statement, primary use was scored as 3, secondary use as 2 and no use as 0. Table 5 presents these scores, summed and averaged over the clinical, administrative and decision support categories, within each UCI type. The mean usage scores were highest for clinical purposes in all UCI types, with the ASSIGNED group reporting the highest mean (2.24). These results can be interpreted as pointing towards a special affinity between ASSIGNED identifiers and primarily clinical usage.

FIGURE 2

WHY DO STATES USE A UNIQUE CLIENT IDENTIFIER?

CLINICAL PURPOSE	ADMINISTRATIVE PURPOSE	DECISION SUPPORT
Client Tracking	Unduplicated counts	Decision support
Continuity of care (CCM)	Identify heavy users	
	Billing/contracting	

	Fraud detection	
	Research	
	Planning/budgeting	

TABLE 5

WHY STATES USE UNIQUE IDS: MEAN USAGE SCORES

Existing	Assigned	Constructed	Multiple number identifier	number identifier	Total (N=4)	(N=17)	(N=11)	(N=7)	(N=39)
Administrative purpose	0.9	1.36	1.44	1.86	1.42				
Clinical purpose	1.5	2.24	1.82	2.07	2.02				
Decision support	1.0	1.59	1.91	2.14	1.72				

SCORES: Primary use = 3; Used = 2; Not used = 0

It is reasonable to assume that the primary purpose for which a UCI is designed determines the required error tolerance for the identifier, and therefore the type of UCI most likely to be selected. To further evaluate the association between usage and the UCI types, see the analysis of the technical problems encountered by respondents, presented in the next section.

SECTION 4: TECHNICAL AND OTHER IMPLEMENTATION PROBLEMS

Seven technical problems were listed in question 7. The eighth "other" option, proved to include mostly concerns about breach of confidentiality involved in the use of the social security number (detailed individual state responses to this question are provided in Appendix C table C). Question 8 listed 11 "difficulties" including security issues which did not refer to SSN specifically, and resistance from major stake holders and special interest groups (for state-by-state details see Appendix C Table U). The frequency of states reporting any of these problems is presented in Table 6 by UCI type and for the total sample.

In general, technical problems were reported more often than other difficulties. Assigning multiple identifiers to the same individual was the most prevalent technical problem cited (59%), and it was most frequent in the CONSTRUCTED identifier group, with nine out of the 11 states (81.8%) reporting it. The same pattern, only at lower levels, was seen for the impact of

name change (through marriage or adoption) on the identifier.

TABLE 6

TECHNICAL PROBLEMS AND OTHER DIFFICULTIES IN *usrnc* A UCI

EXISTING ASSIGNED CONSTRUCTED MULTIPLE TOTAL

PROBLEMS N % N % N % N % N %

N 4 17 11 7 39

TECHNICAL PROBLEMS

Mult ID same indiv 2 50.0 8 47.1 9 81.8 4 57.1 23 59.0

Impact of name change 1 25.0 6 35.3 7 63.6 4 57.1 18 46.2

Same ID mult indivs 1 25.0 4 29.4 6 54.5 3 42.9 14 35.9

Keying errors 0 - 1 29.4 5 45.5 2 28.6 12 30.8

SS confidentiality 3 75.0 1 5.9 1 9.1 3 42.9 8 20.5

Problematic names 0 - 0 - 0 - 1 14.3 1 2.6

Too much time 0 - 0 - 0 - 0 - 0 -

Complex (manual) 0 - 0 - 0 - 0 - 0 -

DIFFICULTIES

Provider resistance 1 25.0 3 17.6 2 18.2 3 42.9 9 23.1

Security issues 0 - 1 5.9 2 18.2 4 57.1 7 17.9

Consumer resistance 0 - 3 17.6 1 9.1 2 28.6 6 15.4

Hardware at sites 0 - 3 17.6 2 18.2 0 5 12.8

Staff resistance 1 25.0 2 11.8 1 9.1 1 14.3 5 12.8

Trainingrequired 0 - 4 23.5 1 9.1 0 - 5 12.8

StateLaws 0 - 1 5.9 1 9.1 1 14.3 3 7.7

Registration delays 0 - 3 17.6 0 - 0 - 3 7.7

Staff required 0 - 1 5.9 0 - 0 - 1 2.6

Software maintenance 0 - 1 5.9 0 - 0 - 1 2.6

Family resistance 0 - 1 5.9 0 - 0 - 1 2.6

Hardware maintenance 0 - 0 - 0 - 0 - 0 -

CHANGES NEEDED

Implementation 0 - 3 17.6 2 18.2 3 42.9 8 20.5

Algorithm 1 25.0 1 5.9 2 18.2 1 14.3 5 12.8

Hardware/software 1 25.0 1 5.9 1 9.1 0 - 3 7.7

Relatively few states reported difficulties with resistance from special interest groups, with the highest resistance reported as coming from service providers (23.1%). Similarly, only a few states reported that they wanted to change either the implementation (20.5%), the algorithm (12.8%), or the hardware/software used to generate the UCI (7.7%).

The different problems listed in the two questions described above were collapsed into five categories:

- o Confidentiality issues (not SSN related)

- o Technical issues (i.e., keying errors, impact of name changes, assignment of same ID to multiple individuals etc.)
- o Resources issues (i.e., training requirements, staff required, software maintenance etc.
- o SS# confidentiality issues, and
- o Resistance (i.e., provider, family, advocates and consumer resistance).

These data are presented in Tables 7 and 8. Table 7 indicates for each state whether it did experience at least one problem in each domain. This presentation may help states contemplating selecting a specific UCI to consult with states already experienced with the problems (and utility) of the same or Similar UCIs. Surprisingly low were reports of resistance from any interest group. Only ten states reported any concerns with resistance of any kind, and these were evenly distributed among the different UCI types.

The most common problems reported were technical ones, and this was true for all UCI types, although the amount of reported troubles varied and problem

TABLE 7

PROBLEMS EXPERIENCED BY STATES WITH DIFFERENT TYPES OF UCI

STATE CONFIDENTIALITY TECHNICAL RESOURCES SSN RESISTANCE

EXISTING NUMBER

Florida X

Illinois X

Louisiana X X

New Mexico X X

ASSIGNED NUMBER

Alabama

Connecticut X X

Delaware X

D.C. X X

Georgia X X

Hawaii X

Indiana X X

Iowa

Missouri X X

New York X

Oregon X

Rhode Island

S. Carolina X X

Texas X

Utah X

Virginia X

Washington X

CONSTRUCTED ID

Alaska X

Colorado X

Maryland X

Massachusetts X X

Minnesota X X X

Montana X X

New Jersey X X

N. Carolina X X

Oklahoma X

S. Dakota X X

Wisconsin X X

MULTIPLE UIDS

Arizona X X

California X

Kansas X

Kentucky X X X X

Nebraska X X X X

Ohio X X X

Pennsylvania X

STATES WITH NO CURRENT UID

Arkansas

Idaho X

Maine X X

Michigan

Mississippi

N. Dakota

Puerto Rico

Tennessee

Vermont

West Virginia

Wyoming

TABLE 8

TYPE OF PROBLEMS REPORTED BY STATES USING DIFFERENT UID TYPES

 PROBLEM TYPE

 ID TYPE CONFIDENTIALITY TECHNICAL RESOURCES SS CONFID RESISTANCE

EXISTING NUMBER (N=4)

States reporting problem 0 2 0 3 1

Percent of ID type 50.0 75.0 25.0

ASSIGNED NUMBER (N=17)

States reporting problem 1 11 6 1 3

Percent of ID type 5.9 64.7 35.3 5.9 17.6

CONSTRUCTED ID (N=11)

States reporting problem 2 10 3 1 3

Percent of ID type 18.2 90.9 27.3 9.1 27.3

MULTIPLE IDS (N=7)

States reporting problem 4 6 0 3 3

Percent of ID type 57.1 85.7 42.9 42.9

NO CURRENT UCI (N=11)

States reporting problem 1 0 0 2 0

Percent of ID type 9.1 18.2

seemed more prevalent in the CONSTRUCTED identifier group. Although only four states reported using the SSN, ten states, including two not currently using any UCI, specifically expressed concerns regarding the appropriateness of using the Social Security number as a client identifier. The concerns were around the impossibility of safeguarding patient identity and privacy when using such a widely known and commonly used identifier, shared with credit companies, health services, employers and many more. Concerns regarding the legality of

requiring patients to submit SSN as a precondition for service was also voiced.

Table 8 presents a summary of the detailed state-by-state data presented above. Technical problems were the most frequently reported by all UCI types, with CONSTRUCTED UCI leading (90.9%). As expected, resource issues were not raised by states using the SSN since there is no overt added cost to the states. Resource issues were most prevalent in the ASSIGNED UCI group (35.3%). Confidentiality issues (non SSN) were most prevalent in the MULTIPLE UCI group (57.1%)

SECTION 5: STRENGTHS AND WEAKNESSES OF THE UCI TYPES

The project team's discussion of survey results and other sources of information (Carr, personal communication) led to an evaluation of each type in terms of its expected accuracy, the resources needed to implement it, and related technical and political problems. Admittedly, the following evaluation was not strictly derived from specific survey results. We believe it may nevertheless be useful for states contemplating installing a new UCI or a revision of an existing, ineffective one.

EXISTING NUMBER

Since the only existing number used by states responding to our survey was the social security number (SSN), the following discussion will focus on this one example of an EXISTING identifier. Some of the arguments would be general and may fit other such UCIs, others will be specific to the SSN.

Strengths:

1. The SSN is widely used by many agencies and services. It is thus potentially ideal for establishing linkage across different agencies and service systems. Because of its central, Federal origin, it may even allow linkage across states.
2. Because the SSN is essential for many other purposes, it is easy to obtain and use. Most people have an SSN, or can obtain it without cost or too much bureaucratic hassle.
3. Using the SSN does not (overly) require any additional state cost. The state does not generate these numbers and is not responsible technically to assure that each individual has one and only one unique SSN. Thus, it is clearly the most economical choice.

Weaknesses

1. Contrary to popular thinking, not everyone has a social security number, nor is everyone required to have one. Children are one clear example, although a SSN is required on tax form 1040 when (and if) it is completed. Others who may not have an SSN are members of various migrant populations and other disadvantaged groups who may be eligible for an SSN but for some reason do not request it.
2. Contrary to popular belief, it is not uncommon for the same person to have more than one SSN, nor is it completely unknown for different people to have the same SSN. In addition, it is a known practice for some family members to share the use of one SSN. All of these may cause problems in the unique identification of clients.

3. Because the SSN is so widely used and is required as part of employment records, credit checking, schooling, housing etc., it becomes tantamount to specific identification of the client in a way that is potentially shared by almost anyone. The risk to client confidentiality is enormous. Literally anyone could find out the identity of a mental health client by simply checking the SSN.
4. Some federal regulations (5 U.S.C. 552a; 26 U.S.C. 408) prohibit the use of SSN as a condition of service provision. Thus clients could simply refuse to give their SSN, and could enter the service without providing the state's UCI.
5. Because some clients lack the SSN, due to any of the above mentioned reasons, states would have to generate a "pseudo SSN", i.e., some numbering system that would uniquely identify clients who do not have a proper SSN. Thus, the use of SSN as the mental health system's UCI requires the creation of a second, "shadow" system that is costly and may cause additional identification and matching problems.

CONSTRUCTED UCI

Strengths:

1. The CONSTRUCTED identifier is usually simple enough to be constructed manually and on site, and does not depend on centralized, sophisticated machinery to generate it.
2. The personal information items used to construct the identifiers are known to the client and easily retrieved and verified.
3. Using bits and pieces of personal information items permits the creation of a UCI that is mostly opaque and cannot be directly or easily associated with an individual. Thus, it is possible and relatively easy to mask the client's identity and protect confidentiality.
4. Because it can be generated on site and by persons, as opposed to a centralized computer generation, the costs involved are limited. Costs will be incurred in training staff to generate the UCI and in periodic checking to ensure that the training is effective. Other than that, no additional cost is associated with this UCI.

Weaknesses.

1. The CONSTRUCTED identifier is susceptible to errors due to name changes (i.e., as in marriage or adoption), use of nicknames, aliases, shortened version(s) of names (e.g. Peggy or Maggie for Margaret) and handling of long, hyphenated, or other unusual forms of names, including foreign and ethnic ones. Errors and matching difficulties may also be caused by different sites developing their own local variation (e.g., using maiden name versus middle name).
2. Duplicate, identical UCIs for different persons are another instance of errors associated with constructed UCIs. This type of error depends on the complexity of the generating algorithm and on the size of the population. In a large population, duplicates are almost inevitable. In some cases a tie breaker is enough, as in differentiating two twins, sharing the same initials, gender and date of birth. In any case, duplicates are hard to detect, and therefore, difficult to correct.
3. Because the CONSTRUCTED identifier is generated on site, its reliability is compromised by the reliability of the major source of information. Errors can occur due to practices unique to the site, mistakes committed by staff entering the data, and errors coming from the client him/herself. Even when the staff are well trained or the UCI is constructed by the local

computer, accuracy is ultimately dependent on the reliability of the information provided by the client.

ASSIGNED NUMBER

Strengths:

1. The ASSIGNED UCI is centrally generated by a computer. It thus gives the SMHA control over the entire process, including safety features and designing the most appropriate identity checking procedures. This level of control by itself insures a certain level of accuracy.
2. With a well-designed procedure to check and msure the inique identity of each client, the ASSIGNED number is much less error prone than the other two UCIs, and allows a more accurate clinical tracking.
3. Because it is centrally located, the cost of adding new systems that use the same algorithms may be minimal.
4. As the number itself is meaningless, it provides no leads regarding the client's identity. Thus, the use of the ASSIGNED UCI protects the dient's privacy and confidentiality.

Weaknesses:

1. The ASSIGNED UCI requires a central registry/data base which houses all information necessary to identify an individual. This type of data base requires technical sophistication and thus a certain level of skilled staff which is likely to be expensive.
2. The UCI implementation tends to be more expensive than the other methods. It requires hardware of sufficient size and power and ongoing maintenance and monitoring. Cost is especially high at implementation, although some cost continues to be associated with ongoing use.
3. Some confidentiality concerns are related to having a central registry. The personal information of all the system's clients is available in one location. Thus, special security arrangements are necessary to protect access to this file. Special security measures are expensive, and there is always a danger of breaking security, in spite of all the measures taken to prevent it.

SECTION 6: BENCHMARKING TEST RESULTS

To examine the efficiency of the different approaches to unique identification of clients in a system-wide data base, a benchmark test was conducted by Julie Bonner, Texas Department of MHMR. Four different methods were tested against a known database including 750,033 case records. These records represented 547,254 unique individuals, many with multiple local case numbers which could be used to detect duplicates.

The database includes one record per unique ID. This record contains the latest social security number, sex, ethnicity and date of birth for any local case number for same unique ID, and all the names that have been submitted for the same local number or unique ID. The master file was constructed in 1987 and it has undergone repeated checks and clean-ups since then. Today it contains only extremely rare instances of duplicate records.

The four different methods utilized for the benchmark testing included:

(1) constructed UCI based on name only, (2) constructed UCI based on name, sex and date of birth, (3) social security only (existing number), and (4) a machine-generated Assigned UCI. Two types of analysis were undertaken. The first tested for two types of errors: multiple records appearing as the same person, and matches made in error (same person, appearing as multiples).

The second analysis looked for sources of errors and sought to understand the most common ones.

Constructed UCI based on name alone:

Using a UCI based on name only, yielded 59,788 occurrences of multiple persons combined under one UCI. 17,924 persons had multiple IDs with over 9,000 people having more than ten different UCIs per person. For this error level, a proposed one-digit tie breaker would clearly have been an ineffective solution. The total error rate for a constructed UCI based on name only was 12%.

Constructed UCI based on name, sex and date of birth:

Using additional information (sex, and date of birth) with the algorithm constructing the UCI decreased the occurrences of multiple persons with same UCI to 2,095 (from 59,788), but did not change the number of persons with multiple identifiers. The total error rate dropped to 4%.

Social Security Number as UCI:

Using Social Security Number as sole identifier posed several other problems. This benchmark test indicated that the SSN is particularly subject to digit transposition. In addition, more than 119,000 records did not contain the SSN. For those that did, there were 11,100 occurrences of one person with multiple social security numbers, and 1,897 occurrences of multiple persons with the same SSN. Thus, the Social Security Number used as a unique identifier was inaccurate 24% of the time.

Assigned, machine generated, UCI:

The assigned, machine-generated UCI tested here was the one generated by an algorithm in Texas' client information system. This comparison yielded 4,779 occurrences of one person with multiple UCIs and 207 occurrences of multiple persons identified (erroneously) as one. The total error rate for this UCI was less than 1%.

For further information and/or technical assistance in evaluating proposed algorithms, contact Julie Bonner, Texas Department of MHMR, P.O. Box 12668, Austin, Tx 78711-2668.

SUMMARY/CONCLUSIONS

This paper presents data from a national survey that collected information from all but two states, and included Washington D.C., and Puerto Rico. The survey asked states to report the type of UCI in use, elements used to construct or verify the UCI and the problems, technical and others, encountered during implementation and ongoing use of the UCI. The major

findings were that:

1. There is a clear need for a glossary of terms to be included in the MHSIP standards, which will create a common language and common terms regarding the implementation and use of unique client identifiers in large, statewide service systems.
2. Three types of UCI were identified and were found to constitute the universe of methodologies currently used by the responding states. The three types were: a) an EXISTING number, b) an ASSIGNED number and c) a CONSTRUCTED identifier. Some states reported more than one UCI type in use, but no state has suggested an alternative to the three types presented in the survey.
3. Thirty nine states reported the use of a unique identifier in at least some sector of their service delivery system. The most frequent UCI was the ASSIGNED number (17 states). The least common (4 states) was the EXISTING number, with SSN the only existing number used.
4. Only five states reported having no technical problems with their UCI, and all of these states were using an ASSIGNED number. Sixteen states reported no resources and no resistance problems with their UCI. These states were distributed across all UCI types.
5. In general, the reported level of interest groups' resistance to the implementation and use of a UCI was low. Nevertheless, the highest resistance was reported as coming from service providers.

RECOMMENDATIONS

1. MHSIP should address definitional problems which were identified in this study. A common language needs to be developed beginning with a glossary of terms.
2. MHSIP/NIMH should sponsor a task force to first identify and sort through all the federal regulations regarding use of SSN as UCI, preferably with input from the Social Security Administration. Then the task force should formulate, and clearly communicate to states, a common policy regarding the use of the social security number as unique identifier in mental health databases.
- 3 Further studies are needed in the following areas:
 - o Systematic bench marking studies to determine:
 - a) the optimal number and the best combinations of elements to be used for a constructed UCI, and effective tie-breaking methods.
 - b) the best algorithms to use for resolution of matching problems when using an assigned UCI, as well as ways to optimally organize access to the central registry.
 - o Systematic study of issues around the organization, operations and costs that were not directly addressed by our survey, e.g., centralization, staffing, resources etc.). Such a study should focus on pragmatic and policy issues within the organization(s) responsible for maintaining the MIS and the UCI.

o Systematic study of the impact of new approaches to mental health service provision and data maintenance on the implementation and maintenance of UCI's and appropriate client data in state level organization. Such issues, to name a few, would be the advent of person-based systems, increased. privatization, and the more often required inter-agency collaboration.

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APPENDICES

Appendix A: Work plan

Appendix B: Copy of the Survey Instrument packa~e

Appendix C: Background tables A-D

APPENDIX A

Work plan

UNIQUE CLIENT IDENTIHER STUDY

WORK PLAN

RESPONSIBLE

DATES ACTIVITY STATE(S)

1991

7/29-30 1. Organizational Meeting in Atlanta Georgia

7/30-8/20 2. Develop cover letter. Georgia

Determine mailing list

8/9-9/6 3. Finalize Draft of Data to be Collected Texas

9/6-10/18 4. Internal Pilot

10/18-10/22 5. Determine Needed Revisions of Georgia

Data Items Revision of form Texas

10/28-11/15 6. Mail Out Forms, Texas

Collect Forms Alabama

11/18-12/13 7. Follow-ups on Data Needed Alabama

Non-response, rough edits S. Carolina

Florida

Detail edits New Jersey

11/11-12/31 8. Preliminary Data Manipulation, Analysis New Jersey

Distribution of results New Jersey

Content analysis of open-ended Questions SC, FL, TX

Content analysis of "other" categories GA, TX

1992

1/3-2/15 9. Collect Any Additional Information Needed All

2/15/92 10. Cut-off date for Accepting Data

3/4-5 11. Second meeting to process/interpret findings, Georgia

finalize recommendations/outline report.

Fall/92 12. Final ReportNJ, All

APPENDIX B

Copy of the survey instrument package

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APPENDIX C

Background Tables A-D

APPENDIX C, TABLE A

ITEMS USED FOR ID CONSTRUCTION OR VERIFICATION

STATE DOB SSN LNA NSD FNA SEX ETH MNA TBI FAD COR MMN MOT CLC Q60TH

STATES USING AN EXISTING NUMBER

Florida 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Illinois 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Louisiana 1 1 1 0 1 1 0 0 0 0 1 0 0 0 0 0

New Mexico 1 1 0 0 1 0 0 0 0 0 0 1 0 0 1 1

STATES USING AN ASSIGED NUMBER

Alabama 1 1 1 0 0 1 1 0 0 0 0 0 0 1

Connecticut 1 1 1 1 1 1 1 1 0 0 0 0 0 1 0

Delaware 0 0 0 0 0 0 0 0 0 1 0 0 0 1 1

D.C. 1 1 1 1 1 1 0 0 0 0 0 1 0 0 0

Georgia 1 1 1 1 1 1 1 0 0 0 0 1 0 0 1

Hawaii 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0

Indiana 1 1 1 0 1 1 1 0 0 0 0 0 0 0 0

Iowa 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0

Missouri 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0

New York 1 1 1 0 1 1 0 1 0 0 0 0 0 0 0

Oregon 1 1 1 0 1 1 1 1 1 0 1 0 0 0 0

Rhode Island 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1

S. Carolina 1 1 1 0 1 1 0 0 0 0 0 0 0 0 1

Texas 1 1 1 0 1 1 1 0 0 0 0 0 0 0 0

Utah 1 1 1 0 1 1 1 0 0 0 0 0 0 0 0

Virginia 1 0 1 0 1 1 1 0 0 0 0 0 0 0 0

Washington 1 0 1 0 1 1 0 0 0 0 0 0 0 0 0

STATES USING A CONSTRUCTED IDENTIFIER

Alaska 1 0 1 1 1 1 1 0 1 0 0 0 0 0 0

Colorado 1 0 1 0 0 1 1 0 0 0 0 0 0 0 0

Maryland 1 0 1 0 1 1 0 0 0 0 0 0 0 0 0

Massachusetts 0 1 0 1 0 0 0 0 1 0 0 1 0 0 0

Minnesota 1 1 0 0 0 1 0 0 0 0 0 0 0 0 1

Montana 1 0 1 0 1 0 0 1 1 0 0 0 0 0 0

New Jersey 1 0 1 0 1 0 0 0 1 0 0 0 0 0 1

N. CaroLina 1 0 1 0 1 1 1 0 1 0 0 0 0 0 0

Oklahoma 1 0 1 0 1 1 0 1 0 0 0 0 0 0 0

S. Dakota 1 0 1 0 1 1 0 1 1 0 0 0 0 0 1

Wisconsin 1 0 1 0 1 1 0 0 1 0 0 0 3 0 0

STATES USING MULTIPLE IDENTIFIERS

Arizona 1 0 1 0 1 1 0 0 1 0 0 0 0 0 0

California 1 1 1 0 1 1 0 0 0 1 1 1 1 1 0

Kansas 1 1 1 0 0 1 0 0 0 0 0 0 0 0 0

Kentucky 1 1 1 0 0 1 1 0 0 1 0 0 0 0 1

Nebraska 1 1 1 0 1 1 0 0 0 0 0 0 0 0 0

Ohio 1 1 1 0 1 1 1 1 0 0 1 0 0 0 0

Pennsylvania 0 1 1 0 0 1 0 1 0 0 0 0 0 0 0

LEGEND:

DOB=Date of birth SSN= Social Security number LNA= Last name

NSD=soundex FNA=First name SEX=gender

ETH Ethnicity/race MNA=Maiden name TBI=Tie breaker

FAD= First admitted COR =Country of residence MMN=Medicare/medicaid

MOT= Mother's maiden name CLC= CLinic code Q60TH= other

APPENDIX C, TABLE B

PURPOSE(S) FOR UCI USE

ADMINISTRATIVE USAGE	CLINICAL USAGE	MEAN USAGE SCORES
Undup Decis. Heavy Billing Fraud Plarnirg/ STATE counts support users contr. detect. Research budget	Client Cont. tracking care	Adminis. Clinical
STATES USING EXISTING NUMBER		
Florida 3 2 2 0 0 2	0 0	1.17 .00
Illinois 2 2 0 3 2 0 0	2 3	1.17 2.50
Louisiana 0 0 0 3 0 0 0	3 0	.50 1.50
New Mexico 2 0 0 0 0 2	2 2	.67 2.00

STATES USING AN ASSIGNED NUMBER		
Alabama 2 2 2 0 0 2 2	3 2	1.33 2.50
Connecticut 2 3 2 2 0 2 3	3 3	1.83 3.00
Delaware 3 2 3 3 0 3 2	3 3	2.33 3.00
Dist of C 2 3 3 3 0 3 2	3 3	2.17 3.00
Georgia 2 2 2 0 2 2 2	3 2	1.67 2.50
Hawaii 3 3 2 3 0 2 2	3 3	2.00 3.00
Indiana 2 2 2 0 0 0 2	3 0	1.00 1.50
Iowa 2 0 0 2 0 0 0	2 0	.67 1.00
Missouri 0 0 0 0 0 0 0	3 0	.0 1.50
New York 2 2 2 2 0 0 2	3 2	1.33 2.50
Oregon 2 2 3 0 0 3 2	3 0	1.67 1.50
Rhode Island 0 0 0 2 0 0 0	3 0	.33 1.50
S. Carolina 2 0 2 0 0 0 0	3 3	.67 3.00
Texas 3 2 2 2 2 2 2	3 2	2.17 2.50
Utah 2 2 0 2 2 2 2	2 2	1.67 2.00
Virginia 3 0 3 0 0 0 0	3 0	1.00 1.50
Washington 3 2 3 0 0 2 0	3 2	1.33 2.50
STATES USING A CONSTRUCTED IDENTIFIER		
Alaska 3 2 3 0 0 0 2	3 0	1.33 1.50
Cotorado 3 2 2 2 0 0 2	3 2	1.50 2.50

Maryland 3 3 2 2 0 2 2	3 3	1.83 3.00
Massachusetts 2 2 0 3 0 2 2	3 0	1.50 1.50
Minnesota 2 2 2 0 0 2 2	3 2	1.33 2.50
Montana 2 2 2 2 0 2 2	2 3	1.67 2.50
New Jersey 2 3 0 0 0 2 2	0 0	1.00 .00
N. CaroLina 2 0 0 2 0 2 2	2 0	1.33 1.00
OkLahoma 3 2 3 0 2 2 2	3 2	2.00 2.50
S. Dakota 3 0 0 0 0 0 0	2 0	.50 1.00
Wisconsin 2 3 2 2 2 0 3	2 2	1.83 2.00
STATES USING MULTIPLE IDENTIFIERS		
Arizona 3 2 2 2 2 2 2	3 2	2.17 2.50
California 2 2 2 3 2 2 2	3 2	2.17 2.50
Kansas 2 2 2 0 2 2 2	2 2	1.67 2.00
Kentucky 3 3 0 0 0 0 3	0 0	1.00 .00
Nebraska 2 2 2 2 2 2 2	3 3	2.00 3.00
Ohio 3 2 2 2 0 2 2	2 2	1.83 2.00
Pennsylvania 2 2 3 2 2 2 2	2 3	2.17 2.50
STATES NOT CURRENTLY USING A UCI		
Arkansas 0 0 0 0 0 0 0	0 0	.00 .00
Idaho 0 0 0 0 0 0 0	0 0	.09 .00
Maine 3 3 2 0 0 2 3	2 0	1.67 1.00

Michigan 0 0 0 0 0 0 0	0 0	.00 .00
Mississippi 0 0 0 0 0 0 0	0 0	.00 .00
North Dakota 0 0 0 0 0 0 0	3 0	.00 1.50
Puerto Rico 0 0 0 0 0 0 0	0 0	.00 .00
Tennessee 0 0 0 0 0 0 0	0 0	.00 .00
Vermont 0 0 0 0 0 0 0	0 0	.00 .00
W. Virginia 0 0 0 0 0 0 0	0 0	.00 .00
Wyoming 0 0 0 0 0 0 0	0 0	.00 .00

NOTE: 3 = PRIMARY USE; 2 = USED; 0 = NOT USED

APPENDIX C, TABLE C

TECHNICAL PROBLEMS WITH THE UNIQUE CLIENT IDENTIFIER

STATE SKE TCM INC AS! AM! HLH ETA SSNPROS OTHER TOTAL

STATES USING AN EXISTING NUMBER

Florida 0 0 0 1 1 0 0 0 2

Illinois 0 0 0 0 0 0 0 1 0 1

Louisiana 0 0 1 0 1 0 0 1 0 3

New Mexico 0 0 0 0 0 0 0 1 0 1

STATES USING AN ASSIGNED NUMBER

Alabama 0 0 0 0 0 0 0 0 0 0

Connecticut 0 0 0 0 0 0 0 0 0 0

Delaware 1 0 0 1 1 0 0 0 1 4

D.C. 1 0 1 1 1 0 0 0 0 4

Georgia 0 0 0 0 1 0 0 0 0 1

Hawaii 0 0 1 0 0 0 0 0 0 1

Indiana 1 0 1 0 0 0 0 0 0 2

Iowa 0 0 0 0 0 0 0 0 0 0

Missouri 0 0 0 0 0 0 0 1 0 1

New York 0 0 0 0 1 0 0 0 0 1

Oregon 0 0 1 0 1 0 0 0 0 2

Rh IsLand 0 0 0 0 0 0 0 0 0 0

S. CaroLina 1 0 1 1 1 0 0 0 0 4

Texas 0 0 0 1 1 0 0 0 0 2

Utah 1 0 1 0 0 0 0 0 0 2

Virginia 0 0 0 0 0 0 0 0 0 0

Washington 0 0 0 0 1 0 0 0 0 1

STATES USING A CONSTRUCTED IDENTIFIER

ALaska 0 0 0 1 1 0 0 0 2

Colorado 0 0 1 1 0 0 0 1 3

Maryt and 1 0 1 1 1 0 0 0 4

Massachusetts 0 0 1 0 1 0 0 0 2

Minnesota 0 0 0 0 0 0 0 1 1

Montana 1 0 0 0 1 0 0 0 1 3

New Jersey 1 0 1 1 1 0 0 1 0 5

N. Carolina 0 0 1 1 1 0 0 0 3

Oklahoma 1 0 0 1 1 0 0 0 3

S. Dakota 1 0 1 0 1 0 0 0 3

Wisconsin 0 0 1 0 1 0 0 0 2

STATES USING MORE THAN ONE TYPE OF IDENTIFIER

Arizona 0 0 1 1 1 0 0 0 3

California 0 0 0 0 1 0 0 0 1

Kansas 0 0 0 0 0 0 0 1 0 1

Kentucky 0 0 1 0 0 0 0 1 1 3

Nebraska 1 0 0 1 1 1 0 1 0 5

Ohio 1 0 1 1 0 0 0 0 3

Pennsylvania 0 0 1 0 1 0 0 0 2

LEGEND: SKE-- Susceptible to keying errors TQM = Too complex for manual

INC = Impact of name changes ASI = Same UCI to multiple individuals

AMI = Multiple UCI to same individual HLH = Long, hyphenated, ethnic names

ETR = Excessive time required SSNPROB = 55w confidentiality

APPENDIX C, TABLE C

NON-TECHNICAL DIFFICULTIES WITH THE UNIQUE CLIENT IDENTIFIER

STATE TREQ NSRE HDDH SOMA LHSS POCR PRRE SCRE CORE ADFR SEIS STLW Q80TH TOTAL

STATES USING AN EXISTING NUMBER

Florida 0 0 0 0 0 0 0 0 0 0 0 0

Illinois 0 0 0 0 0 0 0 0 0 0 0 0

Louisiana 0 0 0 0 0 0 0 0 0 0 0 0

New Mexico 0 0 0 0 0 0 1 1 0 0 0 0 2

STATES USING AN ASSIGNED NUMBER

Alabama 0 0 0 0 0 0 0 0 0 0 0 0

Connecticut 0 0 0 0 1 0 0 0 0 0 1 1 1 4

Delaware 0 0 0 0 0 0 0 0 0 0 0 0

D.C. 1 0 0 0 1 1 0 0 0 0 0 0 0 3

Georgia 1 1 0 0 0 1 0 0 0 0 0 0 0 3

Hawaii 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Indiana 0 0 0 0 0 0 1 1 1 0 0 0 0 3

Iowa 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Missouri 1 0 0 0 0 0 0 0 0 0 0 0 0 1

New York 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Oregon 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Rhode Island 0 0 0 0 0 0 0 0 0 0 0 0 0 0

S. Carolina 0 0 0 1 1 1 0 0 0 0 0 0 0 3

Texas 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Utah 0 0 0 0 0 0 1 0 1 1 0 0 0 3

Virginia 1 0 0 0 0 0 0 0 0 0 0 0 0 1

Washington 0 0 0 0 0 0 1 1 1 0 0 0 0 3

STATES USING A CONSTRUCTED IDENTIFIER

Alaska 0 0 0 0 0 0 0 0 0 0 0 0 0 0

CoLorado 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Maryland 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Massachusetts 0 0 0 0 1 0 0 0 0 0 0 0 1 2

Minnesota 0 0 0 0 1 0 1 0 0 0 1 1 0 4

Montana 1 0 0 0 0 0 0 0 0 0 0 0 0 1

New Jersey 0 0 0 0 0 0 0 0 0 0 0 0 1 1

S. Carolina 0 0 0 0 0 0 0 0 0 0 1 0 0 1

OkLahoma 0 0 0 0 0 0 0 0 0 0 0 0 1 1

S. Dakota 0 0 0 0 0 0 1 0 0 0 0 0 0 1

Wisconsin 0 0 0 0 0 0 1 1 0 0 0 0 2 0

STATES USING MORE THAN ONE TYPE OF IDENTIFIER

Arizona 0 0 0 0 0 0 0 0 0 0 1 0 0 1

California 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Kansas 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Kentucky 0 0 0 0 0 0 1 0 0 0 1 0 0 2

Nebraska 0 0 0 0 0 0 1 1 1 0 1 0 0 4

Ohio 0 0 0 0 0 0 1 0 1 0 1 1 0 4

PennsyLvania 0 0 0 0 0 0 0 0 0 0 0 0 0 0

LEGEND: TREG = training requirement NSRE = Staff requirement HDDN = Hardware maintenance

SOMA = Software maintenance LHSS = No hardware on site PDCR = Program deLays

PRRE = Provider resistance SCRE = Staff resistance CORE = Consumer resistance

ADFR = Advocates/famiLy res. SEIS = Security issues STLW = State Law needs changing

Q8OTH = other difficulties