



INSTRUCTION MANUAL

Data Preparation

PART

2d

Vital Statistics
NCHS Procedures for Mortality
Medical Data System File Preparation
And Maintenance

Effective 1979

U.S. DEPARTMENT OF
HEALTH AND HUMAN SERVICES
Public Health Service
Office of Health Research, Statistics, and Technology
National Center for Health Statistics

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Janya W. Pitts

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PART 2d

NCHS PROCEDURES FOR MORTALITY MEDICAL
DATA SYSTEM FILE PREPARATION AND MAINTENANCE

Effective 1979

SECTION I - INTRODUCTION

Mortality medical data are processed by four basic types of programs in sequential order: QUALITY, ACME, TRANSAX, and EDIT. QUALITY checks the accuracy of the multiple cause codes initially coded by a nosologist (see Part 2b of the Vital Statistics Instruction Manual Series for coding instructions). ACME ^{1/} edits the multiple cause codes and assigns the underlying cause of death applying a predefined algorithm to the multiple cause codes based on traditional ICD ^{2/} rules for manual selection of the underlying cause of death (see Part 2a of the Vital Statistics Instruction Manual Series). TRANSAX ^{1/} translates the multiple cause data from an entity axis of classification to a record (person) axis of classification. EDIT ^{3/} represents a series of programs which check for missing records, edit for rare multiple and rare underlying causes, perform age/cause and sex/cause conditional and absolute compatibility checks, and validate code assignments. Each phase, except TRANSAX, rejects records not meeting certain predefined criteria. The rejected records are manually corrected and then updated prior to processing the work unit in a subsequent phase. This provides for a complete, updated file to be entered into each program phase.

This manual contains instructions for input preparation and maintenance of the various medical data files required to support the systems programs. This includes initial input to the system, reconciliation of reject messages, and rekeying of rejected records at each stage of processing.

Instructions for entry and updating of demographic data from the death record are contained in Part 4 of the Vital Statistics Instruction Manual Series. The National Center for Health Statistics (NCHS) processes the demographic and medical data from a death certificate in two separate

1/ For more detailed information on ACME and TRANSAX, see "A National Multiple Cause of Death Data System" by Chamblee and Evans published in the proceedings of the Third Annual Symposium on Computer Applications in Medical Care, October 14-17, 1979, Washington, D. C.

2/ International Classification of Diseases, Volumes 1 and 2.

3/ For more detailed information on edits applied to mortality data, see Parts 2a, 2b, 4, and especially 11 of the Vital Statistics Instruction Manual Series.

tracks creating a demographic data record and a medical data record for each certificate. The demographic record is first entered and established as a master record against which a corresponding medical record is paired and the combination record is then edited for inconsistencies. Accordingly, this manual covers data entry steps relative to independent medical record processing and to merged record processing but not to the independent demographic processing. The flow chart in Appendix 1 describes the data flow and segregation of activities.

This manual provides processing instructions which are, for the most part, carried out internal to NCHS. However, all medical data entry and some reject reconciliation steps are handled at the State level by States (15 as of 1980) which supply data through a State/NCHS shared data system. In these States, the initial coding and reconciliation of ACME rejects is handled by the State office. And, in most cases (13 States as of 1980) the ACME software is installed (TRANSAX software to be installed effective with 1981 data) in the State office to permit local processing of the data through these phases prior to transmittal of a data file to NCHS. In the remaining States (2 as of 1980), all computer processing takes place at NCHS with the State supplying the input data. In both situations, after NCHS receives the data from the States, it is evaluated against quality control specifications and processed through subsequent edits either of which may indicate the need for corrective action by the State office. The flow chart in Appendix 1 illustrates the CHSS and non-CHSS components of the program.

SECTION II - MEDICAL DATA RECORD INPUT

For the purpose of computer processing, medical data record input to the system must be in character representation and subscribe to the format given in Appendix 2. The record length must be 120 bytes with the last 18 bytes containing blanks or user defined data which ACME ignores. Position 102 is reserved for system use in flagging records for manual review and must be left blank.

Data entry can take any form (optical character recognition, key disk, key tape, card punch, etc.) and use any reasonable format so long as the final product serving as input to ACME meets the above specifications. Table 1 provides specifications for coding each data field in the input record. The "Key-to-Disk Input" and "Interactive Edit" columns are unique to the NCHS key-to-disk mode of data entry. The key-to-disk jobname for accessing this format is MORTMED. The remaining instructions are not geared to a specific equipment application and represent basic requirements for ACME input. In cases where coding is carried out on transcription sheets prior to key entry, appendix 3 is illustrative of the transcription sheet to be used.

Beyond the specifications given in Table 1, the following paragraphs cite special instructions for entering the State file number and multiple cause codes in the input record:

TABLE 1

Item	Key To Disk Input		Code Structure	Coding Specifications	Interactive Edit	Tape Output Position (Input to ACME)
	Program Level	Data Position				
Data Year	2	1	9	Data year being processed.	Format generated.	1
Place of Injury	3	90	Ø, 0-9	Refer to page 138 of Part 2b and ICD-9, Volume 1, page 569.	Valid code check.	2
Shipment Number	2	2-3	01-15	Refer to Lot Control Record. Care should be taken to assure the correct <u>shipment number</u> is entered and <u>not</u> the lot number.	Valid code check.	3-4
State File Number	3	1-6	000001-999999	Number located in upper right hand corner of certificate (except for California) is entered. See special instructions in text for this item.	Valid code check. This file number = 1 + preceding file number (allow override).	5-10
State Code	2	4-5	01-51	Refer to list of geographic codes in Special List B, Part 2b.	Valid code check.	11-12
Component of Reporting Area	2	6	New York City Bronx Borough --- 1 Brooklyn Borough --- 2 Manhattan Borough --- 3 Queens Borough --- 4 Richmond Borough --- 5	Entered from Lot Control Record.	Valid code check. Should be Ø if data position 4-5 is not equal to 14 or 33.	13

TABLE 1 - Continued

Item	Key To Disk Input		Code Structure	Coding Specifications	Interactive Edit	Tape Output Position (Input to ACME)
	Program Level	Data Position				
Component of Reporting Area - Continued			Chicago ----- 6 All other report- ing areas ---- 0			
Lot Number	2	7-9	001-999	Entered from Lot Control Record.	Valid code check.	14-16
Coder Status	2	10	1 - Production Coder 2 - Coder - Verifier 3 - Coder - Verifier	Entered from Lot Control Record.	Valid code check.	17
Manually Assigned Underlying Cause of Death	3	86-89	ØØØØ - Not coded. 000Ø-9999 if coded. (Refer to Part 11 instruction manual.)	Refer to Part 2a. If a three- digit code, the last digit is spaced.	Valid code range check.	18-21
Reject Code	3	91	Ø - Not rejected 1-5 - Inconsistent duration 9 - More than 4 "due to's"	Refer to pages 61 and 62 of Part 2b.	Valid code check.	22
Conditions	3	7-85	Refer to Part 11 manual.	For coding of individual con- ditions, refer to Part 2b. For placement and sequencing instructions, special instru- tions in text apply to this item.	Field can contain only 0-9, Ø, *, (,), and & on a position- by-position basis.	23-101
Blank	-	-				102-120

A. State File Number

Occasionally, the coder encounters certificates with duplicate numbers or certificates which have not been numbered. The following numbering procedures are prescribed for such certificates:

1. Duplicate State File Numbers - For duplicate State file numbers assigned to different events, the State file number is coded and entered as it appears for the first record; 99 is entered for the first two digits of the State file number of the second duplicate number record, 98 for the third such number, 97 for the fourth, 96 for the fifth, 95 for the sixth, 94 for the seventh, 93 for the eighth, 92 for the ninth, 91 for the tenth, 90 for the eleventh, 89 for the twelfth, etc., for all subsequent records having duplicate State file numbers.

<u>Example</u>	<u>Enter as State File Number</u>
002277 (first record)	002277
002277 (second record, first duplicate)	992277
002277 (third record, second duplicate)	982277

2. Unnumbered Records - Each unnumbered source record is assigned the same State file number as that of the preceding source record except 99 is substituted as the first two digits of the State file number. The first two digits of the State file number are altered in descending order 98, 97, 96, etc., for all subsequent unnumbered records.

<u>Example</u>	<u>Enter as State File Number</u>
002796 (first record)	002796
unnumbered (second record, first unnumbered)	992796
unnumbered (third record, second unnumbered)	982796

B. Multiple Cause Codes

Multiple cause codes are entered in free format fashion with special symbols denoting placement and sequence. Instructions are as follows:

1. Symbols unique to ACME input data are:

<u>Symbol</u>	<u>Function</u>	<u>Example</u>
/	Denotes line entry in Part I of certificate (up to 5 lines allowed in part I for processing purposes).	Part I. a) 410 b) 4409 c) 4140 Part II. 4292
*	Denotes entry(s) in Part II of certificate.	410/4409/4140*4292

() Encloses codes which relate to the manifestations of a disease. ~~8~~(~~8~~3207~~8~~3234~~8~~)~~8~~

& Identifies the following: &8789 &462

- a. The most specific E Code causing injuries or poisoning,
- b. The underlying condition that necessitated the medical or surgical care when there was a complication or adverse effect of the medical or surgical care,
- c. The adverse effect or complication of medical or surgical care when classifiable to Chapters I-XVI and the underlying condition that necessitated the medical or surgical care is not stated or implied,
- d. A misadventure occurring during medical or surgical care when classifiable to Chapters I-XVI, whether or not the underlying condition that necessitated the medical or surgical care is reported, and
- e. Certain localized effects of poisonous substances (E860-E869) or aspiration (E911-E912) when classifiable to Chapters I-XVI.

(Denotes the first digit, "8," of the 800 Series for the Nature of Injury category 1/ since the same span of code numbers is used for both nature of injury and external cause categories in ICD-9. 800 = (00

) Denotes the first digit, "9," of the 900 Series for the Nature of Injury category 1/ since the same span of code numbers is used for both nature of injury and external cause categories in ICD-9. 901 =)91

1/ Codes in Chapter XVII, Injury and Poisoning, International Classification of Diseases - Ninth Revision.

2. In using the / (slash) to denote lines of Part I and the * (asterisk) to denote Part II (referred to as line 6), the following rules are observed:
 - a. The symbol is placed prior to the codes assigned on each line.

Exception: for line a), the slash must not be used.
 - b. If no codes appear on a line, the line symbol is omitted.

Exception: (1) When codes appear on lower line(s) of Part I but not on upper line(s), the slash must be used to denote empty lines above the first used line (excluding line a), and (2) when codes appear on upper line(s) and lower line(s) of Part I but not on intervening lines, slashes must be used to denote empty intervening lines.
3. Manifestation codes, if any, are placed within parentheses, at the end of the line, following all other codes entered on that line. A space must be left before and after opening and closing parentheses, e.g., ~~Ø~~(Ø3218Ø3234Ø)~~Ø~~.
4. When the parenthesis is used as the first digit of Nature of Injury codes, a space must not be left between the parenthesis and remaining numerals of the code, e.g., (03.
5. A space must not be left between an "§" and the code to which it relates, e.g., §887.
6. When a code is contiguous to a / or *, a space is not left between the code and the symbol (but note item 3 above for manifestation codes), e.g., 2019/500*2029.
7. ICD-9 Volumes 1 and 2 provide a decimal point between the third and fourth digits of four digit categories. However, this decimal point is not entered when coding.
8. Excess (more than eight codes) or repetitive codes on a given line are deleted according to page 6 of Part 2b of the Vital Statistics Instruction Manual Series.

C. Illustration

The data record appears in a format illustrated by the following:

Item:	Data	Place of	Shipment	State File	Component of	
Location:	Year	Injury	Number	Number	STATE	Reporting Area
	(1)	(2)	(3-4)	(5-10)	(11-12)	(13)
Examples:	9	∅	02	000001	01	0
	9	∅	02	000002	01	0
	9	9	02	000003	01	0
	9	∅	02	000004	01	0

Item:	LOT	Coder	Underlying Cause	Intentional
Location:	(14-16)	Status	of Death	Reject
	(17)	(18-21)	(22)	
Examples:	001	1	4320	1
	001	2	2019	∅
	001	3	220∅	9
	001	1	0020	∅

Item:	Multiple Cause Codes	Blanks
Location:	(23-101)	(102-120)

Examples: 4320/2109
 4320///2019*8010
 220/4300/4019∅3109∅2019/2019/500*2029∅(03∅*887
 //0020∅2773∅(∅5178∅)∅*887

etc.

SECTION III - QUALITY CONTROL OVER MEDICAL CODING - NON-CHSS DATA

Control of the quality of multiple cause coding assures quality underlying cause codes as well as multiple cause of death codes since the underlying cause is derived from the multiple cause codes. However, because new revisions of the ICD and ACME system were implemented for coding 1979 events, a separate manual coding of the underlying cause of death is being carried out on a sample basis to further validate and refine the overall system. For multiple cause purposes, an initial qualification period was utilized at the beginning of coding 1979 events to verify that coders successfully made the transition in code structure and rules from ICDA-8 to ICD-9 and are coding accurately. Once initially qualified, coders are monitored by the regular quality control procedure described herein.

A. Multiple Cause Quality Control Procedures

Each work lot which is coded by a "qualified coder" is verified on a 10 percent sample basis using a technique called three-way independent verification. Under this technique -- first introduced to mortality coding for ICDA-8 data in 1970 data year -- if three trained people code an entity and all three or two of the three agree on a common code assignment, then it is highly probable that the agreement code is the correct or preferred code for the entity.

In mortality coding, the procedure is carried out by having one coder (called the production coder or coder 1) code all records in each work lot of approximately 2,500-3,000 certificates. A second (coder 2) and third (coder 3) coders independently code identical 10 percent samples of the lot. The resultant 3 sets of sample codes for 10 percent of the records are compared by computer on a record-by-record, line-by-line, code-by-code basis to charge code error based on the majority opinion as correct. Detailed specifications are given in the following paragraphs.

1. Work Assignment - Work lots are assigned on a coder available basis within the framework of unit priorities. Once coders initially qualify for unit coding, no preference (in terms of sample versus production assignments) is made for varying levels of accuracy or experience. For each lot, the production assignment is done prior to the sample assignment which may be carried out in either order (2 and 3 or 3 and 2). The work assignment record is completed by each coder as indicated.
2. Sample Digit - For purposes of coder 2 and 3 coding, each lot is assigned a sample digit (0-9) from a random number table. In sample coding, only those certificates which have a units digit of the State file number corresponding to the sample digit are verified. In general, assuming no missing or duplicate State file numbers, every tenth certificate is coded by coders 2 and 3.

The sample digit is assigned only after the production coding is complete.

3. The Preferred Set - The computer software generates a hypothetical record which represents the majority or preferred opinion of the three coders coding each sample record. Errors are then charged to each coder by comparing his set of codes against the preferred set of codes. The preferred set is created through a process which compares each code assigned by a coder in a given positional location (e.g., the second code on line 3) with the code(s) assigned by the other two coders in the corresponding line and positional location and places the preferred (majority) code in that positional location in the preferred set. Codes are entered in free format fashion and one coder may assign fewer codes than others. In such situations, for purposes of creating the preferred set, each coder's set of codes on a line is supplemented with null codes to equal the maximum number of codes assigned by the three coders.

Where two null codes are compared with a real code, the preferred set is empty in that location. In situations where all coders disagree on the code assignment in a given location, a dummy code, XXXX, is placed in the preferred set. For manifestation codes, the left and right parentheses are deemed to denote a separate line for purposes of calculating the preferred set. When only 2 coder statuses are present for a certificate (i.e., 1 and 3, 2 and 3, or 1 and 2), the missing coder's data record is defined as a complete null set of codes. When only a coder 1, only a coder 2, or only a coder 3 record is present for a given certificate, that record is bypassed.

4. Charging Errors - To charge errors, the software examines the preferred set of codes for each line in comparison to each coder's code assignment using the following rules:
- a. If the number of codes in the preferred set is equal to or greater than the number assigned by the coder, then an error is charged for every code in the preferred set omitted by the coder.
 - b. If the number of codes in the preferred set is less than the number assigned by the coder, then an error is charged for every code she listed that is not in the preferred set.

Examples of preferred set creation and corresponding error assignment are as follows:

<u>Coder Status</u>	<u>Multiple Cause Codes</u>	<u>Place of Injury</u>	<u>Reject Code</u>	<u>Number of Errors</u>
Coder 1	4019 4 410 4 4140*)599 4 49289	1	4	0
Coder 2	4019 4 410 4 4140*)599 4 49289	1	4	0
Coder 3	4019 4 411 4 4148 4 412*)599 4 49289	1	9	4
<u>Preferred Set</u>	4019 4 410 4 4140*)599 4 49289	1	4	

<u>Coder Status</u>	<u>Multiple Cause Codes</u>	<u>Place of Injury</u>	<u>Reject Code</u>	<u>Number of Errors</u>
Coder 1	4019/4140 410	1	1	3
Coder 2	4029/4140	1	1	1
Coder 3	4039	1	1	2
<hr/>				
Preferred Set	XXX/4140	1	1	
<hr/>				
Coder 1	2506 (7854) /2500 2503			1
Coder 2	2506 (7854) /2500			0
Coder 3	2506 2503 (7855)			3
<hr/>				
Preferred Set	2506 (7854) /2500			
<hr/>				
Coder 1	4019/4039			2
Coder 2	4019 4039			0
Coder 3	4019 4039			0
<hr/>				
Preferred Set	4019 4039			
<hr/>				
Coder 1	4019 4029			1
Coder 2	4019			0
Coder 3	Missing			1
<hr/>				
Preferred Set	4019			
<hr/>				
Coder 1				2
Coder 2	4019 4029			0
Coder 3	4019 4029			0
<hr/>				
Preferred Set	4019 4029			
<hr/>				
Coder 1	5939 586/8789/(20*4140 4274 887		9	2
Coder 2	5939 586/8789/(20 (21*4140		9	2
Coder 3	5939 586/8789/(20*4140 4274		9	0
<hr/>				
Preferred Set	5939 586/8789/(20*4140 4274			

5. Error Rates - Two separate lot error rates are computed and included on the printout (a code error rate and a record error rate) for each of the three coders. The code error rate is based on the number of errors (including place of injury, reject code, and ampersands) in all lines of all sample certificates divided by the number of codes in the preferred set in all lines of all sample certificates. The record error rate is based on the number of records charged with one or more code errors divided by the number of sample records. All error rates are presented in percentages. In addition to the error rates, the printout includes the percentage of records in the lot which have a 1-2-3 match. Runs not having at least 80 percent of the sample available in each lot are aborted for corrective action prior to error rate computation.
6. Processing - As soon as practicable after a given lot has been coded by all three coders, it is submitted alone (or with others) to the computer for quality control processing. The data are sorted in ascending order by data year, lot, State, component of reporting area, State file number, and coder status (major to minor).
7. Evaluation - When the output listing (see Appendices 4 and 5) is received from the computer, it is reviewed for a "successful run" and resubmitted if necessary. For "successful runs," the condition error rate is posted to the coder's "Employee Assignment Record" (see Appendix 6). The listing is forwarded to the supervisor for action. For those lots not exceeding the 5.00 percent condition error rate tolerance on any of the three coders, the supervisor reviews errors (see Appendix 4) with the coders if she deems it helpful.

For lots on which the production coder's error rate exceeds the tolerance, the supervisor reviews the quality control printout to determine the necessary update procedure. In most cases, it is determined that the production coder's work needs updating and a fourth coder (or the original production coder in some cases) independently verify/corrects the production coder's work (or her own work) on the key-to-disk system in "find" mode. These corrected coder/records are then resubmitted for a computer match against the original coder 2 and 3 records with generation of a new printout for posting and review. (Coder 2 and 3 error rates are not reposted.) The cycle continues until the lot has an acceptable production error rate.

Occasionally, poor quality coding in one of the samples has caused artificial inflation of the production coder's error rate. In such cases, a fourth coder independently recodes the 10 percent sample using coder status 2 or 3 depending on the sample being coded. These corrected coder/records are then resubmitted for a computer match against the original production coder and the other sample coder with generation of

a new printout for posting and review. (The new error rates are posted for the production coder and the other sample coder, but the sample coder whose work was updated keeps the original error rate.)

After the coding is complete on such lots, the supervisor reviews the errors (see Appendix 4) with the coder(s) to detect specific problem areas. For lots on which only the sample coder's error rates exceed the tolerance, the errors are also reviewed with the coder(s), even though data file correction is not required.

8. File - For purposes of Division of Vital Statistics data evaluation and preparation of the technical appendix, all graphs, charts, and error listings are retained 18 months after the final data file is released from Data Preparation Branch. Copies of Appendixes 7 and 14-17 are forwarded to Division of Vital Statistics, Technical Services Branch as they are produced.

B. Underlying Cause Quality Control Procedures

In order to monitor the ACME assignment of the underlying cause of death and collect data which facilitates refinement of the system's decision tables, the underlying cause of death is assigned manually on a 10 percent sample of records for 1979 data. For subsequent years, the sample size is 2 percent.

The underlying cause coding is carried out by senior level experienced underlying cause coders who simultaneously code and key-enter control data and the underlying cause of death in the same format as used for regular input to ACME (see Table 1). However, for this purpose, the jobname is MORTUC; the multiple cause, place of injury, and reject fields are automatically blanked; and only coder status "1" is valid. Records are selected from the same sample as was coded by multiple cause coders 2 and 3; however, the underlying cause coders do not have access to the original multiple cause code assignments made by coders 1-3. After the first sample State file number is keyed, the program automatically generates subsequent sample numbers so that only the underlying cause of death is keyed record by record. Each of the four tasks on each lot is carried out by four different coders. Since senior level coders made the code assignments and errors are likely to be detected in the adjudication process, these records are not verified. The underlying cause coders are instructed not to use the ACME decision tables since, in order to truly measure ACME error, the errors must be manually coded in a fashion which is entirely independent of the ACME process.

After quality control processing but prior to ACME processing, the underlying cause sample records are matched to the coder 1 data records, and the manual underlying cause is inserted into the coder 1 record in columns 18-21. This is accomplished using the regular ACME update routine, ACMEUPDT. Then, ACME processing can proceed at which time the number of differences between ACME and manual assignments is computed and a difference rate is produced for evaluation purposes.

The differences are reviewed and adjudicated to identify further refinements in the ACME system. Proposed changes in the ICD-9 ACME decision tables which result from this process are posted to Appendix 7. In the adjudication process, the portion of differences assignable to the manual underlying cause coder is converted to an error rate for that process.

C. Initial Qualification Procedures for ICD-9 Data

As coders enter actual coding after initial classroom training in ICD-9, established work assignment procedures are followed except that coders 2 and 3 code on a 100 percent basis. This continues until a multiple cause coder has demonstrated an average error rate of less than 3.75 percent over three consecutive work lots. At that point, the coder is qualified for sample verification. Coders who do not reach the acceptable level within three to five weeks are given supplemental classroom training.

Because the timing of feedback is critical at this stage of processing, the data are batched in work lots of $\leq 1,500$ records, and each lot is processed through quality control on an individual basis. Initial qualification of underlying cause coders is accomplished through entry and verification of the current mortality sample -- the commencement of which precedes regular file coding by several months.

SECTION IV - ACME PROCESSING

Each lot of data passing initial quality control procedures is eligible for processing through ACME (job ACMEBTCH) as specified in "Computer Installation Instructions for the Automated Classification of Medical Entities (ACME ICD-9)". In ACMEBTCH, ACME program logic performs the following:

1. Checks the multiple cause codes and format for validity; rejects those that are invalid; rejects records with intentional reject code = 9.
2. If codes and format are found to be valid and record is not to be intentionally rejected,
 - a. assigns an unconditional underlying cause of death through application of nonambivalent selection and modification entries in the decision tables, or
 - b. assigns a conditional underlying cause of death when one or more ambivalent table entries are encountered by assuming yes, continuing the selection/modification process, and rejecting the record for review.
 - c. assigns no underlying cause of death because of lack of a causal entry in the decision tables and rejects the record for manual underlying cause coding.

3. If an absolute ACME underlying cause assignment is made and a manually assigned underlying cause is in columns 18-21, compares the two assignments and rejects those with differences for review.

Records which pass these edit criteria and have an absolute underlying cause of death assigned are written to a "good" output file in which the data are reformatted into a 215 character record (see Appendix 8). Records failing an edit criterion are written to a "bad" record output file in the same format as the input record but with an action code 2 in column 102 and the ACME assigned underlying cause of death in the manually assigned underlying cause of death field (columns 18-21) (see Appendix 9). (Is blanked if ACME could not assign an underlying cause of death.) The latter enables ACME to use its initial underlying cause as the final underlying cause of death without further coding if such action is approved in the nosological review of the reject list. If the ACME underlying cause is in error and, therefore, cannot be used, a corrected underlying cause is supplied to the system through the manual underlying cause field.

The purpose of action code 2 is to cause the system in its update phase (i.e., second pass of a file) to execute its editing and validation feature but skip the underlying cause selection portion of the program logic and take the code in columns 18-21 as its underlying cause of death. Assuming all formatting and input and output codes are valid, the system then writes the previously rejected records onto its good output file.

A. Reject Lists

1. Messages - Messages are generated on a record-by-record basis corresponding to reason for edit failure (see Appendix 10) and are listed in a fashion which gives the entire logic utilized by ACME in processing a given record.

There are four categories of messages which are produced by ACME for rejected records:

- a. Messages which indicate the need to correct multiple cause codes and/or format and to manually assign an underlying cause.

Format Error

TOO MANY LINES

TOO MANY *'S

TOO MANY CODES PER LINE

Code Error

INVALID DIGIT IN CODE

WRONG LENGTH CODE

INVALID CODE XXXX

INVALID CODE IN PARENTHESES

- b. Messages which indicate the need to manually assign an underlying cause.

Cause Not Addressed in Tables:

NO ENTRY IN TABLE C FOR CODE XXXX

Intentional Reject:

REJECT CODE = 5 (inconsistent duration which cannot be automatically resolved by ACME)^{1/}

REJECT CODE = 9 (more than four due to's)

Invalid ACME Underlying Cause:

XXXX IS INVALID UNDERLYING CAUSE

INVALID MANUAL UNDERLYING CAUSE = XXXX (applicable only to second pass processing)

Other:

CIRCULAR LINKAGE LOOP

- c. Messages which indicate the need to verify and possibly correct the ACME underlying cause assignment.

Ambivalent Table Entries:

CAN XXXX BE DUE TO YYYY	MAYBE
XXXX DS YYYY	MAYBE
XXXX SENDC YYYY	MAYBE
XXXX SENMC YYYY ZZZZ	MAYBE
XXXX IDDC YYYY ZZZZ	MAYBE
XXXX LMP YYYY	MAYBE
XXXX SMP YYYY	MAYBE
XXXX LDP YYYY	MAYBE

^{1/} Reject codes 1-4 are automatically resolved by ACME without rejection of records for manual underlying cause of death coding.

ACME/Manual Discrepancy :

MANUAL UNDERLYING CAUSE = XXXX

ACME UNDERLYING CAUSE = YYYY

In these cases, the ACME assignment is conditional. If in review of the record the conditional underlying cause is found to be correct, no correction need be made.

- d. Messages which may accompany the above types but are informational in nature and give the logic followed in assigning the underlying cause. Such messages require no action. The following list is organized by selection/modification rule for sake of clarity:

Selection Rule:

CAN XXXX BE DUE TO YYYY YES

CAN XXXX BE DUE TO YYYY NO

TUC = XXXX SELECTION RULE

Rule 3:

XXXX DS YYYY

XXXX DSC YYYY ZZZZ

Rule 4:

XXXX IS SENILITY

XXXX SENDC YYYY ZZZZ

XXXX SENMC YYYY ZZZZ

Rule 5:

XXXX IS ILL-DEFINED

TUC IS ILL-DEFINED: RESELECT

XXXX IS TUC (765-766)

XXXX IS NON-ID FROM PART II

XXXX IS ID TUC FROM PART I

XXXX IS ID TUC FROM PART II

XXXX IS ID TUC

XXXX IDDC YYYY ZZZZ

Rule 6:

XXXX IS TRIVIAL

XXXX IS FROM PART II

Rule 7:

XXXX LMP YYYY

XXXX LMC YYYY ZZZZ

XXXX LDP YYYY

XXXX LDC YYYY ZZZZ

CONFLICT IN LINKAGE

Rule 8:

XXXX SMP YYYY

XXXX SMC YYYY ZZZZ

XXXX SDC YYYY ZZZZ

CONFLICT IN SPECIFICITY

Recode E-Codes:

RECODE E-CODE XXXX

Priority to Ampersand:

TUC IS MED-CARE: PREFER AMP XXXX

TUC IS N-CODE: PREFER AMP-E-CODE XXXX

TUC IS N-CODE EXCEPTION: RESELECT

TUC IS E-CODE EXCEPTION: PREFER AMP XXXX

Other:

XXXX CONVERTED TO YYYY

MANUAL UC = XXXX ACME UC = XXXX

TUC = XXXX

IGNORE INCONSISTENT DURATION

The abbreviations used in the preceding messages are decoded in the following manner:

XXXX	stands for a code
YYYY	stands for a code
ZZZZ	stands for a code
TUC	stands for Temporary Underlying Cause
TUC2	stands for a second Temporary Underlying Cause
MED-CARE	stands for Medical Care Code
AMP	stands for Ampersanded Code
E-Code	stands for External Cause of Injury and Poisoning Code
N-Code	stands for Nature of Injury and Poisoning Code
Manual UC	stands for manually assigned underlying cause code
ACME UC	stands for underlying cause code assigned by the ACME program
NON-ID	stands for Non-III-Defined Condition
DS	stands for Direct Sequel
DSC	stands for Direct Sequel Combination
SENDC	stands for Senility "Due To" Combination
SENMC	stands for Senility With Mention of Combination
ID	stands for III-Defined Condition
IDDC	stands for III-Defined "Due To" Combination
LMP	stands for Linkage "With Mention Of" Preference
LMC	stands for Linkage "With Mention Of" Combination
LDP	stands for Linkage "Due To Position" Preference
LDC	stands for Linkage "Due To Position" Combination
SMP	stands for Specificity "With Mention Of" Preference
SMC	stands for Specificity "With Mention Of" Combination
SDC	stands for Specificity "Due To Position" Combination

2. Correction Instructions - In correcting records, the following procedure is used:

- a. The source certificates and any available additional information for the States to which the ACME reject listing corresponds are obtained.
- b. For each record on the list, problems with the underlying cause-of-death assignment indicated by the messages are resolved by taking one of the following actions:
 - (1) An underlying cause of death is assigned where ACME could not make such an assignment, or
 - (2) An erroneous conditional underlying cause assignment made by ACME is corrected, or
 - (3) ACME is allowed to keep the conditional assignment it made if that assignment is correct. (This is the default option and requires no action by the individual coding the reject lists.)

In addition, any error in multiple cause coding or format indicated by the messages is corrected. Specific instructions for each message are given in Table 2.

- c. All corrections are made in red pencil directly on the listing. When codes are corrected, the old code is crossed out in entirety and the correct code is entered above the deleted code.

To blank an entire field, the original codes are marked out and "###" are written above the field.

Data year, lot, State, component of reporting area, and State file number (in ascending sort major to minor) are control fields and cannot be changed without deleting the entire record and adding a substitute record. To do this, "delete" is indicated on the listing beside the old record. The correct ID is inserted along with the correct codes for all fields on the new record with an "add" noted beside it. When keypunched as noted in paragraph 3, this causes the system to delete the original record and add the new record. "Delete" (and "add") are used to delete (or add) any record from (to) the file.

NOTE: Instruction c applies to procedures where nosological review of the listing and key entry of update records are carried out in separate steps. For organizations where review and key entry are carried out in one step, no corrections need

*mostly
place reject*

*436/4409 delete
410/4019/2500 add*

(all multiple cause codes would be an entire field)

TABLE 2

<u>Messages Requiring Action</u>	<u>Action Taken</u>		
	<u>Correct Multiple Cause Codes and/or Format</u>	<u>Manually Assign Underlying Cause</u>	<u>Check ACME Underlying Cause and Make Manual Assignment if Incorrect</u>
TOO MANY LINES	X	X	
TOO MANY *'s	X	X	
TOO MANY CODES PER LINE	X	X	
INVALID DIGIT IN CODE	X	X	
WRONG LENGTH CODE	X	X	
INVALID CODE XXX	X	X	
INVALID CODE IN PARENTHESES	X	X	
NO ENTRY IN TABLE C FOR CODE XXXX			X
REJECT CODE = 5			X
REJECT CODE = 9			X
XXXX IS INVALID UNDERLYING CAUSE			X
INVALID MANUAL UNDERLYING (second pass only)			X
CIRCULAR LINKAGE LOOP			X
CAN XXXX BE DUE TO YYYY	MAYBE		X
XXXX DS YYYY	MAYBE		X
XXXX SENDC YYYY ZZZZ	MAYBE		X
XXXX SENMC YYYY ZZZZ	MAYBE		X
XXXX IDDC YYYY ZZZZ	MAYBE		X
XXXX LMP YYYY	MAYBE		X
XXXX LMC YYYY	MAYBE		X
XXXX SMP YYYY	MAYBE		X
XXXX LDP YYYY	MAYBE		X
MANUAL UNDERLYING CAUSE = XXXX			X
ACME UNDERLYING CAUSE = YYYY			X

be made directly on the listing. Also, see paragraph 3 entitled "Preparation of Correction Records."

- d. In reviewing the reject listing, corrections are not confined solely to the problems identified by ACME. Other errors the reviewer notices are corrected. For example, if the reviewer is assigning an underlying cause to a "reject code = 9" certificate and notices that a condition code is in error, that error is also corrected. Likewise, errors in the place of injury, shipment number, reject code, and coder status fields are corrected.
- e. When the reviewer discovers that an ACME problem indicates the need for an ACME decision table change, the data record correction indicated in the preceding paragraphs is made. Also, the listing is flagged, Appendix 7 is completed, and the proposed decision table change is referred to the supervisor.
3. Preparation of Correction Records - ACME files are sorted on the following items (major to minor) which are used as control data and must be entered for each corrected record in the same manner as they were entered for original processing of the record. This means that the codes for each item must be keyed as given on the reject listing.

<u>Item</u>	<u>Positions</u>
1. Data Year	1
2. Lot Number	14-16
3. State Code	11-12
4. Component of Reporting Area	13
5. State File Number	5-10

Only those records on the listing which have a correction are processed. Within each record, only those fields with a correction are entered. However, each field with a correction must be repunched in its entirety (including the multiple cause field). Where a field is to be changed from a valid code to a blank, b's are entered in the entire field.

*pt 9 should be blank
B ref. also*

The record format for correction records is the same as the ACME input record format originally submitted to NCHS (see Table 1). However, any code key-entered into the manual underlying cause field (columns 18-21) is used by ACME during second pass processing as the underlying cause-of-death assignment for that record. ACME replaces its original output underlying cause with the manual underlying cause.

For records noted "delete" on the reject listing, the control items are keyed as given above with "DELETE" in positions 23-28. For records noted "add" on the reject listing, the entire record is keyed in the ACME input format with "ADD" in positions 103-105.

NOTE: Again, the paragraphs above are written to correspond to a procedure whereby review and key entry are separate steps in processing. Where they are merged into one step, only the applicable instructions should be followed.

For States submitting ACME input data to NCHS, the correction records are submitted on tape to NCHS. NCHS matches the corrected records to the original file. These records are then substituted for the rejected records on a field-by-field basis and reprocessed through ACME to check code and format validity. If the format is incorrect or codes are invalid, the record again rejects for correction. Where this second set of rejected records is very small, corrections are handled by telephone.

At NCHS and for States fully utilizing the ACME system, the corrected records are submitted through job ACMEUPDT which updates the rejected records on a field-by-field basis. The update is checked for successful execution, and the updated file is reprocessed through ACMEBTCH before the file is submitted to NCHS.

B. Control Totals

For control purposes, ACME produces the statistical table given in Appendix 11. These data are utilized for the purpose of monitoring performance of the ACME system (processor and decision tables) in terms of its ability to assign an accurate underlying cause and to make adjustments as necessary. Action on the basis of this listing and other tables produced on an ad hoc basis for evaluation purposes is made on an annual basis prior to processing each data year file.

SECTION V - AXIS TRANSLATION

After the CHSS data and the non-CHSS data have been updated from ACME processing, the files are ready for axis translation by TRANSAX. The axis translation process automatically converts the multiple cause codes on each record from an entity axis of classification to a person axis of classification based on a set of tables containing predefined linkage relationships among entity codes. This creates a set of multiple cause codes (without placement designation) wherein each code is assigned within the context of the medical certification as a whole utilizing accepted linkage relationships among conditions. This augments the original entity axis set in which each code was assigned with placement designators but with minimal regard to other entities on the certification. Both sets of codes are retained on the TRANSAX output tape (see Appendix 12), each having its own distinctive application to multiple cause of death data analysis.

A. Reject Lists

TRANSAX rejects no records for nosological review. The input data have already been validated by ACME, and ambivalent table entries are imputed to the most probable result.

B. Control Totals

TRANSAX control totals are shown in Appendix 13. In addition to these control totals, special statistical tables are run on an ad hoc basis to monitor each aspect of the axis translation process and provide the basis for any necessary corrective action.

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SECTION VI - QUALITY CONTROL OVER MEDICAL CODING - CHSS DATA

For medical data received from CHSS States, independent quality control programs are exercised in the State offices. In each State, the program is developed and administered in a manner which is most practicable for the State, yet meets contractual commitments to NCHS. In addition, NCHS receives from the State a separate monthly transmittal of death certificates which are underlying cause and multiple cause coded by NCHS nosologists for quality control purposes. For each record, the NCHS codes are compared with State codes; and the resultant differences, if excessive, are discussed and resolved between NCHS and State staff. Where indicated, procedures are revised, retraining is given by NCHS and/or the State, and/or data are retransmitted and updated. For States that submit ACME input data, the quality of the multiple cause coding is evaluated prior to ACME processing by NCHS. If the error rate is excessive, a corrected replacement tape is secured from the State prior to submitting data to ACME. For States that submit ACME/TRANSAX output data, the evaluation and subsequent correction, if necessary, is made prior to any merged record edits at NCHS. There are two phases to this quality control program:

Phase I: When the State first enters the program, NCHS carries out independent coding and evaluation of 50 percent of the records coded by the State for a minimum period of three months. If the State error rate in any of the first three months is in excess of 5.00 percent, then 50 percent NCHS coding and evaluation continues beyond the third month until three consecutive monthly error rates equal or fall below 5.00 percent.

Phase II: When the above criterion is met, NCHS coding reverts to a small sample of certificates -- usually about 200-300 per month.

A. Phase I Procedures

1. Difference Rates - Based on an automated comparison of code assignments made by NCHS and the State, six separate difference rates are computed for each shipment of State-coded records: (1) the multiple cause nonparenthetical code difference rate (entity axis); (2) the multiple cause parenthetical code difference rate (entity axis); (3) the place of injury code difference rate; (4) the reject code difference rate; (5) the underlying cause difference rate; and (6) a combination difference rate which includes nonparenthetical codes, reject codes, and place of injury codes. The multiple cause nonparenthetical code difference rate takes into account only those codes which are outside parentheses; codes within parentheses are compared as a distinct category referred to as multiple cause parenthetical codes. No record axis error rates are computed since these codes are derived automatically from the ACME input (entity axis multiple cause codes).

- a. ACME/TRANSAX Output Data - For States submitting ACME/TRANSAX output data, all six of the above difference rates are computed for the shipment. In addition, a separate set of the same difference rates is computed for the subset of records which have been flagged during ACME processing for nosological review. (Code 2 in column 23 of the ACME output record).

Differences are assigned by the software on a line-by-line basis according to the following rules.

- (1) If the number of codes assigned by the State is less than or equal to the number of codes on the NCHS-coded line, a difference is assigned for every code on the NCHS-coded line that the State failed to list.
- (2) If the number of codes assigned by the State is greater than the number of codes on the NCHS-coded line, a difference is assigned for every code the State listed that is not on the NCHS-coded line.

The total number of differences for each record is the sum of the number of differences on each line of that record.

For computational purposes, the denominator is incremented by the number of codes on the line coded by NCHS when NCHS has the same number or more codes per line than the State. When the State has coded more codes per line than NCHS, then the number of codes on the State record is incremented in the denominator. This has been done to prevent the difference rate from exceeding 100 percent when rule 2 is applied to charge differences. The numerator is the total number of code differences detected.

If the place of injury codes or reject codes differ, a difference is assigned to the appropriate category. In calculating these difference rates, the denominator is incremented each time a State and/or NCHS sample record has one of these codes.

The underlying cause difference rate is calculated when NCHS has assigned a manual underlying cause. The manual underlying cause code assigned by NCHS is matched with the ACME-assigned underlying cause code

which is on the State file. The denominator is the number of sample records which contain an underlying cause code.

On the listing for ACME output States (see Appendix 14), for each record containing one or more code differences, the NCHS-coded record is printed above the corresponding State-coded record in the following order: (1) State code; (2) registration area; (3) certificate number; (4) manual underlying cause; (5) ACME underlying cause; (6) ACME reject code; (7) intentional reject code; (8) place of injury code followed by the number of code differences detected in each of the five difference rate categories excluding the combination category. "MC" indicates the total number of multiple cause nonparenthetical code differences; "PAREN" indicates the total number of differences in parenthetical codes. The columns labeled "PI," "RJ," and "UC" indicate a code difference in the place of injury codes, reject codes, or underlying cause, respectively. These columns contain a "1" if a code difference is detected or a "0" if the codes match. The multiple cause codes are printed below the information given above in ACME input format for ease in adjudication. In reformatting the States's data from ACME output back to ACME input, the "§" symbol, used to denote a code for which surgery could have been performed and E-codes to which N-codes relate, could not be re-established and, therefore, no error is charged for erroneous use of an §.

If a match is not found for a record on the NCHS file, the NCHS-coded record is listed with the message "STATE OMITTED ABOVE SAMPLE RECORD" printed below the record.

- b. ACME Input Data - The same procedure is followed and similar listings are produced for the ACME input States (see Appendices 16 and 17). However, error rates for underlying cause assignment and ACME rejects are not applicable to ACME input data. Additionally, errors can be and are charged for erroneous use of an §.
2. Adjudication - The difference rates are presented in a comprehensive statistical table (see Appendix 15 for ACME output States; Appendix 17 for ACME input States) at the end of each shipment listing of record-by-record differences. To determine source of error, all coding differences are adjudicated and divided into "State error," "NCHS error," and "no error charged." Then the actual error rates are computed for each State and written on the statistical table.

In the adjudication process, a statement is given for each code difference, reflecting the entry(s) as it appears on the source document and an explanation of the coding instructions used to assign the correct code. When the code differences are repetitive, the explanations are not duplicated. Code differences assigned to "no error charged" include code differences resulting from illegible entries on the NCHS copy which may be clearer on the original document; decisional entries, etc. These errors are usually indicated as "no charge" on the adjudicated listing.

Assignment of errors is based upon the entries on the microfilm document and any other additional information which is available to NCHS. Frequently, some differences occur when additional or corrected information based on queries is received in the State office and reflected on the tape but the information was not available at the time the certificates were microfilmed and consequently is not on the NCHS copy of the certificates. These differences are not charged to the State during the adjudication process if "hard" copies of all additional information received by the State are sent to this office along with the tape. Where this does not occur, the State can alert NCHS staff to the fact that additional information has been received during State review of the adjudicated listing.

3. Acceptability of Data - The acceptability of State-coded data is based only on the combination error rate for the overall shipment of data. The remaining error rates are informational in nature and are used as an aid in detecting problem areas and in determining the need for additional training in specific areas. A shipment is acceptable if the combination error rate is equal to or less than 5.00 percent.

B. Phase II Procedures

After the State has met the specified tolerance level in Phase I (five percent or less for three consecutive months), Phase II of the Cooperative Health Statistics System's data monitoring system is implemented. During this phase, the quality control sample size is reduced to approximately 200-300 records per month. The actual sampling rate for a State is based on the estimated total annual receipts for death events (Appendix 18).

The same computations for difference rates are carried out in Phase II as in Phase I. However, in addition to the monthly statistical tables, NCHS produces a table which reflects the cumulative estimate of the code difference/error rates. The overall acceptability of the State's data is based on the monthly combination difference rates and the cumulative combination difference rates in relation to the sample

size and proportion of records sampled. A shipment is acceptable if both the monthly and cumulative combination difference rates are less than or equal to the tolerance levels given in Appendix 19 for the specified sample sizes and proportions. For example, for a monthly sample of 1,000 codes out of 5,000 (20 percent) and a cumulative sample of 3,000 codes out of 15,000 (20 percent), the monthly difference rate must be less than 6.13 percent, and the cumulative difference rate must be less than 5.65 percent. In Phase II, the adjudication of differences to allocate error in a monthly file is carried out on every sample record with a difference only when the combination difference rates exceed the tolerance levels specified in Appendix 19. However, in the event that the combination difference rate is within tolerance but one or more of the individual item difference rates (total file error rates by parenthetical codes, underlying cause, place of injury, and intentional reject; ACME rejects by nonparenthetical codes, parenthetical codes, underlying cause, place of injury, and intentional reject) exceeds 15.00 percent, adjudication of those specific items is undertaken and the error is allocated according to regular procedures.

The purpose of the item-by-item adjudication procedure is to identify specific problem areas in data development and to initiate corrective action in future processing. Accordingly, explanatory notes for adjudicated item error rates in excess of 8.00 percent are examined to determine if the reasons for the errors are repetitive in nature and indicate misunderstanding of coding instructions, processing procedures, etc. Such problems are conveyed to the State for corrective action along with other data for information and action.

C. Initial Qualification Procedure for ICD-9 Data

Analogous to the non-CHSS procedures, all CHSS States were requalified at the beginning of ICD-9 coding. This was accomplished through 50 percent NCHS sample coding and comparison and adjudication of NCHS/State differences until the State achieved a monthly error rate no greater than 5.00 percent for three consecutive months. At that point, NCHS monthly coding reverted to the routine sample.

SECTION VII - MERGED RECORD

As the demographic and medical records are merged, the following edits (see Part 11 of the Vital Statistics Instruction Manual Series) are carried out and messages are produced for records which:

1. have a demographic record but lack a corresponding medical record.
2. have combinations of age/cause (multiple and underlying) and sex/cause (multiple and underlying) which are considered invalid or improbable for mortality applications.
3. have invalid cause codes -- multiple and underlying.
4. contain causes (multiple and underlying) considered to be rare in the United States.

A. Coding Specifications

This reject listing is the final stage of manual data processing prior to computer input for tabulation of mortality data for the data year. Experienced underlying cause-of-death coders are responsible for processing the mortality medical reject listings with the supervisory staff responsible for reviewing work on the reject lists to assure adherence to instructions.

General specifications are as follows:

1. The source microfilm, any available additional information, and the reject listing are used in the processing.
2. Changes are limited to place of injury, age, sex, underlying cause, and the entity axis multiple cause fields. Corrections are made to as many of these fields as necessary to resolve the problem(s) indicated by the message(s). A problem with one field may occasionally require changes to other fields to retain comparable, accurate data. Code errors noticed by the reviewer but not flagged on the listing for corrective action are also corrected. Errors in record axis codes are corrected by processing the revised entity data through TRANSAX.
3. If any part of a field is changed, the entire field is re-entered.
4. If the wrong certificate was originally coded, all fields are corrected.
- ✕ 5. Entire data records cannot be deleted or added at this point in processing.

6. The multiple cause entity axis codes are converted back to input format for purposes of display on the reject listing; however, &'s could not be regenerated. Corrections are made in the free format of the ACME input record.

Specific instructions corresponding to each error message are given in Table 3.

TABLE 3
INSTRUCTIONS FOR REJECT LIST PROCESSING

Message	Underlying Cause	Multiple Cause	Demographic	Action
Demographic Medical Cross Edit Age-Underlying Cause Age-Multiple Causes "Entity (Record) Axis Code ___ is incompatible (conditional or absolute) with age" Sex-Underlying Cause Sex-Multiple Causes "Entity (Record) Axis Code ___ is incompatible (conditional or absolute) with sex"	X	X	X	1. Verify with film. 2. If medical information is incorrect, underlying and/or multiple cause data are corrected as necessary. 3. If the demographic record is incorrect, the age or sex is corrected as necessary. NOTE: 1. For edits flagged "absolute" either the cause or age/sex field must always be changed. If both are correctly coded based on reporting, applicable causes are changed to the minimum necessary to pass the edit and the age/sex field is left as coded. 2. For edits flagged "conditional," the age/sex and/or cause code(s) are changed only if they are in error.

Can only change causes

Can change either

TABLE 3 - Continued

Message	Underlying Cause	Multiple Cause	Demographic	Action
Missing Medical Record ("Unmatched Demographic")	X	X		Entity axis cause codes, underlying cause, and place of injury are coded.
Entity Axis (Record Axis) Code ___ has an invalid character	X	X		Multiple-cause entity axis code(s) are corrected. Underlying cause is corrected as necessary.
Entity Axis locator codes are invalid or out of sequence		X		Multiple-cause entity axis codes are corrected.
Invalid Underlying Cause	X			Underlying cause is corrected.
Rare Cause	X	X		<ol style="list-style-type: none"> 1. Verify on film. 2. If improperly coded as rare, underlying cause and/or multiple cause is corrected as necessary. 3. If properly coded and cause is approved by health officer on face of the record, no change is made. List with cycle number, certificate number, sequence number, State, and verified code is submitted to Chief, Medical Coding Unit. 4. If properly coded and cause is not approved on the face of the certificate,

TABLE 3 - Continued

Message	Underlying Cause	Multiple Cause	Demo-graphic	Action
				<p>record is flagged for verification with health officer. No change is made to record.</p> <p>a. A copy of the certificate with cycle number, State file number, sequence number, State, all information at top of certificate, all of Part I and Part II, and doctor's name and address is made.</p> <p>b. State code and NCHS code is placed on the certificate.</p> <p>c. Above certificate is submitted to Chief, Medical Coding Unit.</p> <p>d. On reject list, "XXXX-rare" is circled with blue pencil and initialed to indicate that a certificate was made.</p>

B. Key Entry

2. A 120 byte control record containing blanks in all fields except the identifying information is read into the key-to-disk system for each rejected record from a cycle of data. The reject list reviewer locates each record with a change in any field and enters the new data into the key disk record. Fields not requiring a change are left blank. The input format is designed to allow processing through ACME as well as to incorporate age, sex, and sequence number fields. At this point in processing, the sequence number is the essential control item.

<u>Item</u>	<u>Position</u>	
Data Year	1	
Place of Injury	2	
Sequence Number	3-10	(3-4 is shipment number and 5-10 is State file number in input format given in Table 1)
State Code	11-12	
Component of Reporting Area	13	
Age	14-16	(Lot number in input format given in Table 1)
Sex	17	(Coder status in input format given in Table 1)
Underlying Cause	18-21	(If 3-digit code, space position 21.)
Reject Code	22	
Entity Axis Codes (free format as coded for ACME input)	23-101	
Action Code = 2	102	
Blank	103-106	
Shipment Number	107-108	
Blank	109	
State	110-111	

This creates seq. #

MC codes

Blank	112
Component of Reporting Area	113
Blank	114
State File Number	115-120

The correction records are matched against the master reject file, and those not requiring ACME/TRANSAX processing (only age, and/or sex changed) are held pending such processing for records with an underlying cause and/or multiple cause change. The latter group of records is processed through ACME (underlying cause selection logic suspended) and TRANSAX to produce an updated medical file. At that point, the new demographic medical data are re-edited for invalid codes and absolute age/cause, sex/cause incompatibility. Occasionally, fail edit records remain in the file after the initial correction cycle. In such cases, these higher order rejects are recycled until no further records reject.

SECTION VIII - INCORPORATION OF ADDITIONAL INFORMATION (NON-CHSS DATA ONLY)

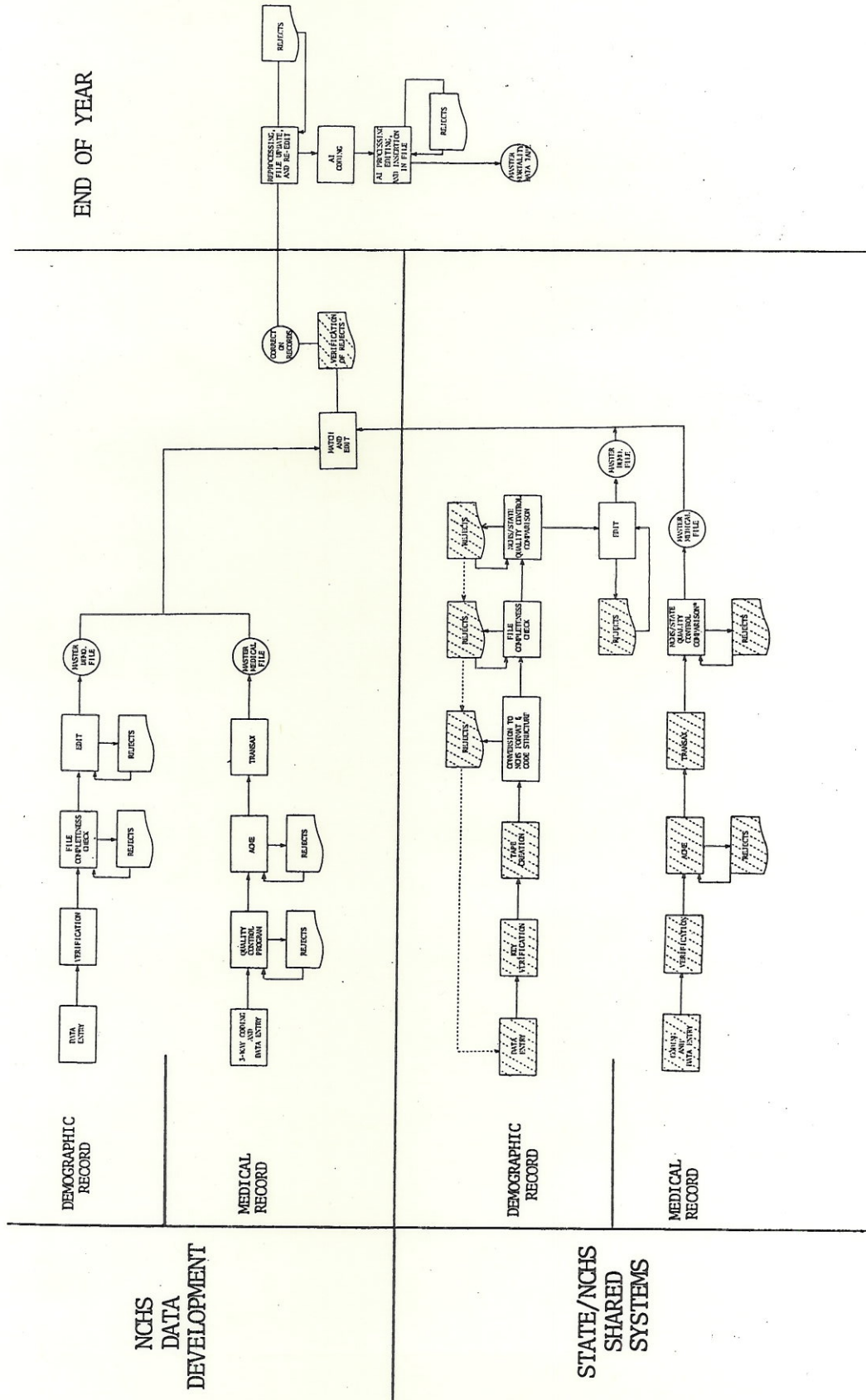
Additional information received after the records are initially processed is incorporated into the data file at the end of the year in the following manner.

1. The medical certification portion of the "AI" certificate and the original certificate are matched to determine if there have been changes which affect the underlying cause assignment or multiple cause code assignment, or place of injury code.
2. For certificates affecting one or more code assignments, a new record is keyed in the format of Table 1 entering control data and all fields including those which are unchanged. The underlying cause of death is assigned manually.
3. The new record is processed through the ACME and TRANSAX systems in the conventional manner except that ACME does not assign an underlying cause on these records since action code 2 is being used. The new data then replace the old data on the mortality master data file.

SECTION IX - RARE CAUSE VALIDATION

Once all needed rejects have been corrected and redited, records with a rare underlying cause or multiple cause code are listed on the rare cause validation list (Appendix 20). This list is then verified by nosologists against a manual record cumulated on a monthly basis reflecting the results of verification calls to State offices. This enables a final check to assure that no rare causes have been missed in the validation process.

APPENDIX I
PROCESSING OF MORTALITY DATA



Denotes functions performed in total or in part in State offices for States participating in State/NCHS shared systems.

* This step is carried out prior to ACME processing for those States which submit input data to NCHS for ACME and TRANSAX processing on the NCHS computer.

APPENDIX 2

ACME INPUT FORMAT

<u>Field Size</u>	<u>Memory Position(s)</u>	<u>Item</u>	<u>State Code As</u>
1	1	Data Year	9
1	2	Place of Injury	Refer to Part 2b Instruction Manual
2	3-4	Shipment Number	Can be blanked if necessary
6	5-10	State File Number	Assign from certifi- cate
2	11-12	State Code	Can be blanked if necessary
1	13	Component of Reporting Area	Can be blanked if necessary
3	14-16	Lot Number	Can be blanked if necessary
1	17	Coder Status	Can be blanked if necessary
4	18-21	Manually Assigned Under- lying Cause	Refer to Part 2a Instruction Manual
1	22	Reject Code	Refer to Part 2b Instruction Manual
79	23-101	Conditions	Refer to Part 2b Instruction Manual
19	102-120	Blanks	Blank

A C M E ----- MORTALITY MEDICAL DATA SYSTEM QUALITY CONTROL OVER CONDITION CODING
 NATIONAL CENTER FOR HEALTH STATISTICS

APPENDIX 4

NO	Y	LOT	ST	CP	SH	CERT	C	UC	CONDITIONS	A	R	ERR
481	9	047		0	06		1		4449 4599/4140*797 5990 2765			2
	9	047		0	06		2		7998/4140*797 5990 2765			1
	9	047		0	06		3		4599/4140*797 5990			2
									XXXX/4140*797 5990 2765			
482	9	047		0	06		1		)584 1599/129 (68 (79**8415		9	0
	9	047		0	06		2		)584 1599/129 (68 (79**8415			1
	9	047		0	06		3		)584 1599/129 (68 (79**8415			0
									)584 1599/129 (68 (79**8415			
483	9	047		0	06		1		4275/410/486*2500 4439			0
	9	047		0	06		2		4275/410/486*2500 4409			1
	9	047		0	06		3		4275/410/486*2500 4439			0
									4275/410/486*2500 4439			
484	9	047		0	06		1		4280/4254*1749 1985 7100			1
	9	047		0	06		2		4280/4254*1749 1985 1969			1
	9	047		0	06		3		4280/4254*1749 1985 1970			1
									4280/4254*1749 1985 XXXX			
485	9	047		0	06		1		)598/1599 88120*)420			0
	9	047		0	06		2		)598/1599 88120			1
	9	047		0	06		3		)598/1599 88120*)422			0
									)598/1599 88120*)422			
486	9	047		0	06		1		485/4340/4409*3320			1
	9	047		0	06		2		485/4340/4409*3320			0
	9	047		0	06		3		485/4340/4409*3320			0
									485/4340/4409*3320			
487	9	047		0	06		1		5184/4029*586 3483 4379			1
	9	047		0	06		2		5184/4029*586 3483 4479			1
	9	047		0	06		3		5184/4029*586 3483			1
									5184/4029*586 3483 XXXX			
488	9	047		0	06		1		4349/4370*4140			0
	9	047		0	06		2		4275/4370*4140			1
	9	047		0	06		3		4349/4370*4140			0
									4349/4370*4140			
489	9	047		0	06		1		)973/68789 5609/67515*797 7515			2
	9	047		0	06		2		)973/68789 5609/7514*797 5680			2
	9	047		0	06		3		)973/68789 5609/7515*797 7515			1
									)973/68789 5609/XXXX*797 7515			
490	9	047		0	06		1		1991 1539			0
	9	047		0	06		2		1539			1
	9	047		0	06		3		1991 1539			0
									1991 1539			

APPENDIX 4 - continued

A C M E ---- MORTALITY MEDICAL DATA SYSTEM QUALITY CONTROL OVER CONDITION CODING
NATIONAL CENTER FOR HEALTH STATISTICS

NO	Y	LOT	ST	CP	SH	CERT	C	UC	CONDITIONS	A	R	ERR
491	9	047		0	06	1			486/2765*4284			0
	9	047		0	06	2			486/2765*4284			0
	9	047		0	06	3			431/4019			3
									486/2765*4284			
492	9	047		0	06	1			1947 88121/(61)/(62			0
	9	047		0	06	2			133 8911/(61)/(62 88121			3
	9	047		0	06	3			1947 88121/(61)/(62			0
									1947 88121/(61)/(62			
493	9	047		0	06	1			4275/3481/1948 89250*486 7823 7800			0
	9	047		0	06	2			4275/3481/1948 89250*486 7823 7800			0
	9	047		0	06	3			4275/3481/1948 89250*486 7823 7800	0		1
									4275/3481/1948 89250*486 7823 7800			
494	9	047		0	06	1			(54 89550			0
	9	047		0	06	2			(54 89550			0
	9	047		0	06	3			(54 89550*(73			1
									(54 89550			
495	9	047		0	06	1			7990 4279/5188/4939 492*494 4140 4169			1
	9	047		0	06	2			7990 4279/5188/4939 492*494 4140			0
	9	047		0	06	3			7990 4279/5188/4939 492*494 4140			0
									7990 4279/5188/4939 492*494 4140			
496	9	047		0	06	1			1598/(07 88162 (61 (60			0
	9	047		0	06	2			1598/(07 88162 (61 (60			1
	9	047		0	06	3			1598/(07 88162 (61 (60			0
									1598/(07 88162 (61 (60			
497	9	047		0	06	1			5789/5789/1539			0
	9	047		0	06	2			5789/5789/1539*2899			1
	9	047		0	06	3			5789/5789/1539			0
									5789/5789/1539			
498	9	047		0	06	1			4349/4029 4273/4019 4409*4280			1
	9	047		0	06	2			4349/4029 4409/4019 4409*4280			0
	9	047		0	06	3			4349/4029 4409/4019 4409*4280			0
									4349/4029 4409/4019 4409*4280			
499	9	047		0	06	1			5722/5712/2859*7469 7464		2	0
	9	047		0	06	2			5722/5712/2859*7469 7464		2	0
	9	047		0	06	3			5722/5712/2859*7469 7464		2	1
									5722/5712/2859*7469 7464			
500	9	047		0	06	1			3485/7990/4787*133 8911		6	0
	9	047		0	06	2			3485/7990/4787*133 8911		6	0
	9	047		0	06	3			3485/7990/4787		6	3
									3485/7990/4787*133 8911			

APPENDIX 5

A C M E ----- MORTALITY MEDICAL DATA SYSTEM QUALITY CONTROL OVER CONDITION CODING
NATIONAL CENTER FOR HEALTH STATISTICS

LOT	NUMBER IN LOT	PERCENT SELECTED	# CODES PREFERRED SETS	C O D E R 1 ERRORS PERCENT	R E C ERR	C O D E R 2 ERRORS PERCENT	R E C ERR	C O D E R 3 ERRORS PERCENT	R E C ERR
038	2608	10.01	854	11	1.29	32	3.75	19	2.22
039	2618	9.97	839	38	4.53	35	4.17	29	3.46
040	2571	10.00	803	38	4.73	16	1.99	35	4.36
041	2603	9.99	877	34	3.88	31	3.53	29	3.31
042	2296	9.97	783	42	5.36	22	2.81	44	5.62
043	2958	10.01	983	51	5.19	42	4.27	34	3.46
044	2542	9.99	800	44	5.50	26	3.25	18	2.25
045	2603	9.99	846	23	2.72	14	1.65	25	2.96
046	2647	10.01	854	37	4.33	28	3.28	44	5.15
047	2580	10.00	873	30	3.44	37	4.24	30	3.44
SECTION TOTALS									
	26026	9.99	8512	348	4.09	283	3.32	307	3.61
									8.19

APPENDIX 7

PROPOSED CHANGE IN ICD-9 ACME DECISION TABLES

Date: _____

CAUSAL RELATIONSHIP

	<u>Address</u>	<u>Subaddress</u>	<u>Causal Relationship</u>
Present Entry	_____	_____	_____
Proposed Entry	_____	_____	_____

MODIFICATION TABLES

	<u>Table</u>	<u>Address</u>	<u>Subaddress</u>	<u>Combination Code</u>
Present Entry	_____	_____	_____	_____
Proposed Entry	_____	_____	_____	_____

	<u>Full Text</u>	<u>ICD-9 Multiple Cause Codes</u>
Certification Raising Need for Table Change:	I (a) _____	_____
	(b) _____	_____
	(c) _____	_____
	(d) _____	_____
	(e) _____	_____
II _____	_____	_____

Underlying Cause:	Accident, Suicide Undet., Etc.	Injury Infor.
-------------------	--------------------------------	---------------

Describe Reason for Proposed Change: _____

Recommended by: _____

APPENDIX 8

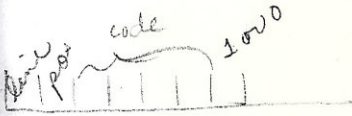
ACME "GOOD" RECORD OUTPUT FILE

(Contains records with no fail edit messages or flags and records where all fail edit messages or flags have been resolved through manual corrections)

<u>Field Size</u>	<u>Memory Positions</u>	<u>Item</u>	<u>Source</u>
1	1	Data Year	Input
2	2-3	State of Death	Input
1	4	Component of Reporting Area	Input
6	5-10	Certificate Number	Input
2	11-12	Shipment Number	Input
3	13-15	Lot Number	Input
1	16	Coder Status	Input
6	17-22	Sequence Number	Generated
1	23	Type Record: 1 if not previously rejected for manual review. 2 if previously rejected for manual review.	Generated
1	24	Intentional Reject	Input
1	25	ACME/Manual UC Comparison (Code 1 if different) (Code 0 if same) (Code ∅ if manual UC field is blank)	Generated
4	26-29	Manual Underlying Cause	Input
4	30-33	ACME Underlying Cause	Generated
1	34	Place of Injury	Input

"Good" Record Output File - Continued

<u>Field Size</u>	<u>Memory Positions</u>	<u>Item</u>	<u>Source</u>
140	35-174	Fixed Format Condition Codes (Maximum of 20 codes of 7 positions each)	Reformatted from Input
		<u>Format of Each 7 Position Code</u>	
		1 position: for part/line number	Generated
		1 = Part I line 1	
		2 = Part I line 2	
		3 = Part I line 3	
		4 = Part I line 4	
		5 = Part I line 5	
		6 = Part II	
		1 position for sequence within line Codes: 1-8 (maximum number codes per line)	Generated
		4 positions for condition code	Generated and Input
		Remove & before codes	
		Codes with leading "(" convert to 8 as leading digit	
		Codes with leading ")" convert to 9 as leading digit	
		1 position for nature of injury flag	Generated
		Code 1 for condition codes having leading digit of "(" or ")"	
		Code 0 otherwise	
35	175-209	Fixed Format Parenthetical Codes (Maximum of 5 codes of 7 positions each)	Reformatted from Input
		Format of each code same as above except blank sequence within line (1 position)	
6	210-215	Blanks	



35
41401

1999

6/14/4082 4280/30

11/11/4012 4280/13
2 14140022 4280023

APPENDIX 9

ACME "BAD" RECORD OUTPUT FILE

<u>Field Size</u>	<u>Memory Position(s)</u>	<u>Item</u>
1	1	Data Year
1	2	Place of Injury
2	3-4	Shipment Number
6	5-10	Certificate Number
2	11-12	State of Death
1	13	Component of Reporting Area
3	14-16	Lot Number
1	17	Coder Status
4	18-21	Manually Assigned Underlying Cause
1	22	Reject Code
79	23-101	Conditions
1	102	Action Code (Coded as 2)
18	103-120	Blanks

APPENDIX 10

PGM=ACME951 ACME PROCESSING SEQUENCE & ERROR MESSAGE LISTING

YR ACC SHP CERT# ST CMP LOT CD MANU REJ CONDITIONS

9	02		0	028	1	5672/5570 5698/5621*5609 514 485 CAN 5672 BE DUE TO 5621 YES CAN 5570 BE DUE TO 5621 YES CAN 5698 BE DUE TO 5621 MAYBE TUC=5621 SELECTION RULE MANUAL UC = ACME UC=5621
9	02		0	028	1	7670 7511/7651 CAN 7670 BE DUE TO 7651 MAYBE CAN 7511 BE DUE TO 7651 NO CAN 7670 BE DUE TO 7651 MAYBE TUC=7651 SELECTION RULE 7651 IS ILL_DEFINED TUC=7670 SELECTION RULE MANUAL UC = ACME UC=7670
9	02		0	028	1	7991/1985*179 87895 CAN 7991 BE DUE TO 1985 YES TUC=1985 SELECTION RULE MANUAL UC = ACME UC=1985 1985 IS INVALID UNDERLYING CAUSE
9	02		0	028	1	7855/1991/2019 CAN 7855 BE DUE TO 2019 YES CAN 1991 BE DUE TO 2019 MAYBE TUC=2019 SELECTION RULE MANUAL UC = ACME UC=2019
9	02		0	028	1	4110 INVALID CODE 4110
9	02		0	028	1	4275/485/2898 2080 CAN 4275 BE DUE TO 485 YES CAN 485 BE DUE TO 2898 YES TUC=2898 SELECTION RULE 2898 DS 2080 MAYBE MANUAL UC = ACME UC=2080
9	02		0	028	1	1629/791/2754 INVALID CODE 791
9	02		0	028	1	0389/5698 5621*5751 5315 5329 CAN 0389 BE DUE TO 5698 YES TUC=5698 SELECTION RULE 5698 DS 5621 MAYBE MANUAL UC = ACME UC=5621

APPENDIX 10 - continued

PGM=ACME951	YR	ACC SHP	CERT#	ST	CMP	LOT	CD	MANU	REJ	CONDITIONS
	9	9	02		0	028	1			7991/1989 68789/4140*6(21) 6887 CAN 7991 BE DUE TO 4140 YES CAN 1989 BE DUE TO 4140 NO CAN 7991 BE DUE TO 1989 YES CAN 1989 BE DUE TO 4140 NO TUC=1989 SELECTION RULE TUC IS N-CODE: PREFER AMP-E-CODE 8789 TUC IS MED-CARE: PREFER AMP (21 MANUAL UC= ACME UC=(21 (21 IS INVALID UNDERLYING CAUSE
	9	02			0	028	1			791/4151*586 4280 INVALID CODE 791
	9	02			0	028	1	7651		7651*7615 TUC=7651 SELECTION RULE 7651 IS ILL_DEFINED TUC=7615 SELECTION RULE MANUAL UC=7651 ACME UC=7615
	9	02			0	028	1			7991/5191/4349 3352 CAN 7991 BE DUE TO 5191 YES CAN 5191 BE DUE TO 4349 MAYBE TUC=4349 SELECTION RULE MANUAL UC= ACME UC=4349
	9	02			0	028	1	1991		5119 TUC=5119 SELECTION RULE MANUAL UC=1991 ACME UC=5119
	9	02			0	028	1			2639/988/1519 INVALID CODE 988
	9	02			0	028	1			7670/7651 CAN 7670 BE DUE TO 7651 MAYBE TUC=7651 SELECTION RULE 7651 IS ILL_DEFINED TUC=7670 SELECTION RULE MANUAL UC= ACME UC=7670
	9	02			0	028	1			7855/7798/9320*6515 CAN 7855 BE DUE TO 9320 YES CAN 7798 BE DUE TO 9320 MAYBE TUC=9320 SELECTION RULE TUC IS MED-CARE: PREFER AMP 515 MANUAL UC= ACME UC=515
	9	02			0	028	1			5609/5570 5698 CAN 5609 BE DUE TO 5570 YES TUC=5570 SELECTION RULE

APPENDIX 10 - continued

ACME PROCESSING SEQUENCE & ERROR MESSAGE LISTING

PG# ACME951

YR ACC SHP CERT# ST CMP LOT CD MANU REJ CONDITIONS

9	02		0	028	1	5570 LMP 5609 MAYBE MANUAL UC = ACME UC=5609	
						4289/0389 2880/2000 CAN 4289 BE DUE TO 2000 YES CAN 0389 BE DUE TO 2000 YES CAN 2880 BE DUE TO 2000 MAYBE TUC=2000 SELECTION RULE MANUAL UC = ACME UC=2000	
9	02		0	028	1	7991/5070/5301*2390 4140 CAN 7991 BE DUE TO 5301 YES CAN 5070 BE DUE TO 5301 YES TUC=5301 SELECTION RULE 5301 DS 2390 MAYBE MANUAL UC = ACME UC=2390	
9	9	02		0	028	1	7798/133 6911/7651 CAN 7798 BE DUE TO 7651 YES CAN 133 BE DUE TO 7651 YES CAN 911 BE DUE TO 7651 YES TUC=7651 SELECTION RULE 7651 IS ILL_DEFINED CAN 7798 BE DUE TO 133 MAYBE TUC=133 SELECTION RULE TUC IS N-CODE: PREFER AMP-E-CODE 911 MANUAL UC = ACME UC=911
9	02		0	028	1	0130	431 2866/0310 3209/3314 5789*3314 CAN 431 BE DUE TO 3314 YES CAN 0310 BE DUE TO 3314 NO CAN 0310 BE DUE TO 5789 NO TUC=3310 SELECTION RULE MANUAL UC=0130 ACME UC=0310
9	02		0	028	1	2773/2030*5329 485 CAN 2773 BE DUE TO 2030 MAYBE TUC=2030 SELECTION RULE MANUAL UC = ACME UC=2030	
9	02		0	028	1	4174284*2500 WRONG LENGTH CODE	
9	02		0	028	1	4275/4110*4379 INVALID CODE 4110	
9	02		0	028	1	5908	586/5908/4409 797*2762 5532 CAN 586 BE DUE TO 5908 YES CAN 5908 BE DUE TO 4409 YES

NATIONAL CENTER FOR HEALTH STATISTICS
STATISTICAL SUMMARY FOR ACME CYCLE

	NUMBER OF RECORDS	PERCENT
TOTAL RECORDS	2000	100.00
REJECTED RECORDS	12	0.60
INVALID M/C DATA OR FORMAT	12	0.60
REJECT 9	0	0.00
OTHER REJECT CODES	0	0.00
RECORDS THROUGH SYSTEM	1988	99.40
RECORDS REJECTED DURING PROCESSING	22	1.11
AMBIVALENT DECISION		1.01
TABLE ENTRY	20	0.00
NO CR TABLE ADDRESS	0	0.00
CIRCULAR LINKAGE LOOP	0	0.00
INVALID UNDERLYING CAUSE	2	0.10
RECORDS FREE OF DATA AND SYSTEMS PROBLEMS	1966	98.89
ACME-MANUAL UNDERLYING CAUSE AGREE	189	9.61
ACME-MANUAL UNDERLYING CAUSE DISAGREE	9	0.46
NO UC CODED	1768	89.93

APPENDIX II - continued

NATIONAL CENTER FOR HEALTH STATISTICS
UNDERLYING CAUSE COMPARISON

TABLE	TOTAL ENCOUNTERS	POSITIVE RELATIONSHIP	NEGATIVE RELATIONSHIP	AMBIVALENT RELATIONSHIP	PERCENT AMBIVALENCE OF TOTAL
CR	2314	1892	405	17	0.00
DS	11	8	---	3	0.00
DSC	1	1	---	0	0.00
SENDC	0	0	---	0	0.00
SENMHC	0	0	---	0	0.00
IDDC	0	0	---	0	0.00
T	2	2	---	---	---
LMP	184	182	---	2	0.00
LDP	5	5	---	0	0.00
LMC	28	28	---	0	0.00
LDC	2	2	---	0	0.00
SMP	18	18	---	0	0.00
SDC	1	1	---	0	0.00
SMC	1	1	---	0	0.00
CONVERSION	50	50	---	---	---

APPENDIX 12

TRANSAX OUTPUT RECORD

<u>Field Size</u>	<u>Memory Positions</u>	<u>Item</u>	<u>Source</u>
209	1-209	Same as ACME "Good" Record (Appendix 8)	ACME Output
1	210	Conversion Flag	TRANSAX
100	211-310	<u>Record Axis (MC) Codes</u> (Maximum of 20 codes of 5 positions each) Format of each code: 4 positions for ICD code 1 position for Nature of Injury flag Code 1 if Nature of Injury code Code \emptyset otherwise	Axis Translation of Entity Axis Multiple Cause Codes in 35-174 of ACME Output

APPENDIX 13

SUMMARY TABLE - AXIS TRANSLATION PROGRAM

621738	Total Records Read
621738	Total Records Through Axis Translation Phase
64283	Total Records With One Or More Code Translations
57352	Total Records With No Code Translations, Duplicate Codes Deleted
500103	Total Records With No Action Required
266	Number Non-Ambivalent Linkages In Table 1
65111	Number Non-Ambivalent Linkages In Table 2
361	Number Non-Ambivalent Linkages In Table 3
757	Number Non-Ambivalent Linkages In Table 4
13092	Number Non-Ambivalent Linkages In Table 5
13251	Number Non-Ambivalent Linkages In Table 6
610	Number Ambivalences Encountered In Table 1
7955	Number Ambivalences Encountered In Table 2
1238	Number Ambivalences Encountered In Table 3
235	Number Ambivalences Encountered In Table 4
198	Number Ambivalences Encountered In Table 5
2955	Number Ambivalences Encountered In Table 6
56	Number Of Ambivalent Linkages Used From Table 1
3873	Number Of Ambivalent Linkages Used From Table 2
676	Number Of Ambivalent Linkages Used From Table 3
159	Number Of Ambivalent Linkages Used From Table 4
106	Number Of Ambivalent Linkages Used From Table 5
2698	Number Of Ambivalent Linkages Used From Table 6
106029	Total Table Entries Written For Evaluation

APPENDIX 14

MORTALITY MEDICAL DATA COMPARISON
(ACME OUTPUT FORMAT)

STATE NAME: HYPOTHETICAL
STATE CODE: 99
INPUT CERTIFICATE NO. SPAN: 2150 5072

THE FOLLOWING RECORDS CONTAIN DIFFERENCES

ST	RA	CERT_#	UC	ACME	UC	INT	REJ	PI	PI
NCHS	:	99	0	002213					
STATE:	:	99	0	002213		1991	1		

ALL CONDITIONS LISTED ON RECORD
NCHS : 1991 1990*4019
STATE: 1991*4019

NUMBER OF ERRORS				
AC	PAREN	REJ	PI	UC
1	0	0	0	0

ST	RA	CERT_#	UC	ACME	UC	INT	REJ	PI	PI
NCHS	:	99	0	002333					
STATE:	:	99	0	002333		436	1		

ALL CONDITIONS LISTED ON RECORD
NCHS : 7991/439
STATE: 7991/436

NUMBER OF ERRORS				
AC	PAREN	REJ	PI	UC
1	0	0	0	0

ST	RA	CERT_#	UC	ACME	UC	INT	REJ	PI	PI
NCHS	:	99	0	002353					
STATE:	:	99	0	002353		5188	1		

ALL CONDITIONS LISTED ON RECORD
NCHS : 4275/7991/5188
STATE: 4275/7991/5189

NUMBER OF ERRORS				
AC	PAREN	REJ	PI	UC
1	0	0	0	0

APPENDIX 14 - continued

MORTALITY MEDICAL DATA COMPARISON
(ACME OUTPUT FORMAT)

ST RA CERT_# MANUAL ACME ACME INT
UC UC UC REJ REJ PI
NCHS : 99 0 002443 7650 1
STATE: 99 0 002443

ALL CONDITIONS LISTED ON RECORD
NCHS : 7651 7650
STATE: 7650

NUMBER OF ERRORS
AC PAREN REJ PI UC
1 0 0 0 0

ST RA CERT_# MANUAL ACME ACME INT
UC UC UC REJ REJ PI
NCHS : 99 0 002473 9650 1
STATE: 99 0 002473

ALL CONDITIONS LISTED ON RECORD
NCHS : 3488/173 69650
STATE: 3488/173*9650

NUMBER OF ERRORS
AC PAREN REJ PI UC
2 0 0 0 0

ST RA CERT_# MANUAL ACME ACME INT
UC UC UC REJ REJ PI
NCHS : 99 0 002543 4151 1
STATE: 99 0 002543

ALL CONDITIONS LISTED ON RECORD
NCHS : 1973/68789
STATE: 4151

NUMBER OF ERRORS
AC PAREN REJ PI UC
2 0 0 0 0

APPENDIX 15

MORTALITY MEDICAL DATA COMPARISON
SUMMARY STATISTICS (ACME OUTPUT FORMAT)
CODED BY HYPOTHETICAL

292 NUMBER OF NCHS RECORDS
2921 NUMBER OF STATE RECORDS
290 NUMBER OF MATCHED RECORDS
2 NUMBER OF SAMPLE RECORDS OMITTED BY STATE
20 NUMBER RECORDS WITH ONE OR MORE DIFFERENCES
6.90 PERCENT MATCHED RECORDS WITH ONE OR MORE DIFFERENCES
35 NUMBER OF STATE RECORDS WITH ACME REJECT=2
3 NUMBER OF MATCHED SAMPLE RECORDS WITH ACME REJECT=2
0 NUMBER ACME REJECT RECORDS WITH ONE OR MORE DIFFERENCES
0.00 PERCENT ACME REJECT RECORDS WITH ONE OR MORE DIFFERENCES

	RATE	# CODES	# DIFFERENCES
MULTIPLE CAUSE - NON-PARENTHETICALS	4.30	745	32
MULTIPLE CAUSE - PARENTHETICAL	0.00	0	0
PLACE OF INJURY	12.50	8	1
REJECT	0.00	1	0
UNDERLYING CAUSE	0.00	0	0
COMBINATION	4.38	754	33
COMBINATION REFERS TO SUM OF NON-PARENTHETICAL CODES, REJECT CODES, & PLACE OF INJURY CODES			

ERROR RATES FOR ACME REJECTS ONLY

	RATE	# CODES	# ERRORS
MULTIPLE CAUSE - NON-PARENTHETICALS	0.00	12	0
MULTIPLE CAUSE - PARENTHETICAL	0.00	0	0
PLACE OF INJURY	0.00	0	0
REJECT	0.00	0	0
UNDERLYING CAUSE	0.00	0	0
COMBINATION	0.00	12	0

ADJUDICATED ERROR RATES - STATE

	RATE	# CODES	# ERRORS
MULTIPLE CAUSE - NON-PARENTHETICALS			
MULTIPLE CAUSE - PARENTHETICAL			
PLACE OF INJURY			
REJECT			
UNDERLYING CAUSE			
COMBINATION			

ADJUDICATED ERROR RATES - NCHS

	RATE	# CODES	# ERRORS
MULTIPLE CAUSE - NON-PARENTHETICALS			
MULTIPLE CAUSE - PARENTHETICAL			
PLACE OF INJURY			
REJECT			
UNDERLYING CAUSE			
COMBINATION			

APPENDIX 16

MORTALITY MEDICAL DATA COMPARISON (ACME INPUT FORMAT)

STATE NAME: HYPOTHETICAL
STATE CODE: 99
INPUT CERTIFICATE NO. SPAN: 1 1777

THE FOLLOWING RECORDS CONTAIN DIFFERENCES

ST	RA	CERT_#	MANUAL	INT
			UC	REJ PI
NCHS :	99	0	000008	
STATE:	99	0	000008	

AC	PAREN	REJ	PI	UC
1	0	0	0	0

NUMBER OF ERRORS

ALL CONDITIONS LISTED ON RECCRD

NCHS : 7855/4275/486
STATE: 7802/4275/486

ST	RA	CERT_#	MANUAL	INT
			UC	REJ PI
NCHS :	99	0	000012	
STATE:	99	0	000012	

AC	PAREN	REJ	PI	UC
2	0	0	0	0

NUMBER OF ERRORS

ALL CONDITIONS LISTED ON RECCRD

NCHS : 1539 1991
STATE: 1539/1991

ST	RA	CERT_#	MANUAL	INT
			UC	REJ PI
NCHS :	99	0	000020	
STATE:	99	0	000020	

AC	PAREN	REJ	PI	UC
4	0	0	0	0

NUMBER OF ERRORS

ALL CONDITIONS LISTED ON RECCRD

NCHS : 4275/5188/584*0389 (07 5845 586 2866 88160
STATE: 4275/5185/5185*0389 5845 586 2666 (070 88160

APPENDIX 17

MORTALITY MEDICAL DATA COMPARISON
SUMMARY STATISTICS (ACME INPUT FORMAT)
CODED BY HYPOTHETICAL

888 NUMBER OF NCHS RECORDS
1777 NUMBER OF STATE RECORDS
888 NUMBER OF MATCHED RECORDS
0 NUMBER OF SAMPLE RECORDS OMITTED BY STATE
190 NUMBER RECORDS WITH ONE OR MORE DIFFERENCES
21.40 PERCENT MATCHED RECORDS WITH ONE OR MORE DIFFERENCES

	RATE	# CODES	# DIFFERENCES
MULTIPLE CAUSE - NON-PARENTHETICALS	11.40	2702	308
MULTIPLE CAUSE - PARENTHETICAL	0.00	1	0
PLACE OF INJURY	31.58	38	12
REJECT	46.15	13	6
UNDERLYING CAUSE	0.00	0	0
COMBINATION	11.84	2753	326
COMBINATION REFERS TO SUM OF NON-PARENTHETICAL CODES, REJECT CODES, & PLACE OF INJURY CODES			

ADJUDICATED ERROR RATES - STATE

	RATE	# CODES	# ERRORS
MULTIPLE CAUSE - NON-PARENTHETICALS			
MULTIPLE CAUSE - PARENTHETICAL			
PLACE OF INJURY			
REJECT			
UNDERLYING CAUSE			
COMBINATION			

ADJUDICATED ERROR RATES - NCHS

	RATE	# CODES	# ERRORS
MULTIPLE CAUSE - NON-PARENTHETICALS			
MULTIPLE CAUSE - PARENTHETICAL			
PLACE OF INJURY			
REJECT			
UNDERLYING CAUSE			
COMBINATION			

0 TOTAL STATE RECORDS WITH FORMAT ERRORS

APPENDIX 17 - continued

MORTALITY MEDICAL COMPARISON
SUMMARY STATISTICS (ACME INPUT FORMAT)

STATE NAME: HYPOTHETICAL
SHIPMENT: 99

ERRORS APPEARING IN STATE ACME INPUT DATA

0 TOTAL STATE RECORDS WITH FORMAT ERRS

APPENDIX 18

SAMPLING RATES AND PROPORTION OF
RECORDS SAMPLED BY ESTIMATED ANNUAL RECEIPTS

EXPECTED VOLUME OF RECORDS	SAMPLING RATE	PROPORTION SAMPLED
< 2,000	1 in 1	100%
2,000-9,999	1 in 2	50%
10,000-17,999	1 in 5	20%
18,000-35,999	1 in 10	10%
36,000-59,999	1 in 20	5%
60,000-99,999	1 in 25	4%
100,000-199,999	1 in 50	2%
≥ 200,000	1 in 100	1%

APPENDIX 19

CODE TOLERANCE LEVEL BY PROPORTION OF
RECORDS SAMPLED AND SPECIFIED NUMBER OF SAMPLE CODES

Number of Sample Codes	Proportion Sampled ^{1/}	
	< 50%	50%
	Tolerance Level (%)	
200	7.54	6.79
400	6.79	6.27
600	6.46	6.03
800	6.27	5.90
1,000	6.13	5.80
1,200	6.03	5.73
1,400	5.96	5.68
1,600	5.90	5.63
1,800	5.85	5.60
2,000	5.80	5.57
2,200	5.76	5.54
2,400	5.73	5.52
2,600	5.70	5.50
2,800	5.68	5.48
3,000	5.65	5.46
3,200	5.63	5.45
3,400	5.61	5.43
3,600	5.60	5.42
3,800	5.58	5.41
4,000	5.57	5.40
4,200	5.55	5.39
4,400	5.54	5.38
4,600	5.53	5.37
4,800	5.52	5.37
5,000	5.51	5.36
5,500	5.48	5.34
6,000	5.46	5.33
6,500	5.44	5.31
7,000	5.43	5.30
7,500	5.41	5.29
8,000	5.40	5.28
8,500	5.39	5.27
9,000	5.38	5.27
9,500	5.37	5.26
10,000	5.36	5.25

^{1/} If the proportion sampled is 1 in 1 (i.e., the quality control sample is 100 percent), there is no sampling error. Therefore, the code tolerance level is 5.00 percent regardless of sample size.

APPENDIX 20

LISTING OF RARE CAUSES OF DEATH FOR 1979 MORTALITY

ST OCC	CO OCC	R A	CERT #	SEX	AGE	ACME CAUSE	CAUSE CONDITIONS
01	050	0		1	065	0239	0389 5990 586/5920/0239
02	075	0		2	074	001	4275/001
03	006	0		1	599	0200	5739/0200
04	020	0		1	086	0051	2639 2769/558/0051*175
05	014	0		1	048	1229	7991 5729/1229
06	026	0		2	060	1229	]973/&8789/&1229/1229
07	011	0		1	049	0840	3239/0840
08	079	0		1	025	071	071 3239 4229
09	125	0		1	085	0309	4289/0309/1991
10	057	0		1	049	1231	3489/1231
11	101	0		1	059	1231	486/7993/1231
12	162	0		1	060	1231	7991/1231
13	029	0		1	071	1220	]973/&8786 5729/&1220 5329*4140
14	017	0		2	084	0788	7855/2762/0788
15	052	0		2	067	1279	2762/1279

NOTE: Data are hypothetical - Used for illustrative purposes only.