

Section IV

Use of Inter-record Edit Utility and the CINA (Cancer in North America) File Submission, 1995-2001



USE OF INTER-RECORD EDIT UTILITY AND THE CINA (CANCER IN NORTH AMERICA) FILE SUBMISSION, 1995-2001

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Introduction

The North American Association of Central Cancer Registries, Inc (NAACCR, Inc.) is a professional organization that develops and promotes uniform data standards for cancer registration; provides education and training; certifies population-based registries; aggregates and publishes data from central cancer registries; and promotes the use of cancer surveillance data and systems for cancer control and epidemiologic research, public health programs, and patient care to reduce the burden of cancer in North America. NAACCR member registries are certified based on annual data quality evaluations. The criteria¹ are listed below for attaining at least a Silver level of certification:

- Data for 1997 through 2001 had to be submitted to NAACCR by December 3, 2004.
- The prevalence of duplicate case reports had to be less than 2 per 1000.
- 97% of cases had to pass EDITS.
- Fewer than 3% of cases had unknown gender, county of residence at diagnosis or age at diagnosis, and fewer than 5% had unknown race.
- Percent of cases from death certificates only (DCOs) was less than 5%.
- Completeness of case ascertainment estimate was 90% or higher.

Registries that meet at least the Silver level of certification for at least 3 consecutive data years are eligible to be included on the NAACCR CINA Deluxe analytic research file. Previous research studies, using the CINA Deluxe file, had been hindered by data quality issues involving errors between records, or inter-record errors. For example, one record for a patient may have a different birthplace than another record for that same patient. It is important to minimize data quality errors on the CINA Deluxe file, so that if researchers conclude that there are differences in the data, they can be attributed properly.

The CDC (Centers for Disease Control and Prevention) and NCI-SEER (National Cancer Institute-Surveillance Epidemiology End Results) inter-record edits utilities catch common data collection errors at the registry-level and can be resolved by registry personnel before the data are used for research. For example, the IR01 edit checks to see that the patient's birthplace is the same code on all records for the same patient. The table below is a list of the inter-record edit names and descriptions.²

Table 1. Inter-record edits Names and Descriptions

Inter-record edits Name	Descriptions
IR01	Verify place of birth same on all records for a patient
IR02	Verify date of birth same on all records for a patient
IR03	Verify sequence numbers of primaries using age at diagnosis
IR04	Verify race same on all records for a patient
IR05	Verify sex same on all records for a patient
IR06	Verify sequence numbers using dates of diagnosis
IR07	Verify sequence numbers not in conflict with number of primaries
IR08	Verify date of follow-up same on all records for a patient
IR09	Verify same primary not received twice for a person
IR10	Verify vital status same on all records for a person
IR11	Verify cause of death same on all records for a person
IR13	Verify no duplicate bladder primaries reported for a person
IR14	Verify Spanish surname or origin same on all records for a person

Recently, NAACCR research has also been affected by the data quality of multiple primaries collected by NAACCR registries. Much time and effort is now spent, during the analysis phase of these projects, in deciding how to handle cases that have not been coded correctly. Often these cases need to be excluded from the analysis, thereby decreasing the sample size of cases available for study. Because the NAACCR data set is unique in its ability to study rare tumors, such as multiple primaries, these data quality concerns will continue to grow. Incorporation of a registry process, such as inter-record edits, could ensure that multiple primary or record data are consistent between records, thereby minimizing this data quality concern.

Additional registry operation processes, such as running a utility before a file submission, have been successfully phased into the NAACCR Call for Data process, so that the results can be monitored. Standard registry operations can be developed through the NAACCR committee process and eventually become part of the NAACCR certification criteria. As part of the phase in process, registry staff were required to execute the CDC inter-record edits utility on their files submitted to NAACCR in order be included in the combined registry volume (registry data are combined to represent the United States and/or Canada as a whole) of the Cancer in North America (CINA) 2004 monograph. Registry staff were not required to resolve the errors they found in their database, only to submit their inter-record edits summary report to NAACCR.

Purpose

The purpose of this report was to describe the number and type of inter-record errors found using the CDC and NCI-SEER inter-record edits utility and to assess the feasibility of requiring that all errors be resolved in the NAACCR 2005 Call for Data by registry personnel. Both the CDC and NCI-SEER utilities were assumed to be the same as they were designed to be the same.

Source of Data

The source of data were the NAACCR 2004 annual call for data inter-record edit summary reports for the years 1995 through 2001. Not all registries submitted 7 years of data. Some registries submitted between 3 to 6 years of data.

Methods

Summary reports from the CDC inter-record edits utility were requested from each member registry and were sent to NAACCR. The inter-record edits are used to find errors between records rather than data fields within records.

In order to assess that the utility was executed correctly on each file, the NAACCR Statistical Analytic Unit (SAU) ran the NCI-SEER inter-record utility on each file submission. The number of errors by edit type for both the CDC and NCI-SEER utilities were entered in an Excel spreadsheet, and compared to the data from each registry. The percent error per total records for each edit by registry were also calculated.

The registries were divided into three groups. Group one included registries with a different number of errors between the utilities. Phone calls were made to the registries in group one, notifying the registry director of the discrepancy.

Group two included registries that achieved 0 inter-record edit errors. Phone calls were also made to the registry personnel from group two, who ran the utilities and were asked the following questions:

- 1) The inter-record edit summary report submitted for the NAACCR Call for Data displays 0 inter-record edit errors on your registry's file submission. Could you tell me how this was accomplished?
- 2) Did you use an edit override for any of the inter-record edits?
- 3) Do you have any advice for registry personnel who are trying to reach this goal?

Group three included registries with at least one edit greater than 1.0% inter-record errors per total records.

The threshold of 1.0% errors per total records was chosen by an empirical review of the percentages in the tables. Most registries had 0.0% error per records and few had any edit with greater than 0.0% errors per total records. When a registry had at least one edit greater than 1.0% inter-record errors per total records, this was noted as the goal is to achieve 0.0% for all 13 edits. The highest and lowest percentage of errors by edit and utility, and the most frequently occurring edit by utility were calculated.

Phone calls were made to the registry personnel in group three, who ran the utility for the file submission and asked the following questions:

- 1) What barriers did you experience in running the inter-record edits utility, if any?
- 2) What barriers did you experience in achieving 0 inter-record edit errors on the registry file?
- 3) What are your plans in achieving 0 inter-record edit errors in the NAACCR Call for Data 2005, December 2004 submission?
- 4) Are you confident the file will meet this goal?

Results

A total of 52 U.S. and Canadian registries submitted their inter-record edit summary to NAACCR (Tables 2 and 3). The NAACCR SAU was unable to process the files to produce an inter-record edit summary, due to technical difficulties, for the following four registries, Arkansas, Florida, Minnesota, and Ontario. Therefore, the inter-record edits for these registries are excluded from table 3, resulting in a total of 48 registries.

Thirteen registries achieved 0 edit errors on their file using the CDC utility, while eleven registries achieved 0 using the NCI-SEER utility.

Phone calls were made with the registry personnel that reported 0 errors and they were asked what registry processes were used to achieve 0 errors on their file. All answered that registry personnel used the override flag available in the utility. They also responded that they are required to execute inter-record edits on their file for other calls for data, so they had a more error-free database when they ran the utility on their file. They also were asked to give advice to other registry personnel in achieving this goal. The following list of tips is a summary of their advice:

Tips

- 1) Run the utility frequently and do it as part as your record consolidation process
- 2) Divide the list between staff members and reconcile one by one
- 3) Learn about the override and use appropriately
- 4) Start running the utility early

Summary of Tabular Results:

Twenty-seven percent of registries had data with at least one error with greater than 1.0% errors per total records checked, using the CDC utility (Table 4).

Twenty-nine percent of registries had data with at least one error with greater than 1.0% errors per total records checked, using the NCI-SEER utility (Table 5).

Using the CDC utility, the most frequently occurring inter-record edit error (33 times) among all registries was the IR09 edit which verifies that the same primary is not counted twice for the same person (Table 2).

Using the NCI-SEER utility, the most frequently occurring inter-record edit error (31times) for all registries was also the IR09 edit (Table 3).

Phone calls were made to each registry with at least one error greater than 1.0% errors per total records. Five of the seven registries were certified for their 2001 data and were included in the NAACCR combined rates. Two registries were concerned about resolving all errors, but they will start with the latest year of data (2002) and move to clean up earlier years as far as possible in the time allowed. The responses from the calls are summarized below.

Barriers:

- 1) Lack of staff to resolve each error
- 2) Lack of staff time to resolve each error
- 3) Not a priority to resolve error because resolution was not required

Future Plans:

- 1) Will resolve each error as it is now required and make this a priority
- 2) Will learn about and use the override if needed

Discussion

Fifty-two registry inter-record edit report summaries from the United States and Canada were included in the review. The range of errors found in inter-record edits was quite wide. Further discussion with registry representatives about the nature of why these occur must take place before one can conclude why the percentage of errors were so different between registries. One can speculate the differences can be attributed to the different numbers of cases processed at each registry, the quality of the editing process at the report source and registry level, and the number of qualified staff dedicated to the detection and resolution of errors. When the results were discussed at the NAACCR High Quality Data Use Group and Chair Meetings, members thought that the execution of inter-record edits on a file is good practice for data quality in using data for research, but that using the assessment as a criteria in the production of a reliable incidence rate (registry certification) would be inappropriate at this time.

Because there was a wide range of inter-record edits reported on the summary reports and registry personnel are still learning on how best to resolve all errors, continued monitoring of the summary reports should occur. It is difficult to determine a threshold or standard number or percentage of errors empirically, but many registries achieved 0 inter-record edit errors and this is encouraging for those registries with barriers. Registries that achieved 0% errors did so by diligence in review and resolution of every error and appropriate use of the only edit override available in the program for the IR09 edit. Because many registry personnel from group three responded that if edit resolution is required for the call for data it will be prioritized and therefore improve, the total percentage of errors in this group should be monitored. As registry personnel learn the newly required process, NAACCR staff should encourage the use of the advice from other personnel who have mastered the process. As more registries are successful with the inter-record edit resolution process, a best practice can be developed for training. Achieving 0% inter-record errors does not necessarily mean that the data are error free, but it is a good tool to be used in combination with other data quality checks, such as the criteria for NAACCR certification, that if conducted regularly, can lead to a high quality data file.

Recommendations

- 1) Continue to monitor inter-record error reports.
- 2) No standard for inter-record errors on the file should be set at this time.
- 3) Based on the follow-up interview data, registries from group 3 should be monitored specifically and NAACCR staff should help in any way possible with barriers.
- 4) NAACCR committees should review the resolution of errors found on these records and a best practice can be developed for training.
- 5) The CDC and NCI-SEER software utilities should be reviewed to ensure that they are editing the files in the same way.

Table 2. Number and Percentage of Errors per record by Inter-record Edit, 1995-2001 CDC Inter-record edit software

	Total	∞	0.0	0	0.0	14	0.0	109	0.8	2	0.0	0	0.0	1796	1.6	0	0.0	74	0.4	42973	6.4	1638	1.1	176	1.1	506	1.4	2	
	IR14	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	99	0.1	0	0.0	24	0.1	2976	0.4	0	0.0	0	0.0	0	0.0	0	
	IR13	0	0.0	0	0.0	0	0.0	_	0.0	0	0.0	0	0.0	4	0.0	0	0.0	-	0.0	5	0.0	0	0.0	0	0.0	0	0.0	7	
	IR11	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	10	0.1	0	0.0	0	0.0	0	0.0	0	0.0	0	
	IR10	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	7	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0
	IR09	5	0.0	0	0.0	14	0.0	12	0.1	2	0.0	0	0.0	42	0.0	0	0.0	2	0.0	336	0.1	9	0.0	0	0.0	0	0.0	0	0 0
	IR08	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	16	0.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	IR07	0	0.0	0	0.0	0	0.0	95	0.7	0	0.0	0	0.0	147	0.1	0	0.0	10	0.1	24859	3.7	0	0.0	0	0.0	0	0.0	0	0.0
	IR06	0	0.0	0	0.0	0	0.0	_	0.0	0	0.0	0	0.0	49	0.0	0	0.0	-	0.0	424	0.1	0	0.0	0	0.0	0	0.0	0	0 0
	IR05	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	16	0.0	0	0.0	0	0.0	432	0.1	0	0.0	0	0.0	0	0.0	0	0.0
	IR04	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1433	1.3	0	0.0	7	0.0	1178	0.2	1632	1.1	9//	1.1	909	1.4	0	0 0
	IR03	3	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	21	0.0	0	0.0	_	0.0	215	0.0	0	0.0	0	0.0	0	0.0	0	0
	<u>IR02</u>	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	18	0.0	0	0.0	0	0.0	1071	0.2	0	0.0	0	0.0	0	0.0	0	0 0
ntware	IR01	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	11477	1.7	0	0.0	0	0.0	0	0.0	0	0 0
בכות בתוו א	# Rec	75903		11779		114603		13213		21809		247130		113471		2985		19314		668280		154629		68941		37375		109474	
	Registry	AB	% Error	AK***	% Error	AL^{**}	% Error	AR	% Error	AZ	% Error	CA:LA	% Error	00	% Error	DC***	% Error	DE**	% Error	FLA	% Error	GA*	% Error	GA:ATL	% Error	HI	% Error	IA	% Frror

Table 2. Number and Percentage of Errors per record by Inter-record Edit, 1995-2001 CDC Inter-record edit software

Total		0.0	2416	1.3	38	0.0	0	0.0	0	0.0	0	0.0	2	0.0	1480	1.2	3184	6.4	7450	2.1	2491	1.6	15	0.0	12	0.0	0	0.0	14543	6.2
IR14		0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	464	0.4	4	0.1	118	0.0	0	0.0	0	0.0	0	0.0	0	0.0	325	0.1
IR13		0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.0	33	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
IR11		0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	308	9.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
TR 10		0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	106	0.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
1B00		0.0	13	0.0	38	0.0	0	0.0	0	0.0	0	0.0	7	0.0	53	0.0	15	0.0	388	0.1	0	0.0	15	0.0	9	0.0	0	0.0	89	0.0
112.08		0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1174	2.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
TR 07		0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	604	0.5	182	0.4	49	0.0	0	0.0	0	0.0	3	0.0	0	0.0	3587	1.5
TR OK		0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	224	0.2	61	0.1	535	0.2	0	0.0	0	0.0	7	0.0	0	0.0	92	0.0
112.05		0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	4	0.0	66	0.2	25	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1576	0.7
IBM		0.0	2403	1.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	99	0.1	888	1.8	5835	1.7	2491	1.6	0	0.0	0	0.0	0	0.0	2694	1.1
IR 03		0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	99	0.0	28	0.1	292	0.1	0	0.0	0	0.0	_	0.0	0	0.0	46	0.0
m ()		0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	6	0.0	179	0.4	205	0.1	0	0.0	0	0.0	0	0.0	0	0.0	3074	1.3
TRM		0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	86	0.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3081	1.3
# Rec	36685		189715		410687		144048		140412		176207		38240		122732		49840		351234		152976		154998		165269		31512		235881	
Pogietry		% Error	** ! !	% Error	IL	% Error	KY	% Error	LA	% Error	MA	% Error	MAN	% Error	MD	% Error	ME	% Error	MI	% Error	MI:DET	% Error	MN	% Error	MO	% Error	MT***	% Error	NC	% Error

Table 2. Number and Percentage of Errors per record by Inter-record Edit, 1995-2001

	IR10 IR11 IR13 IR14 Total	0 0	0.0 0.0 0.0	0 0 0	0.0 0.0 0.0	0 0 0	0.0 0.0 0.0	0 2 0	0.0 0.0 0.0 0.0 0.1	0 0 0	0.0 0.0 0.0	20 0 4	0.0 0.0 0.0	0 0 0	0.0 0.0 0.0	0 37 84	0.0 0.0 0.0	0 0 0	0.0 0.0 0.0	0 0 0	0.0 0.0 0.0	0 0 0	0.0 0.0 0.0	0 0 0	0.0 0.0 0.0	0 0 0	0.0 0.0 0.0	
		4																										
	IR08								0.0																			
	IR07								0.0																			
	IR06								0.0																			
	IR05								0.0																			
	IR04	0	0.0	0	0.0	0	0.0	352	0.1	519	1.1	11	0.0	0	0.0	126	0.0	2	0.0	0	0.0	0	0.0	0	0.0	0	0.0	
	IR03	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	5	0.0	0	0.0	226	0.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	
	IR02		0.0	0	0.0	0	0.0	0	0.0	0	0.0	20	0.0	0	0.0	136	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	
	IR01	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	20	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	
CDC Inter-record edit sof	# Rec	14311		58053		40307		322770		47785		53099		480873		336609		81077		343973		101236		42507		95727		
CDC Inter-r	Registry	ND*	% Error	NE	% Error	*HN	% Error	Z	% Error	***NN	% Error	NV	% Error	NY	% Error	НО	% Error	OK	% Error	NO	% Error	OR	% Error	RI	% Error	SC**	% Error	

Table 2. Number and Percentage of Errors per record by Inter-record Edit, 1995-2001 CDC Inter-record edit software

Total	4	0.0	0	0.0	0	0.0	0	0.0	20	0.0	0	0.0	11394	6.1	0	0.0	7	0.0	94333	1.4
<u>IR14</u>	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	4105	0.1
	0																			
, ,,	0																			
IR10	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	116	0.0
IR09	4	0.0	0	0.0	0	0.0	0	0.0	20	0.0	0	0.0	604	0.3	0	0.0	33	0.0	2216	0.0
IR08	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1270	0.0
IR07	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	10132	5.4	0	0.0	0	0.0	40357	0.5
IR06	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	448	0.2	0	0.0	0	0.0	2260	0.0
IR05	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2204	0.0
IR04	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	4	0.0	20918	0.3
IR03	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	168	0.1	0	0.0	0	0.0	1062	0.0
																				0.1
IR01	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	42	0.0	0	0.0	0	0.0	14718	0.2
# Rec	522092		47068		142668		3077		193081		131522		186196		72196		14781		7393774	
Registry	IXI	% Error	UT	% Error	VA	% Error	VT	% Error	WA	% Error	WA:SEA	% Error	WI	% Error	WV	% Error	****M	% Error	Total	% Error

*Submitted 3 years of data within the 1995-2001 time period

Submitted 4 years of data within the 1995-2002 time period *Submitted 5 years of data within the 1995-2002 time period

****Submitted 6 years of data within the 1995-2002 time period

Table 3. Number and Percentage of Errors per record by Inter-record Edit, 1995-2001 NCI-SEER Inter-record edit software

INCI-SEEN IIIIGI-I COI II COI	ווכו-וכוו		2												Ē
<u>Registry</u>	# Kec	IKO		1803	IK04	1805	1K06	IK07		IKUS	IK 10	IKII		IK14	I otal
AB	75903	0		3	0	0	0	0		2	0	0		0	8
% Error		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
AK***	11779	0		0	0	0	0	0		0	0	0		0	0
% Error		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
AL**	114603	0		0	0	0	0	0		14	0	0		0	14
% Error		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
AZ	145306	0		_	23	4	0	17		32	0	0		91	180
% Error		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.1	0.1
CA:LA	247130	0		0	0	0	0	0		0	0	0		0	0
% Error		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
00	113471	0		21	1433	16	49	147		42	0	0		99	1796
% Error		0.0		0.0	1.3	0.0	0.0	0.1		0.0	0.0	0.0		0.1	1.6
DC***	15290	0		0	0	0	0	0		0	0	0		0	0
% Error		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
DE**	19308	0		0	0	0	0	_		_	_	_		7	∞
% Error		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0
GA*	154629	0		0	1632	0	0	0		9	0	0		0	1638
% Error		0.0		0.0	1.1	0.0	0.0	0.0		0.0	0.0	0.0		0.0	1:1
GA:ATL	68941	0		0	922	0	0	0		0	0	0		0	176
% Error		0.0		0.0	1.1	0.0	0.0	0.0		0.0	0.0	0.0		0.0	1.1
HI	37375	0		0	909	0	0	0		0	0	0		0	506
% Error		0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
IA	109474	0		0	0	0	0	0		0	0	0		0	7
% Error		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0

Table 3. Number and Percentage of Errors per record by Inter-record Edit, 1995-2001 NCI-SEER Inter-record edit software

Registry #	# Rec	IR01	IR02	IR03	IR04	IR05	IR06	IR07	IR08	IR09	IR10	IR11	IR13	IR14	Total
_	36685	0	0	0	1	0	0	0	0	2	0	0	0		3
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	410687	0	0	0	0	0	0	0	0	38	0	0	0		38
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
∞	189715	0	0	0	2403	0	0	0	0	13	0	0	0		2416
		0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		1.3
4	144048	0	0	0	0	0	0	0	0	0	0	0	0		0
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
4	140412	0	0	0	0	0	0	0	0	0	0	0	0		0
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
17	176207	0	0	0	0	0	0	0	0	0	0	0	0		0
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
3	38240	0	0	0	0	0	0	0	0	2	0	0	0		7
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
12	122732	0	6	99	99	4	224	604	0	53	0	0	0		1480
		0.0	0.0	0.1	0.0	0.0	0.2	0.5	0.0	0.0	0.0	0.0	0.0		1.2
4	49686	86	177	30	883	86	63	180	1175	21	105	307	7		3183
		0.2	0.4	0.1	1.8	0.2	0.1	0.4	2.4	0.0	0.2	9.0	0.0		6.4
35	351234	0	205	292	5934	25	535	49	0	495	0	0	5		7658
		0.0	0.1	0.1	1.7	0.0	0.2	0.0	0.0	0.1	0.0	0.0	0.0		2.2
15	152976	0	0	0	2491	0	0	0	0	0	0	0	0		2491
		0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		1.6
16	165269	0	0	-	0	0	7	3	0	12	0	0	0		18
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
α	31512	0	0	0	0	0	0	0	0	0	0	0	0		0
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
23	235881	3081	3074	46	2694	1576	92	3587	0	89	0	0	0		14543
		1.3	1.3	0.0	1.1	0.7	0.0	1.5	0.0	0.0	0.0	0.0	0.0		6.2

Table 3. Number and Percentage of Errors per record by Inter-record Edit, 1995-2001 NCI-SEER Inter-record edit software

Registry	•										12	֡֝֝֟֝֝֟֝֝֟֝֝֟֝֝֟֝֟֝֝֟	17	17	1040
	# Kec	IKOI	IK02	1K03	1K04	IKO	1K06	IKO/	IKUS			IKII	CIVI	1111	Inla
ND*	14311	0	0	0	0	0	7	159	0	4	0	0	0	0	205
% Error		0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.3	0.0	0.0	0.0	0.0	1.4
NE	57936	0	7	-	908	0	-	10	0	7	0	0	0	∞	835
% Error		0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
*HN	40307	0	0	0	0	0	0	0	0	6	0	0	0	0	6
% Error		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ŋ	322770	0	0	0	352	0	0	0	0	10	0	0	7	0	364
% Error		0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
NM**	47785	0	0	0	519	0	0	0	0	0	0	0	0	0	519
% Error		0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
NV	53099	20	20	5	11	19	6	29	20	35	ω	20	0	4	195
% Error		0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.4
NY	480873	0	0	0	0	0	0	0	0	1	0	0	0	0	1
% Error		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
НО	336609	0	136	226	126	33	400	172	0	423	0	0	37	84	1637
% Error		0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.5
OK	81059	0	0	0	2	0	0	0	0	9	0	0	0	0	8
% Error		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OR	101236	0	0	0	316	0	_	0	0	12	0	0	0	0	329
% Error		0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
RI	42507	0	0	0	0	0	0	0	0	2	0	0	0	0	5
% Error		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SC***	92905	0	0	0	0	0	0	0	0	9	0	0	0	0	9
% Error		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 3. Number and Percentage of Errors per record by Inter-record Edit, 1995-2001 NCI-SEER Inter-record edit software

Registry	# Rec	<u>IR01</u>	IR02	IR03	IR04	IR05	IR06	$\overline{\text{IR}07}$		IR09	<u>IR10</u>	IR11	IR13	IR14	Total
SD	3424	0	0	0	0	0	0	40	0	17	0	0	0	0	57
% Error		0.0	0.0	0.0	0.0	0.0	0.0	1.2		0.5	0.0	0.0	0.0	0.0	1.7
TX	526105	2	0	0	0	0	0	6		∞	33	40	0	_	70
% Error		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
UT	44728	0	0	0	489	0	0	0		0	0	0	0	0	489
% Error		0.0	0.0	0.0	1.1	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	1.1
VA	142666	0	0	0	0	0	0	0		0	0	0	0	0	0
% Error		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
VT	3077	0	0	0	0	0	0	0		0	0	0	0	0	0
% Error		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
WA	193081	0	0	0	0	0	0	0		20	0	0	0	0	20
% Error		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
WA:SEA	131522	0	0	0	0	0	0	0		0	0	0	0	0	0
% Error		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
WI	186196	42	0	168	0	0	448	10132		604	0	0	0	0	11394
% Error		0.0	0.0	0.1	0.0	0.0	0.2	5.4		0.3	0.0	0.0	0.0	0.0	6.1
WV	72196	0	0	0	0	0	0	0		0	0	0	0	0	0
% Error		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
WY***	14781	0	0	0	4	0	0	0		3	0	0	0	0	7
% Error		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total	6347666	3243	3653	860	21457	1775	1826	15139		2014	112	368	53	1207	52910
% Error		0.1	0.1	0.0	0.3	0.0	0.0	0.2		0.0	0.0	0.0	0.0	0.0	8.0

*Submitted 3 years of data within the 1995-2001 time period

Submitted 4 years of data within the 1995-2002 time period *Submitted 5 years of data within the 1995-2002 time period

Source: Call for Data 2004 Paperwork Files: December 2003

^{****}Submitted 6 years of data within the 1995-2002 time period Omits Registries: Arkansas, Florida, Minnesota and Ontario

Table 4. Number and Percentage of Errors per record by Inter-record Edit, 1995-2001 Registries with greater than 1.0% errors per record CDC Inter-record edit software

CDC Inter-re	CDC inter-record edit software	ware													
Registry	# Rec	IR01	IR02	IR03	IR04	IR05	IR06		IR08	<u>IR09</u>	<u>IR10</u>	IR11	<u>IR13</u>	<u>IR14</u>	Total
9	113471	0	18	21	1433	16	49			45	0	0	4	99	1796
% Error		0.0	0.0	0.0	1.3	0.0	0.0			0.0	0.0	0.0	0.0	0.1	1.6
FLA	668280	11477	1071	215	1178	432	424	24859	0	336	0	0	5	2976	42973
% Error		1.7	0.2	0.0	0.2	0.1	0.1			0.1	0.0	0.0	0.0	0.4	6.4
GA*	154629	0	0	0	1632	0	0			9	0	0	0	0	1638
% Error		0.0	0.0	0.0	1.1	0.0	0.0			0.0	0.0	0.0	0.0	0.0	1.1
GA:ATL	68941	0	0	0	9//	0	0			13	0	0	0	0	176
% Error		0.0	0.0	0.0	1.1	0.0	0.0			0.0	0.0	0.0	0.0	0.0	1.1
H	37375	0	0	0	909	0	0			13	0	0	0	0	506
% Error		0.0	0.0	0.0	1.4	0.0	0.0			0.0	0.0	0.0	0.0	0.0	1.4
** 	189715	0	0	0	2403	0	0			13	0	0	0	0	2416
% Error		0.0	0.0	0.0	1.3	0.0	0.0			0.0	0.0	0.0	0.0	0.0	1.3
ME	49686	86	179	28	888	66	61		٠.,	15	106	308	7	4	3184
% Error		0.2	0.4	0.1	1.8	0.2	0.1			0.0	0.2	9.0	0.0	0.1	6.4
M	351234	0	205	292	5835	25	535			388	0	0	33	118	7450
% Error		0.0	0.1	0.1	1.7	0.0	0.2			0.1	0.0	0.0	0.0	0.0	2.1
MI:DET	152976	0	0	0	2491	0	0			13	0	0	0	0	2491
% Error		0.0	0.0	0.0	1.6	0.0	0.0			0.0	0.0	0.0	0.0	0.0	1.6
NC	235881	3081	3074	46	2694	1576	92			89	0	0	0	325	14543
% Error		1.3	1.3	0.0	1.1	0.7	0.0			0.0	0.0	0.0	0.0	0.1	6.2
ND*	14311	0	0	0	0	0	2			4	0	0	0	0	205
% Error		0.0	0.0	0.0	0.0	0.0	0.0			0.3	0.0	0.0	0.0	0.0	1.4
×* NM*	47785	0	0	0	519	0	0			13	0	0	0	0	519
% Error		0.0	0.0	0.0	1.1	0.0	0.0			0.0	0.0	0.0	0.0	0.0	1.1
SD	3424	0	0	0	0	0	0			17	0	0	0	0	57
% Error		0.0	0.0	0.0	0.0	0.0	0.0			0.5	0.0	0.0	0.0	0.0	1.7
WI	186196	42	0	168	0	0	448			604	0	0	0	0	11394
% Error	% Error 0.0	0.0	0.0	0.1	0.0	0.0	0.2			0.3	0.0	0.0	0.0	0.0	6.1
* C0#122	1 Transfer of date	Tryithin t	7001	200	CITOR OF	_									

*Submitted 3 years of data within the 1995-2001 time period *Submitted 4 years of data within the 1995-2002 time period

Source: Call for Data 2004 Paperwork Files: December 2003

Table 5. Number and Percentage of Errors per record by Inter-record Edit, 1995-2001 Registries with greater than 1.0% errors per record NCI-SEER Inter-record edit software

E	I otal	1796	1.6	1638	1.1	176	1.1	506	1.4	2416	1.3	3183	6.4	7658	2.2	2491	1.6	14543	6.2	835	1.4	519	1.1	57	1.7	489	1.1	11394
	IK14	99	0.1	0	0.0	0	0.0	0	0.0	0	0.0	4	0.1	118	0.0	0	0.0	325	0.1	∞	0.0	0	0.0	0	0.0	0	0.0	0
	IKIS	4	0.0	0	0.0	0	0.0	0	0.0	0	0.0	7	0.0	5	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
	IKII	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	307	9.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
		0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	105	0.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
		42	0.0	9	0.0	13	0.0	13	0.0	13	0.0	21	0.0	495	0.1	13	0.0	89	0.0	7	0.0	13	0.0	17	0.5	0	0.0	604
9041	IKU8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1175	2.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
		147	0.1	0	0.0	0	0.0	0	0.0	0	0.0	180	0.4	49	0.0	0	0.0	3587	1.5	0	0.0	0	0.0	40	1.2	0	0.0	10132
	1K06	49	0.0	0	0.0	0	0.0	0	0.0	0	0.0	63	0.1	535	0.2	0	0.0	92	0.0	10	0.0	0	0.0	0	0.0	0	0.0	448
	IKU3	16	0.0	0	0.0	0	0.0	0	0.0	0	0.0	86	0.2	25	0.0	0	0.0	1576	0.7	-	0.0	0	0.0	0	0.0	0	0.0	0
	1K04	1433	1.3	1632	1.1	9//	1.1	909	1.4	2403	1.3	883	1.8	5934	1.7	2491	1.6	2694	1.1	0	0.0	519	1.1	0	0.0	489	1.1	0
	1K03	21	0.0	0	0.0	0	0.0	0	0.0	0	0.0	30	0.1	292	0.1	0	0.0	46	0.0	908	1.4	0	0.0	0	0.0	0	0.0	168
	1K02	18	0.0	0	0.0	0	0.0	0	0.0	0	0.0	177	0.4	205	0.1	0	0.0	3074	1.3	-	0.0	0	0.0	0	0.0	0	0.0	0
SUILWAIC	IKOI ,	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	86	0.2	0	0.0	0	0.0	3081	1.3	2	0.0	0	0.0	0	0.0	0	0.0	42
		113471		154629		68941		37375		189715		49686		351234		152976		235881		57936		47785		3424		44728		186196
NCI-SEEN IIII	Kegistry	00	% Error	GA*	% Error	GA:ATL	% Error	田	% Error	** *N	% Error	ME	% Error	MI	% Error	MI:DET	% Error	NC**	% Error	NE	% Error	NM**	% Error	SD	% Error	UT	% Error	WI

^{*}Submitted 3 years of data within the 1995-2001 time period
**Submitted 4 years of data within the 1995-2002 time period
***Submitted 5 years of data within the 1995-2002 time period

Source: Call for Data 2004 Paperwork Files: December 2003

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