Injury Hospitalizations among American Indians in a Nevada Service Unit: Supplementing IHS Reported Cases with the Nevada Hospital Discharge Abstract.

Randy Benefield, Class of 1995.

The Indian Health Service (IHS) has primary health care responsibility for American Indians (AIs). This care is provided in two general ways: directly from an IHS or tribal hospital or indirectly through contracted private health care facilities. Funding for contracted health care is provided by the IHS Contract Health Service (CHS); however, CHS is considered to be the provider of last resource. When the patient is eligible under Medicare, Medicaid, or covered by private or other insurance, the alternative program provides the funding for treatment. Acute and specialty health care for American Indians in Nevada is provided primarily through contracted facilities.

The Injury Prevention Program monitors injuries to AIs to formulate and implement intervention programs. In review of IHS patient care reporting it appears that injury cases treated outside the IHS health care program are not always reported in the system. As a result, public health prevention strategies and health policies developed from the IHS data systems may be based on an incomplete, or possibly biased, picture of the health patterns among AIs.

Objective

The basic objective of this study is to determine the magnitude of under-reporting of hospitalized injuries to AIs whose treatment was provided by alternative programs. Secondarily, the additional information on these patients will be used to fully describe the injury patterns within a service area located in the state of Nevada.

Methods

The study population consisted of all registered users of a health care delivery area, or Service Unit, located in Nevada who were hospitalized for one or more days from 1990 to 1994, inclusive, due to an injury as defined by the *International Classification of Diseases*[1] (ICD9) codes 800 - 995.89. Injury cases were obtained from three data sources: the Nevada Hospital Discharge Abstract Reporting System (NHDARS), the IHS Resource and Patient Management System (RPMS), and the IHS Division of Data Processing Service's (DDPS) National Data Base.

Each dataset was examined for type and cause of injury and cases in common. Case matching was performed to identify cases common to each dataset. This matching was accomplished by manually comparing cases for date of admission and discharge, gender, age/date of birth, zip code/community of residence, and diagnosis. The IHS datasets were then combined for comparison with the NHDARS dataset. All datasets were analyzed using EpiInfo statistical software.[2]

Data Sources

Resource Patient and Management System:

IHS records all direct patient care, contracted health care, and patient registration information using the Resource Patient and Management System (RPMS). All transactions conducted by the CHS and contract facilities are entered and maintained in the Contract Health Management System (CHMS) component of RPMS. A computerized search of CHMS was made for inpatient activity by each contract hospital utilized by the service unit. Each transaction was reviewed for an indication of an injury. This process was objective, based on the description of the services. Once identified, the patient medical charts were reviewed to determine cause of injury.

Each hospital is required by the State of Nevada to submit a copy of the Uniform Billing 82 (UB82) form on discharged patients to NHDARS for maintaining state health statistics.[3] The information from the UB82 utilized in the study is listed in Table 1. American Indian cases were identified within the NHDARS by computerized matching with a RPMS dataset of registered users of the service unit consisting of the last six digits of the social security numbers, date of birth, and zip codes.

Table 1:Nevada Hospital Discharge Abstract Reporting System	
1. Zip code	6. Admission Source (EMT, police, ER, etc.)
2. Age	7. Discharge Status (regular, transfer, expired, etc.)
3. Gender	8. Admitting Diagnosis
4. Admission Date	9. Secondary diagnosis (up to 4 additional)
5. Discharge Date	10. Total charge
6. Admission Type	12. Payer ID

Division of Data Processing Services (DDPS) National Data Base

DDPS maintains a centralized database of patient registration, IHS inpatient/outpatient treatment, and contract health inpatient/outpatient data. This data is the basis of all IHS national health statistics reporting. DDPS receives CHS data from two sources, the CHS fiscal intermediate (FI) and the tribal CHS programs.

Background

When a patient presents to a hospital, the service unit CHS is contacted for authorization. The hospital provides CHS a description of services, an estimated cost of treatment, and an estimated length of stay. A payment order or "document" is then issued by CHS consisting of the patient information, treatment need, and alternate insurance program coverage (Medicare, Medicaid, private, etc.). The document information and the amount of money obligated is recorded in the CHMS and electronically transferred to a Fiscal Intermediate (FI). The FI bills the alternative program and pays any residual costs. An Explanation of Benefits Record (EOBR) of payment and treatment information is then electronically transferred weekly by the FI to the service unit and DDPS. Upon discharge, the hospital is to send a discharge summary to the referring physician for review and inclusion to the local medical record.[4]

Limitations

The social security numbers obtained from RPMS represents the service population of the service unit and includes all persons treated at an associated SU clinic. The service population includes certain non-Indian beneficiaries. These non-Indian beneficiaries include non-Indian spouses, non-Indian IHS staff and dependents, and non-Indian PHS Commissioned Corps officers and dependents. This inflates the actual population of AIs; however, these non-Indians share the same exposure to the same hazards and further define those hazards in terms of intervention strategies. The total number of social security numbers obtained from the PCC-RPMS search for registered users was 14,781. The 1990 US Census shows an AI population of 11,107 for the counties occupied by the reservations.[5] Phoenix Area IHS reports the 1993 Active User Population at 11,012 which represents the best available number for the actual AI population.

Table 2: Schurz Service Unit User Population	
Source	**Population**
1990 Census Data	11,107
1993 "Active" Users	11,012
RPMS All Registered Users	14,781
RPMS CHS eligible and Amer Indian/Alaska Native	10,206

Case Identification and Matching Data:

The RPMS search of CHMS inpatient activity identified 121 injury hospitalizations. The DDPS dataset identified 202 cases with 26 cases common to the CHS dataset. In combination, a total of 297 cases were identified within the IHS data system. The NHDARS identified 407 cases attributed to injuries. This represents a 27% under-reporting of injury cases by IHS (Table 3). Of the 297 IHS cases, 152 (37.3%) matched cases in the NHDARS dataset.

Injury Profile: The NHDARS indicated the leading causes of injury were motor vehicle crashes (11.3%), falls (8.6%), assaults (8.6%), and self inflicted (7.6%). Cause of injuries were unknown in 55.5% of the cases.

The combined IHS datasets indicated the leading causes of injuries were other/unspecified (24.9%), falls (20.5%), motor vehicle crashes (17.5%), assaults (12.1%). 91 (75.2%) of the 121 patient medical charts reviewed at local clinics contained sufficient information to assign an e-code; only 12.3% contained discharge summaries. 200 of the DDPS cases or 99% were E-coded. The high percentage of E-coding is due to the FI computer system employing a filter to assign the 988.9 E-code (injury by other or unspecified means) when one is not provided.[7]
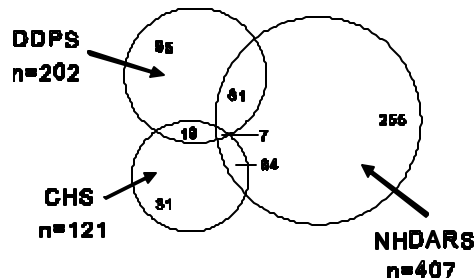
Results: Figure 1

Case Matching by Dataset

DDPS
n=202

CHS
n=121

NHDARS
n=407

Table 3. Leading types of injury by dataset.		
Type of Injury	**Number in NHDARS**	**Number in IHS**
Concussion	10 (2.5%)	6 (2.2%)
Contusion	13 (3.2%)	6 (2.2%)
Dislocation	11 (2.7%)	6 (2.2%)
Eye Injury	5 (1.2%)	6 2.2%)
Headwound	13 (3.2%)	10 (3.6%)
Hip Fracture	8 (2.0%)	4 (1.4%)
Intra-cranial	23 (5.7%)	12 (4.4%)
Internal Injury	21 (5.2%)	13 (4.7%)
Jaw Fracture	11 (2.7%)	8 (2.9%)
Limb Wound	19 (4.7%)	21 (7.7%)
Lower Limb Fracture	94 (23.1%)	57 (20.8%)
Other Injury	34 (8.4%)	22 (8.0%)
Poisoning	38 (9.3%)	19 (6.9%)
Rib-Chest Fracture	6 (1.5%)	10 (3.6%)
Skull Fracture	10 (2.5%)	8 (2.9%)
Sprains	19 (4.7%)	7 (2.5%)
Upper Limb Fracture	33 (8.1%)	17 (6.2%)
Vertebral Fracture	14 (3.4%)	8 (2.9%)
Undetermined	0 (0.0%)	20 (7.3%)
Total Injuries	407	274

Discussion

I could not fully describe the causes of injuries between the datasets due to the limited number of e-coded cases in NHDARS and overuse of the "unspecified" e-code in the DDPS. However, the cases that were e-coded in each dataset reflect the same leading causes of injuries with the exception of self-inflicted injuries (7.6%) which only accounted for 3.7% of the IHS cases. In terms of types of injuries, all cases in the combined IHS datasets and the NHDARS were coded for injury type. The NHDARS reported significantly more cases (27%) than IHS.

It is not apparent why so few cases matched between the IHS data sets. Reportedly, the only way a patient would not be in the IHS systems would be if the 72-hour notification rule was not met. Otherwise, CHS pays any private insurance deductibles and Medicare/Medicaid co-payments and thus would be included in the system. Numbers of discharges varied greatly between the IHS datasets by year. This is most likely related to the search capabilities of RPMS/PCC. Until recently, the CHMS was a stand-alone component of the RPMS, which is now linked. Another reason is the various stages of CHMS payments (open, canceled, partial pay). For example, a document may show to be canceled. However, this could be due to a temporary lack of funds or because the injuries were not as severe as originally suspected and no hospitalization occurred.

The reason for the low number of case matching between the NHDARS and the IHS dataset is also undetermined. A possible reason is that some hospitalization occurred outside the state (i.e. PIMC or reservation bordering state line with closest services in another state). This would only account for a small percentage. There were several cases

in the DDPS dataset which had different social security numbers, date of birth, admission dates, or chart numbers than shown in the RPMS computerized patient health record.

Conclusions

The NHDARS reported 27% more injury hospitalizations during the study period than the IHS data system. These cases cannot be fully investigated because confidentiality issues precluded the NHDARS from providing patient identifiers for case matching. In IHS, the low percentage of discharge summaries and lack of sufficient information to determine causation is adversely impacting injury surveillance. In the environment of self-governance, government downsizing, and services being transferred to the local service unit and tribal level, it is necessary for accurate injury data to be more easily obtained locally.

Recommendations

1. A confidentiality agreement is needed between IHS and NHDARS to obtain datasets with patient identifiers. Medical records of non-reported IHS cases can then be used to determine the number and causes of injuries to AIs.
2. Contracts with private hospitals require discharge summaries be provided. Summaries were present in only 12.3% of medical charts. Procedures must be established to insure inclusion of discharge summaries.
3. The CHMS upgrade updates the PCC patient visit record with dates, diagnosis code, length of stay. However, the FI is not transmitting E-codes on the weekly EOBR report to the SU. Staff at the FI report that there is sufficient room in the data file for e-codes and that the change would not be difficult to program.
4. The CHMS was created as an accounting system. However, it has the essential data for case identification for injury surveillance. Upgrading in 1995 has linked RPMS to CHMS and will now notify the Injury MailMan injury notification system of CHS inpatient activity. This should result in simplifying the case identification process. The Injury MailMan notification system should be utilized and monitored for injury identification accuracy.
5. To insure that healthcare statistics may be maintained and levels of need established, 638 program and compacting agreements should include provisions for DDPS notification.
6. The DDPS should be utilized as the primary source of retrospective injury data.

References

1. *International Classification Of Diseases, 9th Revision, Clinical Modification*. Ann Arbor, MI: 1986.
2. Dean AD, Dean JA, Burton AH, Dicker RC. EpiInfo, Version 6: Usd, Inc. Stone Mountain, Georgia, 1995.
3. Nevada Administrative Code. *Information concerning discharged patients: Submission; limitations on disclosure*. NAC 449.963, 1988.
4. Huggins, George. Developer of Contract Health Management System. Personal Interview. 4-3-96.
5. United States Census, 1990. US Census Bureau.
6. Serda, Andrew. IHS Liason to Fiscal Intermediate. Personal Interview. 4-3-96.