Montana Hospital Discharge Data System

Supplemental Report

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Differences Between the Montana Hospital Discharge Data System and the Montana Central Tumor Registry in the Enumeration of Prostate Cancer Cases and the Description of Treatment Practices

Carol Ballew, PhD, Lead Epidemiologist

The Montana Hospital Discharge Data System (MHDDS) receives annual de-identified hospital discharge data sets through a Memorandum of Agreement with the Montana Hospital Association.[1] Most hospitals in Montana participate in voluntary reporting of discharge data from their Uniform Billing Forms, version 2004 (UB-04).[2] The MHDDS receives information on more than 90% of the inpatient admissions from non-psychiatric facilities in the state. The MHDDS does not receive data on emergency department visits, outpatient procedures, or long term care facilities at this time.

The Montana Central Tumor Registry (MTCR) has been in continuous operation since 1979. By state statute, it receives reports of all invasive cancers diagnosed and treated in Montana.[3] The MCTR includes detailed data on diagnosis, treatment, and survival. The ascertainment of cancer cases is more than 95% complete in the MCTR. Given this completeness and level of clinical detail, the MCTR is a standard against which to assess the completeness and accuracy of the MHDDS for cancer data. Because Montana does not have registries for other chronic diseases, this assessment can serve as a proxy for the utility of the MHDDS for those diseases, and can identify areas for caution.

Patients are entered in the MCTR as newly diagnosed (incident) cases. Diagnosis with cancer, particularly prostate cancer, generally does not involve hospitalization. Patients are entered in the MHDDS as they are admitted to the hospital and include a combination of recently diagnosed and previously diagnosed (incident and prevalent) cases. Cancer may appear as the principal diagnosis at admission in the MHDDS, or as one of up to eight secondary diagnoses. The principal diagnosis usually determines the primary procedure listed in the MHDDS and is usually interpreted as the reason for admission. The MHDDS will under-enumerate cancer-related medical contacts because it does not include outpatient visits or procedures and does not include patients who forego treatment, but it also combines incident and prevalent cases.

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[1] http://www.dphhs.mt.gov/PHSD/MT-HDDS/MTHDDS-index.shtml
[2] http://www.shepscenter.unc.edu/research_programs/hosp_discharge/links/ub04_fact_sheet.pdf
[3] http://www.dphhs.mt.gov/PHSD/cancer-control/tumor-registry-index.shtml

In 2007, there were a total of 831 hospital discharges with a primary or secondary diagnosis of prostate cancer reported by the MHDDS, and 852 incident cases of invasive prostate cancer reported to the MCTR (Table 1). The similarity of these two numbers is coincidental, due to the very stable annual incidence and mortality rates of prostate cancer, and the relatively long average survival with prostate cancer. The incidence rate of prostate cancer among Montana men has been steady at 181/100,000 for the past decade, with an average of 842 cases newly diagnosed each year. More than 99% of men diagnosed between 1998 and 2001 survived at least five years, and 94% survived at least 10 years, after diagnosis.

Table 1. Counts of Discharges and Procedures for Prostate Cancer in the Montana Hospital Discharge Data System and Counts of Diagnoses and Treatments in the Montana Central Tumor Registry, 2007

	MHDDS Discharges		MCTR Incident cases	
Primary diagnosis	365		~	
Secondary diagnosis	466		~	
TOTAL	831		852	
Procedures for Primary Diagnosis in MHDDS or Treatment for Incident Cases in MCTR				
Radical prostatectomy	301	83%	316	37%
Transurethral prostatectomy	22	6%	27	3%
Implanted radiation	0	0%	106	12%
Other cancer treatment	8	2%	245	29%
No treatment for cancer†	~	~	274	32%
Treatment unrelated to cancer	34	9%	~	~
TOTAL	365	100%	968*	113%*

~ Data not available from system.
† No treatment on record through December 2009.
* Sums to more than total cases and more than 100% because some patients had more than one form of treatment, such as surgery plus radiation, chemotherapy, or hormone therapy.

Among the 365 men in the MHDDS hospitalized with prostate cancer as their principal diagnosis, the great majority had a radical prostatectomy, none had implanted radiation, only 2% had other forms of cancer treatment, and 9% had a primary procedure unrelated to prostate cancer. In contrast, among the 852 men with incident prostate cancer in the MCTR, only one third had a radical prostatectomy, 12% had implanted radiation, nearly one third had other forms of treatment for prostate cancer (other types of radiation, chemotherapy, hormone therapy), and 32% had no treatment on record through December 2009.

It is clear that assessing treatment patterns based on the MHDDS is limited, in part because radiation, chemotherapy, and hormone therapy are now most often performed on an

outpatient basis and thus are not captured in the MHDDS data. In addition, one third of men newly diagnosed with prostate cancer do not immediately enter treatment, but opt for a period of "watchful waiting" with their care providers because some prostate cancers are relatively indolent.[4]

It is even more problematic to use MHDDS data to assess age-specific patterns of prostate cancer treatment. An analysis of 2004 Montana hospital discharge data asserted that there was a robust trend away from radical prostatectomy in favor of transurethral prostatectomy with increasing patient age.[5] Table 2 reproduces that analysis for 2007 admissions and compares them to 2007 prostate cancer cases reported to the MCTR. The patterns in the 2007 MHDDS patients are nearly identical to those

Table 2. Percent Distribution of Treatment Modality for Prostate Cancer by Age Group in the Montana Hospital Discharge Data System and the Montana Central Tumor Registry, 2007

	MHDDS Admissions						MCTR Incident Cases				
5-year age group	<55	55-64	65-74	75-84	≥ 85		<55	55-64	65-74	75-84	≥ 85
Number of cases§	52	133	139	21	5		75	261	321	146	49
Radical prostatectomy	100%	96%	85%	14%	0%		71%	53%	38%	3%	2%
Transurethral prostatectomy	0%	1%	5%	48%	80%		0%	2%	3%	6%	10%
Implanted radiation	0%	0%	0%	0%	0%		3%	13%	18%	9%	0%
Other treatment	0%	2%	6%	10%	20%		19%	28%	35%	29%	20%
No treatment†	~	~	~	~	~		17%	20%	26%	63%	69%
Treatment not for cancer	0%	1%	4%	28%	0%		~	~	~	~	~
TOTAL	100%	100%	100%	100%	100%		110%*	116%*	120%*	110%*	101%*

§ Procedure data missing for 15 cases in MHDDS.
~ Data not available from system.
† No treatment on record through December 2009.
*Sums to more than 100% because some patients had more than one form of treatment, such as surgery plus radiation, chemotherapy, or hormone therapy.

[4] http://www.nci.nih.gov/ncicancerbulletin/NCI_Cancer_Bulletin_021908/page3
[5] http://www.mtha.org/pdf/prostate_March06.pdf

reported for the 2004 data. Comparison with the MCTR highlights three limitations of the MHDDS data. First, there are very small numbers of cases in the two oldest age groups, giving misleadingly high percentage values for transurethral prostatectomy in these groups. For example, three of five men (yielding a percentage computation of 80%) age 85 years or older had a transurethral prostatectomy in the MHDDS, although the MCTR data indicate that more than two thirds of men in this age group actually had no treatment at all. Second, because the MHDDS does not have data on outpatient procedures, it misses implanted radiation and most other forms of non-surgical treatment for prostate cancer. Third, the MHDDS data misses the fact that most men age 75 and older do not undergo *any* treatment for their prostate cancer within two years of diagnosis. There is indeed a trend toward less reliance on radical prostatectomy with age, but it is not nearly as dramatic as it would appear from the MHDDS data, and the purported substantial trend toward more transurethral prostatectomes for older men is an artifact of slightly greater reliance on outpatient procedures with increasing patient age, and more significantly, the fact that older men often forego treatment altogether.

CONCLUSION

The existence of the MCTR provides a unique opportunity to examine the strengths and limitations of the MHDDS for one surveillance program. The extent to which the discrepancies identified in this analysis will apply to other chronic diseases in the MHDDS will vary with the diseases in question. In fact, the example of prostate cancer is not even representative of all kinds of cancer. Some cancer diagnoses result in prompt hospitalization and in-patient treatment so there would be a closer correspondence between the MHDDS and MCTR in assessing disease burden and patterns of treatment for those cancers. For other chronic diseases characterized by discrete events for which immediate hospital admission is the norm (e.g., heart attacks, strokes, life-threatening injuries), the MHDDS is a valuable proxy for a dedicated surveillance system. For chronic conditions which do not consistently require hospitalization (e.g., diabetes, asthma), the utility and limitations of the MHDDS need to be assessed on a program by program basis.

Carol Ballew, PhD
Lead Epidemiologist / Program Manager
406-444-6988 cballew@mt.gov

Cody Custis, MSc
Epidemiologist
406-444-6947 ccustis@mt.gov