

**INCREASED PROSTATE CANCER IN ILLINOIS:  
A SCREENING EFFECT  
OR IMPROVED CASEFINDING?**

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## INCREASED PROSTATE CANCER IN ILLINOIS: A SCREENING EFFECT OR IMPROVED CASEFINDING?

### INTRODUCTION

Compared with rates from other central registries across the United States, the Illinois rates of adenocarcinoma of the prostate are dramatically lower, despite similar mortality rates.<sup>1,2</sup> Accurate description of this disease among Illinois males requires an understanding of whether this lower rate is due to incomplete case ascertainment. In 1992, the Illinois State Cancer Registry (ISCR) undertook special steps to improve casefinding from facilities, particularly Veterans Administration (VA) facilities in Illinois that are exempt from state-mandated reporting. During the last 10 years in the United States, increases of 20 percent and more in the incidence of prostate cancer were observed in many states and communities.<sup>3-5</sup> These increases were attributed largely to the introduction of diagnostic serum prostate-specific antigen (PSA) assays, which result in earlier identification of clinically occult disease, rather than to actual changes in the frequency of the disease.<sup>3-5</sup> Thus, differences in the rate of increase among regions might be attributable solely to geographic variability in the adoption of PSA screening.<sup>4</sup>

The increasing temporal trend in prostate cancer incidence complicated our evaluation of case ascertainment completeness. Cancer registration in Illinois began in 1986, therefore it was not possible to project long-term incidence trends, thereby segregating it from improvements in case ascertainment. In order to address the question of whether Illinois' lower prostate cancer incidence in 1988-90 was attributable to incomplete case reporting, we evaluated the 1986 to 1992 trends

within reporting facility categories: (1) federal facilities, where a concerted effort was mounted to improve reporting of 1991 cases; (2) hospitals with a cancer program that included a hospital tumor registry; and (3) non-registry hospitals, which are those without cancer programs. Reporting from Illinois hospitals was estimated to be 97 percent complete, with a population-based reporting completeness rate of 93 percent, when all reporting sources are considered (e.g., out-of-state data exchanges, nursing homes, pathology laboratories, ambulatory surgical centers).<sup>1,6</sup>

The purpose of this study was to compare the expected increase in the incidence of prostate cancer among the four facility types to determine whether the increase in federal facilities was greater and might be attributable to more complete casefinding.

## **METHODS**

### **Source of Cases**

Cases of prostate cancer (International Classification of Diseases - Oncology, 2nd edition, T-code C619) diagnosed among Illinois male residents from 1986 to 1992 were identified through the Illinois State Cancer Registry. Case reports are received from Illinois registry and non-registry hospitals, Veterans Administration (VA) hospitals, and central registries of other states (i.e., California, Florida, Iowa, Indiana, Kentucky, Michigan, Minnesota, Missouri, and Wisconsin) where some Illinoisans travel for their cancer care. All in-state hospitals, except for VA and military hospitals, are mandated by Illinois law to report newly diagnosed cases to ISCR. Some federal facilities report voluntarily.

For each patient with a primary diagnosis of prostate cancer, his age, race, stage of disease at diagnosis, and the reporting facility were extracted. Facilities were aggregated by type: registry hospitals, non-registry hospitals, VA hospitals, and out-of-state hospitals.

Since age is strongly associated with the incidence of prostate cancer and with PSA screening, men younger than 50 years of age were omitted from the analysis. The remaining patients were grouped into three age categories: 50- to 64-years-old , 65- to 79-years-old, and 80-years-old and older. The race categories included in the analysis were African-American, white, and men of other races. Stage at diagnosis was summarized by the Surveillance, Epidemiology, End-Results (SEER) summary stage groups: *in situ*, local, regional, distant and unknown. Since the number of patients diagnosed in an *in situ* stage was small, they were omitted from the analysis.

### **Casefinding Procedure**

Hospital visits were conducted by ISCR staff to identify reportable cases. Staff reviewed the following hospital sources following standard casefinding procedures: the disease index, pathology logs and reports, autopsy reports, and hematology and cytology reports. If a hospital did not have a pathology department, abstracters determined how reports of pathology, autopsy and cytology are returned to the hospital, and then these sources were reviewed. ISCR staff then completed the ISCR incident report form for all reportable cases. These forms were processed by central office staff and added to the cancer registry.

### **Analysis**

A Mantel-Haenszel chi-square test was used to test for a linear association between facilities and year of diagnosis to determine whether the casefinding in the VA hospitals resulted in a measurable differential trend when compared to the trends in other facilities. Then differences

between the group of VA hospitals that report voluntarily and those VA facilities where casefinding was conducted were assessed to determine whether cases identified through casefinding were distinguishable by age, race, or stage or year of diagnosis from cases reported voluntarily. These differences were assessed using the chi-square test. All differences were considered statistically significant when the p value was less than 0.05.

## **RESULTS**

From 1986 through 1992, 37,607 Illinois men 50 years of age and older were diagnosed with invasive adenocarcinoma of the prostate and reported to the Illinois State Cancer Registry. These patients are summarized by age, race, type of reporting hospital facility and stage of disease at time of diagnosis in Table 1. Most of them were white, between 65 and 79 years of age, diagnosed in a local stage, and received their most definitive care in registry hospitals, and thus were categorized as registry cases.

Table 2 summarizes the trends in case reports by facility type. An increasing trend was seen in all facility types, and no differences in trends were found. Among Illinois facilities, each had about 11 percent to 12 percent of their cases diagnosed in 1986 and increased to about 20 percent in 1992. The largest increase was noted in reports from out-of-state facilities, from 8 percent in 1986 to about 20 percent in 1992. In all groups, the biggest annual increase occurred in 1991.

Table 3 summarizes the differences by age, race and stage at diagnosis between VA cases reported voluntarily and those identified through casefinding. As shown, casefinding yielded a significantly older group of VA cases — males 80 years of age and older. It also identified significantly more VA cases among whites, and more VA cases with an unknown stage of disease.

As would be expected, casefinding activities in VA hospitals that do not report voluntarily did increase case reports from these facilities, as shown in Table 4. Although most casefinding activities were conducted for 1991 diagnoses, there was a spill over in reporting to 1992 cases as well.

## **CONCLUSION**

An increase in reporting prostate cancer cases was seen from all the major sources of case reports: registry hospitals, non-registry hospitals, out-of-state facilities and federal facilities. Compared with this, the incremental increase in case reports from federal facilities where casefinding activities had taken place was too small to affect the trends. Thus, the question of whether Illinois rates of prostate cancer were caused by under-reporting of cases or lower incidence of the disease could not be answered. Any casefinding effect was too small to affect the secular increasing trends in the early 1990s throughout the state.

However, when VA facilities with casefinding activities were compared with other VA facilities, a reporting bias became evident. VA facilities that report voluntarily are more likely to report younger men, black men and men in local stages of disease. Case reports identified through casefinding, on the other hand, were more likely to identify cases who were white, 80 years of age and older, and in an unknown stage of disease.

Although the proportion of prostate cancer cases reported by VA facilities is a small percentage of the total cases reported in Illinois and although the VA facilities that voluntarily report include most of the cases diagnosed and treated in these facilities, those cases who receive their

cancer care in the VA facilities that do not voluntarily report are distinctly different in age, race and stage of disease. The omission of these cases results in a small, but measurable, reporting bias.



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Table 1. Frequencies of Prostate Cancer Cases,  
50 Years of Age and Older, by Age, Race, Stage and  
Facility Type, Illinois, 1986-1992

Variable	Number	Percent
<b>Age</b>		
50-64	6,434	17.1
65-79	23,072	61.4
80+	8,101	21.5
<b>Facility Type</b>		
Registry Hospital	30,848	82.0
Non-registry Hospital	3,853	10.3
Out-of-state Hospital	2,109	5.6
Veterans Administration Hospitals	797	2.1
<b>Race</b>		
White	32,262	85.8
Black	4,399	11.7
Other Races	197	0.5
Unknown	749	2.0
<b>Stage of Disease</b>		
Local	23,626	62.9
Regional	5,170	13.7
Distant	5,711	15.2
Unknown	3,100	8.2
<b>Total</b>	<b>37,607</b>	<b>100.0</b>

Source: Illinois Department of Public Health, Illinois State Cancer  
Registry, May 1995

Table 2. Number and Percentage of Prostate Cancer Cases Among Males, 50 years of Age and Older  
By Facility Type and Year, Illinois , 1986-1992

Facility Type	1986	1987	1988	1989	1990	1991	1992	Total
	Percent (No.)	Percent (No.)	Percent (No.)	Percent (No.)	Percent (No.)	Percent (No.)	Percent (No.)	Percent (No.)
Non-registry	11.7 (451)	11.8 (454)	2.0 (464)	14.2 (546)	14.2 (548)	17.4 (669)	18.7 (721)	100 (3,853)
Out-of-state	7.9 (167)	10.2 (215)	10.8 (228)	11.1 (235)	14.7 (309)	25.1 (529)	20.2 (426)	100 (2,109)
Registry	10.9 (3,368)	11.8 (3,651)	11.9 (3,669)	12.2 (3,772)	13.9 (4,284)	17.5 (5,385)	21.8 (6,719)	100 (30,848)
VA Hospitals	12.4 (99)	10.4 (83)	11.4 (91)	14.7 (117)	13.6 (108)	17.6 (140)	20.0 (159)	100 (797)

Source: Illinois State Cancer Registry, Illinois Department of Public Health, May 1995  
Mantel-Haenszel Chi-square test, p=0.22

Table 3. Number and Percentage of Prostate Cancer in Males 50 Years of Age and Older by Veterans Administration Group and Age, Race, and Stage. Illinois, 1986-1992

	VA Hospital Group			
	Voluntarily Reporting (n=714)		Casefinding (n=83)	
	Percent	No.	Percent	No.
<b>AGE</b>				
50-64	25.6	183	20.5	17
65-79	68.2	487	60.2	50
80+	6.2	44	19.3	16
<b>RACE</b>				
White	41.9	299	93.8	75
Black	57.8	412	6.3	5
Other Races	0.3	2	0	0
Unknown Race	-	1	-	3
<b>STAGE OF DISEASE</b>				
Local	62.6	447	53.0	44
Regional	11.5	82	12.1	10
Distant	21.0	150	20.5	17
Unknown	5.0	35	14.5	12

Source: Illinois Department of Public Health, Illinois State Cancer Registry, May 1995

<sup>1</sup> Chi-square test, p<0.001

<sup>2</sup> Chi-square test, p=0.005

Table 4. Number and Percent of Prostate Cancer Cases  
Among Males, 50 Years of Age and Older, by VA Facility Group and Year  
Illinois, 1986-1992

VA Group	Year						
	1986	1987	1988	1989	1990	1991	1992
	Percent (No.)	Percent (No.)	Percent (No.)	Percent (No.)	Percent (No.)	Percent (No.)	Percent (No.)
Voluntary Reporting	13.9 (99)	11.5 (82)	12.8 (91)	16.1 (115)	12.2 (87)	15.8 (113)	17.8 (127)
Casefinding	0 (0)	1.2 (1)	0 (0)	2.4 (2)	25.3 (21)	32.5 (27)	38.6 (32)

Source: Illinois Department of Public Health, Illinois State Cancer Registry, May 1995  
Mantel-Haenszel chi-square test,  $p < .001$

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