



Incident Cases Captured in the National Cancer Database Compared with Those in U.S. Population Based Central Cancer Registries in 2012–2014

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ABSTRACT

Background. The National Cancer Database (NCDB) is a hospital-based cancer registry that includes diagnostic, staging, treatment, and outcomes data for newly diagnosed cancer patients in the United States. The NCDB data include 31 million records for patients diagnosed between 1985–2015. A Participant User File based on a subset of these data has been available to researchers at facilities accredited by the Commission on Cancer since 2010. This study aimed to compare the number of incident cancer cases in the NCDB with a national population cancer registry.

Methods. Incident cancer cases in the NCDB in 2012–2014 were compared with the number of cancer cases in the United States Cancer Statistics data for the 2012–2014 diagnosis years. Comparisons were made by primary site and other factors.

Results. In 2012–2014, the NCDB captured 72% of the cancer cases in the United States, which was slightly higher than the 67% and 69% reported respectively in two prior assessments. Among the top 10 major cancer sites, the highest coverage (80%) was found for breast cancer, and the lowest was found for melanoma of the skin (52%) and prostate (58%). Colon, bladder, and kidney and renal pelvis cancers had relatively high coverage of 71%, 70% and

78%, respectively, whereas lung and bronchus had slightly lower coverage (65%).

Conclusions. The NCDB coverage of U.S. cancer cases has remained relatively high (72%), but differences remain by cancer site and other factors that should be taken into account by users of the NCDB data.

The National Cancer Database (NCDB) is a hospital-based cancer registry that has been collecting data on cancer patients in the United States since 1989.¹ The NCDB is a joint project of the American College of Surgeons Commission on Cancer (CoC) and the American Cancer Society.² Since 1998, hospitals accredited by the CoC have been required to submit all their cases with a new diagnosis to the NCDB. Currently, more than 1500 hospitals submit data to the NCDB, which in 2018 included 37 million records for 31 million unique patients with a new diagnosis in 1985–2015.

The NCDB includes diagnostic, staging, treatment, and outcomes information. Two prior studies assessed case completeness and found that the NCDB captured approximately 69% and 67%, respectively, of all U.S. cancer cases compared with the National Cancer Registry data.^{3,4} The first study used projected estimates of cancer incidence in 2005 to compare coverage, whereas the second study used 2004–2006 United States Cancer Statistics (USCS) population-based comparison data. The United States Cancer Statistics (USCS) data include population-based cancer incidence data from the Centers for Disease Control (CDC)'s National Program of Cancer Registries (NPCR) and the National Cancer Institute Surveillance, Epidemiology, and End Results (SEER) Program. These registries

TABLE 1 Case coverage for National Cancer Data Base (NCDB) by cancer site and sex in 2012–2014

Primary site	USCS count	NCDB count	Case coverage	NCDB male count	USCS male count	Case coverage male	NCDB female count	USCS female count	Case coverage female
All cancer sites combined ^a	4,769,679	3,456,127	72.5	1,631,927	2,394,773	68.1	1,824,200	2,374,906	76.8
Male and female breast	706,521	568,498	80.5						
Female breast	700,254	562,876	80.4				562,876	700,254	80.4
Lung and bronchus	649,944	421,478	64.9	218,406	342,271	63.8	203,072	307,673	66.0
Prostate	540,980	315,183	58.3	315,183	540,980	58.3			
Colon excluding rectum	296,070	210,284	71.0	103,127	147,284	70.0	107,157	148,786	72.0
Melanomas of the skin	220,678	114,572	51.9	66,997	130,195	51.5	47,575	90,483	52.6
Urinary bladder	217,214	151,307	69.7	113,773	164,987	69.0	37,534	52,227	71.9
Non-Hodgkin lymphoma	198,421	144,316	72.7	78,727	108,655	72.5	65,589	89,766	73.1
Kidney and renal pelvis	174,204	135,578	77.8	84,734	109,639	77.3	50,844	64,565	78.7
Male and female breast in situ	171,244	141,523	82.6						
Female breast in situ	170,524	140,756	82.5				140,756	170,524	82.5
Brain cranial nerves benign/borderline ^b	160,498	92,697	57.8						
Corpus and uterus, NOS	154,083	126,941	82.4				126,941	154,083	82.4
Thyroid	143,940	117,377	81.6	29,176	35,768	81.6	88,201	108,172	81.5
Leukemias	141,760	89,942	63.5	51,790	82,437	62.8	38,152	59,323	64.3
Pancreas	136,355	102,212	75.0	52,302	69,937	74.8	49,910	66,418	75.1
Rectum and rectosigmoid junction	120,600	91,499	75.9	53,337	70,621	75.5	38,162	49,979	76.4
Liver and intrahepatic bile duct	91,003	64,837	71.3	45,991	65,366	70.4	18,846	25,637	73.5
Brain/cranial nerves malignant ^b	71,987	61,798	85.8						
Stomach	70,410	53,123	75.5	33,126	43,694	75.8	19,997	26,716	74.9
Myeloma	70,081	48,377	69.0	26,964	39,131	68.9	21,413	30,950	69.2
Brain and other nervous system	66,578	56,975	85.6	31,956	37,033	86.3	25,019	29,545	84.7
Ovary	63,866	53,140	83.2				53,140	63,866	83.2
Esophagus	50,059	37,835	75.6	29,622	39,458	75.1	8213	10,601	77.5
Tongue	39,276	30,714	78.2	21,954	28,210	77.8	8760	11,066	79.2
Larynx	37,488	28,660	76.5	22,369	29,743	75.2	6291	7745	81.2
Cervix	37,151	30,696	82.6				30,696	37,151	82.6
Soft tissue including heart	33,779	27,792	82.3	15,218	18,743	81.2	12,574	15,036	83.6
Testis	25,477	18,471	72.5	18,471	25,477	72.5	–	–	–
Hodgkin lymphoma	25,377	19,742	77.8	10,858	14,079	77.1	8884	11,298	78.6
Small intestine	25,027	19,682	78.6	10,233	13,204	77.5	9449	11,823	79.9
Tonsil	23,928	19,026	79.5	15,569	19,652	79.2	3457	4276	80.8
Anus, anal canal, and anorectum	20,302	16,372	80.6	5853	7413	79.0	10,519	12,889	81.6
Other biliary	18,902	16,125	85.3	8673	10,161	85.4	7452	8741	85.3
Other non-epithelial skin	17,678	10,407	58.9	6283	10,739	58.5	4124	6939	59.4
Gum and other mouth	16,792	12,932	77.0	7171	9346	76.7	5761	7446	77.4
Vulva	15,085	12,147	80.5				12,147	15,085	80.5
Salivary gland	13,394	10,047	75.0	5735	7781	73.7	4312	5613	76.8
Gallbladder	12,050	9263	76.9	2957	3844	76.9	6306	8206	76.8
Mesothelioma	9778	7242	74.1	5385	7420	72.6	1857	2358	78.8
Bones and joints	9292	7572	81.5	4249	5234	81.2	3323	4058	81.9
Eye and orbit	8653	5972	69.0	3268	4703	69.5	2704	3950	68.5
Other endocrine including thymus	7356	5701	77.5	2964	3845	77.1	2737	3511	78.0
Nose, nasal cavity, and middle ear	7069	5962	84.3	3568	4272	83.5	2394	2797	85.6

TABLE 1 continued

Primary site	USCS count	NCDB count	Case coverage	NCDB male count	USCS male count	Case coverage male	NCDB female count	USCS female count	Case coverage female
Other female genital organs	7004	6405	91.5				6405	7004	91.4
Hypopharynx	6910	5588	80.9	4469	5604	79.7	1119	1306	85.7
Ureter	6026	4868	80.8	2991	3733	80.1	1877	2293	81.9
Floor of mouth	5953	4790	80.5	3272	4089	80.0	1518	1864	81.4
Peritoneum, omentum, and mesentery	5913	5522	93.4	360	472	76.3	5162	5441	94.9
Lip	5896	2999	50.9	2142	4270	50.2	857	1626	52.7
Oropharynx	5846	4788	81.9	3655	4478	81.6	1133	1368	82.8
Other digestive organs	5785	3959	68.4	1991	2952	67.4	1968	2833	69.5
Nasopharynx	5420	4070	75.1	2853	3850	74.1	1217	1570	77.5
Uterus, NOS	5077	4672	92.0				4672	5077	92.0
Penis	4135	2845	68.8	2845	4135	68.8	.	.	.
Retroperitoneum	3932	3335	84.8	1653	1972	83.8	1682	1960	85.8
Vagina	3931	3061	77.9				3061	3931	77.9
Other oral cavity and pharynx	3517	1801	51.2	1374	2743	50.1	427	774	55.2
Kaposi sarcoma	3437	2000	58.2	1821	3060	59.5	179	377	47.5
Other urinary organs	3328	2326	69.9	1575	2295	68.6	751	1033	72.7
Trachea, mediastinum, and other respiratory organs	1855	1488	80.2	997	1245	80.1	491	610	80.5
Other male genital organs	1108	679	61.3	679	1108	61.3	–	–	–
Pleura	324	231	71.3	130	189	68.8	101	135	74.8

USCS United States Cancer Statistics, NOS not otherwise specified

^aAll cancer sites combined exclude in situ, except for urinary bladder

^bUSCS data not available by sex for brain and cranial nerves

cover 100% of the U.S. population.⁵ This study aimed to update the NCDB comparisons using USCS data from 2012 to 2014.

METHODS

Incident cancer cases in the NCDB in 2012–2014 were compared with the number of cancer cases in the USCS data for the 2012–2014 diagnosis years. Comparisons were made by primary site, age, sex, race/ethnicity, and the patient's state of diagnosis. Patients living in the U.S. 50 states and the District of Columbia at the time of diagnosis were included in the analyses. The study excluded NCDB patients with a diagnosis and/or, treatment in Veteran's Administration (VA) hospitals. Although the USCS data includes some patient data from VA hospitals, the exact number of VA patients in the USCS is unknown. A survey administered in December 2014 showed 18 NPCR states reporting that they received no data from VA hospitals and 8 states reporting that some but not all VA hospitals were reporting data to their cancer registry (Reda Wilson, personal communication, 8 January 2018).

The USCS cancer data excludes in situ cases except for urinary bladder, and includes separate primary-site categories for invasive and in situ breast. In addition, a separate

brain and cranial nerve data file is available, which includes invasive and benign tumors. The other primary site categories in the USCS data use the SEER site recode (ICD-0-3) groups,⁶ which are also used by the NCDB. The metric used is the number of cases in the NCDB divided by the number of cases in the USCS.

The number of CoC hospitals providing data in 2012–2014 also was assessed and compared with the number of acute-care short-term hospitals in the United States in 2014 from the Area Health Resource Files.⁷ Short-term hospitals are general or specialized hospitals in which the majority of patients stay fewer than 30 days. Long-term facilities as well as psychiatric and specialty hospitals were excluded. All analyses were performed using SAS software (version 9.4; SAS Statistical Institute, Cary NC, USA).

RESULTS

In 2012–2014, the NCDB captured 72.5% of the cancer cases in the United States (Table 1), which is slightly higher than the 67.4% reported for 2004–2006⁴ and the 68.6% reported for 2005.³ Case coverage was slightly higher in 2014 (73.2%) than in 2012 (71.6%) (Table 2).

TABLE 2 Case counts and coverage for United States Cancer Statistics (USCS) and National Cancer Data Base (NCDB) by diagnosis year, race/ethnicity, and age for all cancer sites in 2012–2014

	USCS count	NCDB count	Coverage
Diagnosis year			
2012	1,577,351	1,129,911	71.6
2013	1,595,842	1,157,770	72.5
2014	1,596,486	1,168,446	73.2
Age group (years)			
0–19	45,395	31,088	68.5
20–44	347,139	276,448	79.6
45–54	614,225	484,549	78.9
55–64	1,160,696	874,311	75.3
65–74	1,323,349	947,927	71.6
75–84	897,754	613,806	68.4
≥ 85	381,121	227,998	59.8
Pediatric, AYA age groups (years)			
0–14	31,035	20,218	65.1
15–29	77,867	61,151	78.5
30–39	143,497	113,832	79.3
Race/ethnicity			
White	3,995,821	2,902,931	72.6
Black	519,153	381,341	73.5
American Indian/Alaskan Native	27,122	11,230	41.4
Asian/Pacific Islander	146,572	99,056	67.6
Hispanic	361,851	197,457	54.6

AYA Adolescent young adult

Among the top 10 major cancer sites, the highest case coverage (80%) was found for breast cancer, and the lowest for melanoma of the skin (52%) and prostate (58%). Colon, bladder, and kidney and renal pelvis cancers had relatively high coverage of 71%, 70%, and 78%, respectively, whereas lung and bronchus had slightly lower coverage (65%). For malignant brain and other nervous system tumors, coverage was 86%, but for benign/in situ brain and other nervous system tumors, coverage was only 58%.

Comparing coverage by sex, females had slightly higher coverage (77%) than males (68%). This is partially explained by the high coverage for breast cancer compared with the lower coverage for prostate cancer. For most primary sites, the coverage rates for males and females were similar. Relatively high coverage was also found for most female gynecologic sites, such as ovary (83%), corpus and uterus NOS (82%), and cervix (83%).

TABLE 3 Case coverage by patient state for all cancer sites in 2012–2014

Diagnosis state	NCDB count	USCS count	Case coverage
Alaska	5430	8003	67.8
Alabama	48,800	76,344	63.9
Arkansas	9440	47,857	19.7
Arizona	28,321	87,921	32.2
California	258,680	488,056	53.0
Colorado	52,649	66,526	79.1
Connecticut	57,875	61,734	93.7
District of Columbia	7919	8721	90.8
Delaware	14,650	16,951	86.4
Florida	212,902	332,366	64.1
Georgia	112,960	140,670	80.3
Hawaii	14,708	20,838	70.6
Iowa	38,927	52,126	74.7
Idaho	16,766	22,602	74.2
Illinois	169,125	198,066	85.4
Indiana	84,823	98,288	86.3
Kansas	24,892	44,523	55.9
Kentucky	63,189	79,280	79.7
Louisiana	55,244	73,297	75.4
Massachusetts	83,537	108,979	76.7
Maryland	74,876	88,884	84.2
Maine	21,474	25,632	83.8
Michigan	133,458	159,035	83.9
Minnesota	64,482	84,614	76.2
Missouri	78,319	96,947	80.8
Mississippi	33,550	46,837	71.6
Montana	13,289	16,845	78.9
North Carolina	127,999	153,658	83.3
North Dakota	10,604	10,837	97.8
Nebraska	22,924	28,189	81.3
New Hampshire	16,389	23,578	69.5
New Jersey	124,919	149,442	83.6
New Mexico	15,787	26,782	58.9
Nevada	14,592	35,832	40.7
New York	232,515	327,495	71.0
Ohio	168,202	188,193	89.4
Oklahoma	34,026	57,866	58.8
Oregon	45,988	60,954	75.4
Pennsylvania	184,487	233,568	79.0
Rhode Island	16,653	18,451	90.3
South Carolina	58,495	76,332	76.6
South Dakota	9570	13,320	71.8
Tennessee	85,450	103,796	82.3
Texas	197,230	313,294	63.0
Utah	17,571	29,440	59.7
Virginia	99,104	114,342	86.7
Vermont	7226	10,823	66.8
Washington	82,156	105,314	78.0

TABLE 3 continued

Diagnosis state	NCDB count	USCS count	Case coverage
Wisconsin	73,962	94,260	78.5
West Virginia	26,074	34,245	76.1
Wyoming	3919	7726	50.7

NCDB National Cancer Data Base, USCS United States Cancer Statistics

Age group comparisons showed the lowest coverage (60%) for the 85 and older age group, with the highest coverage for those 20–64 years of age (77%) (Table 2). The pediatric age group (0–19 years) had 68% coverage, and the adolescent and young adult (AYA) group (15–39 years) had 79% case coverage.

Race and ethnicity comparisons showed that coverage was similar for whites (73%) and blacks (73%), intermediate for Asian/Pacific Islanders (68%), and lowest for Hispanics (55%) and American Indian/Alaskan Natives (AIAN) (41%).

Differences in coverage by the patient's state at diagnosis are influenced by the number of CoC-accredited hospitals in the state or surrounding states. The state of Wyoming, which has only one CoC-accredited facility, had 51% coverage, whereas North Dakota, which has six CoC-accredited facilities, had the highest coverage (98%) (Table 3). Three states and the District of Columbia had more than 90% coverage, and 14 states had 80% to 89% coverage. The lowest coverage occurred in Nevada (41%) and Arizona (32%).

The states also were grouped by census division. The East North Central and New England divisions had the highest coverage, at 85% and 81%, respectively (Table 4). The lowest coverage was found in the Mountain and Pacific divisions, with coverage at 55% and 60%. Census division case coverage for the top 10 cancers mirrored that for all cancers, with New England and East North Central having the highest coverage and the Mountain and Pacific having the lowest coverage. Prostate cancer is one example of this, with case coverage of 73% in the East North Central division and 74% in the New England division, and with 43% coverage in the Mountain region and 47% in the Pacific region.

After VA hospitals were excluded, there were 1475 CoC-accredited hospitals in 2012–2014 compared with 5927 acute-care hospitals in the United States in that year, representing 25% of acute-care hospitals. The distribution of hospital coverage and case coverage is shown in Fig. 1. In general, the higher the hospital coverage was, the higher the case coverage was also. The states in the Northeast had

the highest hospital and case coverage, whereas Arkansas, Arizona, and Nevada had low hospital coverage and low case coverage.

DISCUSSION

Overall coverage of cancer cases in the NCDB has remained relatively stable at 72%, with a slight increase above the 67% found in 2004–2006.⁴ Case coverage also increased slightly between 2012 and 2014, as did the number of CoC-accredited facilities (excluding VA facilities), which increased from 1455 to 1475, representing approximately 25% of acute-care facilities. Most primary sites have seen slight increases in coverage since 2004–2006⁴ or have stayed relatively the same. The primary sites at which cancer is often diagnosed and/or treated in an outpatient setting, such as prostate and melanoma of the skin, had the lowest case coverage. Coverage was slightly higher for females than for males, which is partially explained by the high coverage for breast cancer and low coverage for prostate cancer. In addition, some USCS states include data from VA hospitals, which are not included in the NCDB data.

The distribution of coverage by states increased for most states compared with 2004–2006.⁴ Since 2004–2006, 25 states had increases in coverage of 5% or more, with 7 states having increases of 10% or more including New York, Wisconsin, Michigan, Nebraska, West Virginia, Louisiana, and Wyoming. These may reflect newly accredited facilities in these states or surrounding states since 2006.

The states in the Northeast had the highest coverage of both hospitals and cases, and the West and Southwest had both lower case coverage and lower hospital coverage. Data by U.S. census divisions show similar findings, with the highest coverage in the New England (82%) and East North Central (85%) census divisions and the lowest coverage in the Mountain (55%) and Pacific divisions (60%). Similar coverage patterns by major cancer sites also were found by census division. These patterns may also be due to the higher population density in the East, where distance to a CoC facility may be shorter than for patients in lower-density areas in the West and Southwest. Although 93% of the patients received diagnosis, treatment, or both at a facility in their state of residence when their cancer was diagnosed, there was variation by state of residence. The states with a small number of CoC facilities were more likely to have a higher percentage of patients with treatment in a different state from their state of residence (data not shown).

TABLE 4 Case coverage by patient census division and primary site: all sites, and top 10 primary sites

Census division ^a	Primary site	NCDB count	USCS count	Case coverage
New England	All cancer sites combined	203,154	249,197	81.5
Middle Atlantic	All cancer sites combined	541,921	710,505	76.3
East North Central	All cancer sites combined	629,570	737,842	85.3
West North Central	All cancer sites combined	249,718	330,556	75.5
South Atlantic	All cancer sites combined	734,979	966,169	76.1
East South Central	All cancer sites combined	230,989	306,257	75.4
West South Central	All cancer sites combined	295,940	492,314	60.1
Mountain	All cancer sites combined	162,894	293,674	55.5
Pacific	All cancer sites combined	406,962	683,165	59.6
New England	Colon and rectum	16,711	19,767	84.5
Middle Atlantic	Colon and rectum	46,397	60,291	77.0
East North Central	Colon and rectum	55,343	65,669	84.3
West North Central	Colon and rectum	22,011	29,948	73.5
South Atlantic	Colon and rectum	63,796	82,269	77.5
East South Central	Colon and rectum	21,186	28,914	73.3
West South Central	Colon and rectum	27,910	45,871	60.8
Mountain	Colon and rectum	13,275	24,905	53.3
Pacific	Colon and rectum	35,154	59,036	59.5
New England	Corpus and uterus, NOS	7403	8834	83.8
Middle Atlantic	Corpus and uterus, NOS	21,788	26,003	83.8
East North Central	Corpus and uterus, NOS	24,125	25,722	93.8
West North Central	Corpus and uterus, NOS	9283	10,807	85.9
South Atlantic	Corpus and uterus, NOS	25,401	29,429	86.3
East South Central	Corpus and uterus, NOS	7311	8036	91.0
West South Central	Corpus and uterus, NOS	9866	13,418	73.5
Mountain	Corpus and uterus, NOS	5717	9109	62.8
Pacific	Corpus and uterus, NOS	16,047	22,725	70.6
New England	Female breast ^b	43,484	49,323	88.2
Middle Atlantic	Female breast	112,235	131,929	85.1
East North Central	Female breast	123,108	133,396	92.3
West North Central	Female breast	47,229	57,170	82.6
South Atlantic	Female breast	155,563	177,215	87.8
East South Central	Female breast	41,228	50,849	81.1
West South Central	Female breast	58,899	84,105	70.0
Mountain	Female breast	33,470	54,230	61.7
Pacific	Female breast	88,416	132,561	66.7
New England	Kidney and Renal Pelvis	6970	8385	83.1
Middle Atlantic	Kidney and renal pelvis	20,232	24,232	83.5
East North Central	Kidney and renal pelvis	25,043	27,770	90.2
West North Central	Kidney and renal pelvis	10,001	12,436	80.4
South Atlantic	Kidney and renal pelvis	27,625	33,105	83.4
East South Central	Kidney and renal pelvis	9984	11,970	83.4
West South Central	Kidney and renal pelvis	14,777	21,908	67.5
Mountain	Kidney and renal pelvis	6232	10,614	58.7
Pacific	Kidney and renal pelvis	14,714	23,784	61.9
New England	Lung and bronchus	25,248	34,573	73.0
Middle Atlantic	Lung and bronchus	63,054	90,341	69.8
East North Central	Lung and bronchus	79,967	108,418	73.8

TABLE 4 continued

Census division ^a	Primary site	NCDB count	USCS count	Case coverage
West North Central	Lung and bronchus	30,863	46,559	66.3
South Atlantic	Lung and bronchus	95,881	141,170	67.9
East South Central	Lung and bronchus	33,700	51,538	65.4
West South Central	Lung and bronchus	35,053	68,149	51.4
Mountain	Lung and bronchus	15,958	34,224	46.6
Pacific	Lung and bronchus	41,754	74,972	55.7
New England	Melanomas of the skin	7056	11,565	61.0
Middle Atlantic	Melanomas of the skin	18,667	29,890	62.5
East North Central	Melanomas of the skin	19,935	30,739	64.9
West North Central	Melanomas of the skin	9482	16,638	57.0
South Atlantic	Melanomas of the skin	24,835	49,037	50.6
East South Central	Melanomas of the skin	7110	13,052	54.5
West South Central	Melanomas of the skin	6389	16,538	38.6
Mountain	Melanomas of the skin	6545	16,037	40.8
Pacific	Melanomas of the skin	14,553	37,182	39.1
New England	Non-Hodgkin lymphoma	8631	10,752	80.3
Middle Atlantic	Non-Hodgkin lymphoma	23,907	31,118	76.8
East North Central	Non-Hodgkin lymphoma	26,651	30,797	86.5
West North Central	Non-Hodgkin lymphoma	10,887	14,480	75.2
South Atlantic	Non-Hodgkin lymphoma	28,503	37,035	77.0
East South Central	Non-Hodgkin lymphoma	8735	11,428	76.4
West South Central	Non-Hodgkin lymphoma	12,037	20,388	59.0
Mountain	Non-Hodgkin lymphoma	6934	12,016	57.7
Pacific	Non-Hodgkin lymphoma	18,031	30,407	59.3
New England	Prostate	19,392	26,057	74.4
Middle Atlantic	Prostate	47,059	82,935	56.7
East North Central	Prostate	59,935	82,246	72.9
West North Central	Prostate	24,294	36,597	66.4
South Atlantic	Prostate	67,390	112,282	60.0
East South Central	Prostate	22,625	35,835	63.1
West South Central	Prostate	23,901	54,848	43.6
Mountain	Prostate	14,507	33,695	43.1
Pacific	Prostate	36,080	76,485	47.2
New England	Thyroid	7096	9033	78.6
Middle Atlantic	Thyroid	23,270	26,496	87.8
East North Central	Thyroid	19,595	20,756	94.4
West North Central	Thyroid	7257	8941	81.2
South Atlantic	Thyroid	23,029	25,366	90.8
East South Central	Thyroid	6069	7023	86.4
West South Central	Thyroid	10,171	14,332	71.0
Mountain	Thyroid	7197	11,066	65.0
Pacific	Thyroid	13,693	20,927	65.4
New England	Urinary bladder	11,618	13,551	85.7
Middle Atlantic	Urinary bladder	25,890	35,586	72.8
East North Central	Urinary bladder	29,070	35,749	81.3
West North Central	Urinary bladder	10,975	15,314	71.7
South Atlantic	Urinary bladder	30,972	42,637	72.6
East South Central	Urinary bladder	8870	12,715	69.8
West South Central	Urinary bladder	10,021	18,514	54.1

TABLE 4 continued

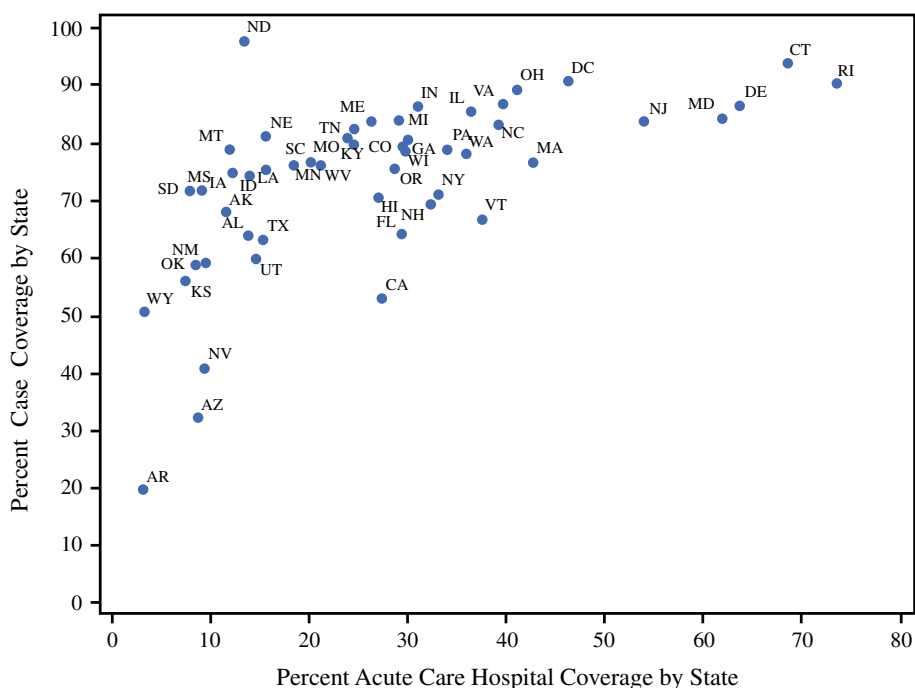
Census division ^a	Primary site	NCDB count	USCS count	Case coverage
Mountain	Urinary bladder	6905	13,781	50.1
Pacific	Urinary bladder	16,986	29,367	57.8

NOS not otherwise specified

^aNew England: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont; Middle Atlantic: New Jersey, New York, Pennsylvania; East North Central: Indiana, Illinois, Michigan, Ohio, Wisconsin; West North Central: Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota; South Atlantic: Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia; East South Central: Alabama, Kentucky, Mississippi, Tennessee; West South Central: Arkansas, Louisiana, Oklahoma, Texas; Mountain: Arizona, Colorado, Idaho, New Mexico, Montana, Utah, Nevada, Wyoming; Pacific: Alaska, California, Hawaii, Oregon, Washington

^bFemale breast includes malignant and in situ cases

FIG. 1 Percentage of National Cancer Data Base (NCDB) case coverage in 2012–2014 by percentage of NCDB short-term acute-care hospital coverage by state in 2014



Comparisons by race for all cancer sites showed that whites and blacks have a similar coverage rate (73%). Asians and Pacific Islanders had slightly lower coverage (68%) than whites and blacks. The lowest coverage (41%) was found for American Indians and Alaskan natives. In 2010, the states with the highest American Indian populations in the United States were California, Oklahoma, Arizona and Texas,⁸ which had relatively low coverage rates in the NCDB. Also, the SEER and NPCR cancer registries are able to link their data to the Indian Health Service Administrative records to help identify the American Indian and Alaskan native population.⁹

Hispanic coverage in the NCDB was only 56%. The lower coverage rates for Hispanics, Asians, and Pacific Islanders may be partially due to the fact that North American Association of Central Cancer Registries (NAACCR) uses an algorithm that identifies Hispanics as well as Asians and Pacific Islanders, which is not available to hospitals.⁹ In addition, California, Texas, Arizona, and New Mexico have the highest percentage of Hispanics in the United States,¹⁰ and these states also have lower case coverage in the NCDB.

Lower coverage rates for the oldest group may be partially due to the fact that the state registries also identify a

small percentage of cases based on death certificates alone.¹¹ Although no more than 5% of cases in the registry are allowed to be based on death certificate alone, these may be more likely to occur for elderly patients. The NCDB data do not include death certificate-alone cases, and this may have a slight impact on the coverage of the oldest cancer patients.

The fact that the NCDB case coverage has remained relatively stable during the past decade is relevant to users of the NCDB Participant User Files (PUFs). These files are a de-identified subset of the NCDB data available to researchers at CoC facilities.¹² However, these users should also be aware of some differences in case coverage by primary site, geography, age, race, and Hispanic origin documented in this report. Users of PUFs should be aware of these differences when analyzing data for any of these subgroups.

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