

CINA Deluxe Data Quality Profile

Date DQP produced: September 23, 2016

Variable examined: Radiation Therapy (NAACCR Data Item #: 1360 and 1570)

Filters: Invasive cases only; excluded lymphoma, leukemia, DCO, and autopsy cases

Diagnosis Years covered: 2009-2013

Cancer Sites: Rectum, lung, female breast, prostate, and cervix

Database citation: CINA Analytic File, 1995-2013, Expanded Races

Number of Registries included: 48 State Registries plus DC Cancer Registry (Three registries including Minnesota, Nevada, and New Mexico that did not meet the NAACCR data quality for years 2009 to 2013 were excluded.)

Data Dictionary: NAACCR Data Dictionary 15

(<http://www.naacr.org/LinkClick.aspx?fileticket=xSH32ZzIzGI%3d&tabid=133&mid=473>)

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Technical Notes:

1. The radiation status was created based on two radiation related treatment data items: RX Summ—Radiation (NAACCR#: 1360) and RX Summ--Rad Regional RX Modality (NAACCR#: 1570). The unknown radiation was based on both radiation related treatment data items with unknown or blank values.

2. Upper Whisker: extends to largest data point within the boundary of $Q3 + 1.5 * (Q3 - Q1)$.
3. Diagnostic confirmation: Microscopic confirmed includes positive histology, positive cytology, and positive microscopic confirmation, method not specified.
4. Type of reporting source: Hospital includes hospital inpatient, radiation treatment centers/medical oncology centers, and other hospital outpatient units/surgery centers.
5. Urban/Rural 2013: The definition of metropolitan area is based on county using 2013 Rural/Urban Continuum Code. Metropolitan area include county metro area with population ≥ 1 million, county metro area with population between 25,000 and 1 million, and county metro area with population $< 25,000$.

Table 1. Unknown radiation by cancer site, Years 2009-2013 combined.

	Rectum		Lung		Breast		Prostate		Cervix	
Registry Level										
25-75% Percentile (IQR)	0.6-3.4%		0.8-3.0%		0.8-3.5%		0.8-5.6%		0.5-3.0%	
Minimum	0.0%		0.0%		0.0%		0.0%		0.0%	
Mean	2.4%		3.1%		2.5%		4.4%		2.8%	
Median	1.7%		1.7%		1.7%		3.1%		1.3%	
Maximum	14.0%		40.2%		10.3%		35.8%		37.0%	
Upper Whisker ¹	7.6%		6.3%		7.5%		12.7%		6.8%	
# outside of upper whisker	2		6		2		3		5	
All cases combined	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk
Sex										
Male	83,741	2.3	534,925	2.9	-	-	970,236	4.2	-	-
Female	58,878	2.5	474,379	2.7	1,079,677	2.4	-	-	59,714	2.6
Race										
White	116,882	2.1	867,827	2.8	899,109	2.3	759,790	3.5	45,565	2.4
Black	16,477	2.9	108,354	2.6	125,939	2.7	150,810	3.9	9,798	2.4
AI/AN	962	1.7	5,019	2.8	5,223	2.5	3,677	2.7	552	3.3
Asian or Pacific Islander	6,139	3.2	24,302	2.7	39,445	2.2	20,265	4.3	2,754	1.8
Unknown race	2,159	13.2	3,802	6.7	9,961	9.4	35,694	18.9	1,045	12.6
Age										
00-49 years	20,465	2.2	41,386	2.0	211,660	2.3	28,178	3.1	29,939	2.6
50-64 years	55,258	2.4	285,430	2.4	397,760	2.3	396,307	3.3	18,088	2.2
65-74 years	32,967	2.3	336,975	2.6	252,572	2.3	366,966	4.0	6,756	2.4
75+ years	33,929	2.5	345,513	3.5	217,685	2.9	178,785	6.5	4,931	3.7
Dx Confirmation²										
Microscopic confirmed	140,496	2.2	917,975	1.8	1,069,735	2.3	949,719	3.9	58,642	2.2
Non-microscopic confirmed	1,315	4.6	71,271	4.3	5,749	9.6	10,441	4.5	392	7.9
Unknown	808	36.1	20,058	43.3	4,193	40.5	10,076	32.8	680	27.1
Type of reporting source³										
Hospital	136,709	1.6	979,450	2.0	1,052,141	2.1	855,034	2.2	57,697	1.8
Non-hospital	5,910	19.9	29,854	30.0	27,536	16.4	115,202	19.0	2,017	24.8
Urban/Rural 2003⁴										
Metro	116,254	2.2	813,920	2.4	918,411	2.3	810,187	4.0	50,366	2.4
Non-Metro	25,656	3.0	191,116	3.9	156,881	3.3	154,805	4.3	9,104	2.8
Unknown	709	3.4	4,268	37.2	4,385	6.2	5,244	32.3	244	30.3
Derived SEER SS2000										
Localized	60,517	1.8	196,082	1.7	681,048	1.9	748,186	2.8	25,842	1.8
Regional	45,643	0.8	234,495	1.7	308,912	2.2	110,344	1.7	21,464	1.0
Distant	23,672	1.2	519,591	1.6	62,248	2.0	46,479	2.2	8,525	1.4
Unknown	12,787	13.0	59,136	21.6	27,469	20.2	65,227	25.0	3,883	18.5

Figure 1
 % Unknown Radiation Therapy by Registry
 Rectal Cancer, 2009-2013

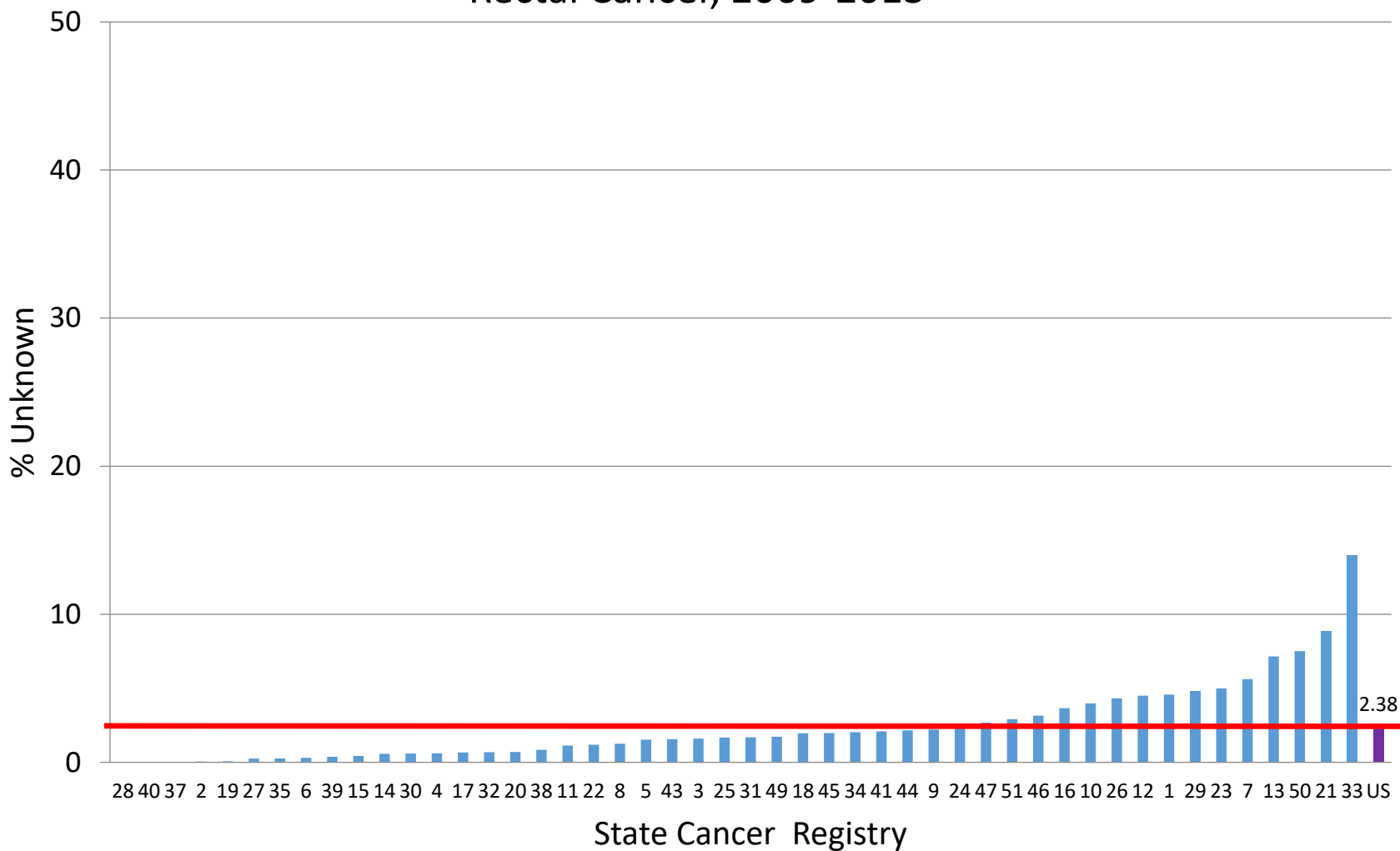


Figure 2
 % Unknown Radiation Therapy by Registry
 Lung Cancer, 2009-2013

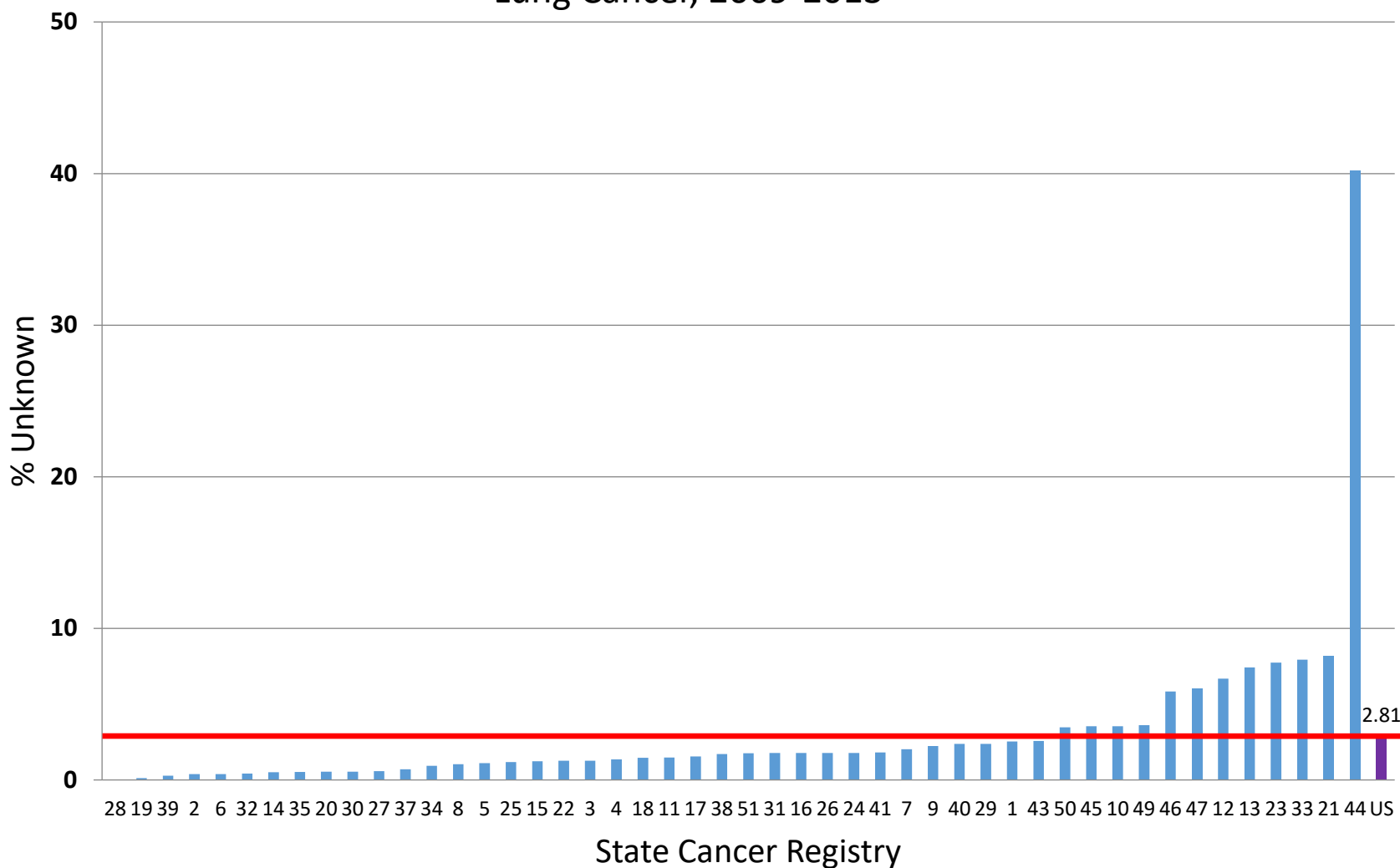


Figure 3
% Unknown Radiation Therapy by Registry
Female Breast Cancer, 2009-2013

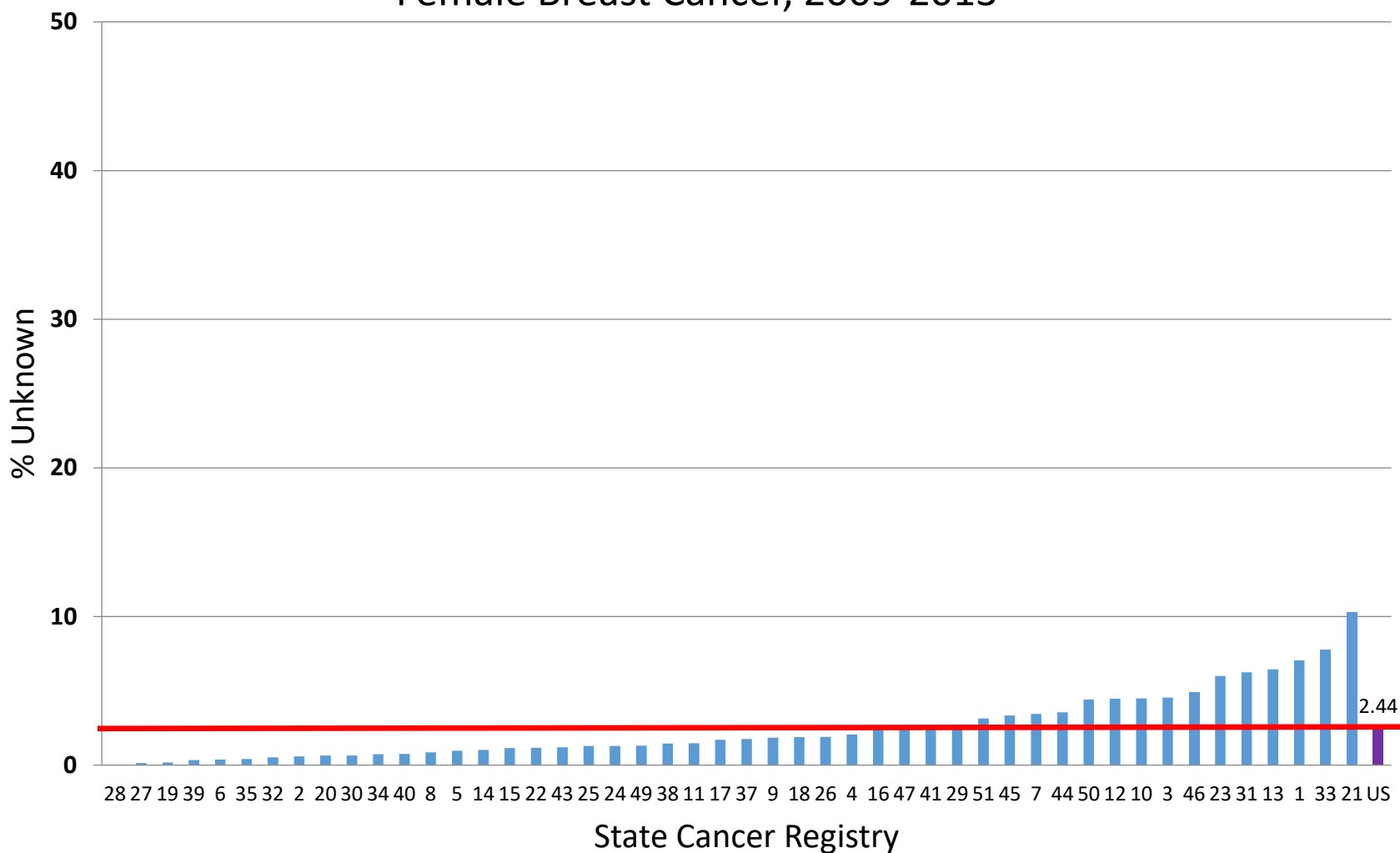


Figure 4
 % Unknown Radiation Therapy by Registry
 Prostate Cancer, 2009-2013

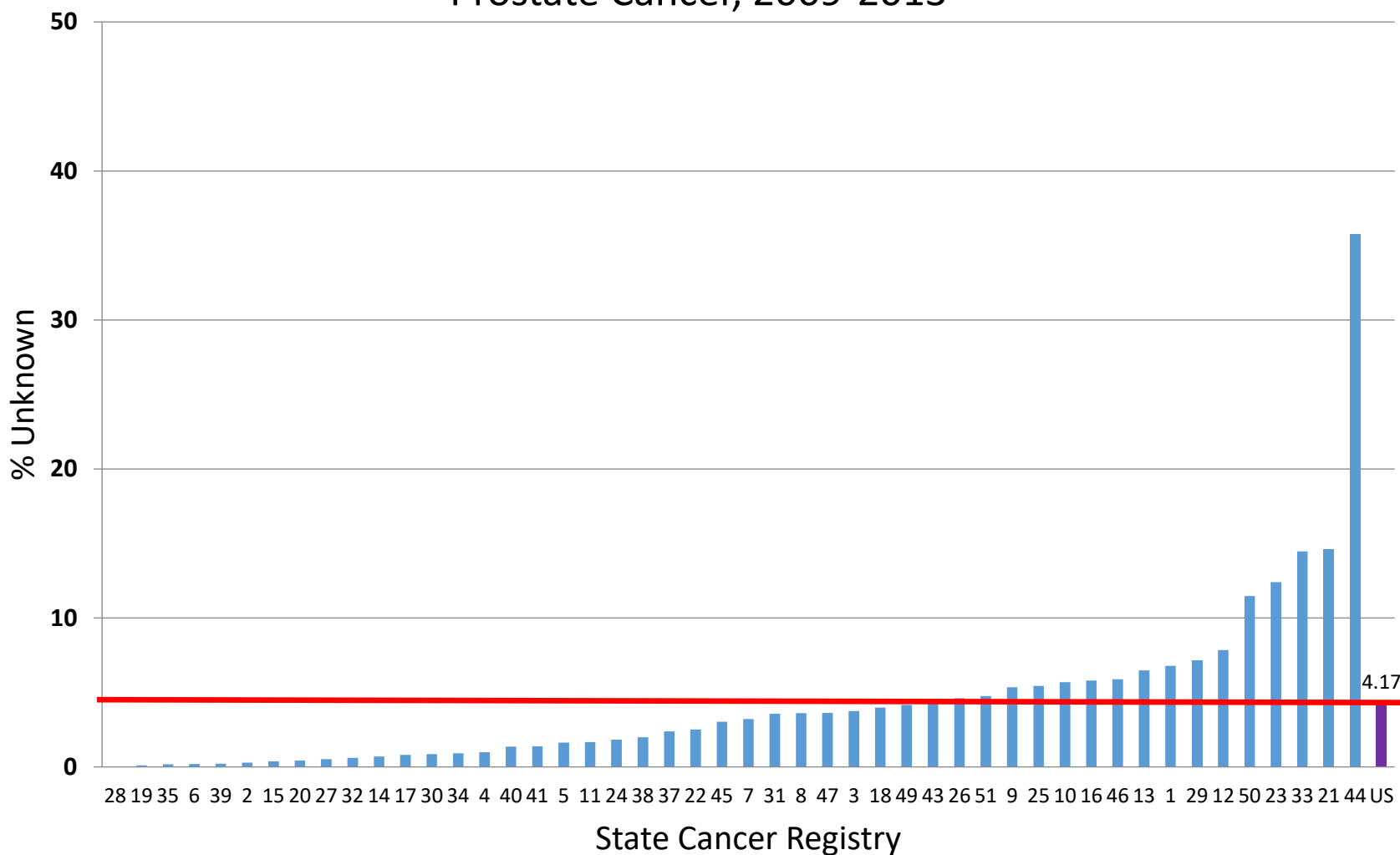


Figure 5
 % Unknown Radiation Therapy by Registry
 Cervical Cancer, 2009-2013

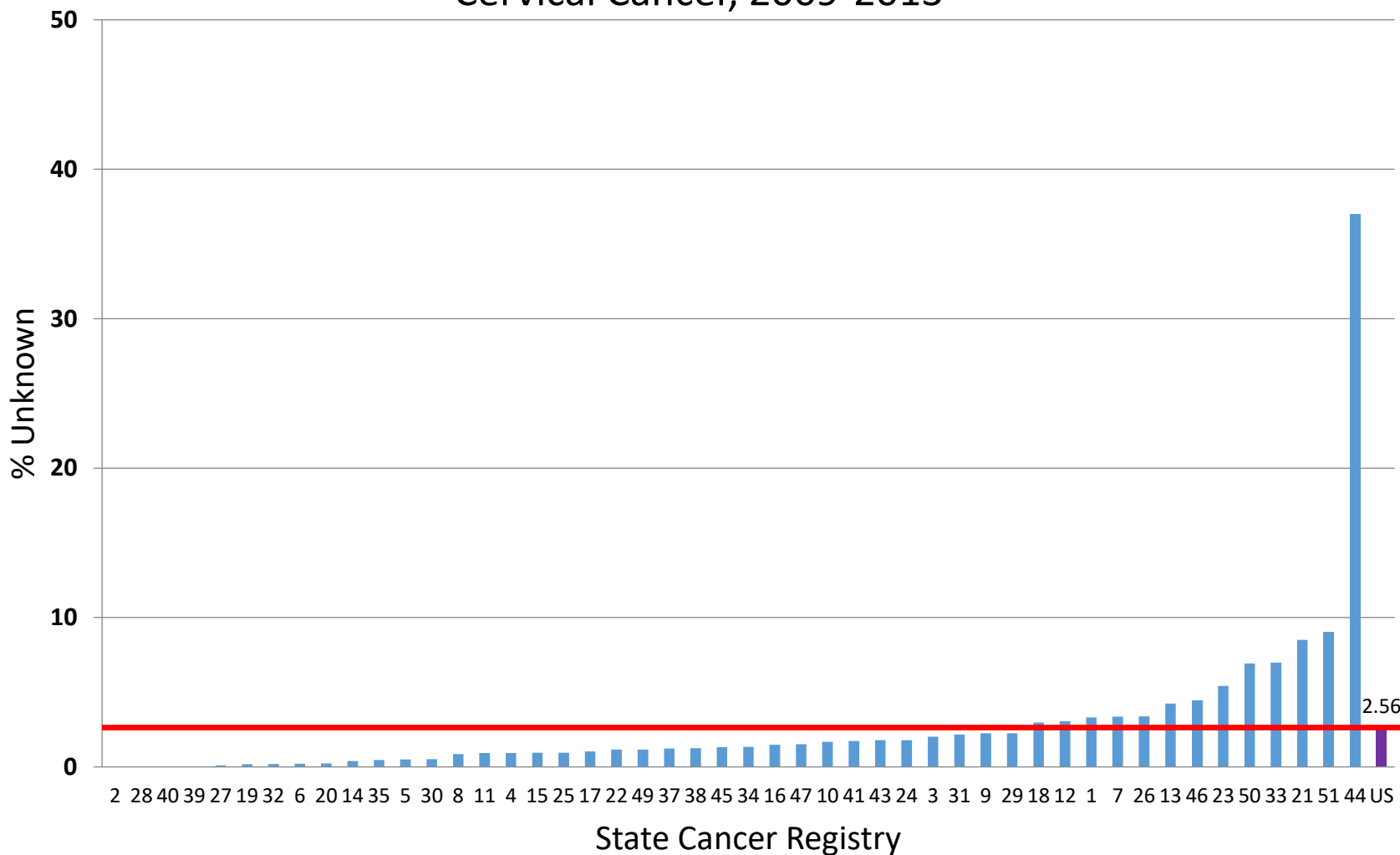


Table 2. Unknown radiation by diagnosis year: Rectal cancer 2009-2013

	2009		2010		2011		2012		2013	
Registry Level										
25-75% Percentile (IQR)	0.2-2.1%		0.0-2.3%		0.4-2.8%		0.9-4.7%		0.7-4.2%	
Minimum	0.0%		0.0%		0.0%		0.0%		0.0%	
Mean	1.6%		1.5%		2.1%		3.3%		3.6%	
Median	0.7%		1.2%		1.1%		2.3%		2.4%	
Maximum	11.2%		6.8%		18.4%		17.0%		21.9%	
Upper Whisker ¹	4.9%		5.6%		6.4%		10.4%		9.5%	
# outside of upper whisker	4		4		3		3		6	
All cases combined	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk
Sex										
Male	16,877	1.7	16,477	1.6	16,494	1.9	16,889	3.1	17,004	3.1
Female	11,933	1.8	11,801	1.7	11,762	2.1	11,613	3.6	11,769	3.5
Race										
White	23,834	1.5	23,181	1.5	23,171	1.7	23,385	2.9	23,311	2.8
Black	3,310	2.2	3,373	1.7	3,184	2.2	3,191	4.6	3,419	3.7
AI/AN	203	1.5	161	0.6	183	1.1	203	1.5	212	3.3
Asian or Pacific Islander	1,085	2.7	1,208	1.7	1,305	4.1	1,242	3.6	1,299	3.8
Unknown race	378	9.3	355	12.1	413	9.9	481	14.6	532	18.2
Age										
00-49 years	4,243	1.8	4,071	1.4	3,994	1.5	4,084	2.9	4,073	3.1
50-64 years	10,749	1.8	10,820	1.5	10,983	2.1	11,170	3.2	11,536	3.4
65-74 years	6,612	1.4	6,463	1.9	6,403	1.9	6,733	3.3	6,756	3.1
75+ years	7,206	1.9	6,924	1.7	6,876	2.1	6,515	3.7	6,408	3.1
Dx Confirmation²										
Microscopic confirmed	28,412	1.6	27,851	1.4	27,816	1.7	28,054	3.1	28,363	3.1
Non-microscopic confirmed	253	4.3	255	5.5	260	2.7	280	6.1	267	4.1
Unknown	145	33.8	172	33.1	180	36.7	168	42.3	143	34.3
Type of reporting source³										
Hospital	27,123	1.2	27,194	1.2	27,166	1.1	27,449	2.3	27,777	2.3
Non-hospital	1,687	10.5	1,084	13.8	1,090	22.9	1,053	29.4	996	29.3
Urban/Rural 2013⁴										
Metro	23,393	1.7	23,038	1.4	23,027	1.8	23,316	3.2	23,480	3.2
Non-Metro	5,261	2.1	5,117	2.7	5,086	2.8	5,042	3.9	5,150	3.5
Unknown	156	1.9	123	0.8	143	2.8	144	6.3	143	4.9
Derived SEER SS2000										
Localized	12,927	1.2	12,186	1.1	11,823	1.4	11,869	2.7	11,712	2.8
Regional	8,579	0.8	9,038	0.5	9,068	0.4	9,415	1.0	9,543	1.1
Distant	4,620	0.8	4,550	0.8	4,722	0.9	4,732	1.9	5,048	1.7
Unknown	2,684	9.2	2,504	10.0	2,643	11.8	2,486	17.9	2,470	16.8

Table 3. Unknown radiation by diagnosis year: Lung cancer 2009-2013

	2009		2010		2011		2012		2013	
Registry Level										
25-75% Percentile (IQR)	0.4-2.0%		0.3-2.0%		0.4-2.2%		1.2-4.2%		1.0-3.4%	
Minimum	0.0%		0.0%		0.0%		0.0%		0.0%	
Mean	1.7%		1.6%		2.0%		5.3%		4.9%	
Median	1.1%		1.0%		1.0%		2.5%		2.4%	
Maximum	8.1%		6.7%		11.0%		99.5%		99.0%	
Upper Whisker ¹	4.4%		4.4%		4.8%		8.8%		7.1%	
# outside of upper whisker	6		5		7		5		5	
All cases combined	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk
Sex										
Male	108,795	2.3	106,824	2.0	106,694	2.2	106,851	4.1	105,761	3.8
Female	94,785	2.2	93,858	1.9	94,184	2.0	95,890	3.9	95,662	3.7
Race										
White	175,792	2.3	172,911	1.9	172,820	2.1	173,881	4.0	172,423	3.8
Black	21,590	1.7	21,459	1.9	21,596	1.9	22,037	3.9	21,672	3.4
AI/AN	946	2.7	1015	0.9	995	1.8	1013	4.1	1,050	4.5
Asian or Pacific Islander	4,536	1.9	4,637	1.4	4,809	2.0	5,034	4.1	5,286	3.7
Unknown race	716	6.7	660	4.8	658	5.0	776	8.5	992	7.5
Age										
00-49 years	9,620	1.7	8,765	1.3	8,157	1.3	7,631	3.0	7,213	3.2
50-64 years	56,819	1.9	56,866	1.6	57,393	1.7	57,579	3.7	56,773	3.3
65-74 years	66,956	1.9	65,658	1.6	66,518	1.8	68,634	3.8	69,209	3.6
75+ years	70,185	2.9	69,393	2.6	68,810	2.8	68,897	4.7	68,228	4.4
Dx Confirmation²										
Microscopic confirmed	184,521	1.1	182,365	0.9	182,953	1.0	184,124	3.0	184,012	3.1
Non-microscopic confirmed	14,722	3.9	13,852	3.1	13,834	3.9	14,496	5.4	14,367	5.3
Unknown	4,337	45.8	4,465	41.1	4,091	45.1	4,121	44.8	3,044	38.6
Type of reporting source³										
Hospital	193,711	1.2	194,980	1.0	195,639	1.2	197,760	3.2	197,360	3.2
Non-hospital	9,869	22.1	5,702	31.4	5,239	34.5	4,981	36.5	4,063	33.1
Urban/Rural 2013⁴										
Metro	164,329	2.0	161,833	1.6	161,694	1.6	163,153	3.4	162,911	3.2
Non-Metro	38,373	3.3	38,010	3.3	38,360	4.1	38,723	4.8	37,650	4.1
Unknown	878	0.8	839	1.2	824	2.1	865	88.0	862	91.9
Derived SEER SS2000										
Localized	39,383	0.9	37,732	0.7	38,539	0.8	39,812	2.9	40,616	2.9
Regional	46,936	0.9	46,797	0.8	46,840	0.9	47,005	3.0	46,917	3.1
Distant	102,797	0.9	103,638	0.8	103,548	0.9	104,950	2.7	104,658	2.7
Unknown	14,464	19.5	12,515	19.0	11,951	21.3	10,974	26.1	9,232	23.6

Table 4. Unknown radiation by diagnosis year: Female breast cancer 2009-2013

	2009		2010		2011		2012		2013	
Registry Level										
25-75% Percentile (IQR)	0.3-1.8%		0.2-2.1%		0.3-2.9%		1.0-4.9%		1.7-5.9%	
Minimum	0.0%		0.0%		0.0%		0.0%		0.0%	
Mean	1.3%		1.4%		1.9%		3.7%		4.1%	
Median	0.7%		0.6%		0.8%		2.4%		3.0%	
Maximum	10.1%		6.8%		9.5%		15.6%		13.5%	
Upper Whisker ¹	4.1%		4.8%		6.7%		10.7%		12.2%	
# outside of upper whisker	3		2		3		5		2	
All cases combined	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk
Race										
White	178,344	1.7	174,389	1.4	179,636	1.7	181,859	3.4	184,881	3.5
Black	24,104	1.8	24,226	1.6	25,409	1.7	25,642	4.0	26,558	4.2
AI/AN	940	1.8	950	0.8	1087	2.6	1071	3.5	1,175	3.5
Asian or Pacific Islander	6,881	1.1	7,503	1.3	7,929	1.7	8,341	3.6	8,791	3.0
Unknown race	1,759	7.9	1,759	6.2	1,753	6.6	2,149	12.8	2,541	11.8
Age										
00-49 years	43,825	1.7	41,847	1.3	42,372	1.6	41,879	3.6	41,737	3.6
50-64 years	77,667	1.6	77,247	1.3	80,103	1.6	80,550	3.4	82,193	3.5
65-74 years	46,664	1.5	46,856	1.4	49,731	1.7	53,054	3.2	56,267	3.5
75+ years	43,872	2.0	42,877	2.1	43,608	2.3	43,579	4.2	43,749	4.1
Dx Confirmation²										
Microscopic confirmed	209,768	1.5	206,734	1.3	213,845	1.5	217,124	3.4	222,264	3.5
Non-microscopic confirmed	1,377	7.3	1,163	7.2	1,077	8.3	1,113	13.2	1,019	13.1
Unknown	883	41.3	930	37.7	892	39.2	825	42.8	663	42.4
Type of reporting source³										
Hospital	203,098	1.4	203,904	1.1	211,237	1.3	214,469	3.2	219,433	3.3
Non-hospital	8,930	9.3	4,923	17.7	4,577	19.9	4,593	20.5	4,513	21.5
Urban/Rural 2013⁴										
Metro	179,977	1.6	177,348	1.3	183,324	1.5	186,340	3.4	191,422	3.5
Non-Metro	31,204	2.3	30,520	2.6	31,640	2.9	31,820	4.4	31,697	4.5
Unknown	847	1.3	959	2.3	850	4.5	902	10.5	827	12.6
Derived SEER SS2000										
Localized	131,235	1.1	129,792	1.0	136,319	1.2	139,529	2.9	144,173	3.0
Regional	62,737	1.4	61,143	1.1	61,487	1.4	61,685	3.6	61,860	3.5
Distant	11,840	1.4	12,230	1.2	12,535	1.2	12,763	3.1	12,880	3.0
Unknown	6,216	17.6	5,662	17.4	5,473	19.0	5,085	22.8	5,033	25.1

Table 5. Unknown radiation by diagnosis year: Prostate cancer 2009-2013

	2009		2010		2011		2012		2013	
Registry Level										
25-75% Percentile (IQR)	0.3-2.9%		0.2-4.1%		0.4-5.2%		1.3-7.8%		1.3-9.0%	
Minimum	0.0%		0.0%		0.0%		0.0%		0.0%	
Mean	2.2%		2.7%		3.3%		7.2%		7.5%	
Median	0.9%		1.0%		1.9%		4.4%		3.2%	
Maximum	16.7%		14.4%		17.7%		99.9%		99.6%	
Upper Whisker ¹	6.7%		9.8%		12.3%		17.4%		20.5%	
# outside of upper whisker	3		2		2		3		2	
All cases combined	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk
Race										
White	167,498	2.6	160,521	2.3	163,837	2.7	136,507	5.3	131,427	5.4
Black	31,943	2.9	30,931	3.1	31,815	3.0	28,448	5.2	27,673	5.4
AI/AN	772	1.4	768	1.4	742	2.4	706	3.7	689	4.8
Asian or Pacific Islander	4,152	3.5	4,094	2.7	4,441	4.5	3,785	5.6	3,793	5.3
Unknown race	6,733	8.8	7,419	14.5	7,813	16.6	6,875	26.4	6,854	28.9
Age										
00-49 years	6,589	2.7	6,046	1.9	6,065	2.1	5,098	4.8	4,380	4.8
50-64 years	86,207	2.3	83,096	2.0	86,201	2.4	72,039	5.2	68,764	5.3
65-74 years	77,791	2.7	75,994	2.8	78,153	3.1	67,975	5.9	67,053	6.2
75+ years	40,511	4.6	38,597	5.0	38,229	6.1	31,209	9.0	30,239	8.9
Dx Confirmation²										
Microscopic confirmed	206,948	2.6	199,508	2.5	204,435	3.0	172,224	5.8	166,604	6.0
Non-microscopic confirmed	2,065	3.6	2,051	4.0	1,998	3.1	2,133	6.0	2,194	5.7
Unknown	2,085	31.8	2,174	30.9	2,215	31.2	1,964	36.9	1,638	33.5
Type of reporting source³										
Hospital	183,004	1.5	180,505	1.2	184,012	1.3	156,574	3.6	150,939	3.6
Non-hospital	28,094	11.6	23,228	15.6	24,636	18.2	19,747	26.5	19,497	27.2
Urban/Rural 2013⁴										
Metro	175,938	2.9	169,495	2.8	174,210	3.2	147,524	5.6	143,020	5.9
Non-Metro	34,006	2.8	33,116	3.1	33,336	3.9	27,834	6.3	26,513	6.2
Unknown	1,154	2.8	1,122	6.4	1,102	7.8	963	82.1	903	79.2
Derived SEER SS2000										
Localized	165,968	1.3	158,777	1.7	162,473	1.9	134,685	4.9	126,283	5.2
Regional	22,393	0.7	22,638	0.7	23,480	0.8	20,813	3.5	21,020	3.4
Distant	8,488	1.4	8,821	1.3	9,169	1.5	9,714	3.6	10,287	3.2
Unknown	14,249	25.9	13,497	21.0	13,526	26.1	11,109	27.6	12,846	24.8

Table 6. Unknown radiation diagnosis year: Cervix cancer 2009-2013

Table 5. Unknown radiation diagnosis year: Cervix cancer 2009-2013

	2009		2010		2011		2012		2013	
Registry Level										
25-75% Percentile (IQR)	0.0-1.7%		0.0-1.6%		0.0-2.3%		0.6-4.3%		0.0-3.7%	
Minimum	0.0%		0.0%		0.0%		0.0%		0.0%	
Mean	1.5%		1.8%		1.5%		4.9%		4.2%	
Median	0.4%		0.4%		0.7%		2.1%		1.6%	
Maximum	14.1%		16.7%		9.8%		98.9%		100.0%	
Upper Whisker ¹	4.3%		4.0%		5.6%		9.9%		9.1%	
# outside of upper whisker	5		5		2		3		3	
All cases combined	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk
Race										
White	9,512	2.3	9,041	1.5	9,195	1.6	9,002	3.4	8,815	3.3
Black	2,016	2.1	2,076	1.5	1,896	1.8	1,903	2.9	1,907	3.7
AI/AN	121	1.7	105	2.9	109	1.8	113	6.2	104	3.8
Asian or Pacific Islander	536	0.7	545	2.0	533	1.1	570	3.2	570	1.9
Unknown race	194	7.7	191	14.1	171	10.5	255	12.9	234	16.7
Age										
00-49 years	6,432	2.3	6,026	1.6	5,944	1.6	5,865	3.9	5,672	3.8
50-64 years	3,555	2.0	3,657	1.6	3,585	1.5	3,674	2.7	3,617	3.4
65-74 years	1,347	1.8	1,300	2.1	1,375	2.1	1,341	3.3	1,393	2.7
75+ years	1,045	3.6	975	2.8	1,000	2.8	963	5.0	948	4.4
Dx Confirmation²										
Microscopic confirmed	12,168	2.0	11,723	1.4	11,691	1.4	11,626	3.1	11,434	3.4
Non-microscopic confirmed	70	7.1	72	4.2	70	7.1	90	6.7	90	13.3
Unknown	141	27.0	163	24.5	143	24.5	127	40.2	106	18.9
Type of reporting source³										
Hospital	11,771	1.6	11,579	1.1	11,537	0.9	11,505	2.6	11,305	2.8
Non-hospital	608	16.0	379	20.1	367	28.1	338	36.1	325	31.4
Urban/Rural 2013⁴										
Metro	10,405	2.2	10,035	1.6	10,035	1.6	10,045	3.1	9,846	3.3
Non-Metro	1,923	2.7	1,864	2.2	1,820	2.1	1,755	3.8	1,742	3.4
Unknown	51	0.0	59	5.1	49	0.0	43	81.4	42	85.7
Derived SEER SS2000										
Localized	5,495	1.5	5,257	0.9	5,068	0.8	5,070	2.9	4,952	3.3
Regional	4,465	0.9	4,240	0.6	4,261	0.3	4,273	1.5	4,225	1.8
Distant	1,597	1.1	1,625	0.4	1,745	0.9	1,764	2.2	1,794	2.2
Unknown	822	17.5	836	15.4	830	16.4	736	23.1	659	21.2