

CINA Deluxe Data Quality Profile

Date DQP produced: February 9, 2018

Variable examined:

CS Site-Specific Factor 1 (SSF1): Estrogen Receptor (ER) (NAACCR Data Item #: 2880)

CS Site-Specific Factor 2 (SSF2): Estrogen Receptor (PR) (NAACCR Data Item #: 2890)

CS Site-Specific Factor 15 (SSF15): Human Epidermal Growth Factor Receptor 2 (HER2)
(NAACCR Data Item #: 2869)

Filters: Invasive and ductal carcinoma in situ cases (DCIS) were evaluated separately. Lymphoma, leukemia, DCO, and autopsy cases were excluded. SSF15 was evaluated for invasive cases only.

- Histology of invasive breast cancer was based on AJCC7 histology inclusion criteria
- Histology of DCIS cases used the following ICD-O-3 codes: 8201, 8230, 8401, 8453, 8500-8501, 8503-8504, 8507, 8522-8523, 8541, and 8543
- Female only

Diagnosis Years covered:

Diagnostic years 2010-2014 for SSF1 and SSF2 since both SSFs were required for the 5 years. Diagnostic years 2011-2014 for SSF15 since it was required by NAACCR for cases diagnosed in 2011 and after.

Cancer Sites: Breast

Database citation: CINA Analytic File, 1995-2014, 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 2010 to 2014 were excluded.)

Data Dictionary: NAACCR Data Dictionary 16 (<http://datadictionary.naacccr.org/>*)

*Access V16 by selecting “16” from the dropdown box at the top left hand corner of the page.

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Technical Notes:

1. The ER, PR and HER2 status were created separately based on the three data item of CS Site-Specific Factor1 (NAACCR Data Item #: 2880), CS Site-Specific Factor 2 (NAACCR Data Item #: 2890), and CS Site-Specific Factor15 (NAACCR Data Item #: 2869), respectively. The unknown ER and PR were defined by test result of unknown (codes 988, 996, 997, 998 and 999) or blank. The unknown HER2 was defined by test result of unknown (codes 988, 997, 998, and 999) or blank.
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. Urban/Rural 2013: The definition of metropolitan area is based on county using 2013 Rural/Urban Continuum Code. Metropolitan area includes county metro area with population ≥ 1 million, county metro area with population between 25,000 and 1 million, and county metro area with population $< 25,000$.
5. Since ASCO/NCCN recommendation on SSF1 and SSF2 for breast in situ are only optional for DCIS, there is an expected higher percentage of missing for SSF1 and SSF2 for breast DCIS.

Table 1. Unknown CS SSF1(ER) status among female invasive breast cancer, 2010 -2014

February 9, 2018

	2010		2011		2012		2013		2014		Total	
Registry Level total	7.1%		6.0%		5.5%		4.8%		4.4%		5.5%	
25-75% Percentile (IQR)	2.9%-6.6%		2.4%-5.1%		2.5%-4.8%		2.0%-4.5%		1.7%-4.2%		2.3%-4.9%	
Minimum	1.4%		1.0%		1.1%		0.9%		0.9%		1.2%	
Median	4.3%		3.8%		3.2%		2.9%		2.6%		3.4%	
Maximum	23.6%		18.6%		18.9%		14.8%		14.1%		17.9%	
Upper Whisker	12.2%		9.2%		8.3%		8.3%		8.0%		8.8%	
# outside of upper whisker	4		7		7		4		4		6	
All cases combined	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk
Race												
White	12,254	7.0%	10,553	5.9%	9,814	5.4%	8,545	4.6%	7,962	4.2%	49,128	5.4%
Black	1,740	7.2%	1,626	6.4%	1,478	5.7%	1,407	5.2%	1,204	4.4%	7,455	5.8%
AI/AN	79	8.0%	74	6.5%	74	6.8%	72	5.9%	74	6.0%	373	6.6%
Asian or Pacific Islander	470	6.2%	405	5.1%	404	4.8%	335	3.8%	273	3.0%	1,887	4.5%
Unknown race	305	18.4%	252	14.9%	337	17.2%	393	17.3%	428	16.5%	1,715	16.9%
Age												
00-49 years	2,639	6.3%	2,203	5.2%	2,043	4.9%	1,808	4.3%	1,650	4.0%	10,343	4.9%
50-64 years	4,620	6.0%	4,131	5.1%	3,765	4.7%	3,361	4.1%	3,144	3.7%	19,021	4.7%
65-74 years	3,233	6.9%	2,788	5.6%	2,706	5.1%	2,426	4.3%	2,348	4.0%	13,501	5.1%
75+ years	4,356	10.2%	3,788	8.7%	3,593	8.2%	3,157	7.1%	2,799	6.4%	17,693	8.1%
Dx Confirmation												
Microscopic confirmed	12,684	6.1%	42,823	5.2%	10,118	4.7%	8,970	4.0%	8,970	4.0%	42,823	5.0%
Non-microscopic confirmed	1,141	98.1%	4,280	98.1%	1,086	97.6%	997	97.8%	997	97.8%	4,280	97.9%
Unknown	894	96.1%	3,121	94.3%	779	94.7%	608	91.8%	608	91.8%	3,121	94.4%
Type of reporting source												
Hospital inpatient/outpatient or clinic	11,763	6.4%	10,090	5.3%	9,384	4.9%	8,110	4.2%	7,462	3.8%	46,809	4.9%
Rad treatment/medical oncology center	449	6.0%	389	5.2%	399	5.2%	394	4.9%	325	3.9%	1,956	5.0%
Laboratory only (hospital or private)	666	28.3%	622	27.8%	723	27.8%	737	28.2%	754	29.2%	3,502	28.3%
Physicians off/private med. practitioner	1,179	47.5%	929	40.3%	830	41.1%	811	39.3%	749	38.1%	4,498	41.5%
Nursing/convalescent home/hospice	88	95.7%	81	93.1%	77	89.5%	73	90.1%	39	65.0%	358	88.2%
Other hospital outpatient/surgery center	703	5.3%	799	5.5%	694	4.4%	627	3.4%	612	3.2%	3,435	4.3%
Urban/Rural 2013												
Metro	12,244	6.9%	10,706	5.8%	9,989	5.3%	8,916	4.6%	8,196	4.2%	50,051	5.3%
Non-Metro	2,520	8.1%	2,178	6.8%	2,093	6.5%	1,811	5.5%	1,682	5.1%	10,284	6.4%
Unknown	84	37.2%	26	25.7%	25	18.7%	25	39.7%	63	54.8%	223	34.9%

Figure 1. Percentage of unknown ER status among female invasive breast cancer by registry, 2010-2014

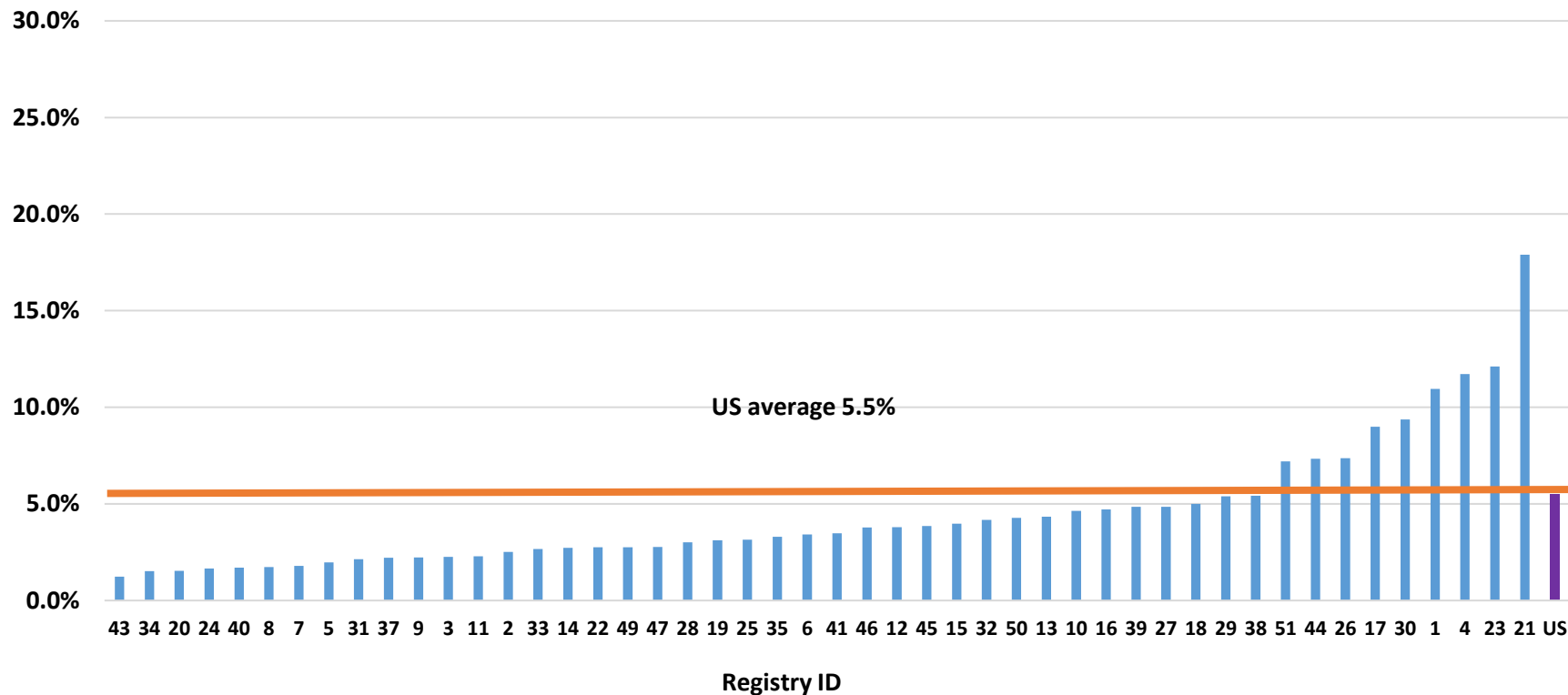


Table 2. Unknown CS SSF2 (PR) status among female invasive breast cancer, 2010 -2014

February 9, 2018

	2010		2011		2012		2013		2014		Total	
Registry Level total	7.5%		6.3%		5.7%		5.0%		4.6%		5.8%	
25-75% Percentile (IQR)	3.4%-6.9%		2.6%-5.6%		2.7%-5.0%		2.2%-4.7%		2.0%-4.5%		2.6%-5.2%	
Minimum	1.8%		1.1%		1.3%		1.3%		1.1%		1.5%	
Median	4.6%		4.0%		3.4%		3.2%		2.9%		3.6%	
Maximum	23.9%		18.8%		19.2%		15.0%		14.3%		18.1%	
Upper Whisker	12.2%		10.1%		8.5%		8.5%		8.3%		9.1%	
# outside of upper whisker	4		6		7		3		4		5	
All cases combined	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk
Race												
White	12,891	7.4%	11,089	6.2%	10,220	5.6%	8,907	4.8%	8,340	4.4%	51,447	5.6%
Black	1,816	7.5%	1,682	6.6%	1,530	5.9%	1,457	5.4%	1,241	4.6%	7,726	6.0%
AI/AN	85	8.6%	75	6.6%	77	7.0%	76	6.3%	81	6.6%	394	7.0%
Asian or Pacific Islander	519	6.9%	457	5.8%	423	5.0%	351	3.9%	295	3.2%	2,045	4.9%
Unknown race	310	18.7%	258	15.2%	338	17.3%	399	17.6%	435	16.8%	1,740	17.1%
Age												
00-49 years	2,767	6.6%	2,310	5.4%	2,115	5.0%	1,863	4.4%	1,700	4.1%	10,755	5.1%
50-64 years	4,898	6.3%	4,368	5.4%	3,940	4.9%	3,513	4.2%	3,298	3.9%	20,017	4.9%
65-74 years	3,420	7.3%	2,965	6.0%	2,817	5.3%	2,541	4.5%	2,469	4.2%	14,212	5.4%
75+ years	4,536	10.6%	3,918	9.0%	3,716	8.5%	3,273	7.4%	2,925	6.7%	18,368	8.4%
Dx Confirmation												
Microscopic confirmed	13,549	6.5%	11,640	5.4%	10,679	4.9%	9,431	4.2%	8,889	3.9%	54,188	5.0%
Non-microscopic confirmed	1,157	98.1%	1,069	98.3%	1,107	98.0%	1,074	98.2%	1,024	96.2%	5,431	97.7%
Unknown	915	96.3%	852	94.7%	802	95.1%	685	92.8%	479	86.0%	3,733	93.6%
Type of reporting source												
Hospital inpatient/outpatient or clinic	12,455	6.8%	10,690	5.6%	9,782	5.1%	8,466	4.4%	7,833	4.0%	49,226	5.2%
Rad treatment/medical oncology center	470	6.3%	400	5.4%	420	5.4%	408	5.0%	339	4.0%	2,037	5.2%
Laboratory only (hospital or private)	684	29.0%	628	28.1%	734	28.2%	741	28.4%	756	29.3%	3,543	28.6%
Physicians off/private med practitioner	1,194	48.1%	934	40.5%	838	41.5%	825	40.0%	759	38.6%	4,550	42.0%
Nursing/convalescent home/hospice	88	95.7%	81	93.1%	77	89.5%	73	90.1%	39	65.0%	358	88.2%
Other hospital outpatient/surgery center	730	5.5%	828	5.7%	737	4.7%	677	3.7%	666	3.5%	3,638	4.5%
Urban/Rural 2013												
Metro	12,921	7.3%	11,307	6.1%	10,411	5.6%	10,411	5.4%	10,411	5.3%	52,490	5.6%
Non-Metro	2,614	8.4%	2,228	6.9%	2,150	6.6%	2,150	6.6%	2,150	6.5%	10,635	6.6%
Unknown	86	38.1%	26	25.7%	27	20.1%	27	42.9%	27	23.5%	227	35.5%

Figure 2. Percentage of unknown PR status among female invasive breast cancer by registry, 2010-2014

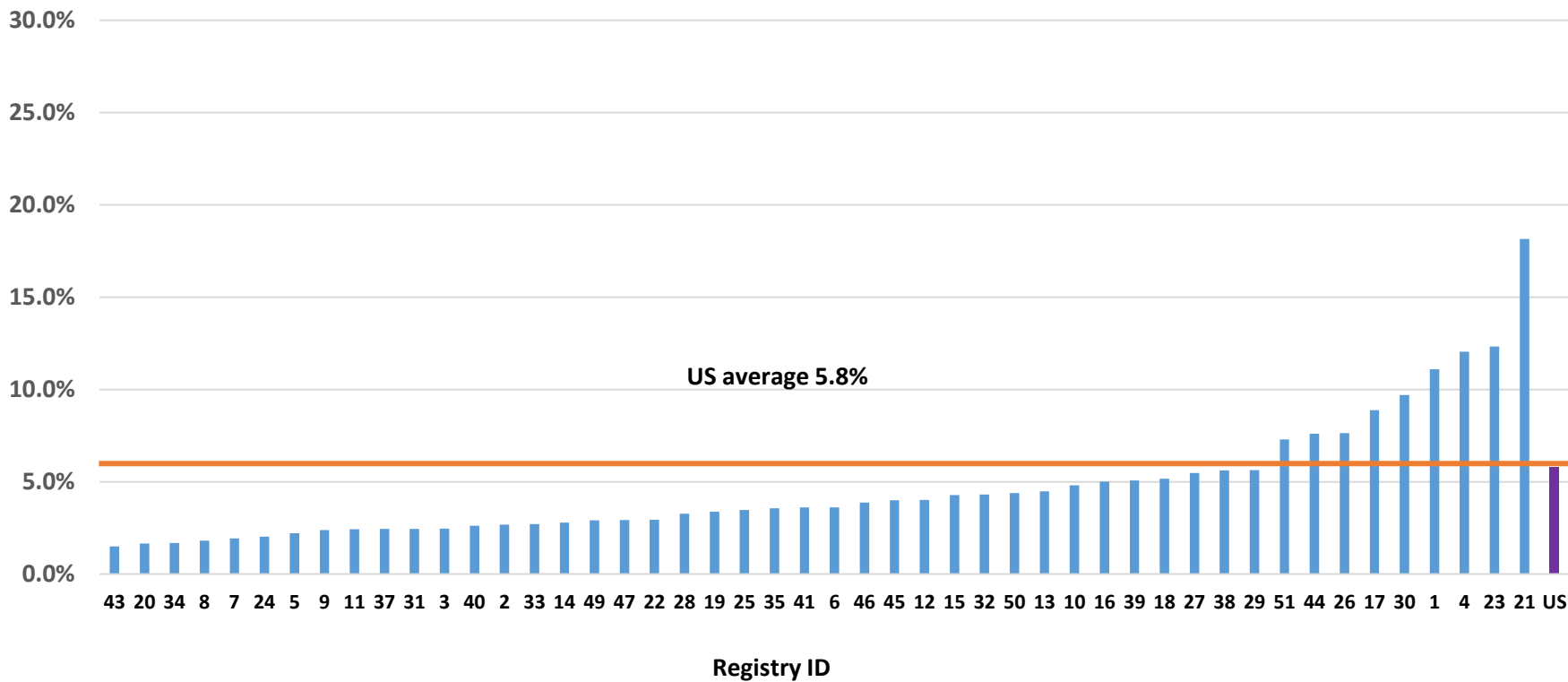
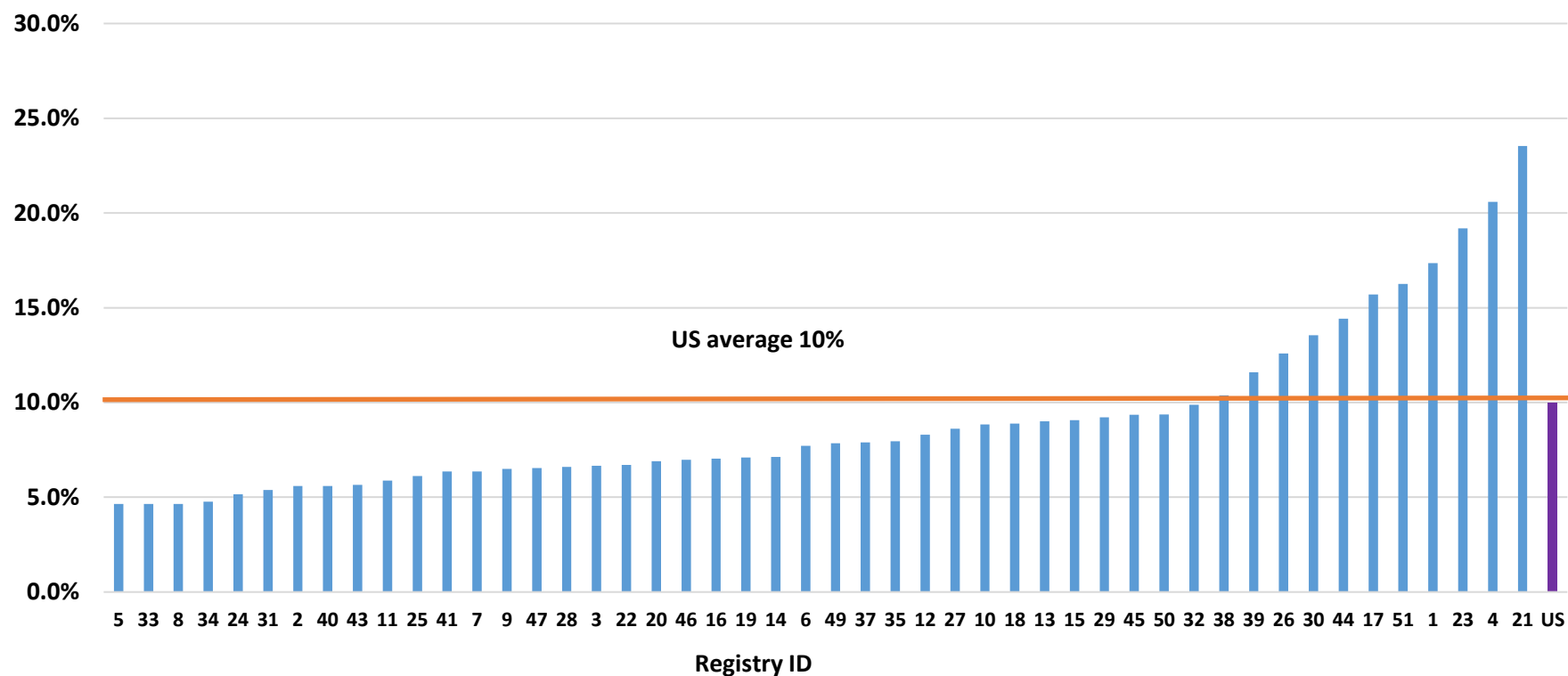


Table 3. Unknown CS SSF15 (HER2) status among female invasive breast cancer, 2011 -2014

February 9, 2018

	2011		2012		2013		2014		Total	
Registry Level total	11.9%		10.5%		9.1%		8.7%		10.0%	
25-75% Percentile (IQR)	7.4%-11.9%		6.5-11.1%		5.6%-9.0%		5.4%-8.5%		6.4%-9.5%	
Minimum	3.7%		4.2%		3.6%		2.7%		4.6%	
Median	9.1%		7.7%		6.8%		6.6%		7.8%	
Maximum	27.3%		25.7%		21.6%		19.9%		23.5%	
Upper Whisker	18.7%		18.0%		14.1%		13.2%		14.2%	
# outside of upper whisker	5		5		4		6		7	
All cases combined	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk
Race										
White	21,112	11.7%	18,745	10.3%	16,485	8.8%	16,039	8.5%	72,381	9.8%
Black	3,276	12.8%	2,893	11.2%	2,665	9.9%	2,433	9.0%	11,267	10.7%
AI/AN	149	13.1%	122	11.2%	126	10.4%	135	10.9%	532	11.4%
Asian or Pacific Islander	867	10.9%	812	9.7%	705	7.9%	649	7.1%	3,033	8.8%
Unknown race	376	22.2%	461	23.6%	529	23.3%	575	22.2%	1,941	22.8%
Age										
00-49 years	4,362	10.3%	3,858	9.2%	3,400	8.1%	3,175	7.6%	14,795	8.8%
50-64 years	8,779	10.9%	7,619	9.4%	6,822	8.2%	6,696	8.0%	29,916	9.1%
65-74 years	5,759	11.6%	5,343	10.0%	4,913	8.7%	4,908	8.4%	20,923	9.6%
75+ years	6,880	15.7%	6,213	14.2%	5,375	12.2%	5,052	11.6%	23,520	13.4%
Dx Confirmation										
Microscopic confirmed	23,841	11.1%	21,107	9.7%	18,744	8.4%	18,307	8.1%	81,999	9.3%
Non-microscopic confirmed	1,075	98.8%	1,112	98.4%	1,077	98.4%	1,032	96.9%	4,296	98.1%
Unknown	864	96.0%	814	96.6%	689	93.4%	492	88.3%	2,859	94.1%
Type of reporting source										
Hospital inpatient/outpatient or clinic	21,330	11.2%	18,669	9.7%	16,375	8.4%	15,955	8.1%	72,329	9.4%
Rad treatment/medical oncology center	806	10.8%	779	10.1%	748	9.2%	676	8.0%	3,009	9.5%
Laboratory only (hospital or private)	816	36.5%	902	34.7%	938	35.9%	895	34.7%	3,551	35.4%
Physicians off/private medical practitioner	1,083	47.0%	984	48.8%	905	43.8%	838	42.6%	3,810	45.6%
Nursing/convalescent home/hospice	82	94.3%	77	89.5%	73	90.1%	41	68.3%	273	86.9%
Other hospital outpatient/surgery center	1,663	11.4%	1,622	10.3%	1,471	8.1%	1,426	7.5%	6,182	9.2%
Urban/Rural 2013										
Metro	21,441	11.7%	19,232	10.3%	17,144	8.9%	16,453	8.5%	74,270	9.8%
Non-Metro	4,303	13.3%	3,769	11.6%	3,339	10.2%	3,311	10.0%	14,722	11.3%
Unknown	36	35.6%	32	23.9%	27	42.9%	67	58.3%	162	39.2%

Figure 3. Percentage of unknown HER2 status among female invasive breast cancer by registry, 2011-2014



Table

Table 4. Unknown CS SSF1 (ER) status among female breast ductal carcinoma in situ, 2010 -2014

	2010		2011		2012		2013		2014		Total	
Registry Level total	15.3%		13.1%		10.9%		9.6%		8.0%		11.3%	
25-75% Percentile (IQR)	8.8%-18.0%		7.1%-17.3%		5.9%-14.2%		6.2%-12.2%		4.5%-10.7%		6.7%-14.6%	
Minimum	3.2%		1.1%		1.2%		2.1%		0.7%		3.8%	
Median	14.0%		10.2%		8.4%		7.8%		6.4%		9.3%	
Maximum	31.2%		32.8%		31.3%		27.5%		20.5%		26.9%	
Upper Whisker	31.8%		32.6%		26.7%		21.2%		20.0%		26.5%	
# outside of upper whisker	0		1		1		1		1		1	
All cases combined	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk
Race												
White	5,688	15.4%	4,924	13.2%	4,106	10.9%	3,742	9.6%	3,024	8.0%	21,484	11.4%
Black	802	14.5%	704	12.1%	621	10.0%	550	8.6%	472	7.3%	3,149	10.3%
AI/AN	34	17.5%	29	13.7%	23	12.6%	28	12.3%	35	15.6%	149	14.3%
Asian or Pacific Islander	290	13.4%	257	11.5%	232	9.5%	213	8.3%	191	7.1%	1,183	9.8%
Unknown race	129	28.7%	117	25.4%	135	25.0%	144	25.4%	132	19.2%	657	24.3%
Age												
00-49 years	1,477	15.2%	1,211	12.7%	1,047	10.8%	945	9.6%	708	7.6%	5,388	11.2%
50-64 years	2,743	14.6%	2,406	12.4%	1,999	10.4%	1,850	9.3%	1,623	8.1%	10,621	10.9%
65-74 years	1,639	15.7%	1,424	13.2%	1,264	10.8%	1,189	9.6%	952	7.6%	6,468	11.2%
75+ years	1,084	17.0%	990	15.2%	807	12.7%	693	10.9%	571	9.5%	4,145	13.1%
Dx Confirmation												
Microscopic confirmed	6,941	15.3%	6,028	13.1%	5,115	10.9%	4,675	9.6%	3,852	8.0%	26,611	11.3%
Non-microscopic confirmed	2	100.0%	2	100.0%	2	100.0%	2	100.0%	2	66.7%	10	90.9%
Unknown	0	-	1	100.0%	0	-	0	-	0	-	1	100.0%
Type of reporting source												
Hospital inpatient/outpatient or clinic	5,576	14.5%	4,831	12.2%	4,103	10.3%	3,651	8.9%	2,989	7.4%	21,150	10.6%
Rad treatment/medical oncology center	284	15.7%	258	14.8%	229	12.6%	189	9.9%	160	8.2%	1,120	12.1%
Laboratory only (hospital or private)	213	36.2%	199	37.7%	203	33.4%	240	38.6%	211	35.8%	1,066	36.3%
Physicians off/private medical practitioner	198	45.5%	153	40.9%	134	35.5%	145	39.1%	131	33.2%	761	39.0%
Nursing/convalescent home/hospice	1	100.0%	0	-	0	0.0%	0	0.0%	0	0.0%	1	20.0%
Other hospital outpatient/surgery center	671	17.1%	590	14.4%	448	10.6%	452	9.5%	363	7.6%	2,524	11.6%
Urban/Rural 2013												
Metro	5,992	15.2%	5,110	12.7%	4,324	10.5%	3,988	9.4%	3,259	7.7%	22,673	11.0%
Non-Metro	935	16.4%	919	15.9%	788	13.6%	687	11.6%	584	9.9%	3,913	13.4%
Unknown	16	34.8%	2	13.3%	5	15.6%	2	25.0%	11	52.4%	36	29.5%

Figure 4. Percentage of unknown ER status among female DCIS by registry, 2010-2014

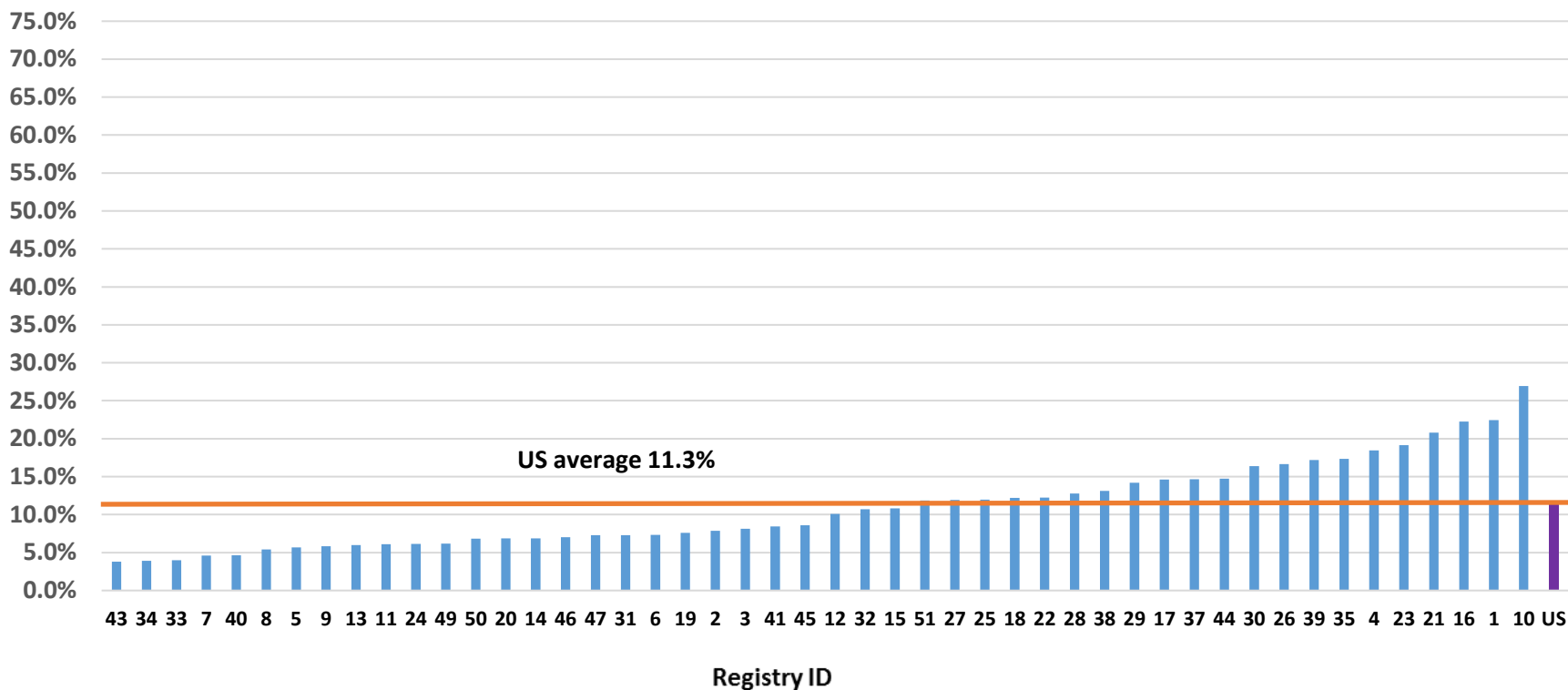


Table 5. Unknown CS SSF2 (PR) status among female breast ductal carcinoma in situ, 2010 -2014

	2010		2011		2012		2013		2014		Total	
Registry Level total	19.4%		17.4%		15.1%		13.7%		13.6%		15.8%	
25-75% Percentile (IQR)	12.6%-24.0%		10.1%-20.6%		8.7%-18.9%		8.2%-17.0%		6.8%-16.5%		9.4%-18.4%	
Minimum	3.2%		1.1%		1.7%		3.4%		1.8%		4.0%	
Median	17.1%		15.5%		14.1%		12.8%		11.1%		14.4%	
Maximum	71.6%		78.7%		69.8%		69.3%		76.4%		73.0%	
Upper Whisker	41.1%		36.4%		34.2%		30.2%		31.1%		31.9%	
# outside of upper whisker	2		2		2		4		2		2	
All cases combined	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk	Total Count	% Unk
Race												
White	7,250	19.6%	6,616	17.7%	5,758	15.3%	5,400	13.9%	5,133	13.5%	30,157	16.0%
Black	951	17.1%	875	15.0%	808	13.0%	745	11.6%	783	12.1%	4,162	13.6%
AI/AN	39	20.1%	36	17.1%	32	17.5%	41	18.1%	40	17.9%	188	18.1%
Asian or Pacific Islander	413	19.1%	388	17.3%	352	14.4%	325	12.7%	403	15.0%	1,881	15.5%
Unknown race	141	31.3%	133	28.9%	159	29.4%	162	28.6%	161	23.4%	756	27.9%
Age												
00-49 years	1,868	19.2%	1,625	17.0%	1,501	15.5%	1,368	13.9%	1,235	13.2%	7,597	15.8%
50-64 years	3,555	19.0%	3,298	17.0%	2,802	14.6%	2,669	13.4%	2,784	13.8%	15,108	15.5%
65-74 years	2,066	19.9%	1,888	17.5%	1,727	14.8%	1,687	13.6%	1,623	13.0%	8,991	15.6%
75+ years	1,305	20.5%	1,237	19.0%	1,079	17.0%	949	14.9%	878	14.5%	5,448	17.2%
Dx Confirmation												
Microscopic confirmed	8,792	19.4%	8,045	17.4%	7,107	15.1%	6,671	13.7%	6,517	13.6%	37,132	15.8%
Non-microscopic confirmed	2	100.0%	2	100.0%	2	100.0%	2	100.0%	3	100.0%	11	100.0%
Unknown	0	-	1	100.0%	0	-	0	-	0	-	1	100.0%
Type of reporting source												
Hospital inpatient/outpatient or clinic	7,167	18.6%	6,522	16.5%	5,803	14.5%	5,327	13.0%	5,277	13.1%	30,096	15.1%
Rad treatment/medical oncology center	325	17.9%	305	17.5%	270	14.8%	232	12.2%	208	10.7%	1,340	14.5%
Laboratory only (hospital or private)	221	37.5%	212	40.2%	221	36.3%	251	40.4%	223	37.8%	1,128	38.4%
Physicians off/private medical practitioner	223	51.3%	182	48.7%	160	42.4%	177	47.7%	185	46.8%	927	47.5%
Nursing/convalescent home/hospice	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	20.0%
Other hospital outpatient/surgery center	857	21.9%	827	20.2%	655	15.5%	686	14.3%	627	13.2%	3,652	16.8%
Urban/Rural 2013												
Metro	7,704	19.5%	6,967	17.2%	6,104	14.8%	5,776	13.5%	5,686	13.5%	32,237	15.7%
Non-Metro	1,072	18.8%	1,077	18.6%	999	17.2%	895	15.1%	823	13.9%	4,866	16.7%
Unknown	18	39.1%	4	26.7%	6	18.8%	2	25.0%	11	52.4%	41	33.6%

Figure 4. Percentage of unknown PR status among female DCIS by registry, 2010-2014

