

# The effect of “National Breast Cancer Awareness Month” on breast cancer diagnoses

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## Background

The National Breast Cancer Awareness Month (NBCAM) was introduced in October of 1985 and since then has been repeated annually. The purpose of this study was to identify the influence of this campaign on diagnosis of breast cancer in the month of October.

## Methods

The SEER 18 database was used to identify the month of diagnosis for all female breast cancers from the year 1974 to 2016. Since months have different numbers of days, we calculated the “expected” number of cancers for each month by assuming that there was an equal number of cancers per day and then multiplying by the number of days in the month. For example the expected number for any group in October would be the total for that group divided by 365.25 and multiplied by 31. The results are then expressed as the percent increase or decrease of the actual results for the month compared to the expected.

## Results

In this cohort of 1,678,886 patients, the largest increase in cancers/day over expected occurred in October, followed by June. The largest decrease was in December followed by July (figure 1). As seen in Figure 2, the increased breast cancers in October occurred after 1985, suggesting that they may have been due to the National Breast Cancer Awareness Month.

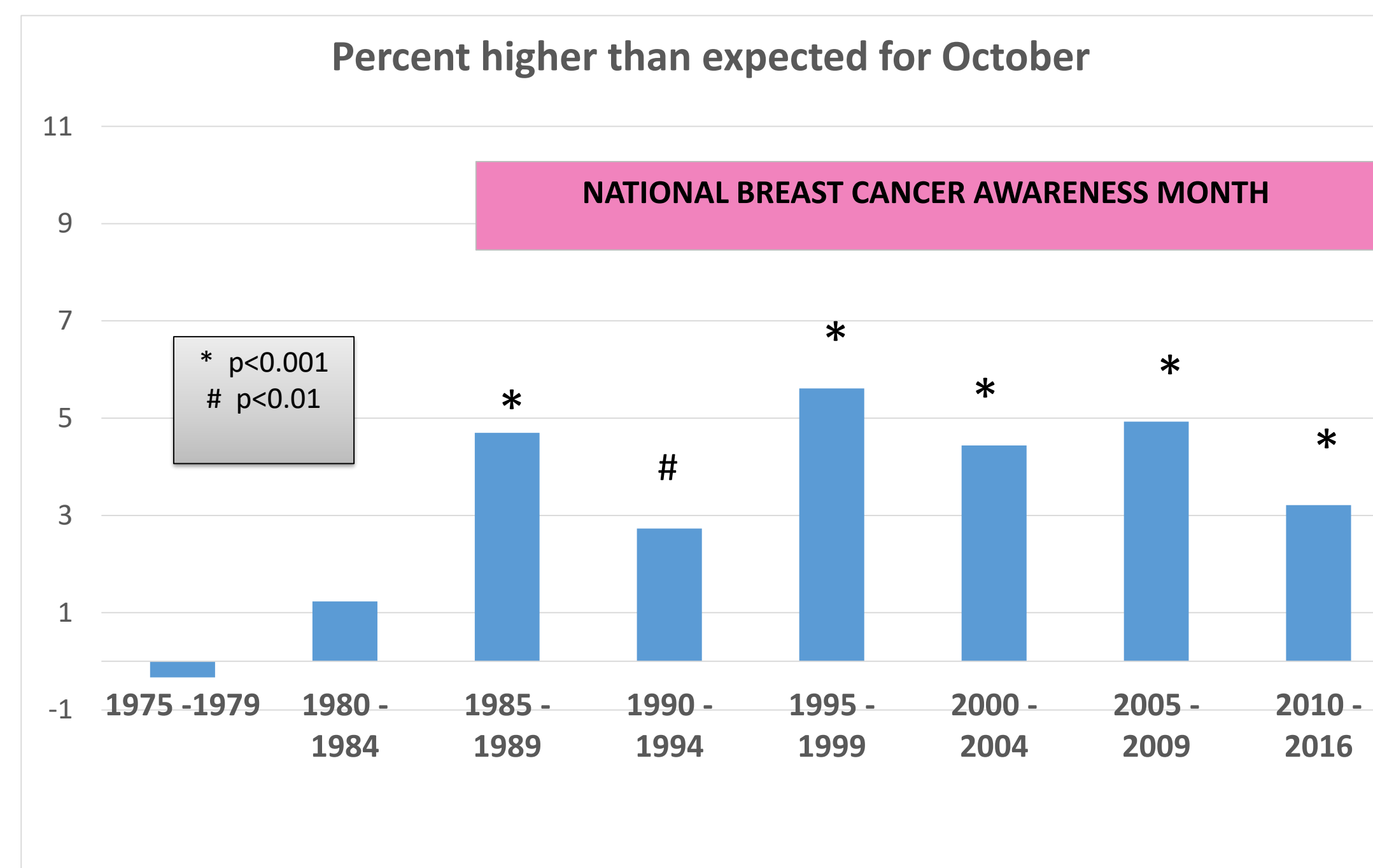


Figure 2. Percent difference between observed and expected number of cases of breast cancer in October from 1975 – 2016..

The excess cancers detected in October were seen in every racial and age group, although they were especially increased in African-American women and in patients over 60 years of age. They were increased similarly in invasive and in situ disease. Stages 0 to 2 were most increased, with a smaller increase in stage 3, but no increase at all in metastatic stage 4 disease. The additional patients diagnosed in October were also more likely to have lumpectomy than mastectomy. (Table 1).

Table 2 shows biological characteristics of the additional patients diagnosed in October. All tumor sizes were increased except for T4 tumors which did not increase at all. The increase was similar for node negative and node positive disease. Both ER/PR positive and negative patients were increased, but the increase was much greater for the hormone receptor positive patients. Similarly all grade tumors were increased, but the increase was much greater for the grade 1 patients and much less for the grade 3 patients.

## Discussion

More breast cancers per day are diagnosed in October than any other month. The data suggest that this may be partially due to the National Breast Cancer Awareness month campaign. Most of the increased cancers are probably detected by screening, although some women with palpable lumps may be stimulated to seek care.

The benefit of this increased diagnosis would ultimately depend on whether mortality is reduced, and of course this is not known. The increase in small and in situ tumors suggests earlier detection but the increase in low grade and ER/PR positive tumors has been found to correlate with overdiagnosis. Therefore the real benefit of the NBCAM is unknown.

Table 1. Percent increase in number of breast cancers diagnosed in October 1985 - 2016

	Actual number in October		Expected number in October*		% increase from expected	P value for % increase	P value for difference in group
	Yes	No	Yes	No			
<b>Race</b>							
White	112,825	1,166,412	108,573	1,170,664	3.92	< 0.001	0.071
Black	14,186	143,635	13,395	144,426	5.91	< 0.001	
Other	10,944	113,533	10,565	113,912	3.59	< 0.001	
<b>Age</b>							
≤ 60	63,221	659,962	61,379	661,804	3.00	< 0.001	< 0.001
> 60	75,552	771,561	71,897	775,216	5.08	< 0.001	
<b>Behavior</b>							
In situ	25,414	260,561	24,272	261,703	4.71	< 0.001	0.301
Invasive	113,365	1,171,083	109,015	1,175,433	3.99	< 0.001	
<b>Stage</b>							
0	23,949	244,114	22,751	245,312	5.27	< 0.001	0.004
1	46,559	477,870	44,510	479,919	4.60	< 0.001	
2	32,595	332,167	30,959	333,803	5.28	< 0.001	
3	12,116	126,506	11,765	126,857	2.98	< 0.001	
4	4,729	50,904	4,722	50,911	0.15	0.915	
<b>Surgery</b>							
Lumpectomy	70,852	724,795	67,529	728,118	4.92	< 0.001	0.001
Mastectomy	56,842	592,986	55,153	594,675	3.06	< 0.001	

\* assuming an equal number of cases per day adjusted for number of days per month

Table 2. Characteristics of invasive breast cancers diagnosed in October 1985 – 2016

	Actual number in October		Expected number in October*		% increase from expected	P value for % increase	P value for difference in group
	Yes	No	Yes	No			
<b>Tumor size</b>							
T1	57,208	588,529	54,806	590,931	4.38	< 0.001	0.032
T2	26,423	267,603	24,955	269,071	5.88	< 0.001	
T3	4,416	45,601	4,245	45,772	4.03	0.006	
T4	2,892	30,882	2,867	30,907	0.87	0.872	
<b>Lymph nodes</b>							
positive	28,262	292,400	27,216	293,446	3.84	< 0.001	0.235
negative	55,761	571,671	53,252	574,180	4.71	< 0.001	
<b>Estrogen receptor</b>							
positive	68,504	699,352	65,171	702,685	5.11	< 0.001	0.009
negative	16,872	176,334	16,398	176,808	2.89	< 0.001	
<b>Progesterone receptor</b>							
positive	58,023	592,677	55,227	595,473	5.06	< 0.001	0.091
negative	26,027	269,385	25,073	270,339	3.80	< 0.001	
<b>Grade</b>							
1	18,492	185,891	17,347	187,036	6.60	< 0.001	0.005
2	37,006	377,614	35,190	379,430	5.16	< 0.001	
3	30,729	318,647	29,653	319,723	3.63	< 0.001	

\* assuming an equal number of cases per day adjusted for number of days per month

## Conclusions

1. More breast cancers per day are diagnosed in October than any other month.
2. This may be partially due to the National Breast Cancer Awareness Month.
3. Almost every subgroup is increased although the increase is greater among black women, older women, those with in situ or lower stage disease, and those with hormone receptor positive tumors or lower grade tumors.
4. Whether this increased diagnosis is a benefit is currently unknown.

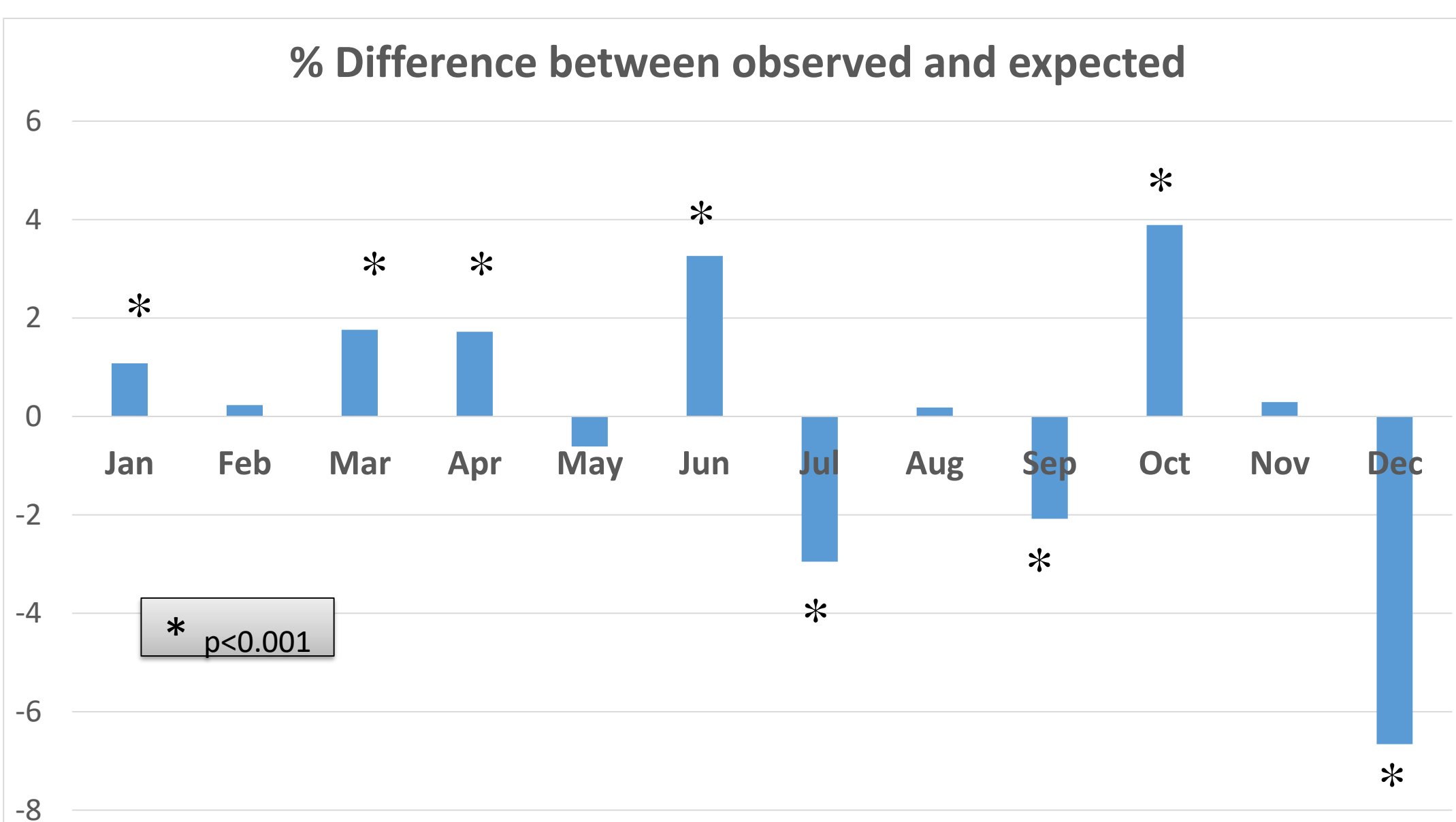


Figure 1. Percent difference between observed and expected number of cases of breast cancer per month. Expected number assumes an equal number of cases per day adjusted for number of days per month.