

The Impact of a Celebrity Promotional Campaign on the Use of Colon Cancer Screening

The Katie Couric Effect

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Background: Public participation in many preventive health programs is suboptimal. While various interventions to increase participation have been studied, the impact of a celebrity spokesperson on cancer screening has not been rigorously examined. The objective of this study was to assess the impact of Katie Couric's March 2000 *Today Show* colorectal cancer awareness campaign on colonoscopy rates.

Methods: A population-based observational study was conducted using 2 different data sources: (1) The Clinical Outcomes Research Initiative (CORI) database—a voluntary consortium of 400 endoscopists who performed 95 000 colonoscopies from July 1998 to December 2000; and (2) 44 000 adult members of a managed care organization. Using change point analyses and linear regression models, we compared colonoscopy utilization rates before and after Ms Couric's March 2000 television series.

Results: The number of colonoscopies performed per CORI physician per month after Ms Couric's campaign increased significantly (15.0 per month before campaign; 18.1 after campaign; $P < .001$). After adjusting for temporal trends, a significantly higher postcampaign colonoscopy rate was sustained for 9 months. Analysis also demonstrated a trend toward an increase in the percentage of colonoscopies performed on women (43.4% before campaign; 47.4% after campaign; $P = .054$). Colonoscopy rates also increased significantly in the managed care organization after Ms Couric's campaign (1.3 per 1000 members per month before; 1.8 after; $P < .001$).

Conclusions: Katie Couric's televised colon cancer awareness campaign was temporally associated with an increase in colonoscopy use in 2 different data sets. These findings suggest that a celebrity spokesperson can have a substantial impact on public participation in preventive care programs.

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PUBLIC HEALTH experts have struggled to find ways to increase participation in preventive health programs. Commonly used interventions have included health fairs, mass media campaigns, and distribution of educational materials.¹ Despite these efforts, use of many established preventive measures remains suboptimal.

The use of celebrity spokespersons to influence public behavior is common outside the public health arena. The recent introduction of direct-to-consumer advertising has extended the use of celebrities to the sale of pharmaceuticals and other health-related products.² However, there has been little study of the use of celebrity spokespersons as a means for positively influencing the use of preventive health measures.

Research has demonstrated that celebrity disclosure of their own illnesses can increase public interest in the specific disease and can change the public's behavior.³⁻⁹ No study, however, has specifically addressed the impact of a healthy celebrity spokesperson on the public's participation in preventive measures such as cancer screening programs. This has particular relevance in diseases such as colorectal cancer, which requires healthy people to undergo invasive, uncomfortable, and often embarrassing tests such as colonoscopy. Theoretically, a celebrity advocate could reduce the stigma and fear associated with colorectal cancer screening, thereby increasing participation in screening and ultimately save lives.

In March 2000, two years after the tragic death of her husband Jay Monahan from colon cancer at age 42, NBC anchor-

Author affiliations are listed at the end of this article. The authors have no relevant financial interest in this article.

Colonoscopy Utilization and Patient Demographics Before and After *Today Show* Awareness Campaign

	Before Campaign	After Campaign	P Value
CORI			
Procedures per physician per month, No.	15.0	18.1	<.001
Women, %	43.4	47.4	.054
Patient age, mean, y	60.8	59.9	<.001
Patients aged <50 y, %	21.6	22.4	<.001
MCO			
Procedures per 1000 members per month, No.	1.3	1.8	<.001
Women, %	49.1	51.6	.32
Patient age, mean, y	52.2	52.1	.82

Abbreviations: CORI, Clinical Outcomes Research Initiative; MCO, managed care organization.

person Katie Couric underwent a live, on-air colonoscopy on the *Today Show*. This event was the cornerstone of a weeklong series promoting colon cancer awareness and endorsing colorectal cancer screening.¹⁰ Although the televised colonoscopy generated substantial media attention, it has been unclear whether this campaign accomplished the stated goal of increasing the use of colon cancer screening tests. Our objective was to estimate the impact of the *Today Show* colon cancer awareness series on colonoscopy rates and assess which populations, if any, responded most strongly.

METHODS**DATA SOURCES**

The Clinical Outcomes Research Initiative (CORI), a voluntary consortium of 400 gastrointestinal endoscopists at 42 sites in 22 states, was the primary data source used in this analysis.^{11,12} After a colonoscopy is completed, a computerized form is submitted electronically to a data repository in Portland, Ore; there the data are stripped of patient identifiers and merged with data from other sites. Each colonoscopy report includes the test date and patient demographic information. Approximately 95 000 colonoscopies submitted to the CORI database between July 1998 (20 months before Ms Couric's procedure) and December 2000 (9 months after) were included in the analysis. Because the number of CORI physicians generally increased over the course of the study period as more physicians joined the consortium, CORI rates are reported as the average number of colonoscopies performed per physician per month.

To supplement and validate CORI results, colonoscopy utilization in a Midwestern managed care organization (MCO) (85 000 covered lives) was analyzed over a similar period (December 1998 to December 2000). Analysis was restricted to individuals between the ages of 30 and 64 years (44 269 members). At the time of this study, the MCO did not officially endorse screening colonoscopy, but did cover all procedures that were performed; furthermore, this policy did not change during the study period. The MCO rates are reported as the number of colonoscopies performed per 1000 members per month. To explore an alternative hypothesis that colonoscopy rates merely followed secular trends impacting screening tests for other cancers, mammography and prostate-specific antigen (PSA) testing rates were analyzed over the same period.

Initial analysis involved screening the data by performing change point analysis to determine if and when a significant change in colonoscopy rates occurred (Change-Point Analyzer 2.2 software; Taylor Enterprises, Libertyville, Ill).¹³ This technique uses serial bootstrap sampling to determine when changes in time-series data have occurred.¹⁴ Each bootstrap sample is a random reordering of the colonoscopy rates; we used 1000 bootstrap samples in this analysis. This procedure allows estimation of the variance associated with the colonoscopy rates. The analysis then looks for substantial deviations from the range of expected rates at each time point, and identifies the specific time points (and confidence intervals around those points) where significant changes have occurred. In essence, this technique searches across time points looking for sudden changes in the data points that are sufficiently large that they cannot reasonably be explained by chance alone.

In addition to attempting to empirically identify a point of change, we also tested the a priori hypothesis that Ms Couric's March 2000 colonoscopy had a direct impact on colonoscopy rates. We performed these analyses using Stata 7.0 software (Stata Corp, College Station, Tex). Mean colonoscopy rates, patient age, sex, and race proportions were compared before and after Ms Couric's cancer awareness series using *t* tests for continuous variables and χ^2 analyses for categorical variables. We then performed linear regression of colonoscopy rates vs time, with an indicator variable identifying the colonoscopy as occurring before or after Ms Couric's colonoscopy, and an interaction term between the time variable and the indicator variable. This allowed us to estimate (1) whether there were general increases or decreases in colonoscopy rates across time; (2) whether there was a sudden increase in colonoscopy rates after Ms Couric's colonoscopy (immediate effect); and (3) whether there were differences in the rates of increase or decrease before and after Ms Couric's procedure (sustained effect). Thus, we assessed both a possible immediate and sustained impact of Ms Couric's televised campaign, while simultaneously adjusting for background changes in colonoscopy rates.

RESULTS**CORI DATA**

We first used change point analysis to empirically test whether colonoscopy rates changed at any time during the study period. The change point analysis indicated that there was a definitive increase in colonoscopy rates in March 2000, coinciding with Ms Couric's television campaign; the analysis calculated that the colonoscopy rate increased from 14.6 procedures per physician per month before the campaign to 18.6 procedures per physician after the campaign. This analysis did not identify any other increases or decreases in colonoscopy rates during the study period.

Once the change point analysis confirmed an increase in colonoscopy rates did occur following Ms Couric's campaign, traditional statistical methods were used to evaluate the nature and magnitude of the change. The mean number of colonoscopies performed per CORI physician per month increased significantly in the 9 months after Ms Couric's campaign compared with the previous 20 months (15.0 per physician per month before vs 18.1 after; $P < .001$) (**Table**). After the *Today Show* series, the percentage of colonoscopies performed on

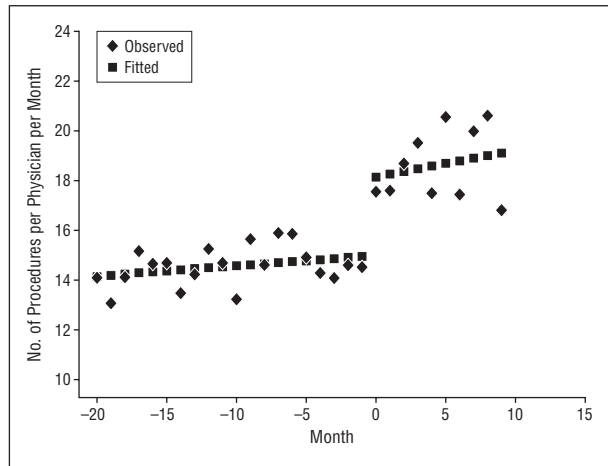


Figure 1. Monthly colonoscopy rates in the Clinical Outcomes Research Initiative database from July 1998 to December 2000. Ms Couric's cancer awareness campaign was televised on the *Today Show* in March 2000 (month 0).

women increased from 43.4% to 47.4% ($P=.054$). There was also a statistically significant but clinically minor decrease in the mean age of individuals undergoing colonoscopy, from 60.8 years to 59.9 years ($P<.001$).

The fitted regression line (**Figure 1**) demonstrates the immediate and sustained impact of the *Today Show* campaign on colonoscopy rates after adjusting for an underlying trend of slowly increasing colonoscopy rates, depicted by the positive slope of the fitted line during weeks -20 to 0. The immediate effect is demonstrated as the "step-up" in colonoscopy rate occurring at month 0 in the figure. CORI physicians performed more than 3 additional colonoscopies per month following Ms Couric's series ($P<.01$). This significant increase in procedure rates was sustained for 9 months. However the sustained effect, represented by the slope of the fitted line, did not change significantly following Ms Couric's procedure, suggesting that there was a one-time effect of Ms Couric's procedure, but that the general rate of increase in colonoscopy use remained constant.

MCO DATA

To validate the CORI findings, similar analyses were performed on the MCO data. Change point analysis of the MCO data again demonstrated a significant increase in colonoscopy use in the months immediately following the *Today Show* campaign. The analysis indicated that the increase in colonoscopy utilization occurred between April and May of 2000, coinciding with Ms Couric's series. The analysis detected an increase from 1.3 procedures per 1000 members per month before the program to 1.9 procedures after. As with the CORI data, the change point analysis did not identify any other significant increases or decreases in colonoscopy rates during the study period.

After the change point analysis confirmed an increase in colonoscopy use, additional analyses were conducted to further characterize the effect of Ms Couric's campaign. The mean number of colonoscopies increased significantly in the 9 months following Ms Couric's

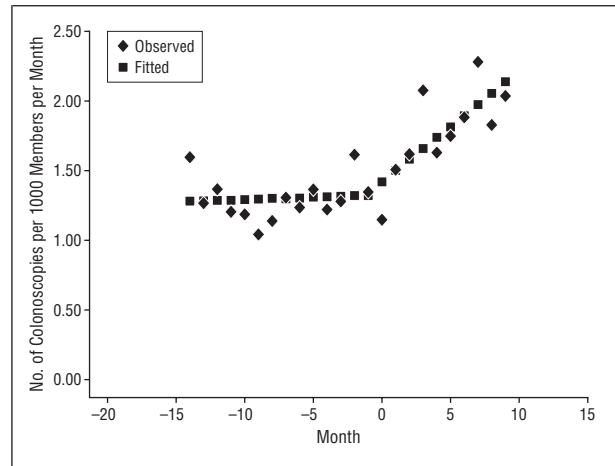


Figure 2. Monthly colonoscopy rates in a Midwestern managed care organization from December 1998 to December 2000. Ms Couric's cancer awareness campaign was televised on the *Today Show* in March 2000 (month 0).

campaign compared with the prior 14 months (1.3 per 1000 members per month before vs 1.8 after; $P<.001$). An increase in the percentage of colonoscopies performed on women from 49.1% to 51.6% was observed but this difference did not reach statistical significance ($P=.32$). There was also no change in the mean age of patients undergoing colonoscopy following the *Today Show* series.

Linear regression analysis of the MCO data (**Figure 2**) revealed that colonoscopy rates were stable during the 14 months prior to the *Today Show* series. The MCO data failed to demonstrate an immediate increase in colonoscopy use following Ms Couric's procedure at week 0. However, the positive slope of the fitted regression line after the event (week 0) illustrates a significant sustained effect manifest by an increase of 0.08 colonoscopies per 1000 MCO members per month during the 9 months after the campaign ($P=.006$).

To further validate the findings, PSA and mammogram rates in the same MCO were analyzed. There was no evidence of a concurrent rise in PSA testing rates in men when the 9 months following Ms Couric's weeklong series was compared with the preceding 9 months (18.4 PSA tests per 1000 members per month before vs 19.0 after; $P=.18$). Mammography rates in women in the MCO decreased significantly after the campaign compared with the period beforehand (37.8 mammograms tests per 1000 members per month before vs 35.6 after; $P<.001$).

COMMENT

Despite robust evidence documenting the life-saving benefits of colorectal cancer screening and a multitude of consensus statements and clinical guidelines promoting its use, fewer than half of Americans are appropriately screened.^{15,16} Therefore, it is paramount that the medical community identify new strategies to increase awareness and utilization of potentially life-saving preventive measures. In this study, we demonstrate a significant increase in colonoscopy utilization in 2 distinct populations coincident with a weeklong March 2000

Today Show cancer awareness campaign that featured a live, on-air colonoscopy performed on its anchor, Katie Couric.

The significant increase in the number of colonoscopies performed by the CORI gastroenterologists was immediate and persisted at a higher rate for nearly a year after the campaign. Validating these findings, colonoscopy rates in an MCO also increased significantly after the televised event, though the effect in the MCO was gradual, with rates continuously increasing throughout the study period. While these results support our hypothesis that Ms Couric's campaign resulted in an immediate and sustained increase in colon cancer screening, follow-up in our present analysis was limited to 9 months. Furthermore, our data did not allow for analysis of whether the increase in colon cancer screening resulted from an increase in appropriate colonoscopies in high-risk individuals or inappropriate screening of low-risk individuals. Future studies should attempt to better quantify both the durability of the sustained effect as well as the appropriateness of the procedures that are performed.

It is unlikely this "Couric effect" was due to concurrent interest in all cancer screening activities, given the lack of increase in mammography or PSA testing rates in the MCO. Furthermore, there were no major journal publications or changes in screening guidelines to explain this increase. Taken together, these findings support the premise that healthy celebrity spokespersons can enhance the adoption of proven preventive interventions for a specific disease.

The finding that more women and slightly younger individuals underwent colonoscopy following Ms Couric's campaign is consistent with the demographics of *Today Show* viewers (60% female; median age, 47.5 years).¹⁷ The *Today Show* audience may be important in the context of colorectal cancer screening, since half of the viewers of Ms Couric's campaign were younger than the population for whom routine screening is recommended by professional organizations.¹⁶ It remains to be seen if future celebrity campaigns can similarly motivate individuals at higher cancer risk than the typical *Today Show* viewer. Similarly, it will be important to determine how race, sex, and age of both the celebrity and intended audience interact in future interventions.

The decline in mammography rates in the MCO data is difficult to explain and intriguing. It is possible that after viewing the *Today Show* series, women substituted a colonoscopy for a screening mammogram. In light of the relative risk reductions of these 2 procedures, this choice may be appropriate, particularly if this "substitution" only occurs every 10 years, the currently recommended interval for colonoscopic colorectal cancer screening.

While celebrity spokespersons have remarkable potential to transmit important medical information, one notable concern is the possibility for well-meaning public figures to use their influence to promote unproven or even dangerous behaviors.¹⁸⁻²² For example, Ms Couric has advocated colorectal screening at ages younger than recommended by most medical authorities, declaring, "But all of the doctors I know—and I know a lot of them—say they had or will get a colonoscopy by their fortieth birthday. That ought to tell you something."²³ While

screening younger, low-risk individuals may reduce colorectal cancer mortality, most experts agree that cancer prevention resources should focus on those unscreened individuals at increased risk for malignancy, particularly in light of limited medical resources and a limited pool of technically proficient endoscopists.^{24,25}

These findings suggest a celebrity spokesperson who does not have the specific disease he or she is promoting can have a substantial impact on public behavior related to that disease. In light of these results, celebrity spokespersons should be advised to deliver carefully targeted, evidence-based recommendations that will ultimately improve public health. Further studies are needed to determine whether similar celebrity efforts are useful for noncancerous conditions or other public health concerns.

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