



Colorectal Cancer (CRC) Costs in the US: Findings from the Medical Expenditure Panel Survey 2008-2012

334622

Mohammad Rifat Haider, Zaina P. Qureshi, Ronnie Horner,
Sudha Xirasagar, M. Mahmud Khan

Health Services Policy and Management, Arnold School of Public Health, University of South Carolina,
Columbia, SC

Introduction

Cancer is one of the prevalent non-communicable diseases and is the second leading cause of death for Americans after heart diseases (Murphy et al., 2013). Not only is cancer a serious debilitating disease but it is also expensive and poses a significant financial burden on the US economy.

Colorectal cancer (CRC) is the second most common cancer among US men and women. It is estimated to cause 49,700 deaths in 2015. This aggressive cancer requires significant care raising the cost of treatment considerably. In the initial phase of the treatment colorectal cancer costs higher than any other cancer (Mariatto et al., 2011).

This study aimed to estimate the total direct costs for CRC from 2008 to 2012 in the US by analyzing the household component data sets of Medical Expenditure Panel Survey (MEPS).

Methods

This study uses the MEPS household component datasets from 2008 through 2012 to calculate the direct cost attributable to cancer care. Propensity score matching was used to match non-cancer controls with cancer patients based on demographic variables.

Variables with missing values were imputed by multiple impute technique. Generalized linear model (GLM) with log link and gamma family was fitted for each year data.

Differences between the estimated cost of cancer and non-cancer groups was calculated to determine the colorectal cancer attributable health care expenditure. Using the Gross Domestic Product (GDP) the health care expenditure was converted into 2013 dollars to analyze the trend in cancer attributable costs in the US (MEPS, 2015).

Finally colorectal cancer attributable costs incurred by the nation was calculated using the total population of that year collected from census data and prevalence of cancer patients from Surveillance, Epidemiology, and End Results (SEER) data.

Results

Cancer attributable costs were found to be higher among those who were 30-44 years old, Black, male, married, and privately insured. The differences in cancer care costs were calculated after propensity score matching (Table 1). The total cancer related costs were highest in 2011.

After taking the effects of the covariates into account in actual dollars cancer-attributable costs for one CRC patient was \$18,604 (in 2013 dollars) in 2009 raised from \$14,715; then it declined in 2010 to \$11,802, and thereafter showed an increasing trend- \$12,986 in 2011 and \$14,039 in 2012 (Table 2).

The total colorectal cancer care costs burden for USA was calculated for each year. Cancer attributable costs incurred on the US economy were \$22.26 billion in 2008, \$26.00 billion in 2009, \$14.88 billion in 2010 and \$15.23 billion in 2011 and \$15.92 billion in 2012 (Figure 1).

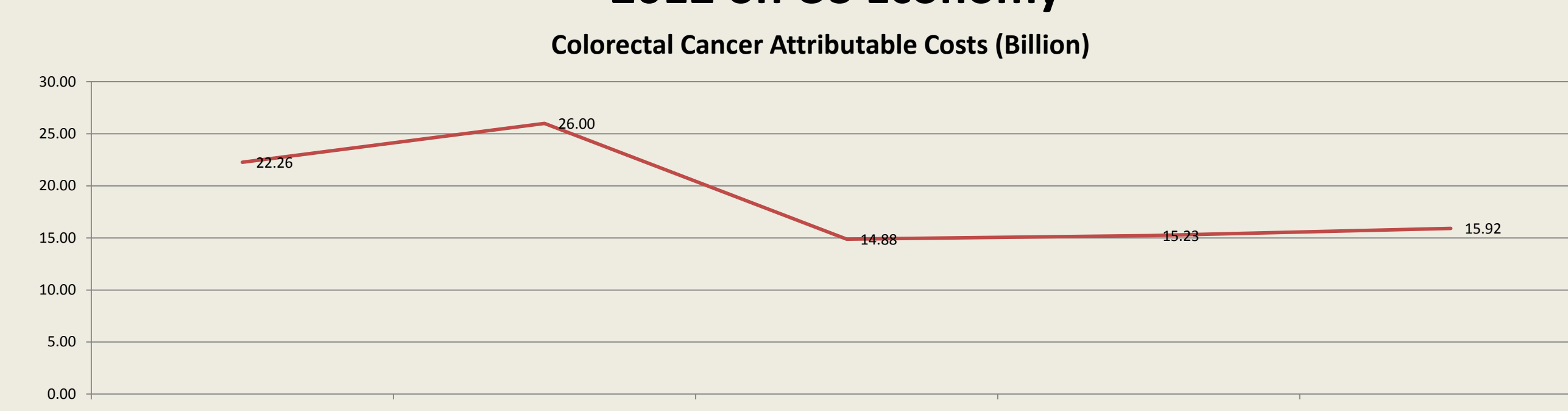
Table 1: Cancer Attributable Total Health Expenditure by covariates from 2008-2012 after Propensity Score Matching

Covariates	2008	2009	2010	2011	2012
Age					
30-44	12,830	31,971	22,393	9,375	16,517
45-64	8,863	16,060	5,236	16,383	13,280
65-74	9,066	5,630	7,934	2,354	2,849
75+	2,914	5,477	3,600	1,064	8,651
Race					
White	7,738	14,092	10,608	11,840	14,616
Black	20,074	12,934	7,422	5,409	6,076
Asian	1,883	13,318	11,994	1,390	34,031
Others	-	-	-	38,009	1,183
Sex					
Male	11,368	19,799	8,644	10,255	14,307
Female	10,735	9,222	11,199	9,798	12,032
Marital Status					
Married	11,731	14,018	7,142	11,162	12,245
Other	10,192	13,643	11,947	8,435	13,084
Insurance Status					
Private Ins.	10,901	12,960	10,142	14,116	14,520
Public Ins.	10,499	15,039	10,332	5,691	9,730
Uninsured	866	377	581	2,995	13,898
Poverty Level					
Poor	11,930	21,991	7,703	4,575	9,313
Near Poor	13,547	3,702	8,250	35,585	17,359
Low Income	11,417	9,412	21,028	8,463	21,112
Middle Income	10,277	12,057	7,150	7,738	13,409
High Income	10,617	19,445	9,576	6,888	10,383

Table 2: Colorectal Cancer Attributable Total Health Expenditure 2008-2011 after Generalized Linear Model (Gamma Family Log Link) Regression

Cancer Care Costs	2008	2009	2010	2011	2012
In actual dollars	13,678	17,430	11,192	12,569	13,833
In 2013 dollars	14,715	18,604	11,802	12,986	14,039

Figure 1: Colorectal Cancer Attributable Total Health Expenditure 2008-2012 on US Economy



Conclusions

Results confirm that Colorectal cancer is a potent cost driver of the US health care system. The rising costs of the colorectal cancer care cost have been widely attributed to the increased prevalence of colorectal cancer patients with longer survival, aging of the population and replacement of low cost treatments with the high costs ones. For bending the cost curve for colorectal cancer care patients, it is high time to formulate policy directed to effective but cost-containing strategies in the realm of cancer care.

Limitations

Study limitations include: a) a lack of consistent data on time since cancer diagnosis which is relevant to cancer care cost computations, and, b) lack of data on stage at diagnosis. However, MEPS is a nationally representative database on health care costs and we have adopted a quasi-experimental approach to estimate costs on total US population by matching control non-cancer population with cancer patients. Additionally, cancer remission status and years of suffering variable was incorporated in the analysis in order to capture the phase specific changes in cancer care costs.

References

- Eagle D. The cost of cancer care: part I. *Oncology-New York*. 2012;26(10):918.
- MEPS. Using Appropriate price indices for analyses of health care expenditures or income across multiple years. Accessed on May 11 2015 at http://meps.ahrq.gov/mepsweb/about_meps/Price_Index.shtml
- Mariatto AB, Yabroff KR, Shao Y, Feuer EJ, Brown ML. Projections of the cost of cancer care in the United States: 2010–2020. *Journal of the National Cancer Institute*. 2011;103(2):117-28.
- Murphy SL, Xu J, Kochanek KD. Deaths: Final Data for 2010. Hyattsville, MD: National Center for Health Statistics, 2013; Contract No.: 4.

Contact:
Mohammad Rifat Haider
 PhD Student
 Dept. of Health Services Policy and Management
 Arnold School of Public Health
 University of South Carolina
 Columbia, SC 29208
 e-mail: mhaider@email.sc.edu