Associations of Cancer and Other Chronic Health Conditions with SF-6D Preference-based Scores among Medicare Beneficiaries

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Existing Literature

❖ Most chronic medical conditions have a negative impact on daily functioning and well-being.
  - Rothrock et al., J Clin Epidemiology, 2010

❖ Medicare managed care beneficiaries with cancer report significantly worse physical health (SF-36 physical component summary score) than those without cancer.
  - Smith et al., Health Care Financing Review, 2008

❖ Significantly worse mental health is reported for some cancers (non-small cell lung, non-Hodgkin's lymphoma, female breast, colorectal, and bladder)
  - Smith et al., Health Care Financing Review, 2008

Specific Aims

Among Medicare managed care beneficiaries ...

- 1) Do the associations of different types of cancer and (non-cancer) chronic conditions with health-related quality of life vary among Medicare managed care beneficiaries?
    - main effects

- 2) Do the associations of non-cancer conditions with health-related quality of life differ for those who have cancer versus do not?
    - interaction effects

- 3) Do the associations between cancer and health-related quality of life vary by stage of disease?

SEER-MHOS Dataset (1)

- Surveillance, Epidemiology and End Results (SEER) program of cancer registries that collect standardized clinical and demographic information for persons with newly diagnosed (incident) cancer in specific geographical areas

- Began in 1973 and covers ˜ 26% of U.S. pop.
  - http://seer.cancer.gov/registries/list.html
  - California, Connecticut, Hawaii, Iowa, Kentucky, Louisiana, New Mexico, New Jersey, Utah
  - Atlanta, Detroit, rural Georgia, Seattle-Puget Sound metropolitan areas

SEER-MHOS Dataset (2)

- Medicare Health Outcomes Survey (MHOS)
  - 95-item survey administered to 1,000 randomly selected beneficiaries (including institutionalized and disabled) in Medicare managed care plans
  - Baseline and follow-up survey (2 years later).
  - 63-72% response rates for baseline surveys
  - MHOS respondents matched using identifiers to SEER-Medicare file for 4 cohorts (1998 to 2003).

http://outcomes.cancer.gov/surveys/seer-mhos/

Limitations

- Does not include:
  - Those who did not complete at least one MHOS survey.
    - Medicare managed care beneficiaries not in MHOS (Including SEER cancer patients)
  - Medicare fee-for-service beneficiaries
  - Information on Medicare claims, prescription drug information, chemotherapy treatment, or cancer recurrences

Sample (n = 126,366)

| MHOS Cohort 1 (1998 & 2000) | MHOS Cohort 2 (1999 & 2001) | MHOS Cohort 3 (2000 & 2002) | MHOS Cohort 4 (2001 & 2003) |
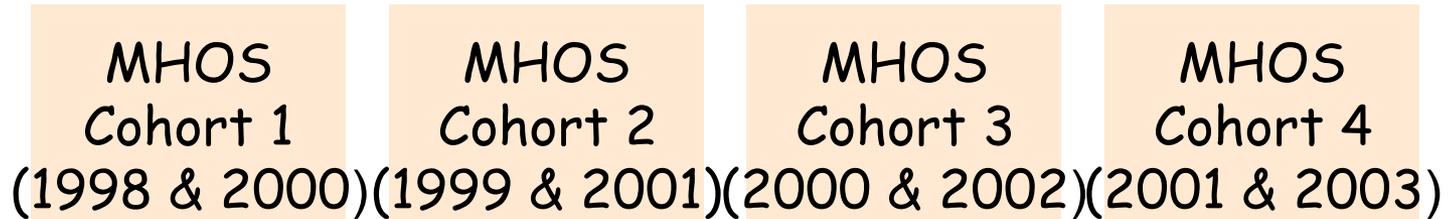
Medicare Beneficiaries:

• **Aged 65 years or older**

• **Cancer and non-cancer respondents reside in same SEER region**

➢ **5,593 Prostate (4%)**
➢ **4,311 Female breast (3%)**
➢ **3,012 Colorectal (2%)**
➢ **1,792 non-small cell lung (1%)**
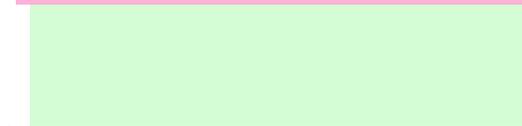
n = 22,740 (18%)   n = 103,626 (82%)

Dependent Variable = SF-6D

- SF-36 health survey, version 1

- 11 of 36 questions representing 6 of 8 domains
  - Physical functioning
  - Role limitations
  - Social function
  - Pain
  - Emotional well-being
  - Energy/fatigue

- Standard gamble elicitation of preferences from a population sample in the UK.

- Scores for those alive range from 0.30 to 1.00 (dead = 0.00).

Health state 424421 (0.59)

- Your health limits you <u>a lot</u> in moderate activities (such as moving a table, pushing a vacuum cleaner, bowling or playing golf)
- You are <u>limited in the kind of work or other activities</u> as a result of your physical health
- Your health limits your social activities (like visiting friends, relatives etc.) <u>most of the time</u>.
- You have pain that interferes with your normal work (both outside the home and housework) <u>moderately</u>
- You feel tense or downhearted and low <u>a little of the time</u>.
- You have a lot of energy <u>all of the time</u>

10 Cancer Conditions (n = 22,740; 18%)

- Prostate cancer   (n = 5,593; 4%)
- Female breast Cancer   (n = 4,311;   3%)
- Colorectal cancer   (n = 3,012; 2%)
- Non-small cell lung cancer   (n = 1,792; 1%)

- Bladder cancer   (n = 1,299; 1%)
- Melanoma   (n = 1,135;   1%)
- Endometrial cancer   (n = 902;   1%)
- Non-Hodgkin's lymphoma   (n = 668;   1%)
- Kidney cancer   (n = 488; 0.4%)

- Other cancer   (n = 3,540; 3%)

Note: Those with more than one cancer diagnosis are excluded.

Historic Stage of Disease (time of diagnosis)

- Localized
  - 2045 breast, 2652 prostate, 1481 colorectal, 466 lung

- Distant (metastatic)
  - 26 breast, 61 prostate, 48 colorectal, 47 lung

- Unstaged
  - 347 breast, 633 prostate, 203 colorectal, 65 lung

13 Non-cancer Conditions
(mean number = 2.44)

- Hypertension   n = 66,968   (53%)
- Arthritis of the hip   n = 44,524   (35%)
- Arthritis of the hand   n = 40,402   (32%)
- Sciatica   n = 26,878   (21%)
- Other heart disease   n = 25,455   (20%)
- Diabetes   n = 20,089   (16%)
- Angina/coronary artery disease   n = 18,017   (14%)
- Chronic obstructive pulmonary disease   n = 15,445   (12%)
- Depressed in the last year   n = 14,815   (12%)
- Myocardial infarction/heart attack   n = 11,982   (9%)
- Stroke   n = 9,479   (8%)
- Congestive heart failure   n = 7,893   (6%)
- Inflammatory bowel disease   n = 5,882   (5%)

Has a doctor ever told you that you had: …
In the past year, have you felt depressed or sad much of the time?

Demographic & Administration Variables

- Age (continuous)
- Education (8th grade or less; some high school; high school graduate; some college; 4 year college grad; > 4 year college)
- Gender (male; female)
- Income (<10k, 10-19999, 20-29999, 30-39999, 40-49999, 50-79999, 80k and above, don't know or missing)
- Race/ethnicity (Hispanic, non-Hispanic white, black, Asian, American Indian, other race, missing)
- Marital status (married, widowed, divorced/separated/never married)

- Proxy completed survey (11%)
- Mode of administration (88% mail vs. 12% phone)

Sample (n = 126,366)

- 55% female
- 79% non-Hispanic white, 7% Hispanic, 5% Black, 5% Asian
- 60% married
- 58% high school graduate or less
- 51% < $30,000 income

Results (1)

- Adjusted R-squared of 39% for 43 dfs
- Intercept = 0.80
  - No chronic condition, average education and age, divorced/separated/never married, white, don't know/missing income, phone mode)
  - SD = 0.14
- Only 2 of 23 conditions had non-significant associations (melanoma, endometrial cancer)

Results (2)

- Adjusted means
  - 0.80 (colorectal cancer, myocardial infarction)
  - 0.79 (bladder cancer, kidney cancer, non-Hodgkin's lymphoma, female breast cancer, prostate cancer, hypertension)
  - 0.78 (non-small cell lung cancer, other cancer, angina/ CAD, other heart disease, diabetes, arthritis of the hand)
  - 0.77 (CHF, inflammatory bowel disease)
  - 0.76 (stroke, COPD/asthma, sciatica, arthritis of the hip)
  - 0.67 (depressive symptoms)

Results (3)

- 52 possible two-way interactions between four most prevalent cancers (female breast, prostate, colorectal, lung) and the 13 non-cancer conditions
  - Only 6 were statistically significant.
  - Two negative interaction coefficients (-0.01)
    - Colorectal cancer and diabetes
    - Lung cancer and COPD/asthma

Distant stage of cancer associated with 0.05-0.10 lower SF-6D Score
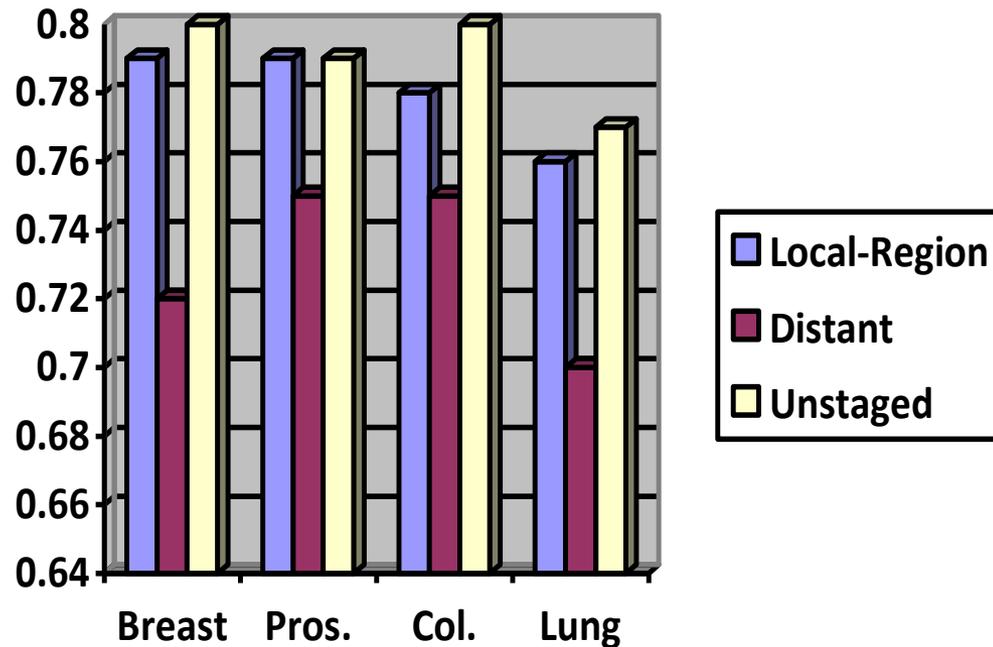
Figure 1. Distant Stage of Disease Associated with Worse SF-6D Scores (Sample sizes for local/regional, distant, and unstaged: Breast (2045,26, 347); Prostate (2652, 61 and 633), Colorectal (1481, 48 and 203), and Lung (466, 47 and 65).

Summary

- Unique associations of multiple chronic conditions on health-related quality of life are generally similar and additive, not interactive
- The largest unique associations of chronic conditions with health-related quality of life among Medicare managed care beneficiaries was observed for four conditions
  - Stroke, COPD/asthma, sciatica, arthritis of the hip
- Advanced stage of cancer is associated with noteworthy decrement in health-related quality of life for four "big" cancers (breast, prostate, colorectal, lung)

Thank you

The adjusted mean decline in the Short Form-36 (version 1) physical component summary scores from baseline to follow-up assessment across the nine cancer types and the control subjects (No Cancer).
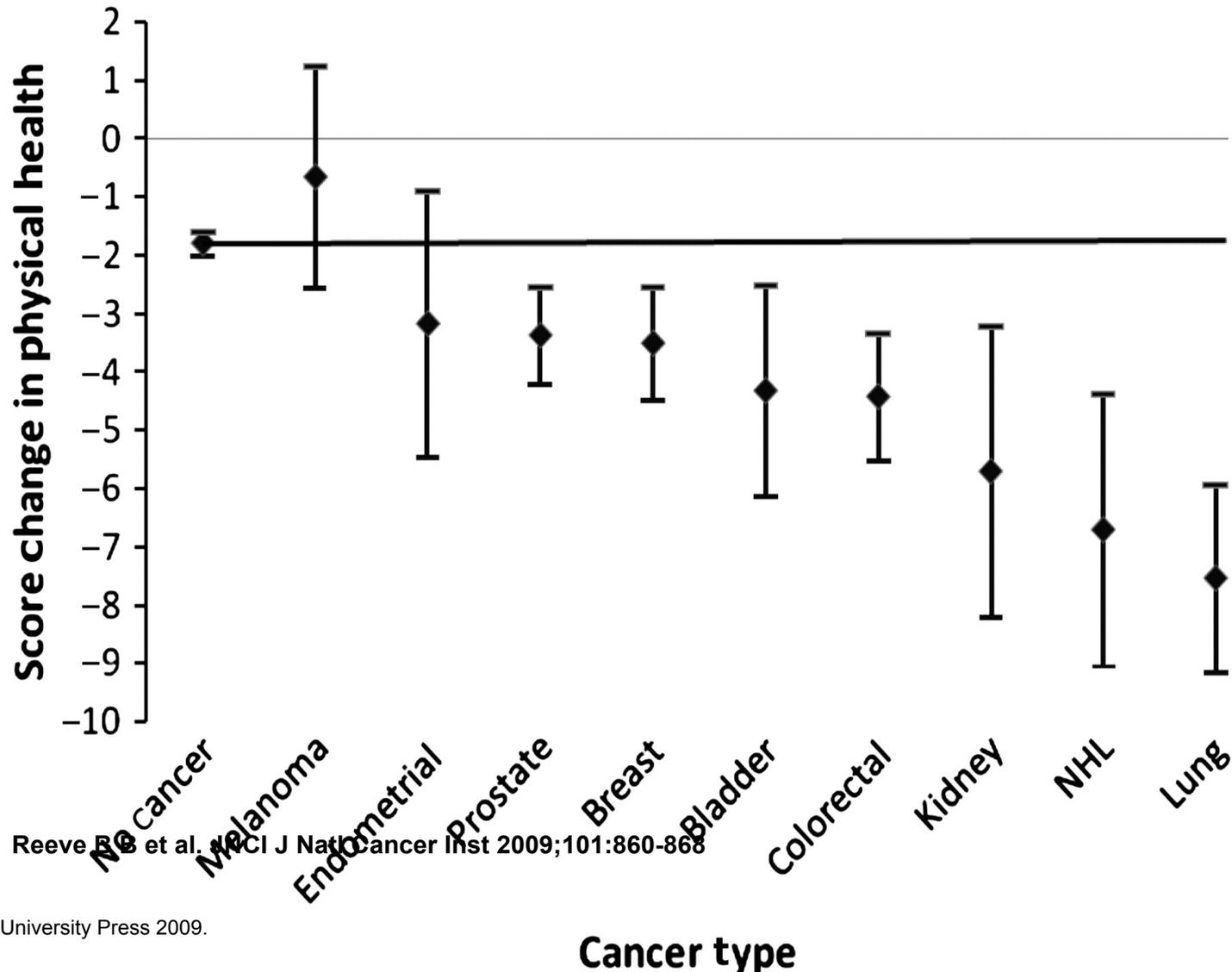
Reeve BB et al. NCI J Natl Cancer Inst 2009;101:860-868

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