



A review of cancer outcomes among persons dually enrolled in Medicare and Medicaid

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Abstract: The fragmentation and lack of coordination of health care may result in less efficient and more costly care and lead to poorer outcomes. There has been increasing interest in examining cancer outcomes among persons who are dually enrolled in Medicare and Medicaid. Previous studies have identified disparities in the quality of cancer treatment according to race, ethnicity, socioeconomic status, and source of health insurance. This article, which is based upon bibliographic searches in PubMed, reviews the literature on dual enrollment in Medicare and Medicaid and cancer survival and quality of cancer treatment. A total of 65 articles were identified. Of the 65 articles that were screened using the full texts or abstracts, 13 studies met the eligibility criteria, one cross-sectional study and 12 cohort studies. The results of this systematic review indicate that there is only limited evidence that dual enrollment in Medicare and Medicaid is associated with poorer survival or quality of cancer care. The number of studies that have looked for associations between dual Medicare-Medicaid status and survival and quality of cancer treatment is still small. Outcomes and cancer site(s) varied among the studies. Additional studies are needed to determine the replicability of findings reported to date. Of particular interest are studies of major forms of cancer (breast, prostate, lung, colorectal) that include adequate numbers of patients described by insurance status, race, comorbidity, stage, receipt of appropriate cancer therapy, and survival.

Keywords: Cancer; dual-system use; mortality; Medicaid; Medicare; quality of care

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Introduction

There are over 9.6 million seniors and adults with disabilities in the U.S. who are dually eligible for Medicare and Medicaid (1). About 20% of Medicare beneficiaries are dually eligible for Medicare and Medicaid, and about 15% of Medicaid enrollees are dually enrolled. They qualify for Medicaid because of their low incomes, disability status, and limited financial assets (2). Roughly two-thirds of dual eligibles are elderly people who meet the age requirement

for Medicare, and the remaining third qualify for Medicare through the Social Security Disability Insurance Program. Persons who are dually enrolled in Medicaid and Medicare include many vulnerable patients who are more likely to be African American or Hispanic, low income, and to have multiple chronic conditions (e.g., depression, Alzheimer's, heart failure, diabetes, chronic obstructive pulmonary disease), complex care needs, and high levels of health care utilization (1). Elderly African Americans and Hispanics are six times more likely than elderly whites to be dual eligibles

(Wright *et al.* 2015). Dual eligibles are of particular concern to health care providers and policy makers because they have substantial health care needs that are often unmet and increased morbidity and mortality (3). Because of low incomes and lack of private health insurance, this is a population that is vulnerable to problems with access to care and loss of Medicaid coverage (4). About 5.4% of dual enrollees become disenrolled in Medicaid each year (5).

For dual eligible beneficiaries, Medicare provides primary coverage, and Medicaid absorbs remaining costs and covers services not available through Medicare, such as long-term care (6). For both Medicare and Medicaid, beneficiaries may be enrolled in fee-for-service or managed care, creating a variety of possible coverage models (7). Dually eligible beneficiaries account for a disproportionate share of spending in both Medicare and Medicaid. For example, despite making up only 18% of the Medicare population, dually enrolled beneficiaries account for 31% of Medicare spending and incur higher annual expenditures than their peers who are enrolled only in Medicare (8,9). To control costs and improve the efficiency and quality of care, states are increasingly turning to integrated delivery for dually eligible beneficiaries (1). Integration entails both financial alignment across Medicare and Medicaid and coordination in the delivery of services (2).

There has been increasing interest in examining cancer outcomes among persons who are dually enrolled in Medicare and Medicaid. Several studies have identified disparities in the quality of cancer treatment according to race, ethnicity, socioeconomic status, and source of health insurance (10-13). Medical costs for patients with cancer have increased over the past decade, partly because of the development of expensive chemotherapy drugs (14). Spending on cancer care in the U.S. is expected to rise from \$125 billion in 2010 to \$207 billion by 2020 (15).

The goal of the current article was to review the literature on dual enrollment in Medicare and Medicaid and cancer outcomes among 4 most common types of cancer (i.e., breast, prostate, lung, colorectal cancer) (16). Of particular interest was whether dual enrollment improves or worsens outcomes, such as survival and the quality of cancer care.

Methods

This review is based upon PubMed bibliographic searches and appropriate search terms. Articles published in English from 1997 through May 2018 were identified using Boolean algebra commands and MeSH search terms: dual use AND

(Medicare OR Medicaid) AND cancer. The searches were not limited to words appearing in the title of an article. The references of review articles were also reviewed (17). Information obtained from the bibliographic searches (information presented in abstract, key words, and study design) was used to determine whether to retain each identified article. Studies with a cohort or cross-sectional study design were included.

A total of 65 articles were identified and screened using either their full texts or abstracts. A total of 13 studies met the eligibility criteria for inclusion in this review.

Results

The 13 studies included one cross-sectional study and 12 cohort studies (*Table 1*). Bradley *et al.* (18) studied a cohort of 2,626 older patients with local and regional stage, non-small cell lung cancer (NSCLC). Dually eligible patients were half as likely to undergo resection as Medicare-only patients ($P < 0.001$) and were more likely to receive radiation than Medicare only patients. Surgically treated dually eligible patients had slightly poorer survival as compared with that of Medicare only patients.

In a population-based cohort study of 103,808 patients with incident breast, prostate, colorectal, and lung cancer, Bradley *et al.* (19) observed an excess cancer incidence for dually enrolled black patients relative to their white counterparts in every cancer site examined, except for lung cancer. The dually eligible patients were enrolled 12 or more months before the diagnosis.

Shugarman *et al.* (20) conducted a retrospective cohort study of 26,073 Medicare beneficiaries ≥ 65 years of age who were diagnosed with lung cancer. Increasing age, and comorbidity, Medicaid enrollment, and having been diagnosed with stage 3 or stage 4 lung cancer were associated with increased mortality risk.

Koroukian *et al.* (21) conducted a cross-sectional study of patients with incident breast, prostate, or colorectal cancer. Dually eligible patients were more likely than low income non-duals to have unknown stage/unstaged breast cancer (OR 1.43, 95% CI: 1.02–2.0) and more likely to have distant stage colorectal cancer (OR 1.74, 95% CI: 1.12–2.70).

In a retrospective cohort study of 2,568 patients with incident breast, colorectal, or prostate cancer, Koroukian *et al.* (22) found that, compared to Medicare only, dual Medicare-Medicaid status was associated with a lower likelihood of receiving definitive treatment for colorectal cancer (OR 0.60, 95% CI: 0.38–0.95) but not for breast or

Table 1 Studies of cancer outcomes among persons dually enrolled in Medicaid and Medicare

Study	Sample	Design	Outcomes	Results
Bradley <i>et al.</i> 2008 (a)	2,626 older patients with local and regional stage NSCLC	Retrospective cohort	Receipt of resection, chemotherapy, radiation therapy, and survival	Dually eligible patients were half as likely to undergo resection as Medicare patients ($P < 0.001$) and were more likely to receive radiation than Medicare patients. Surgically treated dually eligible patients had slightly poorer survival as compared with that of Medicare patients
Bradley <i>et al.</i> 2008 (b)	103,808 patients in Michigan Tumor Registry with incident female breast, prostate, colorectal, and lung cancer	Population based cohort	Cancer incidence	In dually eligible patients enrolled 12 or more months before the diagnosis, an excess cancer incidence was observed for black patients relative to white patients in every cancer site examined except for lung cancer
Shugarman <i>et al.</i> 2008	26,073 Medicare beneficiaries age ≥ 65 years diagnosed with lung cancer	Retrospective cohort	Survival	Increasing age, comorbidity, Medicaid enrollment, and having been diagnosed with stage 3 or state 4 lung cancer were associated with increased mortality risk
Koroukian <i>et al.</i> 2011	Patients with incident breast, prostate, or colorectal cancer in Ohio, age ≥ 65 years	Cross-sectional	Unknown stage/unstaged cancer, and distant stage at diagnosis	Dually eligible patients were more likely to have unknown stage/unstaged breast cancer (OR 1.43, 95% CI: 1.02–2.0), and more likely to have distant stage colorectal cancer (OR 1.74, 95% CI: 1.12–2.70)
Koroukian <i>et al.</i> 2012	2,568 patients with incident breast, colorectal, or prostate cancer in Ohio	Retrospective cohort	Recommended cancer treatment	Dual Medicare-Medicaid status was associated with a lower likelihood of receiving definitive treatment for colorectal cancer (OR 0.60, 95% CI: 0.38–0.95) but not for breast or prostate cancer
Manzano <i>et al.</i> 2014	30,199 patients with gastrointestinal cancer in Texas	Retrospective cohort	Unplanned hospitalization	Unplanned hospitalization was associated with black race; residing in census tracts with poverty levels $> 13.3\%$; esophageal, gastric, and pancreatic cancer; advanced disease stage; comorbidity; and dual eligibility for Medicare and Medicaid ($P < 0.05$ in each instance)
Warren <i>et al.</i> 2015	1,200 Medicare patients with incident cancer of the breast (stage 11B to III), colon (stage III), rectum (stage II to III), lung (stage II to IV), or ovary (stage II to IV)	Retrospective observational	Consultation with an oncologist and receipt of chemotherapy	Dual-eligible patients were less likely to receive chemotherapy than were Medicare patients with private insurance
Doll <i>et al.</i> 2015	4,522 women age > 65 years dually enrolled in Medicare and Medicaid, with cancer of the uterus, ovary, cervix, or vulva/vagina residing in North Carolina	Population based cohort	All-cause mortality and stage at diagnosis	Dual enrollees had increased all-cause mortality overall (HR 1.34, 95% CI: 1.19–1.49) and within each cancer site. Increased odds of advanced stage disease at diagnosis was only present in uterine cancer (OR 1.38, 95% CI: 1.06–1.79)
Guadagnolo <i>et al.</i> 2015	69,572 patients dying of cancer in Texas	Retrospective cohort	Receipt of chemotherapy and radiation therapy, acute care, and costs	Medicaid patients were more likely to receive chemotherapy and radiation therapy, and more likely to have > 1 emergency room visit than Medicare patients (OR 5.27, 95% CI: 4.76–5.84). Dual eligibles were more likely to have > 1 emergency room visit than Medicare-only beneficiaries (OR 1.19, 95% CI: 1.07–1.33). Costs were higher for non-white Medicare, Medicaid, and dually eligible patients compared to white Medicare enrollees

Table 1 (continued)

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Study	Sample	Design	Outcomes	Results
Parikh-Patel <i>et al.</i> 2017	763,884 persons with breast, ovary, endometrium, cervix, colon, lung, or gastric cancer in California	Retrospective cohort	Recommended radiation, chemotherapy, or surgery	Persons with Medicaid or Medicare-Medicaid dual-eligible coverage and the uninsured had lower odds of receiving recommended radiation and/or chemotherapy or surgery for breast, endometrial, and colon cancer, relative to those with private insurance
Ratnapradipa <i>et al.</i> 2017	10,618 patients age ≥ 65 years who underwent colon cancer resection	Retrospective cohort	Laparoscopic or open resections for colon cancer	Medicare-Medicaid dual enrollment, age ≥ 85 years, and higher tumor stage and grade were associated with receipt of laparoscopic surgery
Hess <i>et al.</i> 2017	1,452 patients with NSCLC who were treated with erlotinib	Retrospective cohort	Treatment duration	Low income subsidy status, having Medicare insurance, dual eligibility, and higher erlotinib out of pocket costs were associated with longer treatment duration
Somayaji <i>et al.</i> 2018	262 adults having a lung biopsy in 8 counties in Western New York region	Retrospective cohort	Outpatient and emergency department use, survival time	Age and the number of comorbidities predicted outpatient use and the number of comorbidities predicted emergency department use in patients with lung cancer. Patients with lung cancer who received a lung biopsy by a Commission on Cancer accredited organization had a longer time of survival from the biopsy event

CI, confidence interval; OR, odds ratio; HR, hazards ratio; NSCLC, non-small cell lung cancer.

prostate cancer.

Manzano *et al.* (23) conducted a retrospective cohort study of 30,199 patients with gastrointestinal cancer. Unplanned hospitalization was associated with black race; residing in census tracts with poverty levels $>13.3\%$; esophageal, gastric, and pancreatic cancer; advanced disease stage; comorbidity; and dual eligibility for Medicare and Medicaid ($P < 0.05$ in each instance).

In a retrospective study of 1,200 Medicare patients with incident cancer of the breast (stage IIB to III), colon (stage III), rectum (stage II to III), lung (stage II to IV), or ovary (stage II to IV), Warren *et al.* (14) found that dual-eligible patients were less likely to receive chemotherapy than were Medicare patients with private insurance.

Doll *et al.* (24) conducted a population-based cohort study of 4,522 women age >65 years dually enrolled in Medicare and Medicaid, with cancer of the uterus, ovary, cervix, or vulva/vagina. Compared to Medicare only, dual enrollees had increased all-cause mortality overall (HR 1.34, 95% CI: 1.19–1.49) and within each cancer site. Increased odds of advanced stage disease at diagnosis were only present in uterine cancer (OR 1.38, 95% CI: 1.06–1.79).

Guadagnolo *et al.* (25) conducted a retrospective cohort study of 69,572 patients dying of cancer. Medicaid patients were more likely to receive chemotherapy and radiation

therapy, and more likely to have >1 emergency room visit than Medicare patients (OR 5.27, 95% CI: 4.76–5.84). Dual eligibles were more likely to have >1 emergency room visit than Medicare-only beneficiaries (OR 1.19, 95% CI: 1.07–1.33). Costs were higher for non-white Medicare, Medicaid, and dually eligible patients compared to white Medicare enrollees.

On the other hand, in a retrospective cohort study of 763,884 persons with cancer of the breast, ovary, endometrium, cervix, colon, lung, or stomach, Parikh-Patel (15) found that persons with Medicaid or Medicare-Medicaid dual-eligible coverage and the uninsured had lower odds of receiving recommended radiation and/or chemotherapy or surgery for breast, endometrial, and colon cancer, relative to those with private insurance.

In a retrospective cohort study of 10,618 patients age ≥ 65 years who underwent colon cancer resection, Ratnapradipa *et al.* (26) found that Medicare-Medicaid dual enrollment, age ≥ 85 years, and higher tumor stage and grade were associated with receipt of laparoscopic surgery.

In a retrospective cohort study of 1,452 patients with NSCLC who were treated with erlotinib, Hess *et al.* (27) found that low income subsidy status, having Medicare insurance, dual eligibility (compared to Medicare only), and higher erlotinib out of pocket costs were associated with

longer treatment duration.

Somayaji *et al.* (28) conducted a retrospective cohort study of 262 adults undergoing a lung biopsy. Age and the number of comorbidities predicted outpatient use, and the number of comorbidities predicted emergency department use in patients with lung cancer. Patients with lung cancer who received a lung biopsy by a Commission on Cancer accredited organization had a longer time of survival from the biopsy event than those who received a lung biopsy by a non-accredited organization.

Discussion

The results of this systematic review indicate that there is only limited evidence that dual enrollment in Medicare and Medicaid is associated with poorer survival or quality of cancer care. The number of studies that have looked for associations between dual Medicare-Medicaid status and cancer survival and quality of care is still very modest. Dually eligible patients have been found to be less likely to undergo resection for local and regional stage NSCLC than Medicare only patients (18). In a separate study, dual Medicare-Medicaid status was associated with a lower likelihood of receiving definitive treatment for colorectal cancer but not for breast or prostate cancer (22). Dual Medicare-Medicaid status was associated with a lower likelihood of receiving chemotherapy in one study (14). In a study of patients with lung cancer (20), dual enrollees were found to have poorer survival.

The association between dual insurance status and survival may be through a couple mechanisms. According to evidence collected from this review, dual enrollees were more likely to be diagnosed at later stage of cancer, leading to lower survival. Patients with incident breast cancer have been reported to be less likely to be staged (21), which can adversely affect receipt of appropriate cancer therapy. Second, lower survival may result from disparity in access to high quality of care (e.g., inadequacy of staging, delays in initial treatment, inconsistency with treatment guidelines, etc.). It was reported that the program structure of Medicaid contributed to access barriers to high quality of cancer care, leading to worse prognosis and health outcomes (29). On the other hand, the finding that patients with dual coverage have a poorer survival rate than patients with single insurance coverage must be interpreted with caution. Studies rarely provide information on whether patients were diagnosed and treated with cancer before dual enrollment or vice versa. Ward *et al.* (Ward, 2008) found that patients

with serious medical conditions such as cancer were more likely to have Medicaid and became dual insured, indicating dual enrollees had more complex medical issues and poorer overall health conditions than single insured. Therefore, their lower survival rate could be a result of poor health instead of insurance status.

Outcomes and cancer site(s) varied among the studies. Caution is therefore required in comparing results across studies. Potential sources of bias include under detection of cancer outcomes and procedures due to the sole use of administrative data in some studies. Thus, the jury is still out regarding the issue of whether dual enrollees have poorer or better cancer outcomes than those beneficiaries who have either Medicare or Medicaid but not both, and also regarding the issue of whether dual enrollees receive less aggressive cancer treatment than those Medicare or Medicaid beneficiaries. One might expect that some dual enrollees (e.g., those with Alzheimer's or other life-threatening, terminal disease) would have poorer cancer outcomes and would be treated less aggressively even though they have dual insurance coverage. In addition, Medicaid beneficiaries, being poor and having less access to care, might present with later stage cancers for which treatments are less effective.

Additional studies are needed to determine the replicability of findings reported to date. Of particular interest are studies of major forms of cancer (breast, prostate, lung, colorectal) that include adequate numbers of patients described by insurance status, race, stage, comorbidity, receipt of appropriate cancer therapy, and survival.

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Footnote

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/jhmhp.2018.07.04>). The contents do not represent the views of the U.S. Department of Veterans Affairs or the U.S. Government. The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are

appropriately investigated and resolved.

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