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Decreased Cancer Prevalence in the Nursing Home

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To the Editor: Cancer prevalence increases dramatically with advancing age (1). Yet, large registry datasets have indicated a curious decline in cancer prevalence in the oldest-old (i.e., those over the age of 85 years) (2). Although cellular and sub cellular factors associated with advanced age might favor carcinogenesis, other features of a less fertile microenvironment may be unfavorable for tumor growth.

At the phenotypic level, frailty is becoming more objectively characterized (3), and dysregulated inflammatory processes are thought to figure prominently in its pathogenesis (4,5). Furthermore, a reduced capacity to produce or respond to angiogenesis (6) or other growth factors (7) might be a definable component of frailty. Thus, in frail individuals, the above factors may be responsible for a tissue microenvironment less conducive for tumor growth, and this may result in the appearance of less cancer in frail when compared to non-frail individuals of the same age.

To address this hypothesis we proposed there would be less cancer among those who reside in nursing homes because residents therein have a disproportionately higher representation of individuals meeting established criteria for frailty (8). We examined the Medicare Current Beneficiary Survey (MCBS), a continuous, multipurpose survey of a nationally representative sample of aged, disabled, and institutionalized Medicare beneficiaries (9). The sample included 40,125 persons who lived in the community and 2,190 persons who lived in a long-term care facility. Survey-reported events were linked to Medicare claims data. We examined the age-adjusted prevalence rates of cancer in the various subpopulations within the MCBS dataset. For this analysis, all beneficiaries over the age of 65 years were stratified into three age groups: 65 to 74, 75 to 84, and 85 and over. To estimate sampling error within the dataset, standard errors were determined by incorporating published variability estimates and calculating the Z value. If the absolute value of Z were greater than 1.96, we would conclude that the two rates were significantly different at a p-value of less than 0.05. The prevalence of an active (i.e., coded for reimbursement purposes) cancer diagnosis in the three selected age groups is listed in Table 1.

We found the prevalence of cancer to be lower among institutionalized beneficiaries in all age groups, reaching a level of statistical significance for those over 85 years when compared to age-matched individuals living in the community. The prevalence of cancer among elders in the community in the 75-84 years age group was 20.22% among those who live alone, 23.15% among those who live with spouse, and 19.42% among those who live with others. This was higher when compared to 5.16% among the institutionalized. The difference was even greater for the oldest age group, those 85 years and older. Here, the prevalence of cancer in the community was 19.96% among those who live alone, 22.85 % among those who live with spouse, and 15.58 % among those who live with others. This was

strikingly higher than the rate of 4.18% among those who reside in long term care facilities. The prevalence of cancer was similar among male and female Medicare beneficiaries in the 65-74 and 75-84 age groups. However, for those over 85 years, cancer was diagnosed less commonly in females. It is notable that cancer in this age group occurs less frequently in women. However, 'frailty' is also more common in females of this age-group (10).

These observations support the premise that the development of the frail phenotype may somehow protect against cancer. Certainly, some might argue that the observations could simply reflect less aggressive screening or under reporting of cancer in the nursing home, but whether this could account for a four to five fold difference in cancer prevalence seems unlikely. Further, prospective studies are needed to evaluate the relationship between frailty and cancer among community frail elderly to confirm this finding. If this is indeed true, one logical next step would be to examine the questions of carcinogenesis and tumor growth in animal models of chronic inflammation, as this may lead to clues regarding the biology of frailty and the interrelationships of inflammation, cancer and aging.

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Table 1
Prevalence (% with Cancer) Among Non-institutionalized and Institutionalized Medicare Beneficiaries

Total Sample Age (Years)		Non-Institutionalized						Institutionalized	
		Lives Alone		Lives with Spouse		Lives with Other			
		All		All		All			
M	F	M	F	M	F	M	F	M	F
65-74		16.4		16.04		15.8		9.55	
15.44	16.51								
75-84		17.4		17.3		16.2		9.4	
15.7	15.5	17.4	15.7	17.3	15.5	16.2	15.7	9.4	9.9
21.69	19.97								
>85		20.22		23.15		19.42		5.16	
21.89	14.38								
		22.1		27.3		16.7		5.2	
		19.6	27.3	21.3	16.7	21.9	5.2	4.9	
		19.96	22.85	15.58					
		19.9	20.1	25.3	21.1	12.5	15.6	5.7	3.8

Source: Medicare Current Beneficiary Survey. Non-institutionalized includes beneficiaries who resided only in the community during the year and beneficiaries who resided part of the year in the community and part of the year in a long-term care facility. It excludes beneficiaries who resided only in a long-term care facility during the year.