

## RESEARCH COMMUNICATION

# Geriatric Cancers in India: An Epidemiological and Demographic Overview

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## Abstract

This article provides an overview of aspects of the burden of cancer in the elderly, in India highlighting certain demographic and epidemiological data. In India the normal retirement age is 60 years, so the definition of the elderly, in India is considered above the age of 60 years. Information on the aging of the Indian population is based on various census figures, cancer incidence figures are taken from Mumbai registry data. Men and women aged  $\geq 60$  years are at high risk for major cancers. Men have a risk 15 times greater risk and in women 8 times greater risk than the persons having age  $< 60$  years. Lung and prostate cancers are most prominent cancer in men having age  $\geq 60$  years while in women breast is the leading site followed by cervix and ovary in the same age group. Demographic and epidemiologic data characterize the aging / cancer interface. The changing demographic structures underscore the current incidence imperative for elderly; suggesting a starting demand will be made in the future requiring physician's abilities and skills to meet these needs.

**Key Words:** Cancer Incidence - geriatrics - aging - co-morbidity

*Asian Pacific J Cancer Prev*, 9, 271-274

## Introduction

The population is rapidly aging as the "baby boom" cohort of adults reaches the age of 60+ years. This group differs from those previously moving through the geriatric age range. They are more proactive concerning their health and also more interested in aggressive management of their problems. The older population in most of the countries is rapidly increasing. This increase in the elderly population has become a key issue. The implications for the future care of older persons involves significant medical, public health, economic, ethical and social issues (Kennedy, 1988). This expanding older population has created new fields of medicine. Gerontology is the study of aging. Geriatrics is the health and social care of the elderly. Geriatric medicine is the sub discipline within geriatrics specifically devoted to the medical care of the elderly; and subdivision of geriatric medicine is geriatric oncology. Some would prefer reference to aging and cancer, where cancer is an expected product of aging. This article provides an overview of aspects of the burden of cancer in the elderly, in India, highlighting certain demographic and epidemiologic data.

## Materials and Methods

### Definition of the elderly

In developed countries the cut off is considered to be 65 (and sometimes even 70). The reason is because this is

the age of retirement in these countries. Also their epidemiological data show that more than 50% of their cancers occur in patients who are more than 65 years old. In fact, the American National Institute for aging divides the elderly into three groups: young-old (65-74 years); older-old (75-84); and oldest-old (more than 85 years of age) (4th International Conference on Geriatric Cancers, Rome). In India the normal retirement age is now 60 years and for most cancers, diagnosis is a decade earlier than in the West. Therefore the definition of elderly in the India (i.e. one of the developing countries) is here considered to be above the age of 60 years.

### Data sources

Information on the aging of the Indian population is based on the various census figures (Census-1961, 1971, 1981, 1991, 2001). Midyear and future projection figures are made by making assumptions for future fertility, life expectancy and net immigration levels. Cancer incidence figures for aging population are taken from Mumbai Cancer Registry, covering the resident population of Greater Mumbai, a densely populated metropole (12 million) on the west coast of India, occupying an area of 437.7 sq.km. This registry has been functioning since 1964 and data collected are quite complete and reliable (Yeole and Jussawalla, 1988; Yeole, 2002).

### Prediction Methods

For predicting incidence cases estimated population

Bombay Cancer Registry, Indian Cancer Society, 74, Jerbai Wadia Road, Bhoiwada, Parel, Mumbai – 400 012, Maharashtra. \*For Correspondence: Email: bcrics@vsnl.com

**Table 1. Numbers of Incidence Cases and Rates per 100,000 Population for Leading Sites of Cancers in People Aged <60 and ≥60 years by Sex, Greater Mumbai, 2002-04**

Sex	Rank	Site	60 years		≥60 years		
			Cases	Rate	Site	Cases	Rate
Male							
	1	Mouth	774	3.8	Lung	734	58.8
	2	Leukemia	556	2.9	Prostate	644	51.6
	3	Lymphoma	551	2.9	Esophagus	477	38.2
	4	Brain	490	2.5	Larynx	451	36.1
	5	Tongue	438	2.2	Liver	366	29.3
	6	Lung	422	2.2	Mouth	348	27.9
	7	Esophagus	326	1.7	Lymphoma	303	24.3
	8	Stomach	270	1.4	U Bladder	300	24.0
		All Sites	7,115	36.4	All Sites	6,843	548.3
Female							
	1	Breast	2,649	17.1	Breast	1,345	104.0
	2	Cervix	1,233	8.0	Cervix	615	47.5
	3	Ovary	581	3.8	Ovary	359	27.8
	4	Leukemia	352	2.2	Esophagus	312	24.1
	5	Lymphoma	296	2.0	Lung	265	20.5
	6	Brain	280	1.8	Mouth	231	17.9
	7	Mouth	258	1.6	Lymphoma	209	16.2
	8	Esophagus	236	1.5	Colon	172	13.3
		All Sites	8,313	55.0	All Sites	5,759	445.2

for 60+ for various years by register general of India have been used (Registrar General’s Report). For estimating cancer incidence cases for future period the trends observed in the incidence cases during 1971-2001 for various sites in Mumbai Population has been used.

**Results**

The juxtaposition of cancer, primarily a disease of the elderly, and expansion of the elderly population over the next 2,3 decades or more create a cancer imperative for the aging citizens of India. In 1961, 5.6% of the population (2.47 million persons) was aged ≥60. In 2001 it has increased to 7.5% (7.66 million persons) of the population and it is projected that it will increase to 12.4% (17.32 million persons) in 2026 in this age group.

**Table 2. Ratios of Incidence Rates for ≥60 to <60 Ages for Leading Sites by Sex, Greater Mumbai, 2002-04**

Rank	Site	Males			Females			
		<60	≥60	Ratio	Site	<60	≥60	Ratio
1	Prostate	0.5	51.6	103.2	Lung	1.1	20.5	18.5
2	Liver	1.0	29.3	29.3	Liver	0.7	12.0	17.1
3	Lung	2.2	58.8	26.7	Colon	0.8	13.3	16.7
4	Larynx	1.6	36.1	22.6	Esophagus	1.5	24.1	16.1
5	Esophagus	1.7	38.2	22.5	Stomach	0.9	11.4	12.7
6	Stomach	1.4	27.1	19.6	Mouth	1.6	17.9	11.2
7	Rectum	1.1	18.0	16.4	Tongue	0.9	9.1	10.1
8	Gall Bladder	0.6	9.5	15.8	Rectum	1.0	10.1	10.1
9	All Sites	36	548	15.1	Gall Bladder	1.1	10.9	9.9
10	Colon	1.2	17.0	14.2	Larynx	0.2	4.5	9.0
11	Tongue	2.2	21.8	9.9	All Sites	55	445	8.1
12	Mouth	3.8	27.9	7.3	Lymphoma	2.0	16.2	8.1
13	Lymphoma	2.9	24.3	8.7	Ovary	3.8	27.8	7.3
14	Leukemia	2.8	13.6	4.9	Breast	7.1	104	6.1
15					Cervix	8.0	47.5	5.9
16					Leukemia	2.2	9.9	4.5

Age structure and its changes over these five decades of census population shows the past, present and impending demographic transitions and responds to two questions: how large is the current-older aged population and what is the anticipated expansion for this age group. As the configuration of the age structure changes dramatically in just few decades, the shifts in the older five year age groups cause the age pyramid structure to acquire more rectangular shape. In India, 2026, 1 in 8 Indians will be aged ≥60 years (Table 1).

Cancer disproportionately affects to ≥60 years age group. The impact of the current challenge of cancer in the elderly using Mumbai Cancer data for the years 2002-04 describes the magnitude of the cancer burden for specific tumors (Table 2).

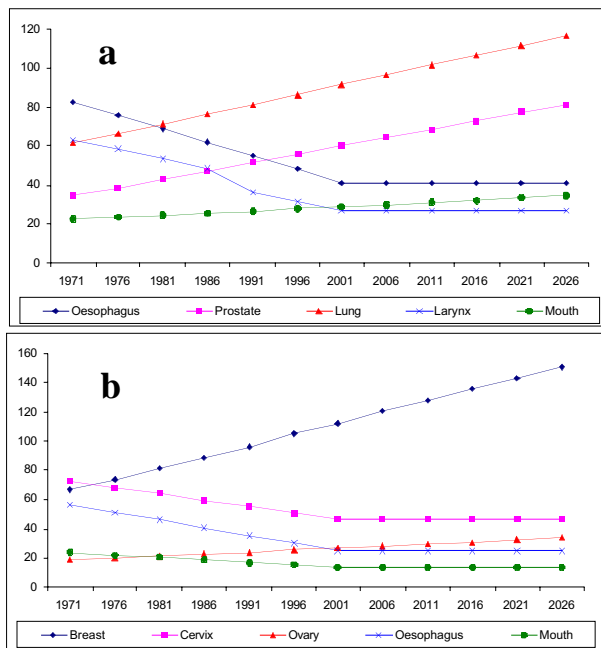
In men, age < 60 years mouth cancer was the leading site of cancer followed by lymphomas, leukemias, and brain in descending order ; while in the age group ≥ 60 years cancer of the lung was the leading site followed by prostate, esophagus, larynx, and liver. In women, in both the age groups (<60 and ≥60) cancer of the breast is the leading site followed by the cervix and ovary, but the incidence rates are very high in the age group ≥60 years as compare to that of < 60 for this cancers.

Men and women age ≥ 60 years are at high risk for the major cancers. Data shows that for the men have been ≥ 60 years have a risk 15 times greater and in women 8 times greater than the persons having age < 60 years. In men, for the age group ≥60 years cancers of the prostate, liver, lung, larynx, esophagus, stomach, rectum and gall bladder have higher risk than all cancers combined. For prostate cancer the risk is more than 100 times greater as compare to the persons having age < 60 years. In women, for the age group ≥ 60 for cancer of lung, gallbladder, liver, colon, esophagus, mouth, tongue, rectum and larynx have greater risk than all cancers combined. For cancer of the breast, cervix, and ovary have a lower risk as compare to total cancers. Even the proportions of these cancers indicated below the average figure are striking because they impart that breast, cervix, and ovarian cancers often believed to be the tumors of young persons, account for nearly 50% of tumors in women aged ≥ 60 years, similarly non Hodgkin’s lymphomas and Leukemias are generally not considered the disease of the older adults, although more than 50% of these tumors in older persons.

Predicted cancer incidence cases ≥ 60 population for

**Table 3. Predicted Cancer Cases in the Aged ≥60 years by Sex in India, 2006-2026**

Sex	Site	2006	2011	2016	2021	2026
Male	Lung	39,405	48,958	62,003	78,860	98,752
	Prostate	26,243	33,072	42,420	54,574	69,050
	Mouth	12,266	14,972	18,711	23,510	29,109
	Esophagus	16,626	19,641	23,709	28,805	34,525
	Larynx	10,921	12,902	15,573	18,921	22,678
	All sites	232,031	269,295	319,256	380,816	447,978
Female	Breast	51,567	61,302	73,908	90,522	111,586
	Cervix	17,346	20,384	24,296	29,423	35,867
	Ovary	11,478	14,193	17,757	22,086	27,808
	Mouth	7,538	8,858	10,558	12,786	15,587
	Esophagus	10,665	12,532	14,938	18,090	22,051
		All Sites	186,011	216,570	255,737	306,801



**Figure 1. Estimated Incidence Rates for the Period 1971-2001 and Predicted Incidence Rates for 2006 to 2026 for Selected Sites, India. a) Males, b) Females**

India for all cancers together and for some major sites by sex for the period 2006 to 2026 are presented in Table 3. For predicting these cancer incidence cases for the future period 2006 to 2026, population estimated by Registrar General and incidence rates based on trends observed for respective sites during 1971-2001 in Mumbai registry has been used.

For estimating predicted cancer incidence rates the trends observed for all sites together and lung, prostate and mouth in males and breast and ovary in females observed during the period 1970-2001 are assumed to be the same for predicted period also. The incidence rate estimated for 2001 for larynx and oesophagus in males and cervix, oesophagus and mouth for females are assumed to be the same for future predicted period (Figure 1a and b).

Cancer is the disease of aging and major cause of morbidity and death more than  $\geq 60$  population will have increase in 2026 by 80% over that of 2006; but the total cancer incidence for  $\geq 60$  population will have increase by 100%, providing that no changes occur in environment or healthcare in India. In  $\geq 60$  population lung and prostate in men and breast, cervix, and ovary are most common cancers.

It has been predicted that in 2026, in India, there will be about 4,50,000 in men and 3,70,000 in women will have cancer incidence cases  $\geq 60$  age population. In men highest incidence cases will be of lung (22%) followed by prostate (15.3%), while in women highest incidence cases will be of breast (34.4%), followed by cervix (9.7%) and ovary (7.5%).

## Discussion

Lung and prostate carcinomas are the most common cancers in men, patients with highest incidence, lung cancer also have also the highest death rate. The cause of

lung carcinoma is a public health prevention issue. Lung carcinoma therapeutics are dismal. Prostate carcinoma is a significant problem that needs to be addressed with expanded research. Early detection may be step forward. Regarding breast and cervical cancers continuing effort is needed to emphasize the opportunity or early detection and effective therapies. There is no need for older women to be treated inadequately. The need for more research on the subject of elderly persons with cancer is apparent. It has been demonstrated that older persons with Hodgkin's disease have a biologically different disease from that younger persons (Kennedy et al., 1992).

Cancer patients  $\geq 60$  years deserves a special attention as a target group for efforts along the cancer control spectrum of early detection, diagnosis, pre-treatment evaluation, treatment and care. Reorganization of the importance of integrating cancer and aging research and practice has been increasing (Fentiman et al., 1990).

Cancer is a very serious health problem at any age, but the diagnosis of a tumor concomitant with the normal and pathologic changes associated with advancing age create a special situation for those providing care and treatment to the elderly. For an elderly patients, diagnosis of a tumor is likely to be made in an individual who may already have concurrent health problems, some of which are very serious and introduce great, complexity into the clinical decision-making collectively, all these conditions are referred to as

It is difficult to separate problems associated with a newly diagnosed cancer in an older person from the context of that individual's normal aging and age related problems as well as the chronic diseases and conditions present at that time of diagnosis of cancer. It is not known which diseases and to what extent coexisting disease, compete for care and treatment with a newly diagnosis tumor in an older individual (Yancik, 1997).

How else is the elderly patients with cancer different? This agegroup is heterogeneous due to co-morbidities. Only 8% of elderly patients with cancer have no other illnesses. 37% have one or two other illnesses and 55% actually have three or more co-morbidities (Repetto et al 1997; Yancik, 1998).

Why is it important to appreciate this? Concomitant illnesses will have different impacts on the patients' health in general and his ability to tolerate cancer therapy in particular. For instance, hypertension and anemia can be easily controlled and may have no impact on overall survival. Neither of them is like to be interfering with therapy for cancer as well. On the other hand, previous history of myocardial infarction will significantly compromise the ability to tolerate chemotherapy particularly with anthracyclines or cyclophosphamide. In a similar manner a history of diabetes mellitus or hepatitis will not allow aggressive dose intensive chemotherapy.

Senior Adult Oncology Programme, Florida, USA suggested two special provisions in the management of the older cancer patient. Prevention of chemotherapy related toxicity in aged patients and over with prophylactic use of homopoietic growth factors, prevention and management of anemia and proper adjustment of drug dosages to individual. A comprehensive of the older

person to unearth an address individual problem that may be compromise to safety and effectiveness of treatment to assess the risk/ benefits balance in individual situations.

Medical professionals will be treating more and more patients with cancer as the number of older persons continuous to increase. Data on the cancer burden provide convincing evidence that stranger files must be made between geriatric medicine and oncology to meet the current and future needs of this age segments of the populations.

Demographic and epidemiologic data characterize the aging/cancer interface. The changing demographic structure underscores the current incidence imperative for the elderly, suggesting a starting demand will be made in the future requiring physician's abilities and skills to meet those needs. Initials who care for older persons (Geriatricians, Oncologists) can certainly benefit greatly from the integration of knowledge and approaches of each other's specialized fields as they focus on cancer and aging in the same individual's.

Limitations of the study: For predicting cancer incidence cases for India. Incidence data available for Mumbai registry for the period 1971-2001 has been used. The site incidence cancer pattern for Mumbai may not be the same for India as whole. Similarly the assumption of the trends which are observed for various sites in Mumbai will not be the same for all India during the prediction period. For predicting cancer incidence cases for future period 2006-2026 we have used population projections made by Registrar General, which may differ from actual figures. Hence our predictions of cancer incidence cases may have certain uncertainty.

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