



Cancer in the Oldest Old in Massachusetts, 1998-2008

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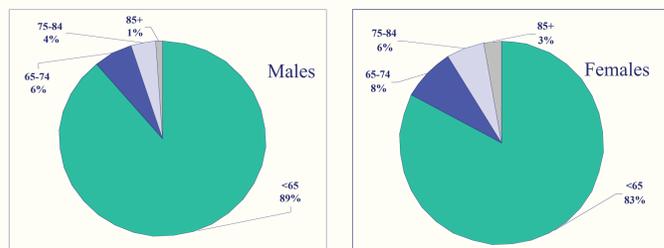
OBJECTIVE: To examine the epidemiology of invasive cancer in Massachusetts residents 85 and older, the 'Oldest Old'.

INTRODUCTION:

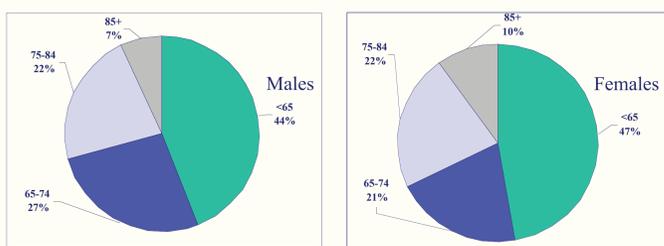
- From 1998 to 2008, the percentage of women 85 and older, the 'Oldest Old', in Massachusetts grew from 2.7% to 2.9% of the population and the percentage of men grew from 1.0% to 1.3%, a trend which mirrored the national trend and is likely to continue given the advances in health care.
- This project focused on the epidemiology of cancer in this group for the most recently available five years of data, 2004-2008, with the exception of 1998-2008 data used for the long-term trend analyses.
- As the population ages and life spans increase, better knowledge of the epidemiology of cancer within this group will become increasingly relevant.
- The presence of co-morbidities (heart disease, diabetes, hypertension, arthritis, and COPD) are higher among the oldest old than in the general population. These conditions may influence what type of cancer treatment can be offered and opportunities to join clinical trials.
- When compared with younger patients with cancer, older patients receive less screening, less aggressive surgery, and less systemic therapy¹
- Cancer in the oldest old is commonly believed to grow more slowly and metastasize less frequently. This is confirmed from autopsy studies that showed metastases from stomach, pancreas, and lung decreased with age.²
- One theory postulates a link between decreased cell division (senescence) in the elderly and decreased proliferative potential among cancers.³

CANCER INCIDENCE IN THE OLDEST OLD:

Population Breakdown in Massachusetts by Sex and Age, 2004-2008

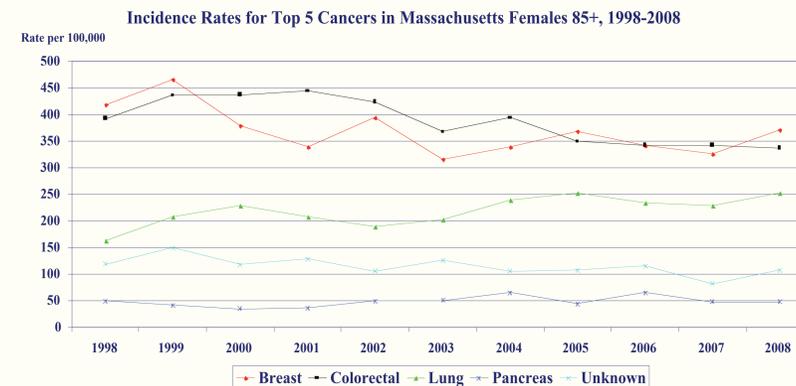
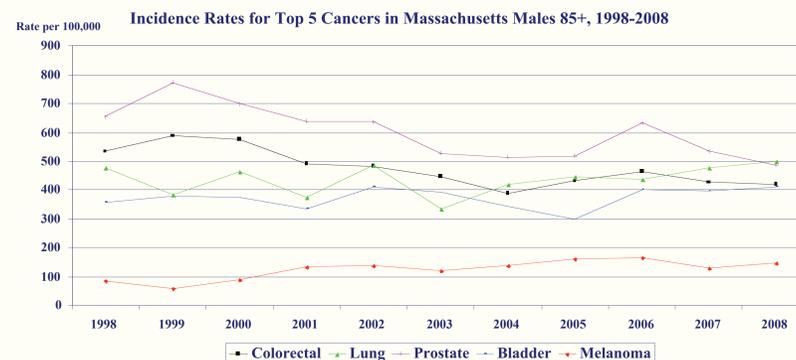


Cancer Cases Breakdown in Massachusetts by Sex and Age, 2004-2008

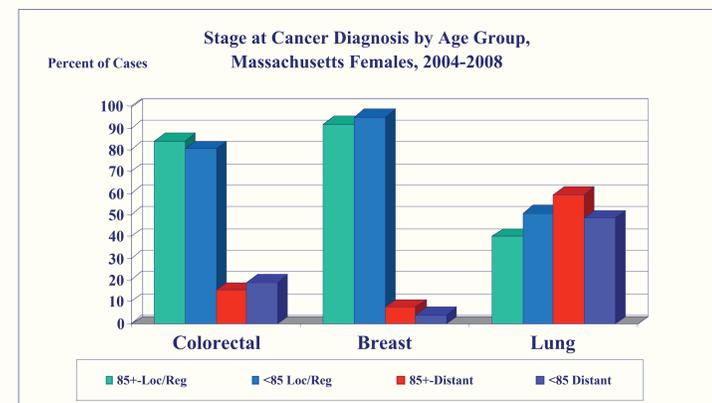
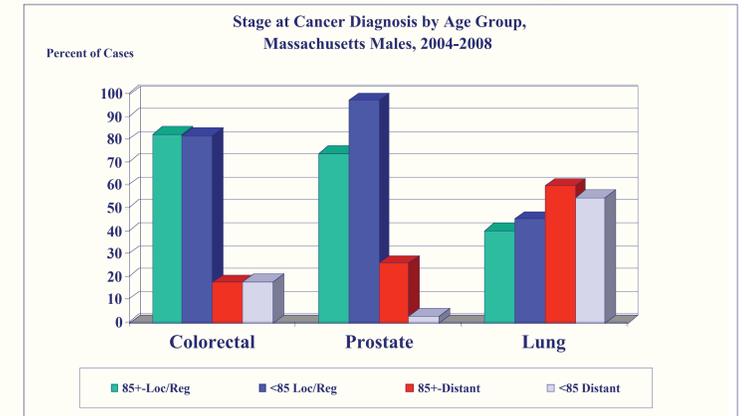


Males:	85+ Incidence Rate (95% CI):	Overall Crude Rate (95% CI):	Females:	85+ Incidence Rate (95% CI):	Overall Crude Rate (95% CI):
Prostate	592.2 (557.5,626.8)	162.7 (160.7,164.7)	Colorectal	363.8 (346.6,381.0)	52.8 (51.7,53.9)
Lung	499.5 (467.7,531.3)	79.0 (77.6,80.4)	Breast	361.9 (344.8,379.0)	154.5 (152.7,156.4)
Colorectal	464.2 (433.6,494.9)	54.7 (53.6,55.9)	Lung	251.5 (237.2,265.8)	76.9 (75.5,78.2)
Bladder	400.0 (371.6,428.5)	42.8 (41.8,43.8)	Unknown	102.8 (93.7,112.0)	10.6 (10.1,11.1)
Melanoma	160.5 (142.5,178.6)	27.6 (26.7,28.4)	Pancreas	91.2 (82.6,99.8)	14.0 (13.4,14.5)

- Prostate cancer was the leading cancer among oldest old males, with an incidence rate 3.7 times the overall population crude rate. Lung cancer, colorectal cancer, bladder cancer, and melanoma had incidence rates between 6 and 9 times higher.
- Breast cancer was the leading cancer among the total female population, but it ranked second among oldest old females with an incidence rate 2.8 times the overall population crude rate. Colorectal cancer, the leading cancer, and pancreatic cancer had rates 8 times the total population rate. Cancers with an unknown primary were diagnosed at a rate greater than 10 times the overall population crude rate.
- For both sexes, colorectal cancer and leukemia incidence rates peaked among the oldest old. Additionally, cancers of the pancreas, stomach, and unknown site peaked in this group for females and melanoma, myeloma, oral cancer, and unknown site peaked for males.



- Among oldest old males, colorectal and prostate cancer incidence rates dropped significantly from 1998 to 2008, perhaps a reflection of better screening of these cancers in the younger age groups.
- Conversely, melanoma rates significantly increased among males, indicating the need for better screening in all age groups.
- Among oldest old females, breast and colorectal cancer incidence rates dropped significantly from 1998 to 2008, perhaps another reflection of better screening in the younger age groups.
- Conversely, lung cancer rates among females significantly increased, perhaps a reflection of female smoking rates increasing several decades ago.
- While cancer with an unknown primary site still ranked 4th among cancers in females 85 and older, the rate declined significantly from 1998 to 2008, indicating better primary site detection.



CANCER STAGING:

- When compared with males younger than 85, males 85+ were significantly more likely to be diagnosed with lung cancer that had metastasized to a distant site.
- There were no significant differences in stage by age group for male colorectal cancer.
- When compared with males younger than 85, males 85+ were significantly more likely to be diagnosed with prostate cancer that had metastasized to a distant site.
- When compared to younger females, females 85+ were significantly more likely to be diagnosed with breast cancer that had metastasized to a distant site; the same was true for lung cancer.
- When compared to younger females, females 85+ were significantly more likely to be diagnosed with colorectal cancer at a localized or regional stage.

CONCLUSIONS:

- While cancer is a disease of aging, owing to the full expression of genetic risks, environmental exposure, and injuries¹ and many cancers reach their incidence peak in this oldest age group; some cancers such as prostate, female breast, esophageal, bladder, liver, Hodgkin and non-Hodgkin lymphomas, thyroid, and testicular peaked before the age of 85.
- Prostate, male and female colorectal, and breast cancers in those 85+ all had significantly elevated incidence rates relative to the crude total population rate, BUT those rates significantly declined from 1998 to 2008. This may be due to these screenable cancers being detected earlier, before becoming invasive.
- Melanoma rates in males and lung cancer rates in females 85+ significantly increased from 1998 to 2008, reflecting the effects of more sun exposure and cigarette smoking in this generation than earlier generations and the need for better screening in the case of melanoma.
- While males and females 85+ were significantly more likely to be diagnosed with late stage lung, breast, or prostate cancer, there was no difference for colorectal cancer. In fact, females were significantly LESS likely to be diagnosed at a late stage.
- Of all the age groups in the cancer registry, the oldest old were the most likely to have missing information on staging, histology, and diagnostic confirmation. This is likely due in part to a significantly higher percentage (18%) of oldest old cases being reported after death through death clearance (6% of those 75-84, 2% of those 65-74, and <1% of those under 65 years were reported this way).
- With an aging population, it is essential for medical oncologists to be able to deal with co-morbidities (heart disease, diabetes, hypertension, arthritis, or COPD) which are more prevalent among the oldest old when determining treatment³.
- The oldest old of MA residents are disproportionately affected by cancer, sometimes as much as 10 times relative to the their portion of the general population. They bear a cancer burden unmatched by any other demographic group in Massachusetts and yet significantly larger amounts of data are missing on this group (primary site, stage, histology, and confirmation method) compared to younger groups. This a group that may hold some answers as to why cancer grows slower and takes longer to occur in some people.

Future Research Questions:

- What sort of treatment does this age group receive compared to other groups?
- What is the cancer-specific mortality for this group? How many of the oldest old die from other conditions instead of cancer?
- How can missing data on stage, histology, and diagnostic confirmation be better collected?

References:

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- Males and females 85 and older were overrepresented among invasive cancers, females much more than males.
- Among the cancers disproportionately higher among the oldest old were unknown primary, bladder, stomach, colorectal, leukemia, myeloma, pancreatic, and mesothelioma.
- Significantly larger proportions of both male and female cancer cases 85+ were white, non-Hispanic, which was reflective of the general population.