



Centro di Riferimento per l'Epidemiologia
e la Prevenzione Oncologica in Piemonte

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Epidemiologia: un'idea del problema

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Argomenti

1. Dati epidemiologici su incidenza e prevalenza delle metastasi ossee
2. Ricoveri e trattamenti per metastasi ossee in Regione Piemonte

- **Incidenza:**

-proporzione di "nuovi eventi" che si verificano in una popolazione in un dato *periodo* di tempo

- **Prevalenza**

– proporzione di "eventi" presenti in una popolazione *in un dato momento*.
– Dipende dalla DURATA della malattia

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Dati Epidemiologici

- L'incidenza di metastasi ossee non rientra tra i dati correntemente raccolti dai registri tumori di popolazione
- I dati riportati da studi di serie cliniche risentono molto dei fattori di selezione, dei criteri usati per definire le lesioni e del tipo di follow-up praticato
- In letteratura sono disponibili pochi studi di coorte a livello di popolazione, di adeguate dimensioni e con stime di incidenza e prevalenza attendibili

Bone metastasis, skeletal-related events, and mortality in lung cancer patients: A Danish population-based cohort study



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ABSTRACT

Objectives: To estimate the incidence rate of bone metastasis and subsequent skeletal-related events (SREs) (radiation to bone, spinal cord compression, fracture, and surgery to bone) in lung cancer patients and to quantify their impact on mortality.

Materials and methods: We conducted a nationwide cohort study of patients diagnosed with lung cancer between 1999 and 2010 in Denmark. We computed the cumulative incidence (%) of bone metastasis and subsequent SREs (treating death as a competing risk) and corresponding incidence rates (per 1000 person-years). Survival was evaluated using the Kaplan-Meier method for three dynamic lung cancer patient cohorts—no bone metastasis, bone metastasis without SREs, and bone metastasis with SREs. Based on a Cox proportional hazards model, we computed mortality rate ratios (MRRs) comparing mortality rates between these patient cohorts, adjusting for age, comorbidity, stage, and histology. Analyses were conducted for the lung cancer patient cohort overall and by histologic subtype.

Results: We identified 29,720 patients with incident lung cancer (median follow-up: 7.3 months). The 1-year cumulative incidence of bone metastasis was 5.9%, and the 1-year cumulative incidence of subsequent SREs was 55.0%. The incidence of bone metastasis and SREs was higher in patients with non-small cell lung cancer (NSCLC) versus SCLC. One-year survival was 37.4% in patients with no bone metastasis; 12.1% in patients with bone metastasis without SREs; and 5.1% in patients with both bone metastasis and SREs. When mortality rates between patients with bone metastasis with and without an SRE were compared, 2-month mortality rates were similar, but the >2-month adjusted MRR was 2.0 (95% confidence interval: 1.7–2.2).

Conclusion: Bone metastases predict a poor prognosis in lung cancer patients. The majority of lung cancer patients with bone metastasis will also experience an SRE, which may further increase the rate of mortality.

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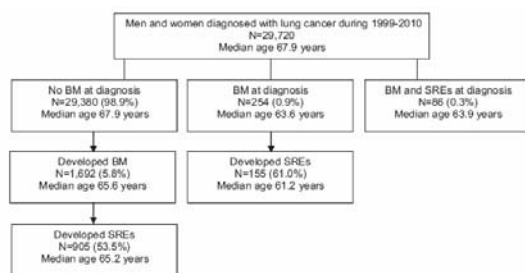
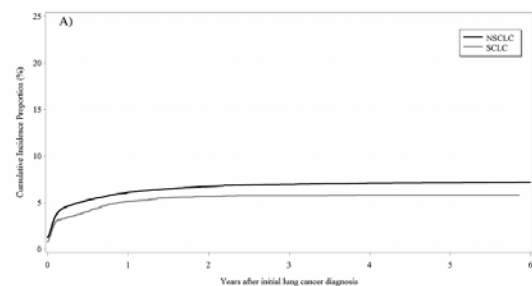
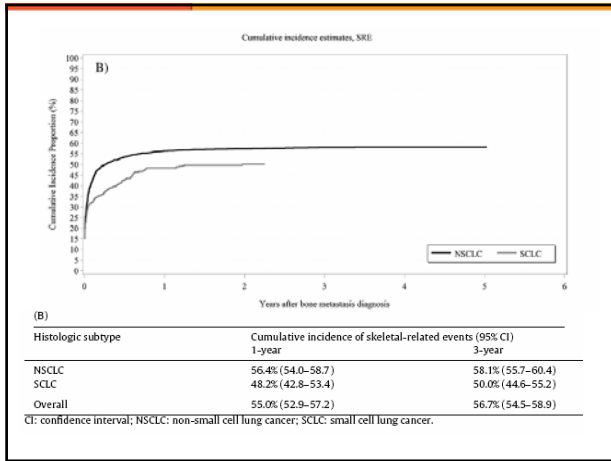


Fig. 1. Lung cancer patient cohort according to the presence of bone metastasis (BM) and subsequent skeletal-related events (SREs) at diagnosis and throughout follow-up.



Histologic subtype	Cumulative incidence of bone metastasis (95% CI)	
	1-year	3-year
NSCLC	6.1% (5.8–6.4)	6.9% (6.6–7.3)
SCLC	5.1% (4.6–5.7)	5.7% (5.2–6.4)
Overall	5.9% (5.6–6.2)	6.7% (6.4–7.0)



Jensen et al. BMC Cancer 2011, 11:29
<http://www.biomedcentral.com/1471-2401/11/29>

RESEARCH ARTICLE Open Access

Incidence of bone metastases and skeletal-related events in breast cancer patients: A population-based cohort study in Denmark

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Abstract

Background: Breast cancer (BrCa) is the most commonly diagnosed cancer among women in the industrialized world. More than half of women presenting with metastatic BrCa develop bone metastases. Bone metastases increase the risk of skeletal-related events (SREs), defined as pathological fractures, spinal cord compression, bone pain requiring palliative radiotherapy, and orthopaedic surgery. Both bone metastases and SREs are associated with unfavorable prognosis and greatly affect quality of life. Few epidemiological data exist on SREs after primary diagnosis of BrCa and subsequent bone metastasis. We therefore estimated the incidence of bone metastases and SREs in newly-diagnosed BrCa patients in Denmark from 1999 through 2007.

Methods: We estimated the overall and annual incidence of bone metastases and SREs in newly-diagnosed breast cancer patients in Denmark from January 1, 1999 to December 31, 2007 using the Danish National Patient Registry (DNPR), which covers all Danish hospitals. We estimated the cumulative incidence of bone metastases and SREs and associated 95% confidence intervals (CI) using the Kaplan-Meier method.

Results: Of the 35,912 BrCa patients, 178 (0.5%) presented with bone metastases at the time of primary breast cancer diagnosis, and of these, 77 (43.3%) developed an SRE during follow-up. A total of 1,272 of 35,690 (3.6%) BrCa patients without bone metastases at diagnosis developed bone metastases during a median follow-up time of 3.4 years. Among these patients, 390 (30.6%) subsequently developed an SRE during a median follow-up time of 0.7 years. Incidence rates of bone metastases were highest the first year after the primary BrCa diagnosis, particularly among patients with advanced BrCa at diagnosis. Similarly, incidence rates of a first SRE was highest the first year after first diagnosis of a bone metastasis.

Conclusions: The high incidence of SREs following the first year after first diagnosis of a bone metastasis underscores the need for early BrCa detection and research on effective treatments to delay the onset of SREs.

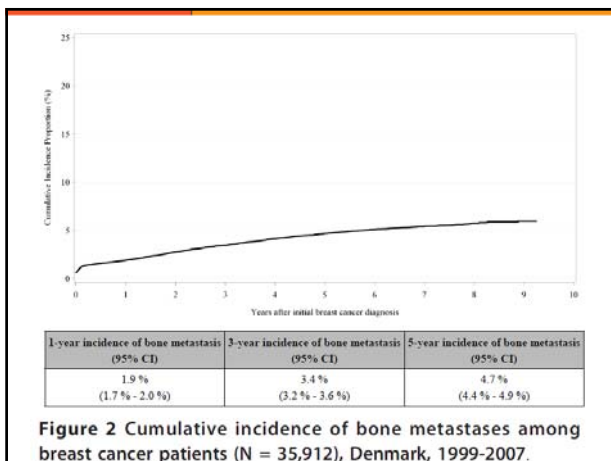


Figure 2 Cumulative incidence of bone metastases among breast cancer patients (N = 35,912), Denmark, 1999-2007.

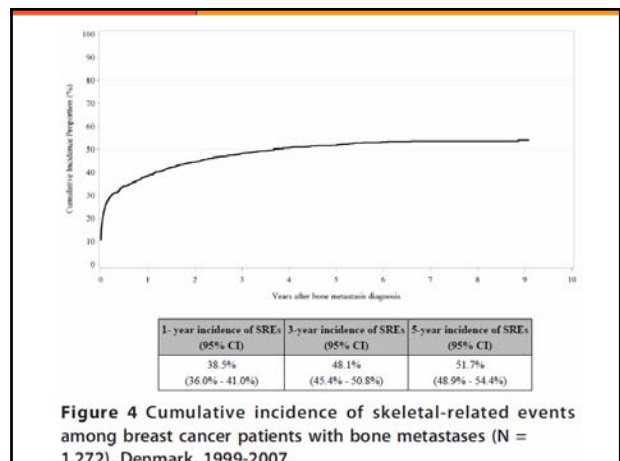
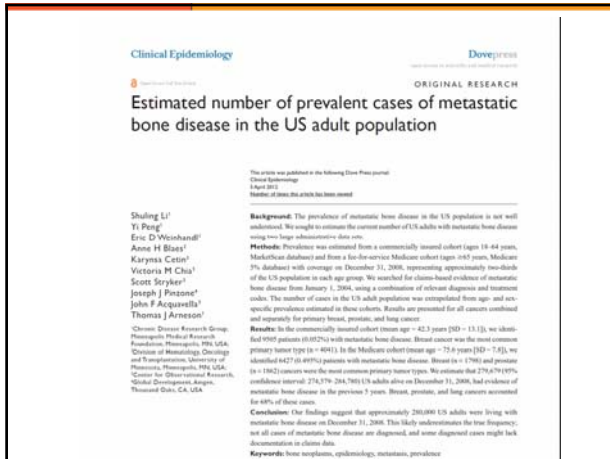


Figure 4 Cumulative incidence of skeletal-related events among breast cancer patients with bone metastases (N = 1,272), Denmark, 1999-2007.



Stima dei casi prevalenti con MTS ossee in Piemonte nel 2010 (*)

Sesso	Età	Popolazione Piemonte 2010	n. casi	Prevalenza (*10000)
Uomini	18-44	758127	49	0.64
	45-64	618270	430	6.96
	65-74	238536	1002	41.99
	75-84	152676	1121	73.41
	>=85	38990	354	90.74
Donne	18-44	741368	105	1.41
	45-64	636152	789	12.40
	65-74	270264	1092	40.39
	75-84	222760	1128	50.63
	>=85	96351	356	37.00
Totale		3773494	6424	17.02

* metodo: Li, Clinical Epidemiology 2012

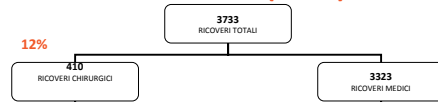
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- ## Ricoveri ospedalieri per metastasi ossee in Piemonte (2014)
- Ricoveri anno 2014:
 - Day hospital
 - Ricovero ordinario
 - Selezione dei ricoveri:
 - Codice ICD9-CM di MTS ossee: 198.5
 - Diagnosi principale o secondaria
 - Identificazione del tumore primitivo con altri codici (stessa SDO)

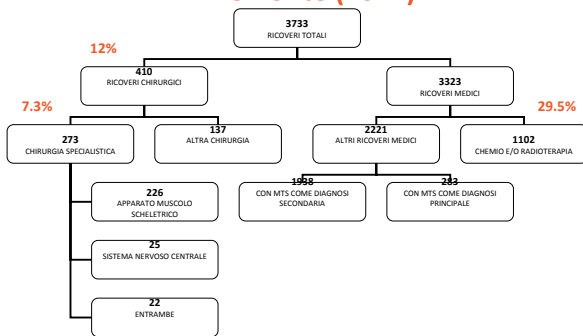
Ricoveri ospedalieri per metastasi ossee in Piemonte (2014)

3733
RICOVERI TOTALI

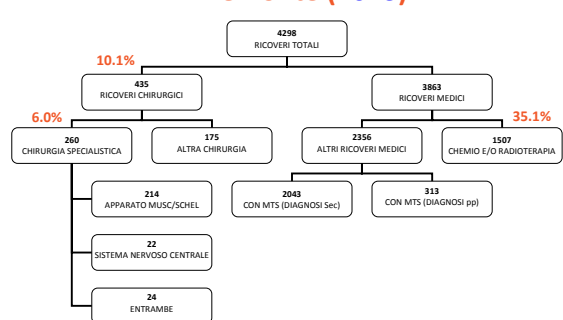
Ricoveri ospedalieri per metastasi ossee in Piemonte (2014)



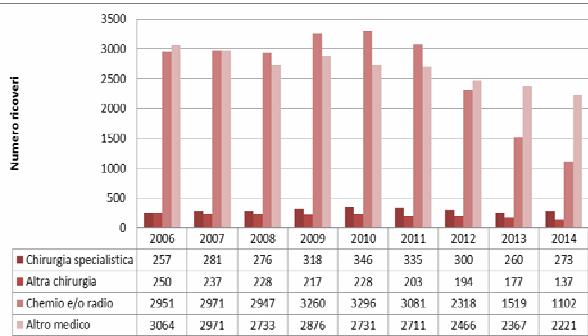
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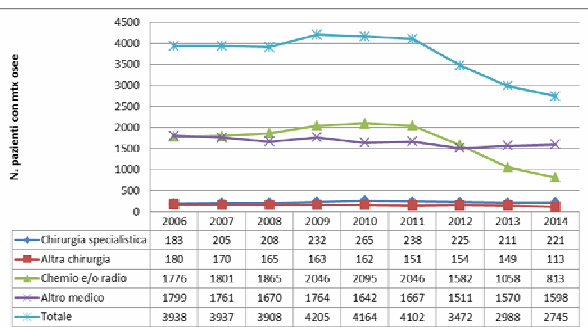
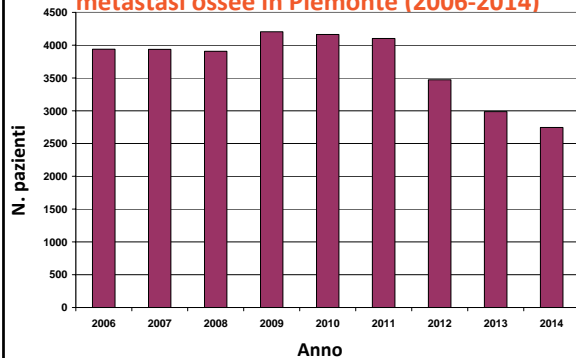
Ricoveri ospedalieri per metastasi ossee in Piemonte (2013)



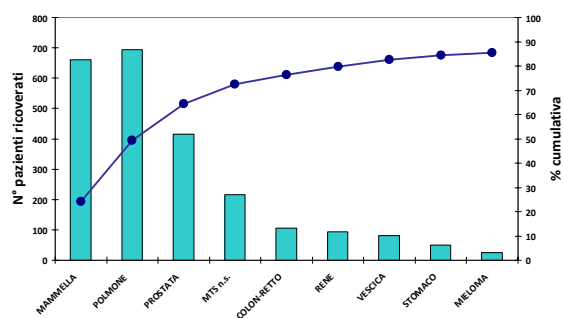
Trend temporale dei ricoveri ospedalieri per metastasi ossee in Piemonte (2006-2014)



Trend temporale dei pazienti ricoverati per metastasi ossee in Piemonte (2006-2014)



Pazienti ricoverati con MTS ossee per diagnosi (2014)



Economic Burden of Metastatic Bone Disease in the U.S.

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BACKGROUND. Previous research has documented the prevalence of primary bone cancer; however, there are few data available regarding the impact of metastatic bone disease (MBD) on national expenditure. In this study, the authors quantified the prevalence and direct medical care costs of patients with MBD and the resulting cost impact on U.S. oncology expenditures.

METHODS. Anonymous, patient-level data on health care utilization and cost were obtained from the Thomson Medstat MarketScan research databases. In total, 396,200 patients who were diagnosed with cancer between 2000 and 2004 were selected for the study. Patients with MBD were matched subsequently to non-MBD controls. A 2-part linear regression model was used to compare cases with controls to quantify the incremental cost associated with the disease.

RESULTS. Cancer prevalence in the U.S. during the study period was estimated at 4,861,987 cases annually, and 5.9% ($n = 256,137$) of those patients had MBD. Rates of MBD were highest in patients with multiple myeloma (28.8%) and lung cancer (15.6%). The mean direct medical cost for all cancers combined was \$75,329 for patients with MBD and \$31,382 for controls. Regression-adjusted, incremental costs were \$44,442 ($P < .001$) across all cancer types. The incremental cost was highest for patients with multiple myeloma (\$63,455) and lowest for patients with lung cancer (\$24,946).

CONCLUSIONS. The national cost burden for patients with MBD was estimated at \$12.8 billion, which is 17% of the \$74 billion in total direct medical cost estimated by the National Institutes of Health, suggesting that MBD is a significant driver of overall oncology cost. *Cancer* 2007;109:2534-42. © 2007 American Cancer Society.