

SHORT COMMUNICATION

Societal Cost of Skin Cancer in Sweden in 2011

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In recent years there has been increasing recognition of skin cancer as a significant economic burden on society, in addition to it being a significant cause of illness, death and human suffering (1–3). In Sweden, skin cancer is the most rapidly increasing form of cancer. The number of deaths each year due to skin cancer in Sweden now exceeds the number of fatalities in road traffic accidents (4, 5). Given this increasing trend, it is important to assess the loss of resources to society due to skin cancer. By assessing the annual cost, the potential saving due to an effective preventive programme can be determined. The main objective of this study is to assess the societal cost of skin cancer in Sweden during 2011.

In 2008, our research group conducted a similar study that estimated the annual cost of skin cancer in Sweden as €142.4 million (6). This estimate included both melanoma and non-melanoma forms of skin cancer and was based on both direct medical costs and indirect costs in terms of lost productivity due to sickness and premature death. In recent years the incidence of skin cancer has continued to increase rapidly. Moreover, new treatment methods have been introduced, making it important to re-assess the societal cost of skin cancer.

The present study utilizes the same data sources and methods as the study conducted in 2008 (6). A full-length version of this article with more detailed description of the methods and results is available from the authors upon request.

RESULTS

Table I summarizes the annual costs associated with skin cancer in Sweden in 2011. The costs were referred to the diagnoses cutaneous malignant melanoma

(CMM), non-melanoma skin cancer (NMSC), melanoma and carcinoma *in situ*, melanocytic naevi (MN), and actinic keratosis (AK).

Healthcare costs due to inpatient care

During 2011 there were 3,007 inpatient episodes due to our selected diagnoses registered in Sweden. CMM was the most common diagnosis, with 1,762 episodes, while NMSC was the second most common diagnosis, with 1,142 episodes. Episodes of other skin cancer-related diagnoses were only minor. The mean cost per episode due to CMM in inpatient care was estimated to €4,996. The corresponding cost for NMSC was €5,590.

The total cost for inpatient care in 2011 was estimated to €15.7 million. Costs associated with CMM represented approximately €8.8 million, while NMSC represented approximately €6.4 million. Costs associated with other skin cancer-related diagnoses were minor in comparison.

Healthcare costs due to outpatient care and primary care

During 2011 there were 307,120 episodes registered due to skin cancer in outpatient care and primary care. NMSC was the most common diagnosis, representing 36% of the patients in outpatient care. MN was the second most common diagnosis, representing 31% of the patients. The total cost of outpatient care episodes was estimated as €86.5 million. NMSC was the main cost driver, at €33 million. The second largest was MN, at €22 million. However, CMM was the diagnosis with the highest mean cost per patient, amounting to €1,208/patient. NMSC was the second most costly diagnosis per patient at €439/patient.

Table I. Cost of skin cancer in Sweden in 2011, in €1,000s (figures in parentheses represent percentage of total cost)

	Cutaneous malignant melanoma	Non-melanoma skin cancer	Melanoma <i>in situ</i> /cancer <i>in situ</i> in the skin	Melanocytic naevi	Actinic keratosis	Total
<i>Direct costs</i>	21,593 (12.2)	39,163 (22)	1,099 (0.6)	21,959 (12.4)	18,393 (10.4)	102,206 (57.5)
Inpatient care	8,803 (5)	6,384 (3.6)	154 (0.1)	199 (0.1)	187 (0.1)	15,727 (8.9)
Outpatient/primary care	12,789 (7.2)	32,779 (18.4)	945 (0.5)	21,760 (12.3)	18,206 (10.3)	86,479 (48.7)
<i>Indirect costs^a</i>	71,783 (40.4)	3,641 (2.1)				75,424 (42.5)
Mortality	64,523 (36.3)	1,682 (1)				66,204 (37.3)
Morbidity	7,260 (4.1)	1,959 (1.1)				9,220 (5.2)
<i>Total costs</i>	93,376 (52.6)	42,804 (24.1)	1,099 (0.6)	21,959 (12.4)	18,393 (10.4)	177,630 (100)

^a3% discount rate.

Production loss due to morbidity

The number of sick leave days due to skin cancer in 2011 amounted to 166.5 production years lost. In the same year 53 individuals with skin cancer were granted compensation for early retirement, which amounted to 42.5 additional production years lost (7, 8). Using the average annual labour cost (including payroll taxes and social fees) of €44,148 (9) the cost of sick leave and early retirement was estimated to €9.2 million.

Production loss due to mortality

According to official statistics from the Swedish National Board of Health and Welfare, 566 patients died from skin cancer in 2011 (4). However, only 164 cases were at an age below 65 at the time of death; subsequently only these cases imply production loss according to the methodology used. CMM was the main cause of death in 158 cases among those who died before age 65. NMSC was registered as the main cause of death in 6 cases. Using an annual labour cost of €44,148 (9) and a discount rate of 3%, the cost of premature death due to skin cancer was estimated as €66.2 million.

CONCLUSION

The total cost of skin cancer in Sweden during 2011 is estimated to €177.6 million. This implies an increase of €35 million since 2005, representing an increase of 27%. When adjusting for inflation this increase is 14%. The direct costs related to skin cancer in 2011 are €102 million, representing an increase of 23% since 2005 (adjusted for inflation). Outpatient care represents almost 50% of the total cost of skin cancer. In total the direct costs (outpatient and inpatient care) represent 57.5% of all costs. The indirect costs caused by skin cancer amount to €75 million. The major cost driver is related to mortality and life years lost, representing 37% of the total cost of skin cancer. The indirect costs, due to mortality and morbidity, represent 42.5% of the total cost.

As in 2005 CMM is the diagnosis that represents the largest cost to society, at almost €93 million and 52.6% of the total cost. Cost arising due to life years lost (production loss) is the major cost driver in CMM. Looking at direct healthcare costs alone, NMSC is the most costly diagnosis, at €42.8 million. The primary

reason why NMSC is more costly compared with CMM regarding direct costs, is the higher level of incidence related to NMSC.

In Sweden, as in most countries with predominantly fair-skinned populations, rapidly increasing incidence rates for skin cancer have been observed in the last decades. The importance of finding effective methods to counteract this growing public health issue cannot be disputed. This is important, not only to avoid significant human suffering, but also to avoid a significant economic burden on society.

To summarize, skin cancer is a major public health issue; this is evident not only in the increasing number of deaths, but also in increasing societal costs. Perhaps it is time to call for a “Vison Zero” plan for skin cancer, just as the Swedish parliament did in 1997 with road fatalities, promising to eliminate road fatalities altogether.

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