

Basal Cell Carcinoma in Sweden 2004–2008

Professional Staff of the Cancer Registry

Birgitta Stegmayr, Head of Division

Medical consultative staff:

Jan Ericsson, MD

Lars Holmberg, MD

Barbro Lundh Rozell, MD

Statistical and administrative staff:

Shiva Ayoubi

Anetta Hällström

Staffan Khan

Åsa Klint

Ulla Tersmeden

For information:

Shiva Ayoubi

Swedish Cancer Registry

Centre for Epidemiology

National Board of Health and Welfare

SE-106 30 Stockholm

SWEDEN

Telephone: +46 075 247 30 51

Fax: +46 075 247 33 27

E-mail: cancerregistret@socialstyrelsen.se

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Preface

The Swedish Basal Cell Carcinoma (BCC) register was established in 2003. In this publication the Centre for Epidemiology (EpC) at the National Board of Health and Welfare presents the 3rd report on incidence of basal cell carcinoma in Sweden. It comprises the material for 2008 and description of trends covering the period of 2004–2008.

In the present report the rates are age standardized according to the population on January 1, 2000.

Site (“topography”) and histopathology (“morphology”) of the tumors has been coded according to regulations by the National Board of Health and Welfare (SOSFS 2006:15).

This report was produced by *Shiva Ayoubi* at the Centre for Epidemiology, National Board of Health and Welfare. *Bernt Lindelöf*, MD, Department of Dermatology and Venereology, Karolinska University Hospital, contributed with medical advice and *Mats Talbäck* at the Centre for Epidemiology, National Board of Health and Welfare, has contributed to the statistical analysis.

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Birgitta Stegmayr

Head of division, Health registers

National Board of Health and Welfare

Stockholm, Sweden

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Sammanfattning

Under 2008 har 36 560 fall av basalcellscancer (BCC) inrapporterats till det svenska cancerregistret. BCC är lika vanlig hos män som hos kvinnor. Sedan 2004, då mätningen påbörjades, föreligger en ökning av antalet fall, vilket delvis kan förklaras av förändringen i befolkningens åldersstruktur.

Antalet personer som drabbas av basalcellscancer varje år är 30 000 – 35 000, varav en del utvecklar mer än en tumör. Risken att få BCC ökar med stigande ålder, dvs. tumören är sällsynt bland ungdomar och medelåldern vid insjuknandet är 70 år för män och 69 år för kvinnor. Den vanligaste lokaliseringen är huvudet, där BCC på öronen är mycket vanligare hos män. Den vanligaste registrerade histologiska typen är den lågaggressiva, nodulära formen. Distributionen av BCC-fall varierar geografiskt med den högsta incidensen i södra Sverige.

Summary

In Sweden, 36 560 cases of basal cell carcinoma (BCC) were reported to the Swedish National Cancer Registry in 2008. The incidence of BCC is not influenced by sex. Since 2004 when the reporting started there has been an increase in tumor incidence which may partly be explained by the ageing population. The number of persons developing BCC in one year is 30 000 – 35 000, and of these some develop more than one tumor annually. The probability of developing BCC increases with age, and the mean age at which the tumor is discovered is 70 in men and 69 in women. The most common site is the head, where BCC on the ears is more common for men. The most frequent histological type is the low aggressive, nodular variety. The distribution of BCC varies geographically with the highest incidence in southern Sweden.

Background

Basal cell carcinoma (BCC) is the most common type of skin cancer. It is slow growing and very infrequently metastasises to other parts of the body, but locally aggressive and may destroy adjacent tissue.

More than one third of every newly diagnosed cancer is localised to the skin, and the vast majority of these are BCC:s. These cancers are supposed to arise from multipotential basal cells of the epidermis (top skin layer) and adnexal structures of the skin, for instance hair follicles.

The most common clinical type of BCC is nodular, a flesh-colored (cream to pink), round or oval, translucent nodule with overlying small blood vessels and a mother of pearl-appearing rolled border. Other clinical types are the superficial and morpheiform variants.

The most important predisposing factor in the development of BCC is the exposure to ultraviolet radiation in sunlight. Almost all BCC:s occur on parts of the body excessively exposed to the sun — especially the face, ears, neck, scalp, shoulders, and back. On rare occasions, however, tumors develop on unexposed skin areas. In a few cases, contact with arsenic, exposure to other types of radiation, ulcerations that resist healing, chronic inflammatory skin conditions and complications from burns, scars, infections, vaccinations, or even tattoos are contributing factors.

Due to their vast number, the BCC:s were not included among the tumors and tumor like conditions previously mandatory to report to the Swedish National Cancer Registry, except from a rare variant, the so called metatypical BCC. Not until well functioning computer systems were available to the pathology laboratories, the National Board of Health and Welfare issued directions regarding registration of all BCC:s in September 2003. Since then, the number of newly diagnosed tumors annually reported is in the range of 30 000 – 35 000. In Sweden the lifetime cumulative rate is about 15 percent up to age 75. The treatment of BCC is mostly surgical but there are several other treatment options available.

Material and Methods

According to regulations by the National Board of Health and Welfare (SOSFS 2006:15) all pathology and cytology departments in Sweden must report all new cases of BCC to the National Swedish Cancer Register. This is an incidence register, i.e. every tumor shall be reported once.

The registration of BCC started in September 2003. Currently, population based complete data are available from the years 2004 – 2008.

The registration of new tumors is performed by 35 pathology and cytology laboratories of the six medical regions of Sweden; Stockholm–Gotland, Uppsala–Örebro, Linköping (South East), Lund–Malmö (South), Göteborg (West) and Umeå (North), Appendix 1.

Data in the BCC register

- Unique personal identification number composed of 8 digits based on century, year, month and day of birth, supplemented with the so-called registration number (3 digits) and a check digit
- Pathology/ cytology laboratory
- Site of tumor with specification of side for bilateral body parts.
- The coding has been performed according to:

Topography (T-code)

T02100	head NOS
T02102	scalp
T02120	face
T02130	eyelid
T02140	nose
T02200	ear
T02300	neck
T02400	trunk
T02410	shoulder
T02424	breast
T02450	back
T02471	buttock
T02480	abdomen
T02511	vulva
T02600	arm NOS
T02610	upper arm
T02630	lower arm
T02800	leg NOS
T02810	thigh
T02830	lower leg

T01000 information lacking

- Histological type according to the Sabbatsberg criteria to estimate the putative aggressiveness of the tumor:

Histology code (M-code)

M80913	low aggressive superficial, type IB
M809031	low aggressive, type IA
M809032	middle aggressive, type II
M809033	high aggressive, type III
M80953	metatypical (for historical reasons)
M80903	information lacking

BCC:s previously reported based on a diagnostic biopsy are excluded by use of code M80904, even though the tumor type may differ in the excision specimens. Also local recurrences are to be excluded from a second reporting by use of code M80907. These two latter morphological codes are not forwarded to the registry. The referring clinicians are obliged to inform the pathologist if the tumor is previously diagnosed or represent a recurrence.

Reference:

Jernbeck J et al: Basalcellscancer. Klinisk utvärdering av histologisk gradering av aggressivitet. Läkartidningen, volym 85, nr 42, sid 3467 – 70, 1988.

Statistical terms

Age

The age of the patient at the date of diagnosis.

Crude incidence rate

The total number of cases divided by the corresponding mean population per 100 000. Rates for men and women are calculated separately.

Age specific incidence rate

Number of cases for each five year age-group divided by the corresponding mean population per 100 000. Rates for men and women are calculated separately.

Cumulative probability of developing cancer

In Table C the cumulative probability of developing BCC before a certain age has been estimated from the age specific incidence rates.

Reference:

Bray F. Age-standardization. In: D.M. Parkin, S.L. Whelan, J. Ferlay, L. Teppo and D.B. Thomas, editors. Cancer Incidence in Five Continents, Volume VIII. IARC Scientific Publications No. 155. International Agency for Research on Cancer, Lyon 2002. Chapter 8, p. 87–89.

Results and Comments

More than 30 000 tumors are reported annually to the BCC registry, which forms a separate part of the Swedish Cancer Registry due to the mode of the registration. Thus the BCC:s are reported only from the pathologists and not simultaneously from the clinicians, stating the location (topography) and the histological type (morphology) as two codes. The advantage of this system is the capacity to handle a large number of registrations with comparatively limited resources. However, the lack of clinical data results in an under-reporting regarding the superficial BCC:s, which often are multiple and, once the diagnosis is established in one of the tumors, are treated without a diagnostic biopsy. On the other hand, over-reporting occurs when both the diagnostic biopsy and following excision are reported because the pathologist is not informed of the previous procedure. The extent of both these errors needs further investigation.

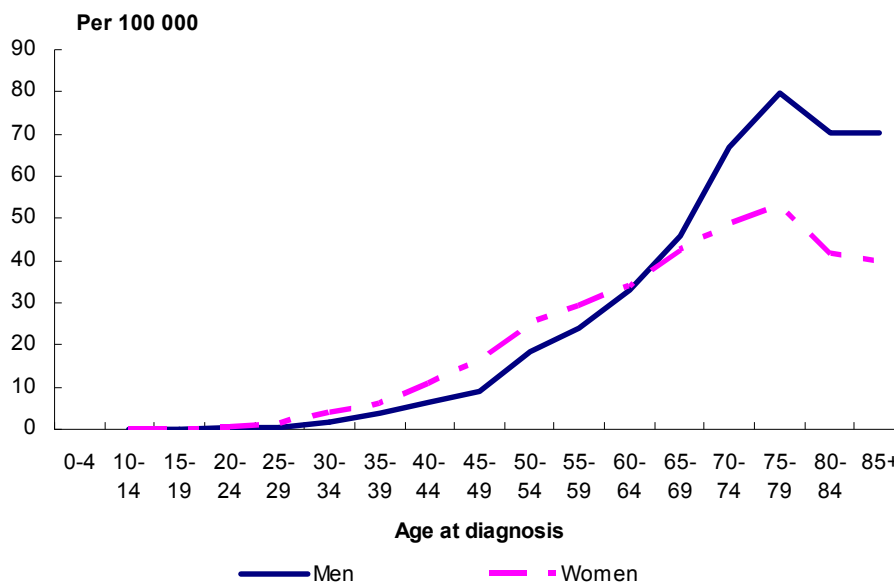
In the following pages, the results are presented as tables and graphs with comments.

Table A: Total number of basal cell carcinoma, by sex 2004–2008

Year	Men	Women	Total tumors
2004	15 632	16 138	31 770
2005	16 369	16 554	32 923
2006	16 489	17 209	33 698
2007	16 710	17 919	34 629
2008	18 165	18 395	36 560

Comment: The number of reported BCC is slowly increasing. The number of tumors is larger in women but the incidence is lower, see figure A.

Figure A: Age specific incidence rates per 100 000, by sex, 2008



Comment: The graph shows that BCC is a disease of the elderly but also affects younger persons. The mean age at discovery is 70 years for men and 69 years for women.

Table B: Percentage distribution by number of basal cell carcinoma, per individual, 2008

Number of BCC:s	Individuals	Tumors	%
1	24 993	24 993	83.0
2	4 562	9 124	14.0
3	493	1 479	2.0
>3	241	964	1.0
Total	30 289	36 560	100

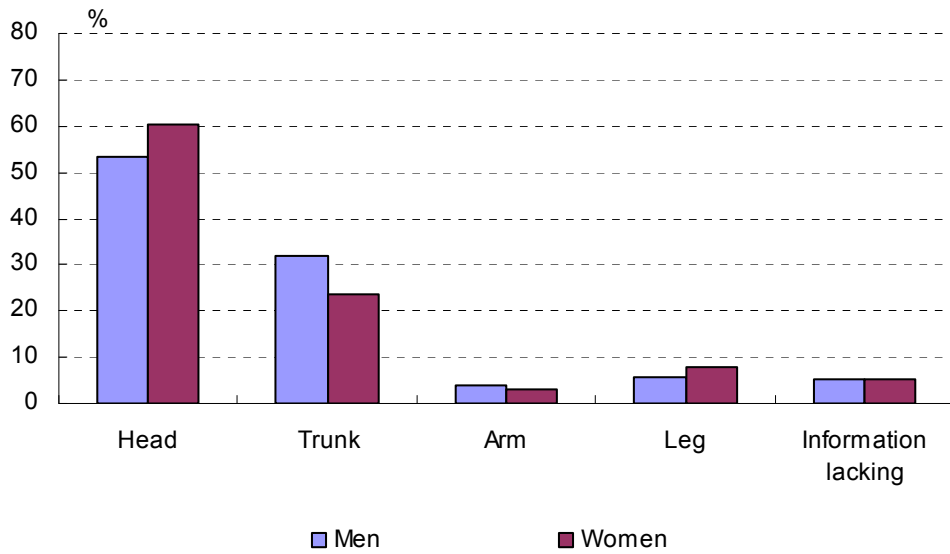
Comment: A large number of patients are reported to have more than one BCC in a year. In 2008, 5296 persons (17 %) were reported to have more than one BCC. The degree of over-reporting is uncertain.

Table C: Cumulative probability of developing basal cell carcinoma before a given age in Sweden, by site and age, 2004–2008

Topography-code	Site	Sex	Age					
			< 25	< 35	< 45	< 55	< 65	< 75
T02100-T02830	All sites	M	0.0	0.2	0.7	2.3	6.4	15.4
		F	0.0	0.3	1.3	3.7	8.3	15.5
T02102-T02300	Head	M	0.0	0.1	0.3	1.1	3.2	8.3
		F	0.0	0.1	0.6	1.7	4.3	9.1
T02400-T02480	Trunk	M	0.0	0.1	0.4	1.0	2.6	6.0
		F	0.0	0.1	0.6	1.6	3.1	5.0
T02600-T02630	Arm	M	0.0	0.0	0.0	0.1	0.3	0.8
		F	0.0	0.0	0.0	0.1	0.3	0.6
T02800-T02830	Leg	M	0.0	0.0	0.0	0.1	0.3	0.9
		F	0.0	0.0	0.1	0.2	0.6	1.4

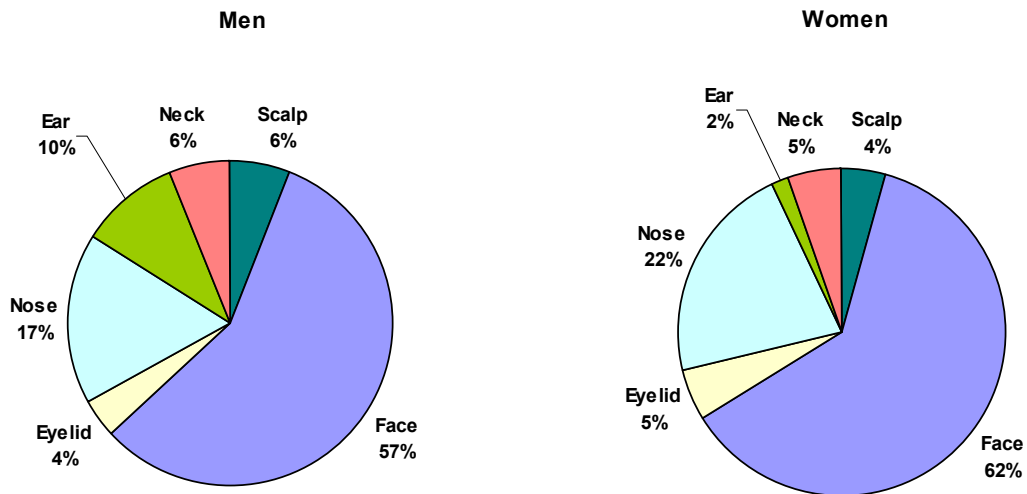
Comment: The risk of developing BCC varies strongly with age and by site with the highest risk for the head in both women and men, 9.1 % and 8.3 % respectively, up to the age of 75 years. The risk of developing BCC at any site is approximately 15 percent for both sexes up to the age 74 years.

Figure B: Percentage distribution of basal cell carcinoma by site, 2008



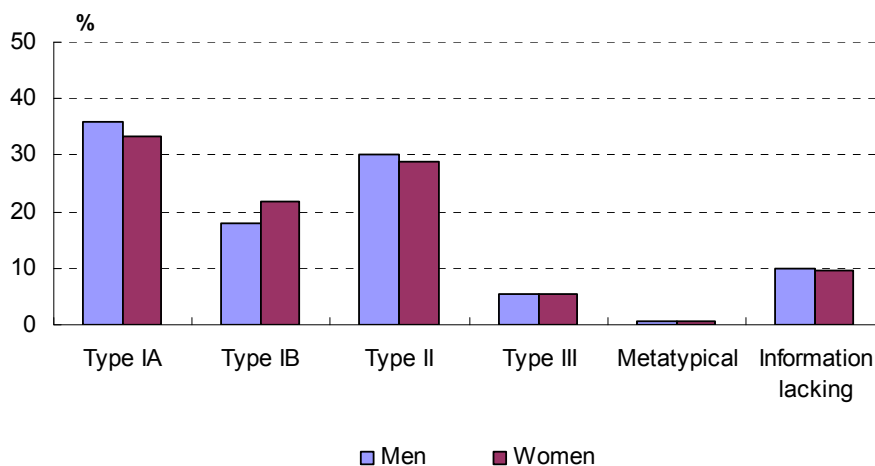
Comment: The most common site of BCC is the head. Women are slightly more affected on this site than men. The opposite is shown for the trunk. Since the clinicians are obliged to supply information regarding the tumor site the high percentage of information lacking is notable.

Figure C: Percentage distribution of basal cell carcinoma in the head and neck area, by site and sex, 2008



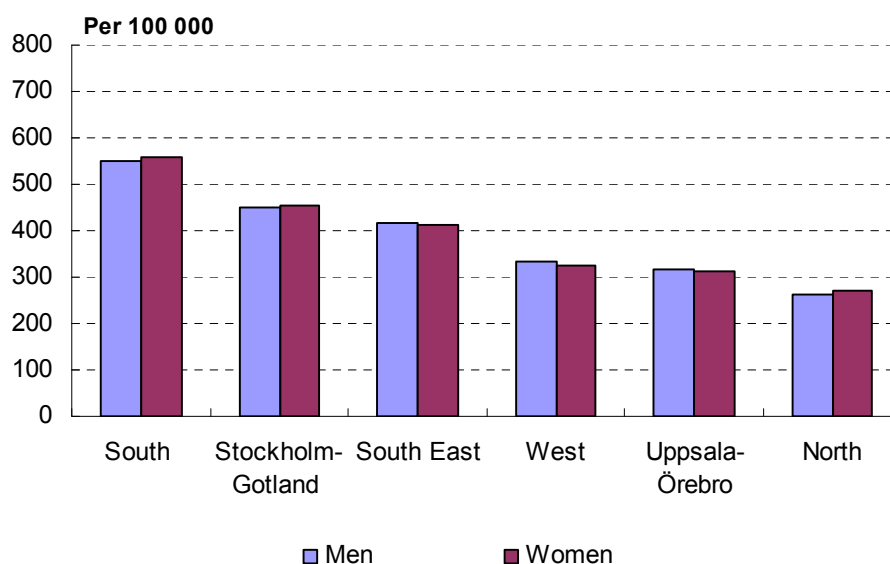
Comment: The distribution in this area differs between the sexes. For men 10 % of the BCC:s are located on the ears compared to 2 % for women. Regarding the scalp, the differences are surprisingly small.

Figure D: Percentage distribution by histological type of basal cell carcinoma, 2004–2008



Comment: The most common histological type of BCC is type IA, low aggressive, nodular type. This type together with type IB, the superficial variant, is usually rather easy to treat and a number of therapy modalities exist. However, type II and III, which affect approximately one third of the patients, demand more qualified surgical procedures.

Figure E: Crude rate of basal cell carcinoma by medical region, by sex, 2004–2008



Comment: The figure shows a higher crude rate of BCC in the southern part of Sweden compared to the northern part. The most probable explanation is the difference in yearly ambient solar ultraviolet radiation. However, other factors might influence the result such as regional differences in number of outdoor workers, the number of elderly individuals, leisure travelling habits, tanning habits and sun bed use.

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Table 1: Number of new cases by site, sex and age at diagnosis

Topography- code	Sex	Total	0-4	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
All sites	M	18165	-	1	1	13	23	68	170	346	415	726	1130	2122	2463	2773	2767	2729	2418
	F	18395	-	4	8	14	44	159	277	542	712	982	1362	2169	2337	2235	2343	2390	2817
T021-T023	M	9693	-	1	-	10	12	31	72	155	181	348	580	1050	1289	1445	1477	1579	1463
	F	10981		3	5	7	17	64	112	228	326	491	708	1239	1363	1366	1490	1600	1962
T024	M	5794	-	-	1	3	9	34	72	141	177	285	392	738	817	900	868	752	605
	F	4385	-	1	3	6	26	77	131	236	288	338	423	584	561	489	427	388	407
T026	M	692	-	-	-	-	-	2	7	19	17	21	50	92	96	105	107	103	73
	F	619	-	-	-	1	-	2	7	15	29	37	55	61	83	74	82	81	92
T028	M	1076	-	-	-	-	-	-	2	11	17	33	60	120	135	175	180	182	161
	F	1501	-	-	-	-	-	5	9	24	25	76	110	176	212	201	229	224	210

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Table 2: Rates per 100 000 by site, sex and age at diagnosis; rates are age adjusted to the population year 2000

Topography- code	Sex	Total	0-4	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
All sites	M	430.0	-	0.0	0.0	0.3	0.5	1.6	3.7	6.6	9.1	18.3	24.0	33.1	45.7	66.9	79.6	70.4	70.1
	F	352.6	-	0.1	0.1	0.3	1.1	4.0	6.2	10.9	16.1	25.2	29.1	34.0	42.5	48.4	53.3	41.7	39.7
T021-T023	M	231.7	-	0.0	-	0.2	0.3	0.7	1.6	3.0	4.0	8.8	12.3	16.4	23.9	34.9	42.5	40.8	42.4
	F	207.7	-	0.1	0.1	0.1	0.4	1.6	2.5	4.6	7.4	12.6	15.1	19.4	24.8	29.6	33.9	27.9	27.7
T024	M	135.1	-	-	0.0	0.1	0.2	0.8	1.6	2.7	3.9	7.2	8.3	11.5	15.2	21.7	25.0	19.4	17.5
	F	86.8	-	0.0	0.1	0.1	0.6	1.9	2.9	4.7	6.5	8.7	9.0	9.2	10.2	10.6	9.7	6.8	5.7
T026	M	16.1	-	-	-	-	-	0.0	0.2	0.4	0.4	0.5	1.1	1.4	1.8	2.5	3.1	2.7	2.1
	F	11.9	-	-	-	0.0	-	0.0	0.2	0.3	0.7	0.9	1.2	1.0	1.5	1.6	1.9	1.4	1.3
T028	M	25.9	-	-	-	-	-	-	0.0	0.2	0.4	0.8	1.3	1.9	2.5	4.2	5.2	4.7	4.7
	F	28.7	-	-	-	-	-	0.1	0.2	0.5	0.6	2.0	2.3	2.8	3.9	4.3	5.2	3.9	3.0

APPENDIX 1

Map of Sweden

County/Municipality	Medical region
01 09	STOCKHOLM
03 04 17 18 19 20 21	UPPSALA
05 06 08	LINKÖPING
07 10 12	LUND-MALMÖ
13 (1315 1380 1381)	
13 (1382 1383 1384) 14	GÖTEBORG
22 23 24 25	UMEÅ

Code	County
01	Stockholm
03	Uppsala
04	Södermanland
05	Östergötland
06	Jönköping
07	Kronoberg
08	Kalmar
09	Gotland
10	Blekinge
12	Skåne
13	Halland
14	Västra Götaland
17	Värmland
18	Örebro
19	Västmanland
20	Dalarna
21	Gävleborg
22	Västernorrland
23	Jämtland
24	Västerbotten
25	Norrbottn

