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Time trends of incidence, mortality, and relative survival of invasive skin melanoma in Lithuania

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ABSTRACT

The aim of this study was to provide insights into the descriptive epidemiology of invasive skin melanoma in Lithuania by analyzing population-based incidence (1978–2002) and mortality (1990–2002) time trends, and relative survival based on 3485 skin melanoma. We calculated age-standardized incidence and mortality rates (cases per 100,000) using the European Standard Population and calculated period estimates of relative survival. The incidence rates increased from 1978 (men: 1.7, women: 2.3) to 2002 (men: 5.0, women: 7.0). The incidence increase over time is accompanied by cohort effects among both men and women. Mortality rates increased from 1990 (men: 1.2, women: 1.7) to 2002 (men: 2.3, women: 2.2). Relative 5-year survival rates among men were 10% lower than among women. The overall difference in survival was mainly due to a more favourable survival among women aged 60–74 years. Overall prognosis was less favourable among men, most likely due to diagnoses at later stages.

1. Introduction

Over the past few decades, the incidence of skin melanoma (International Classification of Diseases, 10th revision[1] code C43) has been rising in almost all western developed countries, especially in predominantly white populations.[2] One of the most established risk factors for skin melanoma is ultraviolet radiation.[3]

Little is known about skin melanoma epidemiology in the Baltic States. We found one Russian language article on the incidence of skin melanoma in Estonia during the period 1963–1982 that reported an annual incidence increase of 6.0% among men and 7.2% among women from 1968 through 1982, with considerably higher relative survival rates among women than men.[4] A time trend analysis of European cancer registries recently showed an increase of the incidence of skin melanoma in Estonia during the period 1968 through 1997. Incidence data from Latvia or Lithuania were not included in these analyses.[5]

The aim of this study was to provide insights into epidemiology of invasive skin melanoma in Lithuania by analyzing population-based incidence, mortality time trends, and relative survival with special emphasis on sex- and subsite-specific changes over time.

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2. Patients and methods

Currently, Lithuania has a population of about 3.5 million inhabitants with about 83% Lithuanians, 7% Polish and 10% Russians and others. Since 1957, Lithuania has had a compulsory nationwide cancer registration. The network of oncology services and the cancer registration methods stem from the Soviet model of specialized oncological services, responsible for diagnoses, treatment and registration of cancer patients, completed by follow-up through the general health care network at the district level.[6] Cancer patients in Lithuania are treated in oncology centers (Kaunas, Vilnius, Siauliai, Klaipeda, and Kaunas University of Medicine). All these institutions serve as the primary source of case notification. The second source of notifications is the death certificate.

Annual reports on cancer incidence have been published since 1964. The cancer registry became a member of the International Association of Cancer Registries (IACR) in 1993. Registry data for the period 1988–1992 and 1993–1997 have been included in 'Cancer Incidence in Five Continents Volume VIII'.[7] The data for the periods 1978 through 1982, and 1983 through 1987 were checked by the 'International Agency for Research on Cancer' (IARC) in 1995 and finally published on the web site of the Lithuanian cancer registry as the data fulfilled the quality criteria for population-based cancer registries. The compulsory case notification includes: surname; name; sex; date of birth; place of residence; nationality; date of diagnosis; site according to ICD9[8] from 1978 through 1997 and according to ICD10[1] since 1997; and morphology according to the 'International Classification of Diseases for Oncology' ICD-O 2nd edition[9] since 1993 and ICD-O 3rd edition[10] since 2003. Before 1993, a local one-digit morphology code was used. The cancer registry file is monthly updated by information of death certificates that are filled in according to the international standards. The last update for the analyses presented here was done in March 31, 2005. On average, two notifications from different sources per skin melanoma case were registered since 2000.

We extracted all invasive skin melanoma (1978–1997: ICD9 172, since 1998: ICD10: C43) from the cancer registry file including 1472 cases from 1978 to 1992 and 1958 cases from 1993 to 2002. For the latter period, we tried to supplement the case data with additional clinical and epidemiological data including information on staging, anatomic subsite and other information. This active search for melanoma cases in five Lithuanian oncology centers revealed 60 additional cases resulting in a case file of 2018 cases for the period 1993–2002. The comparison of data from the active search with the cancer registry files revealed that four registered melanoma in situ were coded as invasive melanoma and one uveal melanoma was coded as skin melanoma. After exclusion of these five cases, the final case file for 1993–2002 included 2013 cases, of which about 76% were checked by files from the hospitals. Within the period 1993 through 2002, 1.7% of all cases were death certificate only (DCO) cases. Only four cases were diagnosed post mortem at autopsy. The proportion of histologically verified melanoma was not routinely recorded and was 72% among the reviewed melanoma (1993–2002), which is an underestimation of the true proportion. Based on Breslow tumour thickness, Clark level, lymph node status, and distant metastasis status, we categorized patients diagnosed between 1993 and 2002 according to the TNM classification.[11]

3. Statistical methods

We calculated crude, age-specific, and age-standardized incidence and mortality rates (cases per 100,000) using the European Standard Population.[12] For the international comparison, we extracted age-standardized incidence rates (European Standard Population) from representative population-based cancer registries all over the world from 'Cancer Incidences in Five Countries' Volume VIII, that usually covers a registration period from 1993 through 1997.[7] To get a summary estimate for Australia, we combined those registries (Capitol Territory, New South Wales, South, Tasmania, and Victoria) that were able to provide incidence estimates for the complete age range (0–85+ years).

We calculated age-standardized incidence rates stratified by stage. We used a 3-year moving average process for the graphical presentation to dampen the roughness of the rates so that underlying time trend patterns can be more clearly seen.[13] For the study of the anatomical distribution of skin melanoma, we used the fourth digit of the ICD code (ICD10: C43.0–4: head with C43.0: lips, C43.1: eye lids, C43.2: ear and external auditory canal, C43.3: other and unspecified parts of face, C43.4: scalp and neck, C43.5: trunk, C43.6: arms and shoulders, C43.7: legs and hips, C43.8–9: overlapping or unspecified sites) and calculated subsite-specific age-standardized incidence rates. To account for different body surface areas, we calculated relative site-specific age-standardized incidence rates per unit area of the skin (RSA) for the period 1993 through 2002. We therefore divided the site-specific age-standardized incidence rates by the proportion of surface area of the corresponding body sites based on the estimates of the proportional surface area from Elwood and Gallagher[14] who used estimates of the body surface from data of Lund and Browder[15] and Pearl and Scott[16]: face 2.3%, ear 0.5%, scalp and neck 6.1%, trunk 32%, arms and hands 16.5%, legs 40%. We estimated the proportional surface area of the lips (0.1%) and the eye lids (0.5%).

We ran joinpoint regression models[17] to obtain estimates of points of change of the age-standardized incidence from 1978 through 2002.[18] We fitted log-linear joinpoint regression models to the age-standardized incidence rates with calendar year as the predictor and the standard error as the error term of the rate. We did not run joinpoint regression analyses of the mortality data because the registration period (1990–2002) was too short for reliable joinpoint regression modelling. Instead, we roughly estimated the annual percentage change by assuming that the change of rate was constant.

For the estimation of percentage changes over time, we fitted regression lines to the natural logarithm of the subsite-specific age-standardized incidence rates using calendar year as a regressor variable, i.e. $y = a + bx$, where $y = \ln(\text{rate})$ and x = calendar year. The estimated annual percentage change (EAPC) is then estimated as $100 * (e^b - 1)$. These models assumed that the logarithm of the rates changed at a constant rate over the period. According to the joinpoint regression

results, the rate of change was roughly constant from 1978 through 1997 among both men and women. We therefore present the EAPCs only for this period.

We calculated period estimates of survival by left truncation of observations at the beginning of that period in addition to right censoring at its end. Details of this methods have been recently published in a review article.[19] We used a publicly available SAS macro, which is described in detail elsewhere.[20] We present relative 5-year survival rates by dividing observed survival rates by the expected survival rates of people with corresponding age and sex. The expected survival rates were obtained from population life tables for Lithuania according to an approach commonly known as Ederer II method.[21] To compare the Lithuanian with other European relative survival rates of the EUROCARE-3 project,[22] we chose 1993–1997 as the years of diagnoses and 1993–1998 as the follow-up period which comes close to the periods used in the EUROCARE-3 project.

Table 1 – Skin melanoma cases in Lithuania, 1978–2002

	Men		Women	
	N	%	N	%
Incident skin melanoma cases (1978–2002)	1167		2318	
0–9 years	4	0.34	8	0.35
10–19 years	41	3.51	26	1.12
20–29 years	71	6.08	93	4.01
30–39 years	115	9.85	257	11.09
40–49 years	161	13.80	407	17.56
50–59 years	242	20.74	458	19.76
60–69 years	241	20.65	460	19.84
70–79 years	201	17.22	421	18.16
80+ years	91	7.80	188	8.11
Distribution by subsite (1978–2002)[a]				
Head (C43.0–4)	266	22.79	489	21.10
Trunk (C43.5)	394	33.76	428	18.46
Arms and shoulders (C43.6)	99	8.48	208	8.97
Legs and hips (C43.7)	182	15.60	757	32.66
Overlapping (C43.8)	66	5.66	145	6.26
Unspecified (C43.9)	160	13.71	291	12.55
Quality indices of registration (1993–2002)	669		1344	
Death certificates only (DCO)	11	1.64	23	1.71
Cases diagnosed at autopsy	2	0.30	2	0.15
TNM stages (1993–2002)[b]				
Stage I	183	27.35	475	35.34
Stage II	145	21.67	303	22.54
Stage III	96	14.35	136	10.12
Stage IV	38	5.68	43	3.20
Stage unknown	207	30.94	387	28.79
Follow-up of incident cases from 1993 to 2002[c]				
Alive	326	48.73	825	61.38
Melanoma-related death	265	39.61	410	30.51
Death due to other causes	64	9.57	94	6.99
Unknown causes of death	14	2.09	15	1.12
Skin melanoma deaths (1990–2002)	335		551	
10–19 years	0	0.00	1	0.18
20–29 years	6	1.79	12	2.18
30–39 years	33	9.85	38	6.90
40–49 years	47	14.03	74	13.43
50–59 years	73	21.79	100	18.15
60–69 years	76	22.69	132	23.96
70–79 years	72	21.49	121	21.96
80+ years	28	8.36	73	13.25

a International classification of diseases, 10th edition.
b TNM according to Sobin and Wittekind, 2002.[11]
c Closing date of follow-up: March 31, 2005.

4. Results

Table 1 presents the characteristics of the 3485 skin melanoma patients reported to the Lithuanian Cancer Registry between 1978 and 2002. The median age at diagnosis among males was 58 years and among females 57 years. For about 69–71% of all cases during the period 1993–2002, information was available that enabled us to classify skin melanomas according to TNM classification. If one ignores skin melanoma with unknown stage, it appears that skin melanoma among women are diagnosed at earlier stages than among men (Table 1).

The age-standardized and crude incidence rates showed a steady increase over the registration period with incidence rates of 1.7 (crude: 1.4) and 2.3 (crude: 2.2) among men and women in 1978 and 5.0 (crude: 4.7) and 7.0 (crude: 8.2) per 100,000 among men and women in 2002, respectively. The age-standardized incidence rate increased steadily from 1978 through 2002 with an estimated annual percentage change (EAPC) of 5.7% (95%CI: 4.7–6.7) without any detectable joinpoint among men. Among women, we identified a joinpoint in 1997 (95%CI 1993–2000); until 1997, the EAPC was 5.8% (95%CI: 4.9; 6.8), from 1997 through 2002 the EAPC was 0.8% (95%CI: −4.1; +5.8). The age-standardized incidence rates were higher among women than men throughout the

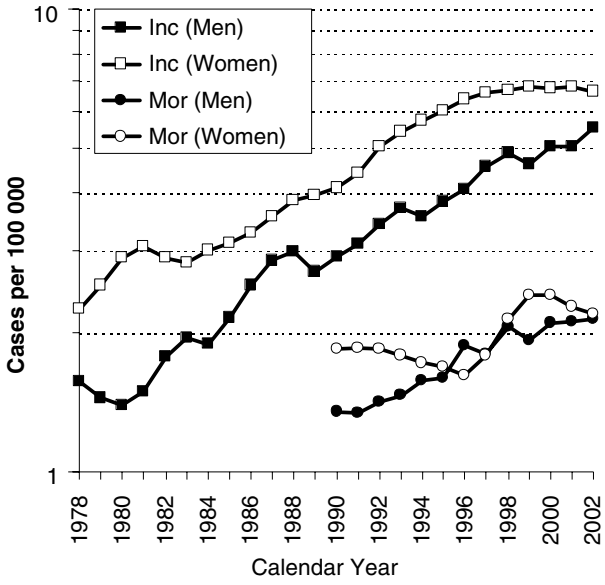

Fig. 1 – Age-standardized incidence (1978–2002) and mortality rates (1990–2002) of skin melanoma in Lithuania. Inc: incidence rates, Mor: Mortality rates; all rates are adjusted to the European Standard Population and have been smoothed by 3-year moving averages.

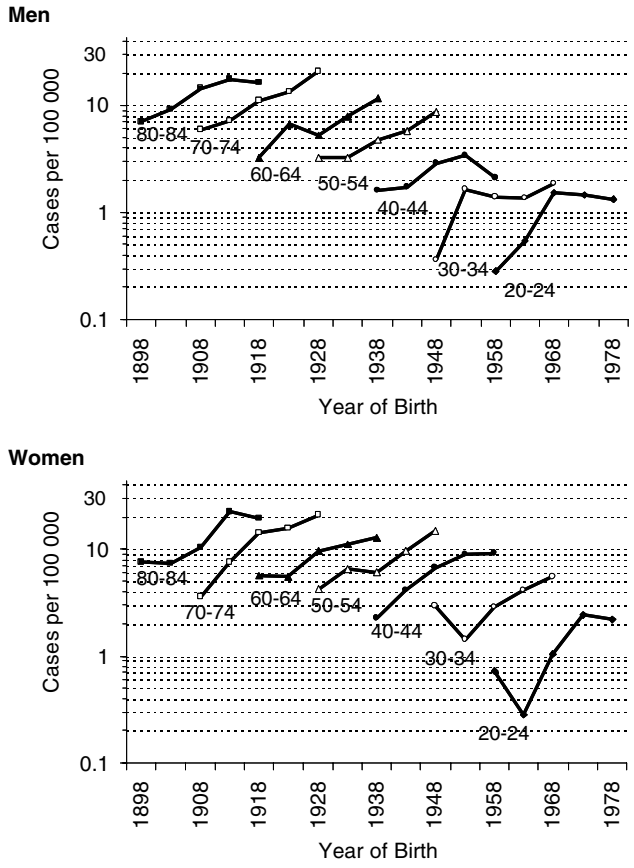

Fig. 2 – Age-specific incidence rates (20–84 years) of skin melanoma in Lithuania by midyear of birth cohort and gender.

registration period. The age-standardized mortality rates showed an increase over the registration period with mortality rates of 1.2 and 1.7 among men and women in 1990 and 2.3 and 2.2 per 100,000 among men and women, respectively, in 2002. Mortality rates tended to be higher among women than men although not throughout the study period. The EAPC of the age-standardized mortality rate (assuming that the logarithm of the rates changed at a constant rate over the periods) was 4.8% (95%CI: 2.6–7.0) among men and 2.7% (95%CI: 0.6–4.8) among women (Fig. 1).

Fig. 2 presents age-specific incidence rates of skin melanoma by mid-year of birth for the period 1978–2002. The inci-

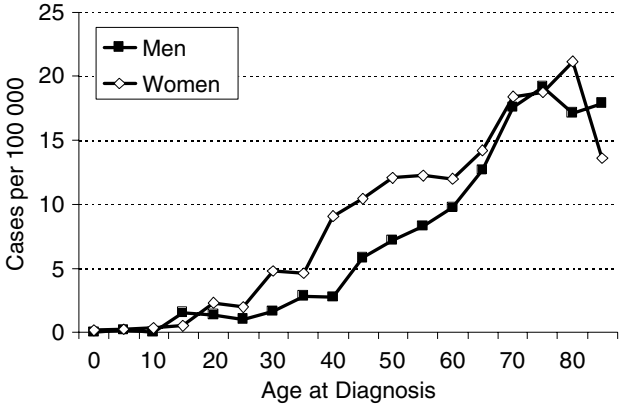

Fig. 4 – Age-specific incidence rates of skin melanoma in Lithuania for the period 1993–2002. All rates are age-standardized to the European Standard Population and have been smoothed by 3-year moving averages.

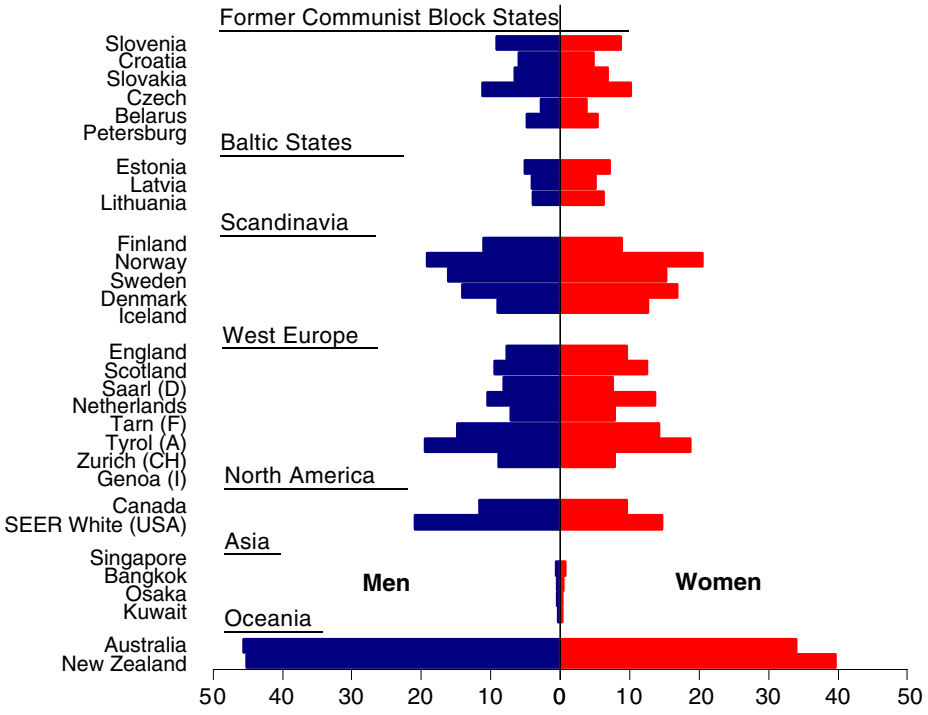

Fig. 3 – International comparisons of age-standardized incidence rates (cases per 100,000) of skin melanoma (1993–1997). Age standard: European Standard Population.

dence increase over time is accompanied by cohort effects among both men and women. The increase among the younger age groups appears to level off during the most recent birth cohorts among both men and women (Fig. 2).

The international comparison shows that Lithuania has similar skin melanoma incidences as the other two Baltic States. The Baltic States have lower incidence rates than other Eastern European countries. Asian countries showed the lowest incidence rates of skin melanoma. The highest incidences were observed in Australia and New Zealand (Fig. 3).

The age-specific incidence rates for 1993–2002 show that incidence rates among subjects especially aged 30–59 years are higher among women than men. For example, the rate difference (women minus men) of the age group 40–44 years is 6.3 per 100,000 (95%CI 4.4–8.2) meaning that on average, six additional women per 100,000 of the age 40–44 years compared to men will be diagnosed with skin melanoma annually (Fig. 4).

Fig. 5 displays age-standardized incidence rates by calendar year and stage. Incidence rates of skin melanoma stage III–IV show only small increases over time, whereas

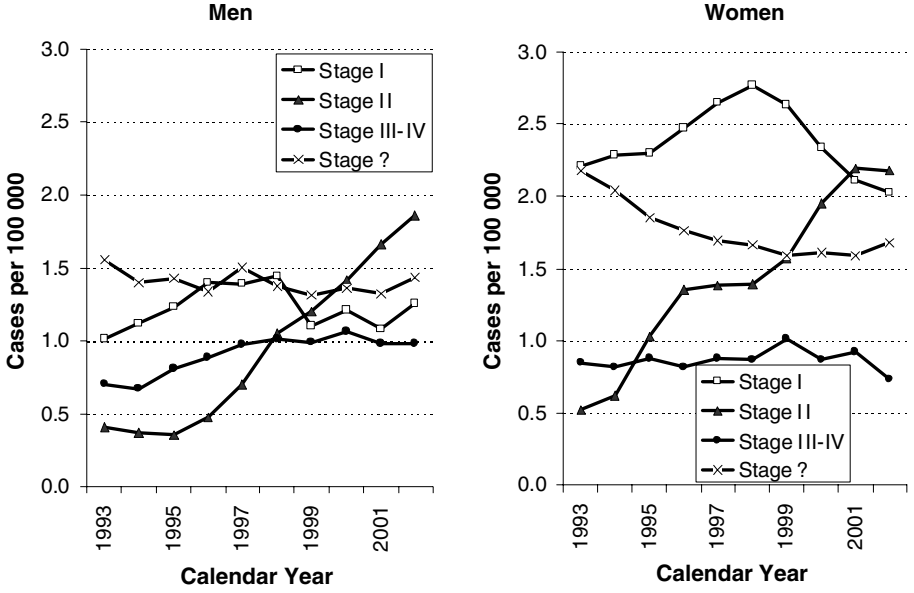

Fig. 5 – Age-standardized incidence rates of skin melanoma in Lithuania from 1993 through 2002 by stage at diagnosis.

Table 2 – Current age-standardized incidence rates (cases per 100,000) and sex ratios of skin melanoma by subsite and stage (1993– 2002) and estimated annual percentage change of the period 1978 through 1997 in Lithuania

	Men						Women						Sex ratio	
	N	Rate	SE	RSA	EAPC	95%CI	N	Rate	SE	RSA	EAPC	95%CI	Ratio	95%CI
Overall	669	4.45	0.17		5.7	4.7; 6.7	1344	6.44	0.18		5.8	4.9; 6.8	0.69	0.63; 0.76
Subsite														
Head (C43.0–C43.4)	94	0.64	0.07	6.88	−1.5	−5.0; 2.1	224	0.96	0.07	10.32	0.9	−1.7; 3.5	0.67	0.52; 0.85
Lip, eye lid, face (C43.0–1, C43.3)	61	0.41	0.05	15.19	−1.6	−6.0; 3.1	174	0.72	0.06	26.67	−0.3	−3.2; 2.6	0.57	0.43; 0.75
Ear, scalp/neck (C43.2, C43.4)	33	0.23	0.04	3.48	−1.6	−6.0; 3.1	50	0.24	0.04	3.64	−0.3	−3.2; 2.6	0.96	0.60; 1.54
Trunk (C43.5)	290	1.92	0.11	6.00	41.4	13.5; 76.2	314	1.62	0.09	5.06	24.1	4.2; 47.8	1.19	1.01; 1.39
Arms and shoulders (C43.6)	73	0.48	0.06	2.91	24.7	−7.8; 68.5	161	0.80	0.06	4.85	34.7	3.5; 75.3	0.60	0.46; 0.78
Legs and hips (C43.7)	124	0.83	0.07	2.08	21.9	3.3; 43.9	525	2.49	0.11	6.23	12.2	8.0; 16.6	0.33	0.28; 0.39
Overlapping/unknown sites (C43.8–9)	88	0.58	0.06		9.1	4.2; 14.3	120	0.57	0.05		2.2	−3.2; 7.8	1.02	0.78; 1.33
Stage														
I	183	1.19	0.09				475	2.38	0.11				0.50	0.43; 0.59
II	145	0.97	0.08				303	1.42	0.08				0.68	0.57; 0.82
III–IV	134	0.90	0.08				179	0.86	0.07				1.05	0.83; 1.33
Unknown	207	1.39	0.10				387	1.78	0.09				0.78	0.66; 0.92

All rates expressed as cases per 100,000; age standard: European Standard Population; SE: standard error; sex ratio, male rate divided by female rate; RSA: body surface adjusted age-standardized incidence rate calculated as 100 * age-standardized rate/percentage of surface; EAPC: estimated annual percentage change; *N*: number of registered cases from 1993 through 2002.

Table 3 – Age-standardized skin melanoma mortality rates (cases per million) by subsite 1990–2002 in Lithuania

	Men			Women			Sex ratio[a]	
	N	Rate[b]	SE	N	Rate	SE	Ratio	95%CI
Overall	335	17.4	1.0	551	19.5	0.9	0.89	0.77–1.03
Subsite (ICD10 codes)								
Head (C43.0–C43.4)	51	2.8	0.4	82	2.7	0.3	1.04	0.73–1.48
Trunk (C43.5)	87	4.5	0.5	73	2.7	0.3	1.67	1.21–2.31
Arms and shoulders (C43.6)	28	1.4	0.3	38	1.4	0.2	1.00	0.60–1.66
Legs and hips (C43.7)	46	2.4	0.4	182	6.3	0.5	0.38	0.28–0.52
Overlapping/unknown sites (C43.8–9)	123	6.4	0.6	176	6.5	0.5	0.98	0.78–1.25

a Sex ratio: men/women.
b Age-standardized mortality rate (European Standard Population).

the incidence rates of skin melanoma stage II appear to drive the overall incidence rate increases, among both men and women. Until the year 2000, the incidence rate of stage I melanoma were the highest stage-specific rates if one ignores the incidence rate of melanoma with missing stage information. Thereafter, stage II melanoma had the highest incidence rates among both men and women (Fig. 5).

Table 2 presents current incidence estimates (1993–2002) and sex ratios by subsite and stage and displays EAPCs for the period 1978 through 2002. Among men, rates are highest on the trunk and among women on the legs and hips. If the body surface area of the subsites is taken into account, the density of skin melanoma per unit surface area (RSA) is highest on the head among both men and women. Detailed analyses of subsites of the head show that the RSA is highest in the face area. Whereas the rates on the head did not show any relevant change over time, rates on the remaining parts showed considerable increases with EAPCs of 7.9% up to 12.3%. The rate of skin melanoma on the head, arms and shoulders, and legs and hips were higher among women than men. In contrast, the rate of skin melanoma on the trunk was higher among men than women. Whereas the incidence of stage I and II melanoma was higher among women, the incidence of stage III–IV melanoma was higher among men if one ignores the rate of melanoma with missing stage (Table 2).

Table 3 presents the skin melanoma mortality rates (cases per million) of Lithuania from 1990 through 2002. The overall mortality rate is higher among women than men. The mortality rate of skin melanoma on the trunk is higher among men whereas the rate on the legs and hips is higher among women (Table 3).

Relative 5-year survival rates based on period analysis of years 2000–2002 show that the survival among men is 10% lower than among women. This overall difference in survival is mainly due to a more favourable survival among women aged up to 74 years, especially among women aged 60–74 years. Survival is strongly associated with tumour stage. Survival among men with skin melanoma of unknown stage is lower than among women with unknown stage. Sex differences in survival differ by topography. For example, the survival of skin melanoma at the arms or shoulders is about 21% higher among women than men (Table 4).

The 5-year relative survival rates of Lithuania are similar to the rates of other Eastern European cancer registries and are considerably lower than the average European survival rates of the EUROCARE-3 study (Table 5).

Table 4 – Relative 5-year relative survival rates (%) and 95% confidence intervals (95%CI) of skin melanoma in Lithuania diagnosed from 1995 through 2002 based on the most recent survival experience of 2000–2002 (period analysis)

	Men		Women	
	Rate	95%CI	Rate	95%CI
Overall	59.9	51.9–67.9	70.1	65.0–75.2
Age group				
15–44 years	62.5	47.2–77.8	70.3	61.1–79.5
45–64 years	55.0	43.6–66.4	73.6	66.3–80.9
65–74 years	60.0	41.2–78.8	73.3	62.7–83.9
75+ years	77.0	41.9–100	54.7	35.7–73.7
Stage				
I	97.6	85.8–100	91.9	85.8–98.0
II	75.4	59.1–91.7	74.5	64.3–84.7
III	48.0	27.0–69.0	42.9	26.4–59.4
IV	–		21.6	0–48.8
Unknown	28.7	16.9–40.5	49.8	39.4–60.2
Topography (ICD10 codes)				
Head (C43.0–C43.4)	71.3	48.4–94.2	78.3	65.2–91.4
Trunk (C43.5)	61.2	49.0–73.4	76.2	66.4–86.0
Arms and shoulders (C43.6)	62.5	39.6–85.4	83.3	70.8–95.8
Legs and hips (C43.7)	59.2	40.6–77.8	66.4	58.6–74.2
Overlapping/unknown sites (C43.8–9)	34.7	12.6–56.8	32.0	15.5–48.5

5. Discussion

To our knowledge, this study is the first detailed population-based incidence and mortality trend analyses of invasive skin melanoma in Lithuania. We observed a considerable increase of the incidence in Lithuania from 1978 to 2002 with an underlying birth cohort pattern that suggests the incidence increase in the younger age groups in the recent years is reaching a plateau. In the context of the detected joinpoint of the incidence trend among women, these findings may indicate that the incidence increase may come to an end in

Table 5 – Comparison of 5-year relative survival rates of Lithuania with other Eastern European nations and overall West- and East-Europe (EUROCARE-3)[22]

	Years of diagnosis	Years of follow-up	Men			Women		
			Cases	Rate	95%CI	Cases	Rate	95%CI
Lithuania	1993–1997	1993–1998	294	56.2	47.0–65.4	632	71.0	66.1–75.9
Results from the EUROCARE-3 analyses								
Estonia	1990–1994	1990–1998	134	54.0	43.1–67.6	238	60.0	53.1–67.7
Poland	1990–1994	1990–1998	271	56.5	48.3–66.0	361	57.9	52.6–63.7
Czech Republic	1990–1994	1990–1998	183	60.4	50.6–72.1	219	78.1	70.9–85.9
Slovakia	1990–1994	1990–1998	582	52.1	47.4–57.4	774	65.6	61.5–70.0
Slovenia	1990–1994	1990–1998	321	60.5	53.6–68.1	423	70.0	64.3–76.1
Europe (West and East)	1990–1994	1990–1998	20625	74.8	72.7–77.0	26793	84.3	83.1–85.6

the near future. The birth cohort patterns, the lack of any skin cancer screening program in Lithuania, the accompanied skin melanoma mortality increase and the small changes of the incidence of stage I melanoma over time argue against overdetection or screening as major cause of the observed incidence increase.

The incidence increase occurred virtually in all age groups and appears to be mainly driven by an increase of stage II melanoma although there is uncertainty in our results owing to the considerable proportion of missing information on stage, which is a frequent problem in population-based cancer registries.[23] The incidence increase in Lithuania was accompanied by a marked mortality rate increase more among men than women which may be due to a later diagnosis of skin melanoma among men than women as the stage-specific incidence trends suggests. Interestingly, we found similar sex differences of the subsite-specific patterns for incidence and mortality rates. The better survival of skin melanoma among women has also been observed in several other countries including Estonia.[4] Gibberd and colleagues showed that the marked advantage in survival among women disappeared when tumour thickness and histology were taken into account in the analysis.[24] Our stage-specific comparison of survival rates corroborates this finding although we could not stratify by histological subgroup.

The survival of skin melanoma patients in Lithuania is comparable with other East European countries and considerably lower than in Western European countries. In a comparison of Western and Eastern European cancer registries, De Vries observed that skin melanoma in Eastern Europe were on average 1.38 mm thicker than those in Western Europe and seemed to be less often superficial spreading melanoma, although their data interpretation was hampered by the large proportion of cases with missing information on stage and histology.[25]

The incidences of skin melanoma in the three Baltic States from 1993 through 1997 were similar and considerably lower than the rates from other Eastern European and Scandinavian countries. The incidences of skin melanoma in Lithuania were on average 40% higher among women than men throughout the registration period. The female excess rate in all three Baltic States is mainly due to a higher incidence among women aged 30–59 years.

Incomplete cancer registration is generally of concern. The high quality Lithuanian cancer registry data was revealed by the IARC, based on proportions of death certificate only cases and the ratio of mortality to incidence. We tried to identify unreported skin melanoma cases by active search of skin melanoma cases in five Lithuanian hospitals. About 97% of the 2013 cases of the period 1993–2002 were reported to the cancer registry which indicates a high quality of cancer registration of skin melanoma in Lithuania.

In conclusion, we provided the first detailed analyses of the incidence and mortality trends of skin melanoma in Lithuania. Women generally had a higher risk of melanoma than men. However, the percentage increase of both incidence and mortality over time is higher among men than women. The prognosis is less favourable among men most likely due to diagnoses at later stages.

Conflict of interest statement

None declared.

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