ROBERT KOCH INSTITUT

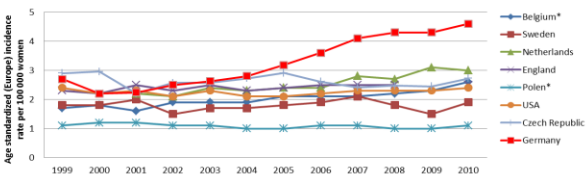
Vulvar cancer on the rise. A German population based cancer registry study using pooled data at the German Centre for Cancer Registry Data (ZfKD)

Nina Buttmann-Schweiger [0 ∞], **Stefanie J. Klug**[∞], **Alexander Luyten**[⌂], **Yvonne Deleré** [0], **Klaus Kraywinkel** [0]

BACKGROUND. A substantial increase of invasive vulvar cancer in younger women over the past three decades has been described in hospital-based studies in Western-Central Germany, and the country ranks highest in the international perspective. Cancer of the vulva related to HPV affects predominantly younger women, has a squamous cell, nonkeratinizing morphology, and is preceded by morphologically corresponding intraepithelial lesions (VIN). We aimed to provide recent trends and characteristics of invasive vulvar cancer in Germany and depict the quantitative burden of in situ vulvar cancer in German registries.

METHODS. National estimates for Figure 1 were calculated according to the ZfKD standard method. For all other calculations on invasive vulvar cancer, we accessed data of seven German cancer registries from 1999-2010, added by five registries that provided data only in the most recent years. ICD-10 and morphology codes in ICD-O-3 were used to select site and histologic types. The annual percentage change has been calculated on age standardized incidence rates (SIR) with a joinpoint regression model. Carcinoma in situ rates of the vulva (VIN III) were calculated on individual federal state-basis for the time period of 2008-2010.

Figure 1. Vulva cancer incidence and mortality rates (SIR) in the international perspective (Source: official websites of cancer registries, accessed 12/2013)



Belgium* 1999-2002 Region Flamish only; Poland* adjusted to world standard population

Table 1. Trends over time in vulvar cancer, annual percentage changes (APC) by characteristic and age group in selected German registries 1999-2010

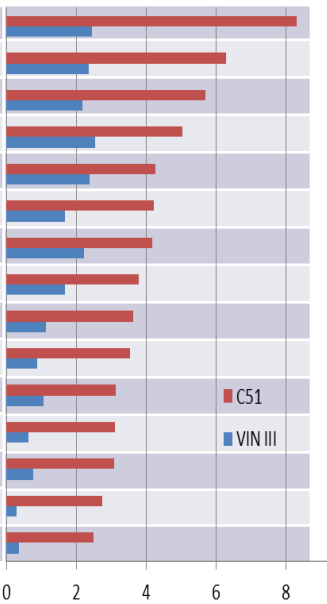
	APC of age standardized incidence rates in %			
	All ages	30-49 years	50-69 years	≥70 years
Vulvar cancer overall	+6,3**	+8,8**	+8,4**	+3,1
Vulvar SCC	+7,7**	+10,6**	+9,8**	+4,3**
Vulvar non-SCC	+3,7**	+9,0	+4,9**	+3,0**
Vulvar cancer, n.h.s.	-4,0	-7,3**	-1,4	-2,6
Labial tumors	+3,4**	+4,4	+4,2**	+1,7
Clitoral tumors	+11,9**	+15,9**	+16,1**	+6,6**
Overlapping tumors	+4,8**	+7,6**	+7,6**	+1,5
Subsite NOS	+7,7**	+11,4**	+9,8**	+4,9**

*The Annual Percentage Change (APC) is significantly different from zero at alpha = 0,05; not histologically specified (n.h.s.)(ICD-O-3 8000-8046); not otherwise specified (NOS) (ICD-10 C51.9)

RESULTS. The annual incidence rate of invasive vulva carcinoma in Germany nearly doubled in the past decade **(Figure 1)**. The largest annual increase was observed among women below 70 years of age **(Table 1)**. A tendency towards increasing rates of squamous cell carcinoma (SCC) and to a lesser extent non-SCC tumors were observed, concurrent with a significant decrease of tumors not otherwise specified. Among sub sites, clitoral tumors depicted the largest increase **(Table 1)**. From 2008 - 2010, a total of 7572 C51 and 2232 VIN III were registered in Germany (Baden-Württemberg not included). Rates varied substantially between federal states. Highest invasive and situ cancer rates were observed in the federal states of Saarland, Schleswig-Holstein, Lower Saxony, and Northrhine-Westfalia whereas Bavaria and the registries in all eastern federal states reported significantly lower rates **(Figure 2**).

Figure 2. Absolute numbers and SIR of VIN III and C51, in a 3-year period (2008 – 2010) by individual federal states

Federal states	N (C51)	N (VIN III)
Saarland	214	56
Schleswig-Holstein	434	122
Hamburg	236	65
Northrhine-Westfalia	2258	827
Lower Saxony	846	326
Hesse	651	187
Bremen	73	26
Rhineland-Palatinate	396	127
Berlin	301	71
Brandenburg	240	46
Bavaria	994	255
Mecklenburg-Pomerania	149	23
Saxony	404	69
Saxony-Anhalt	204	16
Thuringia	172	16



DISCUSSION. The rate of invasive vulvar cancer has doubled in the past decade in Germany, a trend not observable in other cancer registries. The observed increase of vulvar cancer incidence rates in Germany might be caused by improvement in registration praxis. However, most pronounced increases were seen in registries with a long history of continuous registration. A concurrent increase in mortality further makes such an explanation less plausible. The rise of certain risk factors in the German population, as smoking prevalence in women, immunosuppression and potentially of HPV infection might have contributed to the increase of vulvar cancer in Germany. The observed large regional differences might as well reflect former differences in risk behavior (such as smoking), however different degrees of completeness cannot be ruled out –especially for VIN III. A quality assessment study on registration practice of preinvasive vulvar lesions will be essential to estimate true inter-state differences in disease burden from preinvasive lesions for future health services research with epidemiological cancer registry data and for vaccination impact assessment.

0 German Centre for Cancer Registry Data (ZfKD), Dept. of Epidemiology and Health Monitoring, Robert Koch Institute, Berlin; ∞ Cancer Epidemiology, University Cancer Center Dresden, Technische Universität Dresden; ⌂ Dept. of Gynecology and Obstetrics, Klinikum Wolfsburg

ButtmannN@rki.de