

Healthcare Utilization and Costs of Human Papillomavirus (HPV) Associated Anogenital Diseases in Young Women – an Analysis of Statutory Health Insurance Claims Data from Germany

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Introduction

Human Papillomavirus (HPV) is the most common sexually transmitted infection. Most sexually active individuals acquire HPV in their life. The peak prevalence of cervical HPV infection in most European countries is before 25 years.¹ Acquisition of HPV in adolescence and early adulthood is common² and the risk of infection remains through older ages.³

For Germany, local data on healthcare resource utilization (HCRU) and costs for HPV-related anogenital diseases (AGD) in young women are lacking.

Our prior work demonstrated the burden of AGD in young women aged 23-25 years in 2012-2017 using German statutory health insurance claims data.⁴ The respective birth cohorts were the first eligible to receive HPV vaccination as adolescents after its introduction in Germany in 2006 and recommendation with mandatory funding in 2007.

Using the same database, this study aimed to investigate HCRU and incremental costs of AGD in 23-25-year-old-women in Germany.

Methods

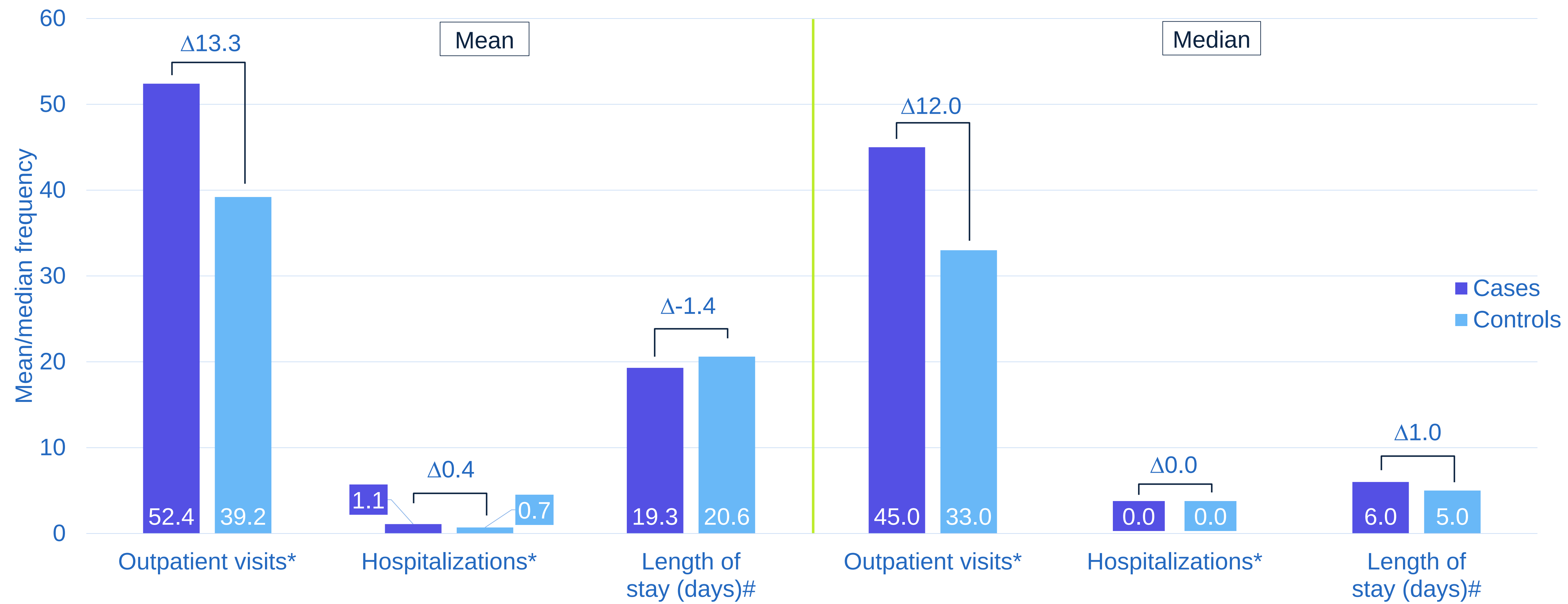
- This retrospective claims data analysis utilizes 2012-2017 statutory health insurance claims data from the “Institute for Applied Health Research Berlin” (InGef) Research Database from the birth cohorts 1989-1992.
- There were N=2,972 23-25-year-old women with AGD identified in the prior study based on ICD-10-GM codes for cervical, vulvar, vaginal, and anal lesions as well as genital warts (cases).⁴
- These were age-matched to women without any record for AGD (controls) with a 1:10 ratio.
- Associated healthcare and pharmaceutical costs were assessed, and incremental costs determined as differences in mean and median costs of cases and controls.
- Due to skewness in the data, both mean and median are reported.

Results

- Outpatient visits were more frequent among cases (**Figure 1**).
- 45.2% of cases and 31.7% of controls had at least one hospitalization. For those hospitalized, median length of stay was slightly longer in cases (**Figure 1**).
- Overall, median and mean total healthcare costs (consisting of costs for outpatient care, inpatient care, and outpatient pharmaceuticals) were higher in cases than controls (**Figure 2**).
- For the identified cases in the InGef Research Database, the incremental cost difference of €1,089 in total healthcare costs and €449 for outpatient healthcare costs suggest increased expenditures of €3.2 Million for total healthcare and €1.3 Million for outpatient care within the 3-year observation period.
- The most frequent outpatient procedures were related to care for HPV-related disease, while the most frequent inpatient procedures related to pregnancy/childbirth and hearing problems, in addition to cervical disease, such as cervical conization which was performed in 4.4% and 4.7% of cases in outpatient and inpatient setting, respectively (**Table 1**).

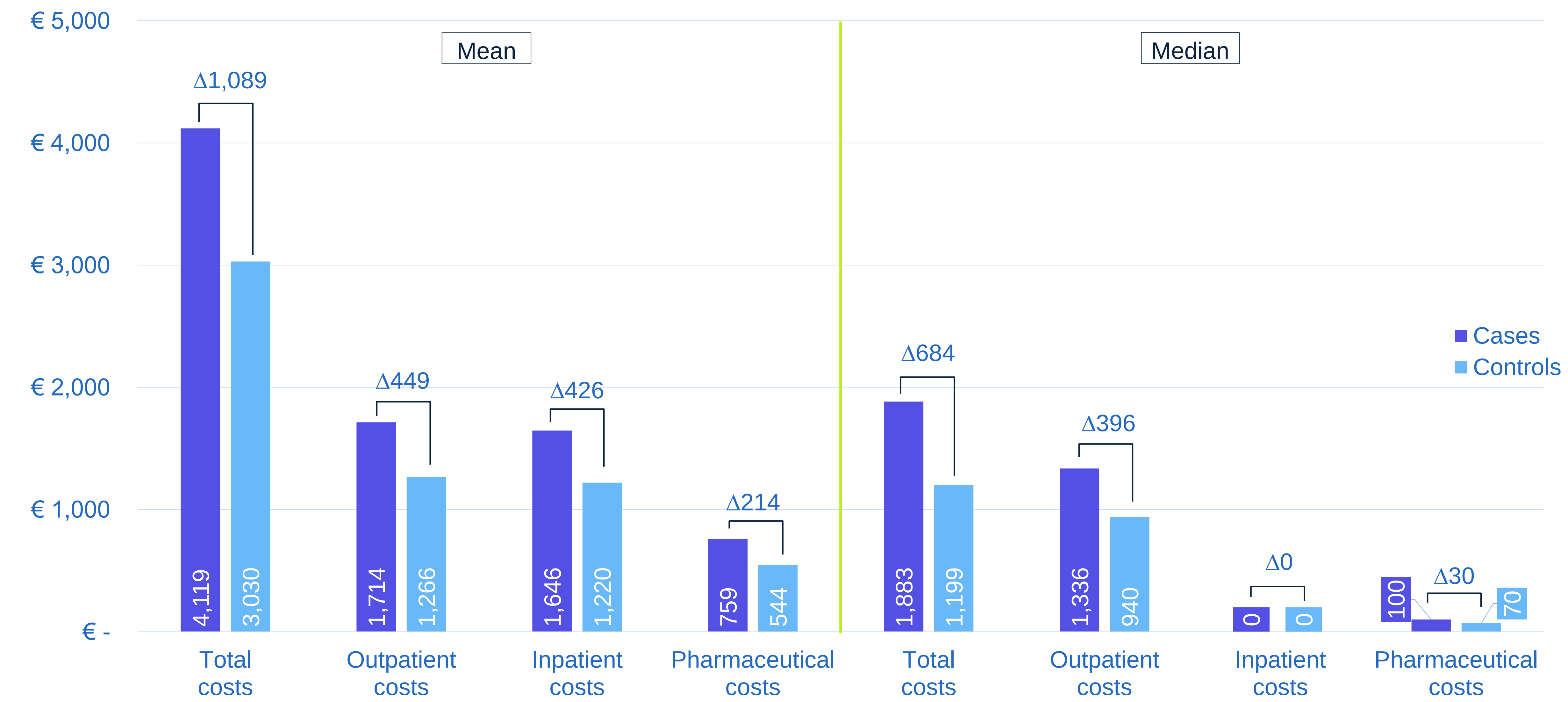
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Figure 1. Healthcare resource utilization for 23-25-year-old women during 3-year observation period



* Based on 2,972 cases and 29,720 controls. # Based on 1,344 (45.2%) cases and 9,434 (31.7%) controls with at least one hospitalization. Δ = Incremental healthcare resource utilization of cases in relation to controls. Due to rounding, differences in increments may occur.

Figure 2. Mean/Median healthcare costs (€) for 23-25-year-old women during 3-year observation period



* Costs are based on 2,972 cases and 29,720 controls. Δ = Incremental healthcare resource utilization of cases in relation to controls. Due to rounding, differences in increments may occur.

Table 1. Top 5 of outpatient/inpatient performed procedure

Top 5 of outpatient performed procedures*		
Description	Cases (%)	Controls (%)
Conization of the cervix uteri: conization	4.4	NR
Other excision and destruction of diseased tissue of the cervix uteri: excision	3.1	0.0
Diagnostic colonoscopy: total, with ileoscopy	2.2	1.2
Therapeutic curettage [abrasio uteri]: without local drug application	1.5	0.4
Biopsy without incision of the cervix uteri: cervical abrasion	1.5	0.1
At least one outpatient procedure#	26.8	14.1
Top 5 of inpatient performed procedures*		
Description	Cases (%)	Controls (%)
Postnatal care of the newborn: routine care	7.5	5.6
Conization of the cervix uteri: conization	4.7	NR
Supervise and direct of normal birth	4.0	3.2
Registration of evoked potentials: otoacoustic emissions	3.5	2.7
Epidural injection and infusion for pain management	3.5	2.1
At least one inpatient procedure#	36.9	23.9

Percentages are based on 2,972 cases and 29,720 controls. NR= not reported due to data protection regulations as n=1-4.
* Based on German Key of operations and procedures (Operationen- und Prozeduren-schlüssel, OPS) codes. # Any outpatient / inpatient procedure.

Conclusion & Implications

In Germany, HPV-associated anogenital disease among young women is associated with considerable resource and financial expenditure, particularly for outpatient and inpatient care. Our study provides a comprehensive view of healthcare consumption and costs of HPV-associated diseases in young women. Such a comprehensive assessment has not been reported to date for the German statutory health insurance system. Extrapolating from the total mean incremental costs, we estimate that HPV-associated anogenital diseases produced approximately €99.9 Million greater healthcare expenditures for the German population of 23-25-year-old women over 3 years. Prevention of HPV-associated diseases in this population would decrease both individual and third-party payer burden.

Conflict of Interest: MR, SM, RW, and CW are full-time employees of MSD Sharp & Dohme GmbH. EG is full-time employees of Merck Sharp & Dohme Corp., a subsidiary of Merck & Co., Inc., Kenilworth, NJ USA. KMS and CJ are full-time employees of Xcenda GmbH, acting as contractors of Merck Sharp & Dohme Corp., a subsidiary of Merck & Co., Inc., Kenilworth, NJ USA for the execution of this study. WG declares no conflict of interest. MH received honoraria as speaker and member of medical advisory boards from MSD Sharp & Dohme GmbH.

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