### STD TREATMENT GUIDELINES TABLES: BURDEN

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<tr>
<th>Author/Citation</th>
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</table>
➢ Disparities noted for HPV-associated cancer incidence rates  
➢ 34,788 new HPV-associated cancers in men, women, 2009  
➢ Anal cancer burden is 5234 total (15.6% of total HPV-associated cancers, 1934 in men and 3500 in women)  
➢ HPV-associated cancers, rates increased for cancer of the oropharynx in white men and women, for vulvar cancer in white and black women, and for anal cancer in white and black men and women. |
| Satterwhite CW, et al. 2013 | Population based assessments (where available), modeling | US Population           | Prevalence and incidence of STIs (including HPV) in general population | ➢ ~79 million prevalent HPV infection and 14.1 million incident infections each year  
➢ HPV the most common STI |
➢ Annual incidence of AGW ranged from 160 to 289 per 100,000 and recurrence was high.  
➢ Prevalence estimates ranged between 0.13%-0.20%  
➢ Peak incidence in females <24 and in males 25-29 years.  
➢ Prevalence estimates based on genital  

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| Forman D, et al. 2012            | Review primarily using existing peer-reviewed literature and cancer estimates from GLOBOCAN 2008 | World         | - HPV prevalence on average 11-12% (based on HC or PCR)—varies based on region  
                          |                                               |               | - Relationship of HPV prevalence and age (some settings it decreases, others there is an increase in older ages)  
                          |                                               |               | - IARC monograph 100B describes those cancer sites with strong evidence for a causal relationship and includes cervix uteri, penis, vulva, vagina, anus, oropharynx, including base of the tongue and tonsils.  
                          |                                               |               | - A total of 610,000 cancers attributable to HPV infection worldwide, 86.9% are cervical cancers  
                          |                                               |               | - Data on anogenital cancers other than cervical less data but appears to be increasing in the areas reported including India, Colombia, Denmark, Japan.  
                          |                                               |               | - Cervical cancer the third most common female malignancy worldwide in 2008, after breast and large bowel cancers, and fourth most common cause of female death from cancer.  
                          |                                               |               | - Cervical cancer was the cause of 7 Million years of life lost in women.  
<pre><code>                      |                                               |               | - GW incidence similar patterns worldwide, little data from low-income settings (0.1-0.2% cases per annum)  |
</code></pre>
<p>| Scarbrough Lefebvre CD, et al. 2011 | Systematic review of available literature | US, UK and France | - Variety of different instruments assessing QoL—QALY weight 0.10 in Brisson et al, and Woodhall et al from 0.39-13.9 points. |</p>
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<td>Senecal M, et al. 2011</td>
<td>Cross-sectional</td>
<td>270 women and men, median age 31.5 years.</td>
<td>Psychosocial impact of genital warts</td>
<td>- Detriment in EQ-5D domains of anxiety/depression, pain/discomfort—differences was 9.9 and 6 percentage points using the different utility scores/health status evaluations</td>
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</tbody>
</table>
- Abnormal Pap test 1.4 million visits, cervical procedures 1.7 million visits, 1.2 million visits for colposcopy |
- Mean duration of episode was 95.4 day, mean no. visits was 1.5 females/1.9 males.
- Mean costs were 647/episode. Estimated economic burden was $760/1000 individuals in general population with total exceeding 220 million. |
| Pirotta M, et al. 2009    | Cross-sectional study             | 331 women, 18-45 years | Psychosocial burden of HPV: abnormal pap, genital warts using a validated instrument, compared to women with normal paps | - Response rate 73% overall
- Highest scores (higher score = increased psychosocial impact) for women with CIN2/3 (46.6), EGW (45.7)
- EGW alone—impact highest on sexuality, self-image and partner and transmission |
<p>| Garland SM, et al. 2009   | RCT post hoc analysis of placebo arm | Women followed 3.6 years, 8800 participants | Incident GW                  | - 3.4% developed GW related to HPV 6, 11. Risk factors for development of GW were infection at baseline, acquisition of new sex partners, higher no. sex partners. |</p>
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| Owusu-Edusei, K, et al 2013 | Direct Medical costs of STI in US | US population          | Direct medical costs for HPV were 1.7 billion.                           | ➢ Overall medical costs from HPV in a given year is 1.7 billion, 747 million for CIN, 485 million for HPV associated cancers 288 million for GW, and 150 million for RRP  
➢ Lifetime cost per case of HPV was 45$ for men and 191$ for women.  |
| Chesson HW, et al 2012     | Model                          | US population          | Direct medical costs for HPV-associated conditions including cancers, disease, and screening | ➢ Overall annual direct medical cost burden 8 billion  
➢ Over 25,000 cases of HPV-associated cancers each year  |
➢ Rates of HPV-related dx procedures varied—Colpo and ECC being highest, then hysterectomy, then a variety of other treatments  
➢ Median cost for Pap test was $163 in 2006.  
➢ Biopsy was the most expensive dx procedure with cost from $1-1600 dollars. Hysterectomy was most expensive tx with cost of 7300 per procedure |
Hu D, et al. 2008  | Collection of lifetime cost per case estimates and using incidence to determine aggregate measure of economic burden  | US population  | Economic burden of non-cervical disease including RRP, anogenital warts, and non-cervical cancers, 2003  | ➢ Total lifetime costs of new cases highest for anogenital warts (171) million and JORRP (82.2) million, and ranged from 7.1 million for vaginal cancer to 171 million for anogenital warts. All conditions were 418 million  
➢ No consideration of non medical direct or indirect costs—so costs could be higher.

### Burden in specific populations (anal cancer in persons with HIV infection)

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| Legarth R, et al. 2013 | Poisson regression to estimate the incidence rate ratios (IRR) of anal carcinoma | HIV-infected Danes in cohort compared to general age and gender matched population | Rate ratios of carcinoma and mortality, anal carcinoma as an ICD-10 code of C.21.0-9 ad ICD-O-e codes of M80503-80763, M81233, M99993. | ➢ The IRR of anal carcinoma among MSM compared to non-MSM was 3.0 (95% CI 1.3-7.3).  
➢ The age adjusted MRR was 3.2 comparing HIV to control. The 5 year survival after dx was 0.14.  
➢ Study showed an 80 fold increased risk of anal carcinoma in HIV-infected individuals c/w controls.  
➢ 7 fold increased risk of anal carcinoma among fathers of HIV patients compared to controls. |
calculated using data from French Cancer Registries | HIV-positive. | ➢ Anal cancer more likely to occur in older patients, men (particularly MSM), patients with prior dx of AIDS, lower CD4.


References