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| **Quality Assessment of Impact Studies** |
| **Reference** | **Potential for selection bias** | **Potential for information bias** | **Potential confounders considered** | **External validity** | **Deemed as sufficient quality** |
| **Bauer 2012 AJPH** | Clinical encounter claims for all enrolled in family planning program for low-income individuals, population unlikely to vary greatly over time | Cases determined from claims data using combination of ICD-9 and NDC codes, potential misclassification but unlikely to vary over time | Stratified by age and gender. No data on vaccination status available, trends in AGW could be due to secular changes | Results could be different for high- and medium-income individuals or low-income individuals in other states | Yes |
| **Flagg 2013 AJPH** | Clinical encounter claims for those in enrolled in commercial health plans, population unlikely to vary greatly over time | Cases determined from claims data using combination of ICD-9, NDC, and procedure codes, potential misclassification but unlikely to vary over time | Stratified by age and gender. Assessed for effect modification and confounding by receipt of Pap smear or pelvic exam, geographic region, residence in metropolitan area, and capitated insurance. No data on vaccination status available, trends in AGW could be due to secular changes | Results could be different for those not enrolled in commercial health plans but still has a nationwide sample | Yes |
| **Nsouli-Maktabi 2013 MSMR** | Records from medical surveillance system for all active service members, population unlikely to vary greatly over time | Cases determined from medical records with ICD-9 code for anogenital warts, potential misclassification but unlikely to vary over time | Stratified by age and gender. No data on vaccination status available, trends in AGW could be due to secular trends | Results could be different for those who are not active duty service members | Yes |
| **Perkins 2015 STD** | Records from adolescents visiting urban and community health centers, population could vary over time | Cases determined from medical records data using combination of ICD-9, NDC, and procedure codes, potential misclassification but unlikely to vary over time | Stratified by gender. Data available on trends in vaccination status, trends in AGW could be due to secular trends but available data suggests impact of vaccination coverage | Results could be different for adolescents at other clinics in the same city or adolescents in other cities | Yes |
| **Flagg 2018 AJPH** | Clinical encounter claims for those in enrolled in commercial health plans, population unlikely to vary greatly over time | Cases determined from claims data using combination of ICD-9, NDC, and procedure codes, potential misclassification but unlikely to vary over time | Stratified by age and gender. Assessed for effect modification and confounding by receipt of Pap smear or pelvic exam, geographic region, residence in metropolitan area, and capitated insurance. No data on vaccination status available, trends in AGW could be due to secular changes | Results could be different for those not enrolled in commercial health plans but still has a nationwide sample | Yes |

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| **Quality Assessment of Effectiveness Studies** |
| **Reference** | **Selection of cohort** | **Ascertainment of exposure** | **Control of other factors** | **Assessment of outcome** | **Adequacy of follow-up** | **Deemed as sufficient quality** |
| **Swedish 2014 PLOS ONE** | Exposed cohort drawn from single anorectal surgery practice in New York City, unexposed cohort drawn from same group | Receipt of HPV vaccine determined from practice billing records, chose to exclude those who did not receive all 3 doses and those vaccinated elsewhere, medical records screened for no prior history of anal condyloma or no recurrence in last 12 months | Considered demographics, smoking status, STIs, history of anal condyloma, history of anal HSIL, and oncogenic HPV status; controlled for history of anal condyloma and oncogenic HPV status in final model | Identified through diagnosis by doctor at practice | Follow-up for up to 4 years after study entry  | Yes |
| **Perkins 2017 STD** | Exposed cohort drawn from commercial claims database, not a probabilistic sample but does cover large number of provider-sponsored insurance plans, unexposed cohort drawn from same group | Receipt of vaccine and number of doses determined from claims through CPT and ICD-9 codes, used 1-year washout period from first dose to exclude prevalent infections | Considered and controlled for age, geographic region, income, proportion of minorities in county of residence, and calendar year in final model | Identified in claims through combination of ICD-9, NCD, and CPT codes | Follow-up for up to 6 years, subjects with fewer than 180 days of follow-up excluded | Yes |
| **Hariri 2018 AJE** | Exposed cohort drawn from patients in integrated health-care delivery system in 3 regions, unexposed cohort drawn from same group | Receipt of vaccine and number of doses determined from electronic health records, used both a 6-month buffer period from last dose and a 12-month buffer period from first dose to exclude prevalent cases | Considered and controlled by propensity score weighting for race/ethnicity, health plan site, age at enrollment in health plan, age at beginning of study period, age at first evidence of probable sexual activity, age at first dose of HPV vaccine or proxy date, continuous enrollment, months enrolled in health plan, previous preventive health visits, Medicaid enrollment, oral contraceptive use, history of tests for pregnancy, chlamydia, and gonorrhea | Identified from electronic medical records using ICD-9 cases, specialty of diagnosing provider, and STI tests ordered at encounter, confirmed through chart review | Follow-up for up to 6 years | Yes |