



Yakima Health District

BULLETIN

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Chikungunya and Other Common Arthropod-Borne Infections

Overview

Summer and fall signal the coincidence of increased travel to areas endemic for arthropod-borne infections, increased local outdoor activity, and the peak of the enzootic cycle for West Nile virus that involves mosquitoes and birds. This article provides a case presentation for a recent traveler diagnosed with a mosquito-borne infection, an update on chikungunya virus, brief surveillance summaries for arthropod-borne infections, and summary tables of key features for the mosquito- and tick-borne diseases most likely to be encountered in Yakima County.

Actions Requested

- Consider the diagnosis of a mosquito- or tick-borne infection in patients presenting with compatible febrile syndromes and conduct appropriate initial testing for all agents in the differential diagnosis.
- Report suspected cases of arthropod-borne infections to YHD at (509) 249-6541 within 1 working day.
- Although Yakima County is home to only a few arthropods competent to transmit these organisms (e.g., West Nile virus, many tick-borne diseases), general prudence warrants keeping suspected cases indoors and away from vectors until their illness has resolved in order to avoid the risk of establishing local transmission.

Case Presentation

An adolescent female presented in mid-July 2014 with a 24-hour history of bilateral polyarthralgia, fever, fatigue, and a papular rash on her back. Three days prior to onset, she had returned from travel to the Caribbean. The clinician suspected chikungunya infection and submitted blood for serologic testing on day 2 of the illness; both serum anti-chikungunya IgG and IgM were negative. Repeat serologic examination on day 10 of the illness revealed an anti-chikungunya IgM titer of 1:2560 (reference <1:10) and an IgG titer of 1:640 (reference <1:10). Fever, arthralgia and rash all resolved within one week of onset and the patient returned to her baseline health.

Chikungunya Virus Summary

- Chikungunya (pronounced chik-en-GUN-ye) is characterized by several days of fever and malaise followed by 7-10 days of severe, often immobilizing symmetric polyarthralgia, with a distal-greater-than-proximal distribution. Many cases also

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have a diffuse, patchy maculopapular rash. Acute complications can involve the cardiopulmonary, renal, hepatic or neurologic systems. Treatment is supportive. A substantial proportion of cases go on to have chronic arthralgias.

- Incubation period: 3-7 days from the infecting mosquito bite (range 1-12 days)
- Laboratory diagnosis: demonstration of anti-chikungunya IgM antibodies, which typically become detectable after the fifth day of illness. Consider also testing for dengue antibodies given clinical and geographic overlap of the diseases.
- Chikungunya, a mosquito-borne virus transmitted by *Aedes* species and originally endemic to West Africa, spread throughout Asia and the Pacific Islands in the past 10-20 years and is now epidemic in the Caribbean and parts of Central and South America. Nearly 500,000 suspected cases have been reported in the western hemisphere, of which 5,000 have been laboratory confirmed.
- At least 400 cases have been reported from 40 states in returning travelers. Endemic transmission has occurred in Florida (4 cases) and is well established in Puerto Rico (199 cases).
- Competent *Aedes* vectors (i.e., *A. aegypti*, *A. albopictus*) exist in the US, but seemingly not in the Pacific Northwest. Consequently, now that the organism has been introduced to the country, endemic transmission may continue indefinitely. The estimated range of these *Aedes* species extends primarily from Texas across the southeast to the Atlantic Coast and as far north as the Ohio River Valley and the Mason-Dixon line. *A. aegypti* and *A. albopictus* have also been found in focal areas of California and the southwest. Although other *Aedes* species exist in the Pacific Northwest, they are not thought to be competent vectors of chikungunya.

Statewide findings from surveillance for arthropod-borne disease

West Nile virus:

“Infected birds and horses were first detected in 2002. The first locally acquired human infections were reported in 2006. In 2009, Washington had the highest number of cases to date with 38 cases and 2 presumptive viremic donors. Of these cases, 36 infections were known to be endemically acquired within Washington. [In] 2012: Four cases were reported, 2 acquired in Washington and 2 associated with travel.”

Other arthropod borne viruses:

“In recent years, 10-20 cases of travel-associated dengue and a few travel-associated chikungunya cases have been reported annually. Rare reports of other travel-associated arboviral diseases include Colorado tick fever and Japanese encephalitis in 2008, and St. Louis encephalitis and Toscana virus in 2009. Other than West Nile virus, the last reported human arboviral infection acquired in the state was western equine encephalitis in 1988. St. Louis encephalitis infections occurred in the past, primarily east of the Cascade Mountains. [In] 2012: 16 cases of dengue fever were reported following travel to Bali, Caribbean, India, Philippines, South America, and Vietnam.”

Lyme Disease

“Each year there are 7 to 23 reports. Most Washington cases are the result of a tick bite out-of-state. The few endemic cases have tick exposures predominantly on the west side of the Cascade Mountains, reflecting the distribution of the *Ixodes* ticks. [In] 2012: 15 cases were reported; only 2 had in-state exposures, which were likely in Pacific and Thurston counties.”

Tick-borne Relapsing Fever

“Each year there are 1 to 12 reports of TBRF cases. Most are associated with overnight stays in rustic summer cabins, but some are exposed in their primary homes. Louse-borne disease is rare, even in travelers; there have been no recent reports. [In] 2012: Six TBRF cases were reported, including 5 with in-state exposures (Okanogan and Chelan Counties) and one exposed in Idaho.”

MOSQUITO-BORNE INFECTIONS

Infection ¹	Vector	Vector Range	Incubation (days)	Illness	Standard Diagnosis	Treatment/Intervention ²
Chikungunya	<i>Aedes aegypti</i> <i>A. albopictus</i>	Asia, Africa Caribbean, Central and South America Southern US	Typical: 3-7 Range: 1-12	Fever Arthralgia (severe) Rash	Serum for IgM Antibodies appear ≥5 days after onset	Supportive care
Dengue	<i>A. aegypti</i> <i>A. albopictus</i>	Tropics and some sub-tropical areas Latitude ~30N-30S	3-14	Fever Headache Retro-orbital pain Myalgias/arthralgias/bone pain Rash Leukopenia Thrombocytopenia Hemorrhage Shock	Serum for IgM Antibodies appear ≥5 days after onset Viral culture or RT- PCR of serum, CSF, or tissue	Supportive care Avoid NSAIDs Early detection of hemorrhagic fever
West Nile Virus	<i>Aedes spp.</i> <i>Anopheles spp.</i> <i>Culex spp.</i> Others	Global, including south central Washington	3-14	Fever Headache Myalgia/arthralgia Rash Neurologic deficits Meningitis Encephalitis	Serum and CSF IgM Antibodies appear ≥3- 8 days after onset	Supportive care
Malaria <i>Plasmodium falciparum</i> <i>P. malariae</i> <i>P. vivax</i> <i>P. ovale</i> (apicomplexan para- site)	<i>Anopheles spp.</i>	Tropics Latitude ~23N-23S	Varies by type Falciparum: 9-14 Others: 12-40 (sometimes longer)	Fever Headache Anemia Altered mental status	Thick and thin blood smears q12-24hours x 3	Varies depending on Plasmodi- um species, patient's clinical status, and anti-malarial sus- ceptibility patterns in region of acquisition

¹West Nile virus can be acquired locally or imported. Chikungunya, Dengue, and malaria are imported.

²Prevention includes mosquito abatement and avoidance, and use of repellants and long sleeves. For malaria, pre-exposure chemoprophylaxis is recommended for visitors to endemic areas.

TICK-BORNE DISEASES

Infection ¹	Vector	Range	Incubation (days)	Illness	Standard Diagnosis	Treatment/Intervention ²
Lyme Disease <i>Borrelia burgdorferi</i> (spirochete)	Western black-legged (deer) tick <i>Ixodes pacificus</i>	<i>I. pacificus</i> : heavily forested or dense brush areas west of the Cascade summit. <i>I. scapularis</i> : eastern US	Typical: 7 Range: 3-30	Erythema migrans Fatigue Headache Fever Myalgia/arthralgia Joint, nervous system, or cardiac complications	Serology with EIA-or-IFA followed by western blot confirmation of positives ³	Doxycycline Amoxicillin Cefuroxime Details depend on stage and features of disease
Tick-Borne Relapsing Fever <i>Borrelia hermslii</i> (spirochete)	Soft tick <i>Ornithodoros hermslii</i>	Western US	Typical: 7 Range: 2-18	Fever x2- 7 days cycling with afebrile periods of 4-14 days. 1-10 cycles if untreated. Also: chills, sweats, headache, myalgia/arthralgia, rash.	Thick and thin blood smears Serology not well developed; but available. Lyme western blot and treponemal tests should be negative.	Penicillins Tetracyclines Alternatives: Cephalosporins Macrolides Chloramphenicol
Rocky Mountain Spotted Fever <i>Rickettsia rickettsii</i>	Dog tick <i>Dermacentor variabilis</i> Rocky Mtn. tick <i>D. andersoni</i>	<i>D. variabilis</i> : East of continental divide <i>D. andersoni</i> : Interior PNW and Rocky Mountains	2-14	Fever Headache Myalgia Centripetal rash (starting 2-5 days after onset) Gastrointestinal	Acute and convalescent serology with IFA for IgG and IgM Viral isolation or PCR from rash biopsy	Doxycycline
Tick Paralysis (intoxication, not an infection)	<i>Ixodes</i> spp. <i>Dermacentor</i> spp. <i>Amblyomma</i> spp.	Wide distribution (see above)	Not specified	Ascending paralysis	Clinical inspection for attached tick	Remove tick
Tularaemia <i>Francisella tularensis</i> (ulceroglandular or glandular form)	<i>Dermacentor</i> spp.	Wide distribution (see above)	Typical: 3-5 Range: 1-12	Ulcer at tick bite site Regional lymphadenopathy Fever	Culture of wound swab and/or LN aspirate/biopsy (notify laboratory of suspicion)	Streptomycin Alternatives: Tetracyclines Fluoroquinolones
Anaplasmosis <i>Anaplasma phagocytophilum</i> (formerly human granulocytic ehrlichiosis)	<i>Ixodes</i> spp.	Pacific Coast Mississippi River basin Eastern US	7-14	Fever Headache Myalgia	Thick and thin blood smears Serology with IFA or ELISA for IgG and IgM Antibodies detectable 7-14 days after onset	Doxycycline
Babesiosis <i>Babesia</i> spp. (apicomplexan parasite)	<i>Ixodes</i> spp.	Pacific Coast Mississippi River basin Eastern US	7-42	Fever/chills Fatigue Myalgia Anemia	Blood smear	Atovaquone+azithromycin Alternative: Clindamycin+quinine

¹Lyme disease is endemic to western Washington or can be imported; other tick-borne diseases are rare but can be acquired locally or imported.

²Prevention includes tick avoidance, use of repellants and long sleeves, and tick search-and-removal. For relapsing fever, it is advised to avoid rodent-infested dwellings.

³<http://www.cdc.gov/lyme/diagnosis/testing/LabTest/TwoStep/index.html>

Human Papilloma Virus Immunization- Data Suggests Need for Stronger Recommendations

Overview:

The Health District wants to offer recognition and thanks to Yakima County health care providers for putting our county among the state's leaders in immunizing youth against human papilloma virus (HPV). However, the vaccine is still underutilized relative to the benefit it provides and relative to up-take of other age-appropriate vaccines. YHD urges you to discuss HPV vaccination with both male and female adolescents and their parents, to routinely recommend the vaccine as part of adolescent health maintenance visits, and to promote completion of the 0, 2 and 6-month three-dose schedule.

Key Findings (see maps):

- Yakima, Grant, and Chelan Counties lead Washington State in HPV vaccine coverage for youth, with $\geq 80\%$ of 13 year-old girls having received at least one dose.
- Still, at least 20% of Yakima County 18 year-old girls have not yet completed the vaccine series and fewer than 40% of 13 year-old boys have even started it.

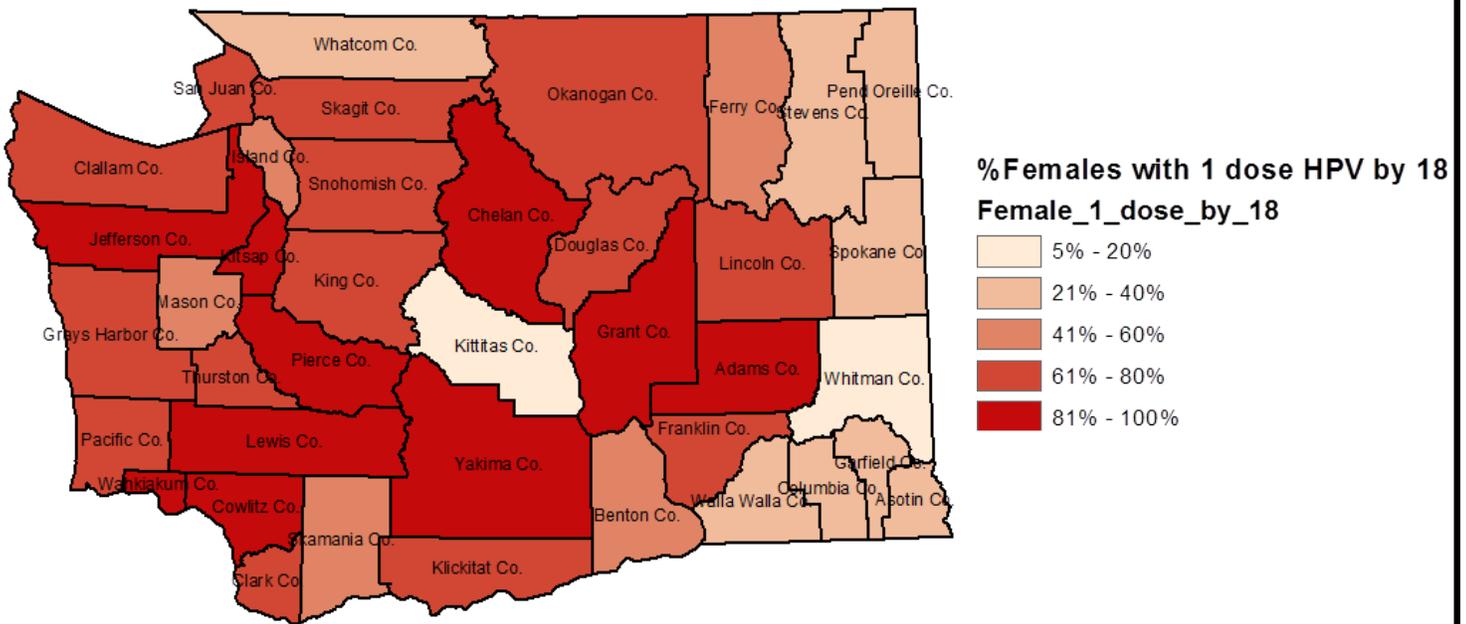
Comments and Recommendations of CDC & Professional Organizations (AAFP, AAP, ACOG, ACP):

- Regardless of a safety profile that is similar to the other adolescent vaccines, parents cite safety concerns as one of the top five reasons they do not intend to vaccinate daughters against HPV. HPV vaccine is as safe as other adolescent vaccines.
- Recent studies show that a patient who receives a provider recommendation is 4–5 times more likely to receive the HPV vaccine.
- Each year, an estimated 26,000 cancers in the United States are attributable to HPV; about 17,000 in women and 9,000 in men.
- Two vaccines (bivalent/HPV2 and quadrivalent/HPV4) are available to protect against HPV 16 and 18, the types that cause most cervical and other anogenital cancers, as well as some oropharyngeal cancers.
- The Advisory Committee on Immunization Practices (ACIP) recommends routine vaccination of girls age 11 or 12 years with the 3-dose series of either HPV vaccine and routine vaccination of boys age 11 or 12 years with the 3-dose series of HPV4.
- Vaccination is recommended for females through age 26 years and for males through age 21 years who were not vaccinated when they were younger.
- Since the vaccine does not protect against all HPV types, it does not replace other prevention strategies, such as regular cervical cancer screening.
- As a healthcare provider, we urge you to improve the strength and consistency of your recommendation for HPV vaccination to your patients. Your recommendation is the number one reason why someone will get the HPV vaccine and be protected from HPV-associated cancers and disease.
- An excellent tip sheet to assist you in answering questions parents may have about HPV vaccines and many other tools on the HPV vaccine are available at www.cdc.gov/vaccines/youarethekey.

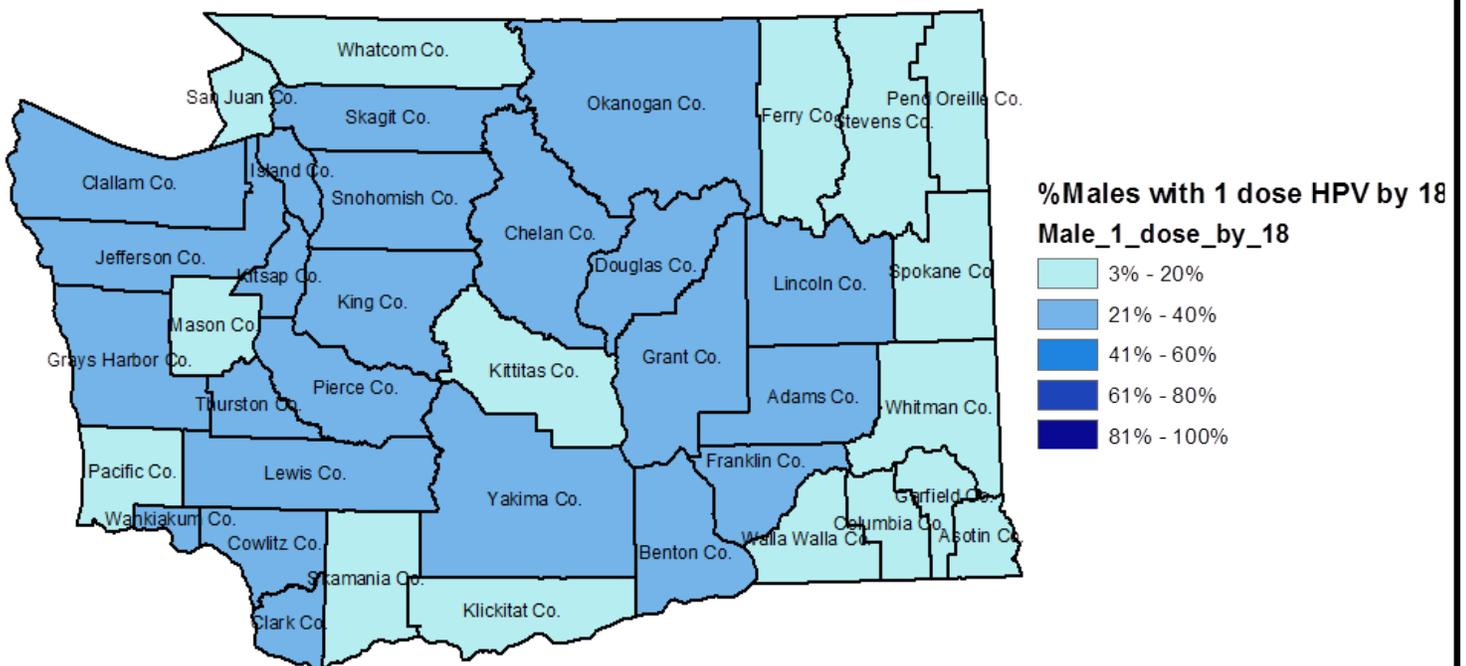
Additional Resources

- An additional fact sheet addressing frequently asked questions can be downloaded from http://www.doh.wa.gov/Portals/1/Documents/Pubs/348-187_HumanPapillomavirusVaccineFactsheet.pdf
- Both formulations of HPV vaccine (Gardasil, Cervarix) can be accessed through the state-supplied vaccine system. For more information, visit: <http://www.doh.wa.gov/YouandYourFamily/Immunization/DiseasesandVaccines/HumanPapillomavirusHPV>

HPV Vaccine Series Initiation by age 18, Females 2013

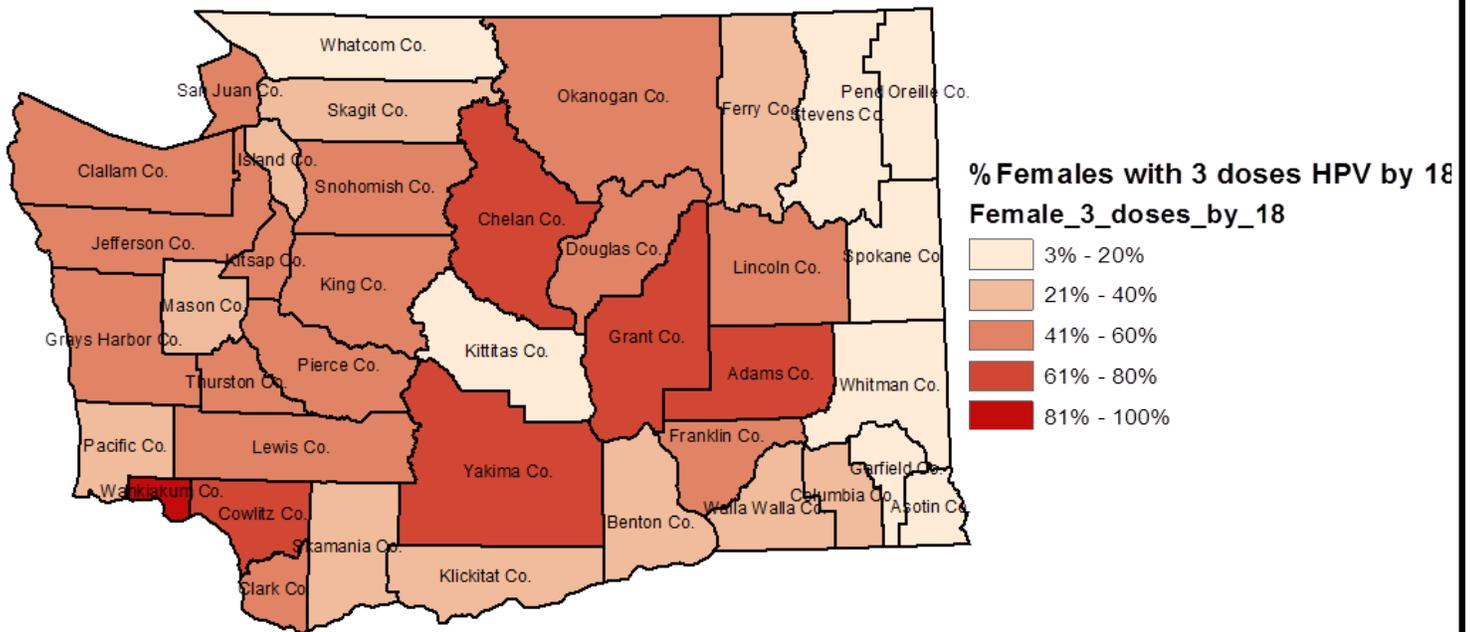


HPV Vaccine Series Initiation by age 18, Males 2013

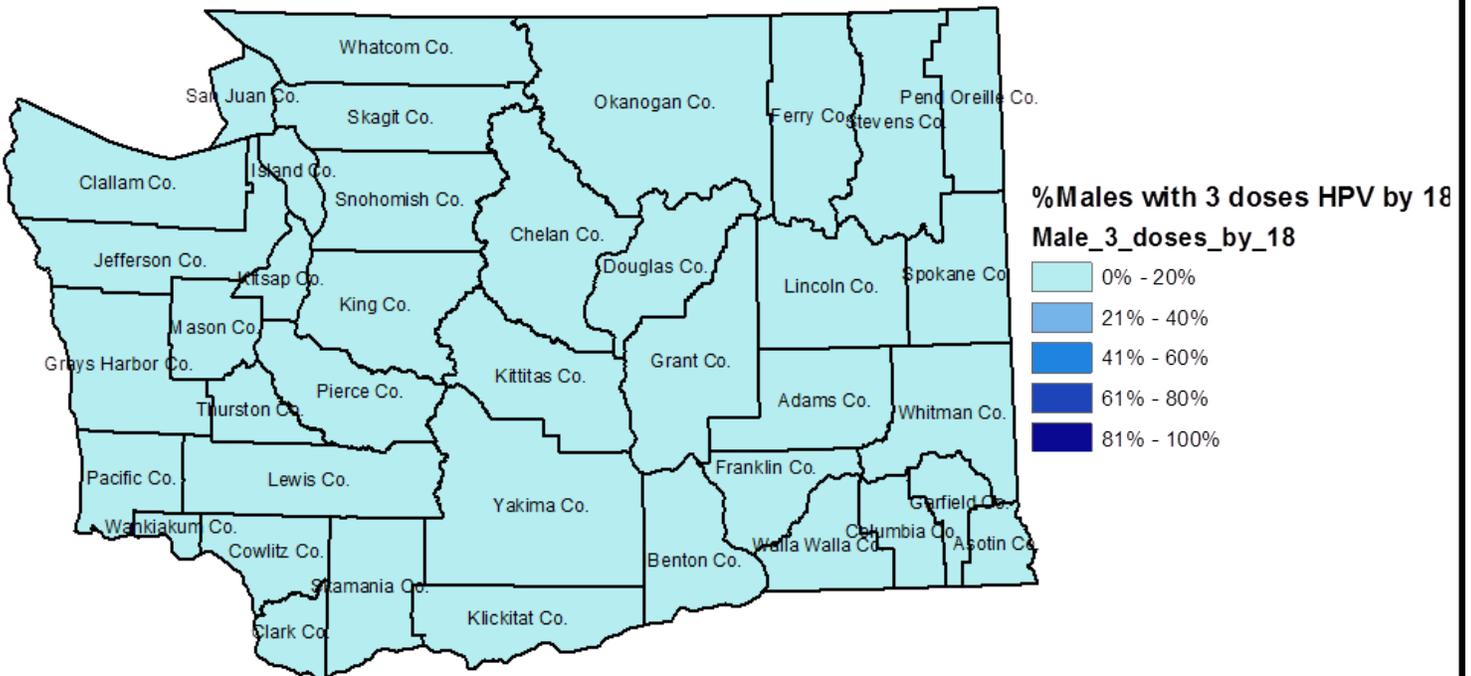


*Note: Kittitas, Walla Walla, Whatcom, and Whitman Counties have census estimates for 18 year olds that are much higher than expected, most likely due to the presence of universities in otherwise relatively small counties. Estimated coverage may not accurately reflect the population in these counties.

HPV Vaccine Series Completion by age 18, Females 2013



HPV Vaccine Series Completion by age 18, Males 2013



*Note: Kittitas, Walla Walla, Whatcom, and Whitman Counties have census estimates for 18 year olds that are much higher than expected, most likely due to the presence of universities in otherwise relatively small counties. Estimated coverage may not accurately reflect the population in these counties.

YAKIMA HEALTH DISTRICT

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<http://www.yakimapublichealth.org>

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Notifiable Condition <i>(includes confirmed and probable cases)</i>	Cases			Total Cases by Year	
	Jan – July	Jan – July	Jan – July	Total Cases by Year	Total Cases by Year
	2014	2013	2012	2013	2012
Campylobacteriosis	42	83	52	154	108
Chlamydia	853	791	751	1378	1303
Cryptosporidiosis	7	2	1	3	5
Genital Herpes - Initial	34	36	33	56	61
Giardiasis	6	4	9	11	15
Gonorrhea	196	80	44	181	81
Hepatitis A acute	0	0	1	4	2
Hepatitis B acute	0	0	0	0	0
Hepatitis B chronic	6	2	4	6	7
Hepatitis C acute	2	0	2	0	2
Hepatitis C chronic	172	106	102	173	176
HIV/AIDS Cumulative Living	196	187	186	192	185
HIV/AIDS Deaths	0	2	6	4	6
HIV/AIDS New	7	3	8	8	9
Meningococcal Disease	1	0	1	0	2
Pertussis	14	115	299	126	493
Salmonellosis	26	18	14	31	26
Shigellosis	12	3	0	6	1
STEC (enterohemorrhagic E. coli)	7	10	3	21	7
Syphilis - Primary and Secondary	5	9	4	14	6
Tuberculosis	1	1	3	9	5

**Notifiable
Conditions
Summary
Jan - July
2014**