



## WA STATE PERTUSSIS UPDATE

December 5, 2024

# Before We Start

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- All participants will be muted for the presentation.
- You may ask questions using the Q&A box, and questions will be answered at the end of the presentation.
- Continuing education is available for nurses, medical assistants, and pharmacists/pharmacy techs.
- If you're watching in a group setting and wish to claim CE credit, please make sure you register for the webinar and complete the evaluation as an individual.
- You can find more information here: <https://doh.wa.gov/you-and-your-family/immunization/immunization-training/pertussis-updates-December-5>

# Continuing Education

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- This nursing continuing professional development activity was approved by Montana Nurses Association, an accredited approver with distinction by the American Nurses Credentialing Center's Commission on Accreditation. Upon successful completion of this activity, 1.0 contact hours will be awarded.
- This program has been granted prior approval by the American Association of Medical Assistants (AAMA) for 1.0 administrative continuing education unit.
- This knowledge activity was approved by the Washington State Pharmacy Association for 1.0 contact hours. The Washington State Pharmacy Association is accredited by the Accreditation Council for Pharmacy Education as a Provider of continuing pharmacy education.



# Disclosures

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The planners and speakers of this activity have no relevant financial relationships with any commercial interests pertaining to this activity.

# Learning Objectives

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- Describe pertussis clinical manifestation, treatment, and vaccine recommendations
- Discuss vaccination coverage in Washington State
- Describe pertussis surveillance and reporting guidelines

# Presenters

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Washington State Department of Health

# Pertussis Clinical Manifestations

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CONOR NATH, MD

## Pertussis, Whooping Cough

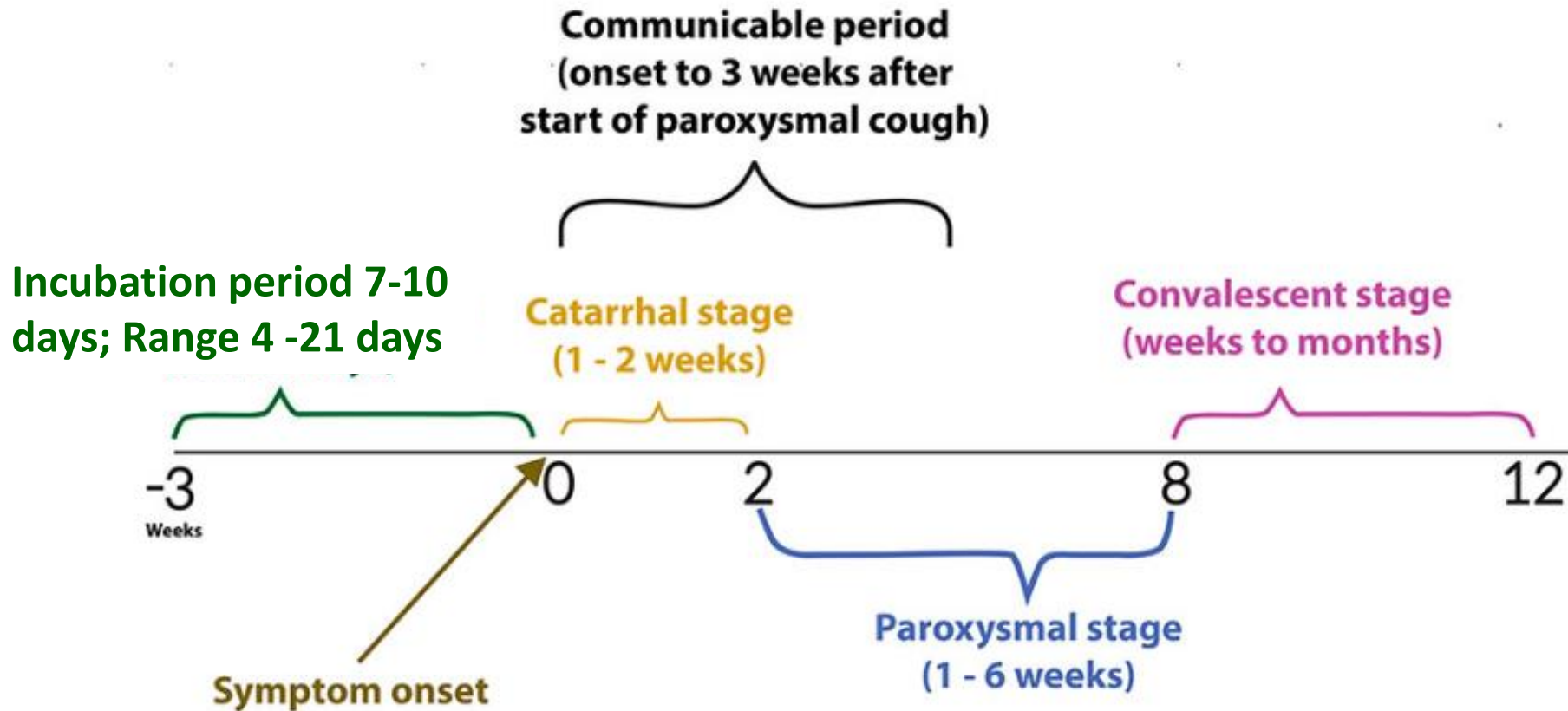
- Pertussis, also known as whooping cough
- Primarily a toxin-mediated disease
- Toxins damage the lining of the respiratory tract
  - interferes with the clearing of pulmonary secretions
  - Can cause inflammation within the airway
- Results in intermittent, violent coughing spells
- Inhaling (gasping) through inflamed airways results in the characteristic “whooping” sound
- The cough can last for months “the 100-day cough”





# Incubation and disease progression

## Pertussis Disease Progression



## Variations to Characteristic Features

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Adolescents, adults, and vaccinated children

- Persistent cough
- Milder disease
- Inspiratory whoop uncommon
- **May still transmit the disease to other susceptible persons**

## Complications: Children, Adolescents and Adults

- Nose bleeds
- Urinary incontinence
- Rib fracture
- Syncope (fainting)

- Pneumothorax (collapsed lung)
- Rectal prolapse
- Subdural hematomas (a type of bleeding in the brain)
- Seizures
- Encephalopathy
- Pneumonia

# Infant Presentation

Most severe in those under 12 months and in preterm or unimmunized infants

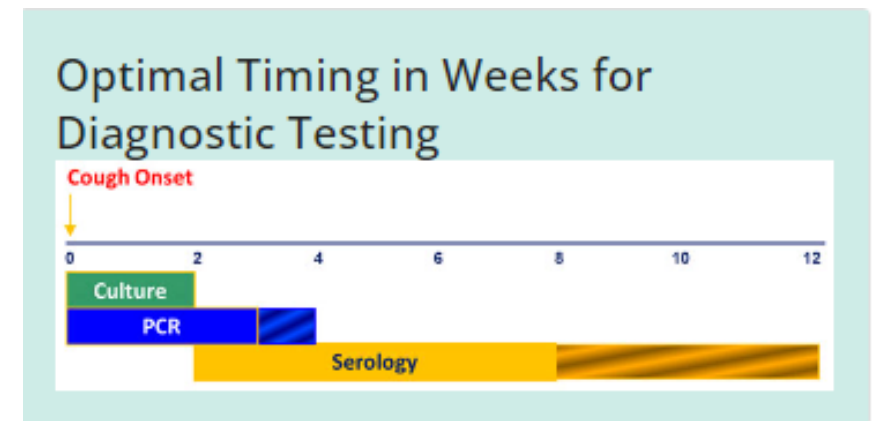
- May not cough or may be minimal
- Absence of the characteristic “whoop”
- Exhaustion
- Struggle to breathe
- Cyanosis
- **Apnea (May be the only symptom)**



Infants may not have classic symptoms and only present with apnea.

# Testing

- **Culture**
  - Gold standard, 100% specific for identification
  - Best within 2 weeks from cough onset (after 2 weeks, risk of false negative increases)
  - Allows for strain identification and antimicrobial susceptibilities (especially helpful during outbreaks)
- **PCR (polymerase chain reaction)**
  - Most rapid test available
  - Use up to 3-4 weeks following cough onset
  - High sensitivity; risk of false positivity
- **Serology testing**
  - Not recommended in Washington State



- Widely available at commercial, hospital, and clinical labs

## Medical Management & Preventive Measures

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- Primarily Supportive
- If administered early, antibiotics can be helpful
  - 5-day course of azithromycin
  - Catarrhal phase
  - Antibiotics eradicate the organism from secretions
  - Decrease communicability
  - May lessen symptoms or shorten duration of disease
- Give before test results if clinical history is highly suggestive or the patient is at high risk for complications

## Post-exposure Prophylaxis

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Given to...

Close contacts

- Living in the same household
- Face-to-face exposure within 3 feet of a symptomatic patient
- Direct contact with respiratory, oral, or nasal secretions from a symptomatic patient
- Sharing the same confined space in close proximity with a symptomatic patient for  $\geq 1$  hour

High risk individuals

- Infants younger than one year, or those in contact with infants  $< 1$  year old
- Pregnant persons
- People with underlying immunodeficiencies or chronic medical conditions.

# Recommended Antimicrobial Agents for the Treatment and Postexposure Prophylaxis of Pertussis

Age	Recommended Drugs			Alternative
	Azithromycin	Erythromycin	Clarithromycin	TMP-SMX
Younger than 1 mo	10 mg/kg/day as a single dose daily for 5 days <sup>b,c</sup>	40 mg/kg/day in 4 divided doses for 14 days	Not recommended	Contraindicated at younger than 2 mo
1 through 5 mo	10 mg/kg/day as a single dose daily for 5 days <sup>b</sup>	40 mg/kg/day in 4 divided doses for 14 days	15 mg/kg/day in 2 divided doses for 7 days	2 mo or older: TMP, 8 mg/kg/day; SMX, 40 mg/kg/day in 2 doses for 14 days
6 mo or older and children	10 mg/kg as a single dose on day 1 (maximum 500 mg), then 5 mg/kg/day as a single dose on days 2 through 5 (maximum 250 mg/day) <sup>b,d</sup>	40 mg/kg/day in 4 divided doses for 7-14 days (maximum 2 g/day)	15 mg/kg/day in 2 divided doses for 7 days (maximum 1 g/day)	2 mo or older: TMP, 8 mg/kg/day; SMX, 40 mg/kg/day in 2 doses for 14 days
Adolescents and adults	500 mg as a single dose on day 1, then 250 mg as a single dose on days 2 through 5 <sup>b,d</sup>	2 g/day in 4 divided doses for 7-14 days	1 g/day in 2 divided doses for 7 days	TMP, 320 mg/day; SMX, 1600 mg/day in 2 divided doses for 14 days

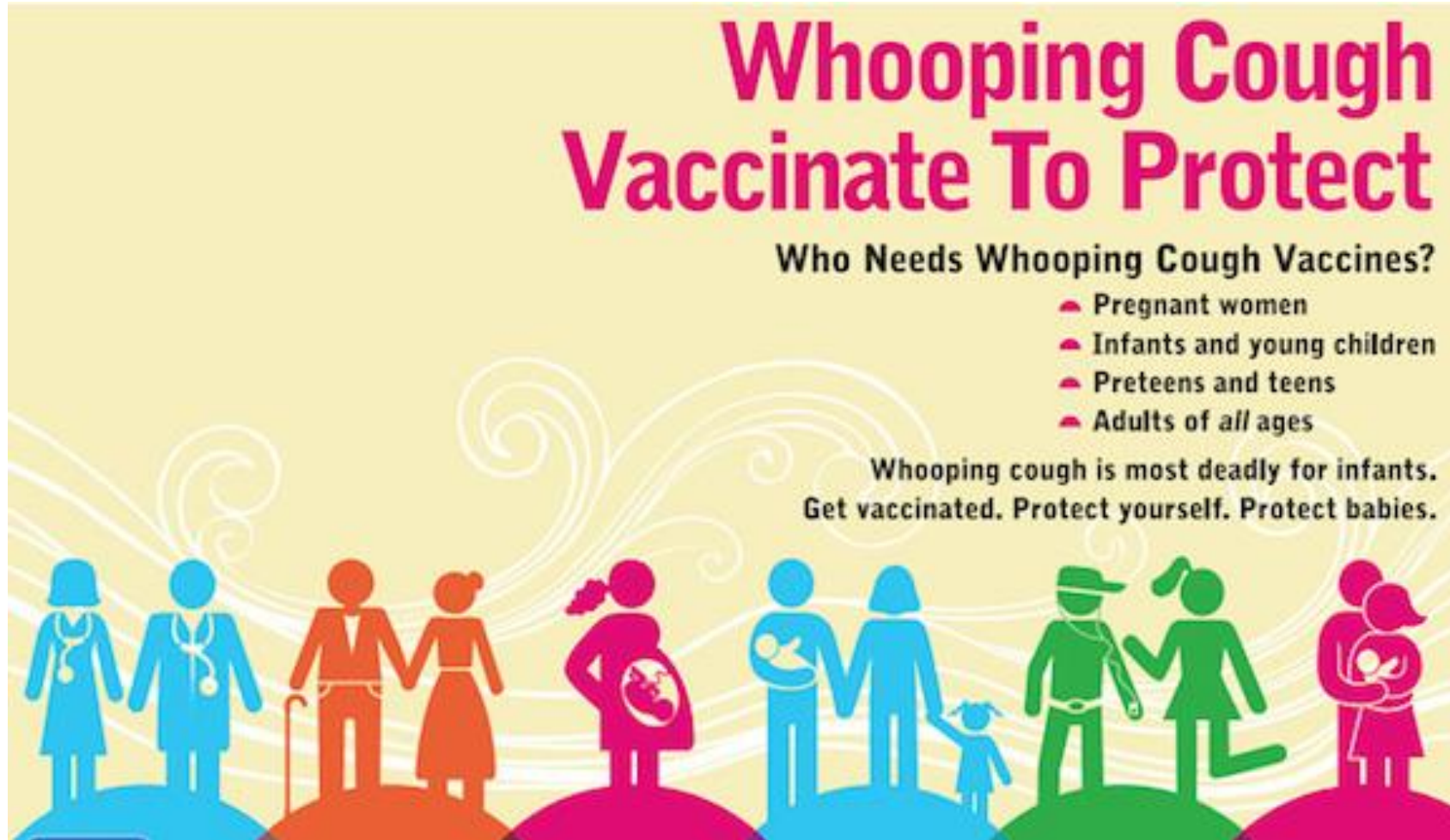
<https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5414a1.htm>



# Vaccine Recommendations

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## Vaccination is the Best Protection



**Whooping Cough  
Vaccinate To Protect**

**Who Needs Whooping Cough Vaccines?**

- Pregnant women
- Infants and young children
- Preteens and teens
- Adults of *all* ages

**Whooping cough is most deadly for infants.  
Get vaccinated. Protect yourself. Protect babies.**

The poster features a row of colorful silhouettes at the bottom representing various groups: two healthcare workers, an elderly couple, a pregnant woman, a family with a child, a young couple, and a woman holding a baby. The background is light yellow with white decorative swirls.

<https://www.cdc.gov/vaccines/pubs/pinkbook/pert.html>

# Available DTaP and Tdap Vaccines

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## Pertussis-containing Vaccines

- DTaP (Daptacel and Infanrix)
- Tdap (Adacel and Boostrix)
- DTaP-HepB-IPV (Pediatrix)
- DTaP-IPV/Hib (Pentacel)
- DTaP-IPV (Kinrix and Quadracel)
- DTaP-IPV-Hib-HepB (Vaxelis)


[Chapter 16: Pertussis | Pink Book | CDC](#)  
[Types of Whooping Cough Vaccines | Whooping Cough | CDC](#)

# DTaP and Tdap Vaccine Recommendations

People of all ages need **WHOOPIING COUGH VACCINES**



<b>DTaP</b> for young children	<b>Tdap</b> for preteens	<b>Tdap</b> for pregnant women	<b>Tdap</b> for adults
✓ 2, 4, and 6 months ✓ 15 through 18 months ✓ 4 through 6 years	✓ 11 through 12 years	✓ During the 27-36th week of each pregnancy	✓ Anytime for those who have never received it

[www.cdc.gov/whoopingcough](http://www.cdc.gov/whoopingcough) 

Adults should get a booster dose of Td or Tdap every 10 years to maintain protection.

Adults and caregivers should receive Tdap to protect vulnerable babies from pertussis in the first few months of life.

[About Whooping Cough](#) | [Whooping Cough](#) | [CDC](#)

## Additional Notes

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[About Whooping Cough | Whooping Cough | CDC](#)

- Vaccines are the best way to protect against pertussis
- Vaccination protects against serious disease if person gets pertussis
- Pertussis vaccines work well but protection fades over time
- Tdap vaccination during pregnancy protects:
  - More than 3 in 4 babies younger than 2 months from pertussis
  - About 9 in 10 babies from being hospitalized
- Review patient history prior to vaccinating
- Review WAIS forecast

# Resources

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- [Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger; 2024 U.S. \(cdc.gov\)](#)
- [Catch-Up Guidance for Children 4 Months through 6 Years of Age Vaccines: DTap, December 2023 \(cdc.gov\)](#)
- [2024: Tetanus, Diphtheria, and Pertussis-Containing Vaccines-- Catch-up Guidance for Children 7 through 9 years of age \(cdc.gov\)](#)
- [2024: Tetanus, Diphtheria, and Pertussis-Containing Vaccines-- Catch-up Guidance for Children 10 through 18 years of age \(cdc.gov\)](#)
- [Communication and Print Resources | CDC](#)
- [Ask The Experts: Pertussis | Immunize.org](#)
- [Pertussis \(Whooping Cough\) | Whooping Cough | CDC](#)
- Clinical questions: [immunenurses@doh.wa.gov](mailto:immunenurses@doh.wa.gov)



[About Whooping Cough | Whooping Cough | CDC](#)

## Knowledge Check

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1. Infants often don't present with the classic pertussis symptoms, what symptom might they present with instead?
2. What groups of people would be eligible for post-exposure prophylaxis?

## Knowledge Check Answers

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1. Infants often only present with symptoms of apnea
2. Groups eligible for post-exposure prophylaxis include:  
Close contacts and individuals at high risk of complications



# Pertussis Immunization Coverage in Washington

KAITLYN SYKES, MPH

# Pertussis Immunization Coverage in Washington

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# Pertussis Immunization Coverage for Children 19-35 Months: WAIS-Based Data

# WAIS Immunization Coverage Data

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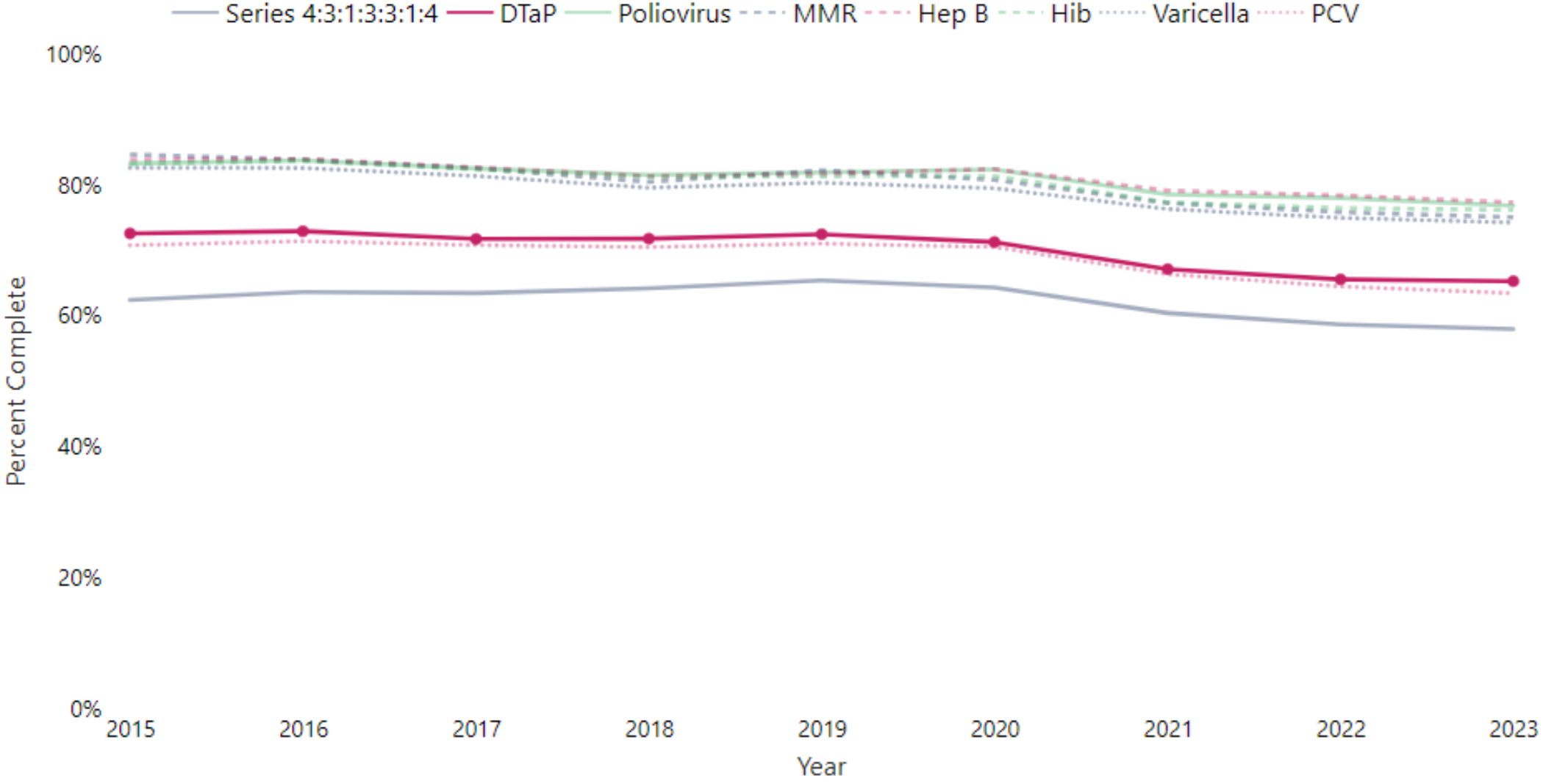
## **Applications**

- Use to assess statewide vaccination coverage as well as geographic and demographic variation
- Provides continuous near real-time updates

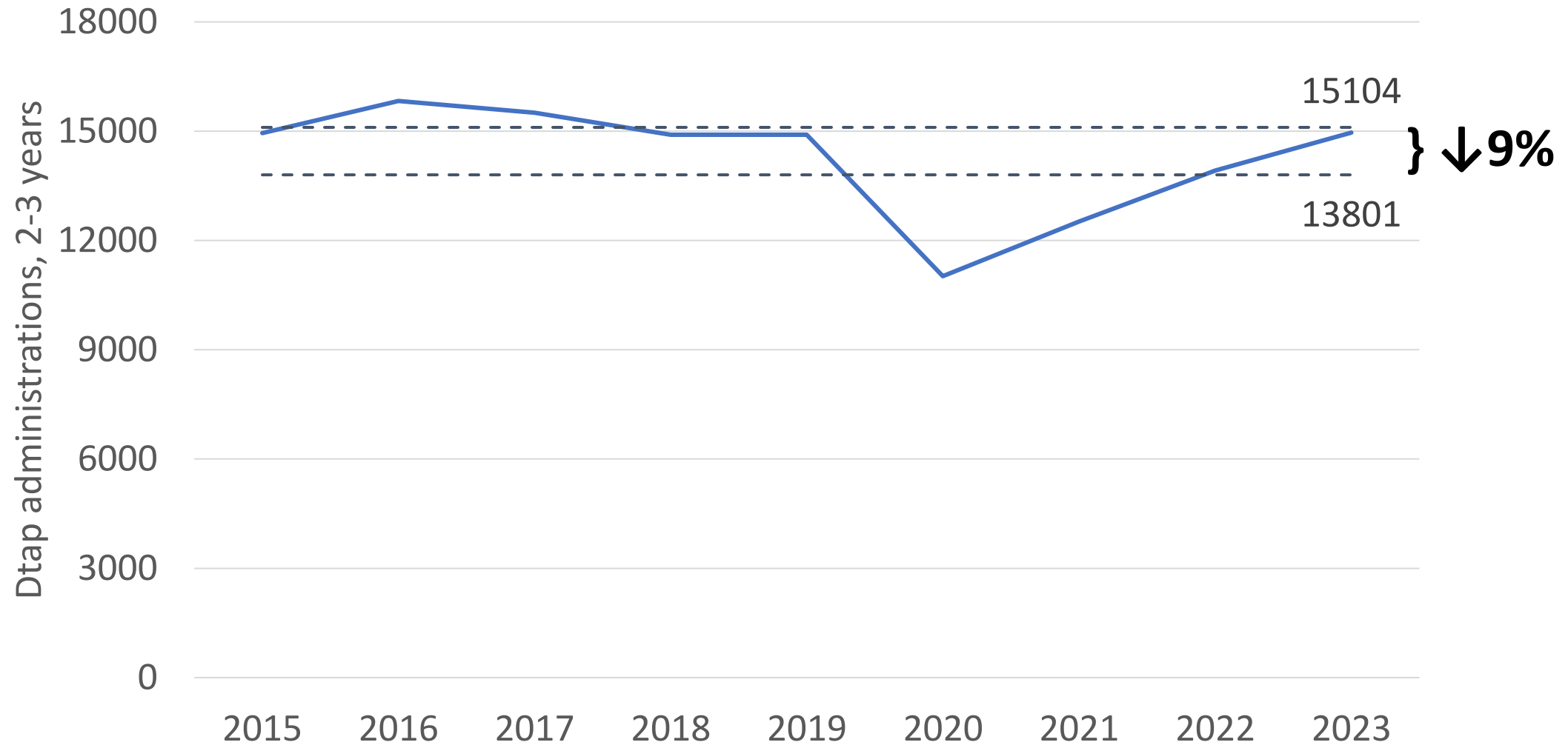
## **Limitations**

- IIS denominator inflation results in underestimates
- Race and ethnicity data are based on provider report to WAIS
- Coverage estimates for earlier time periods can change over time. IIS is an ‘in the moment’ registry

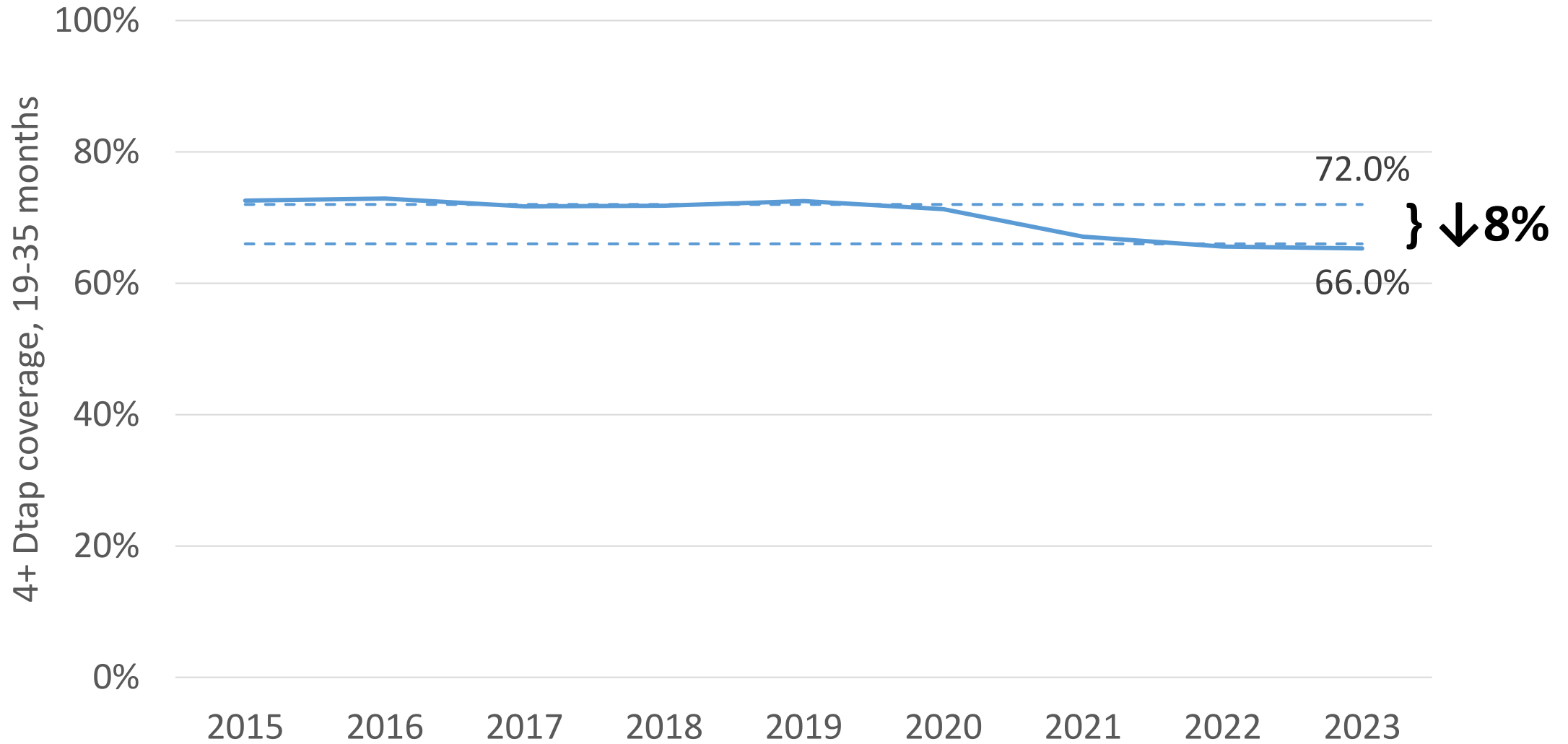
# Statewide Immunization Coverage Trends Among 19-35 Month-Olds, 2015 to 2023



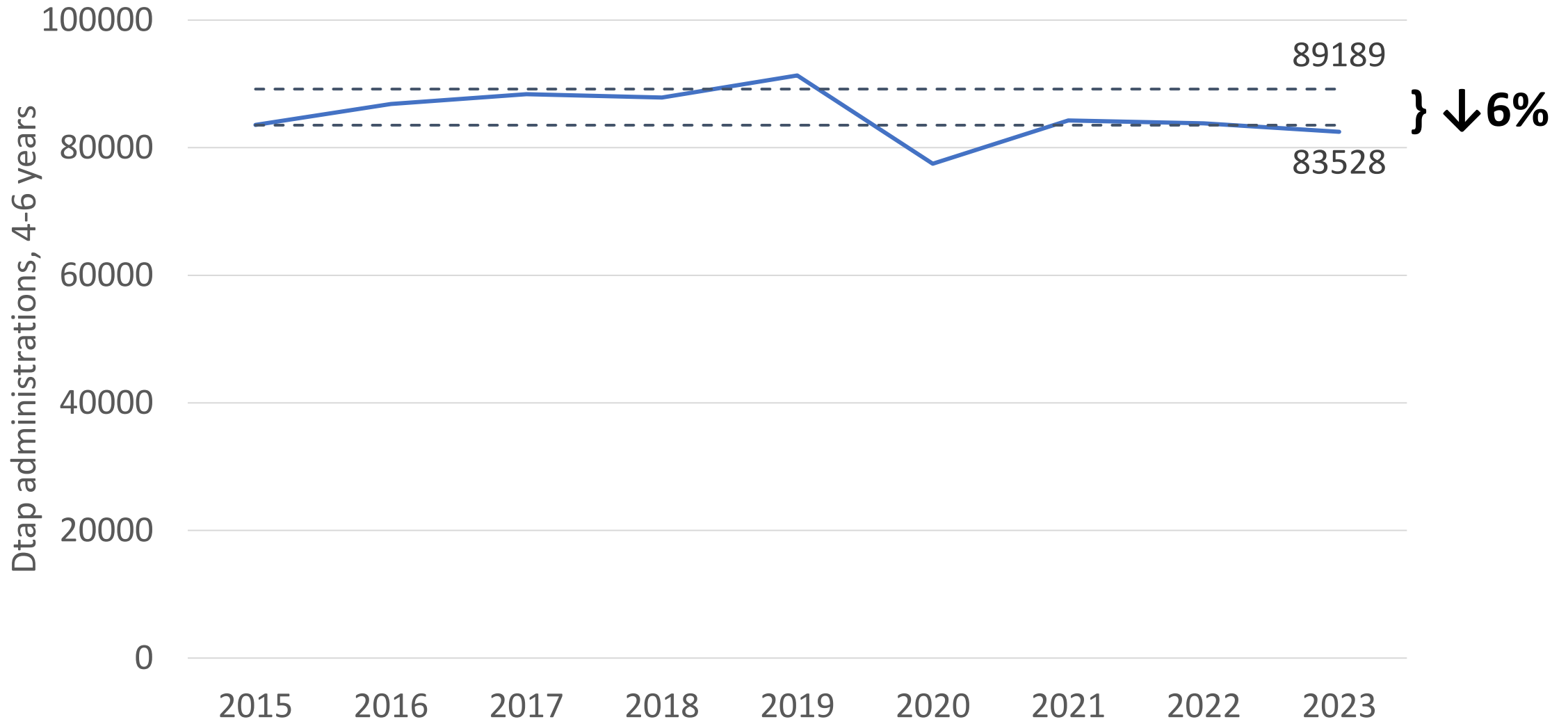
# DTaP administrations among 2-3 year olds, 2015 to 2023



# 4+ Dtap coverage among 19-35 month olds, 2015 to 2023

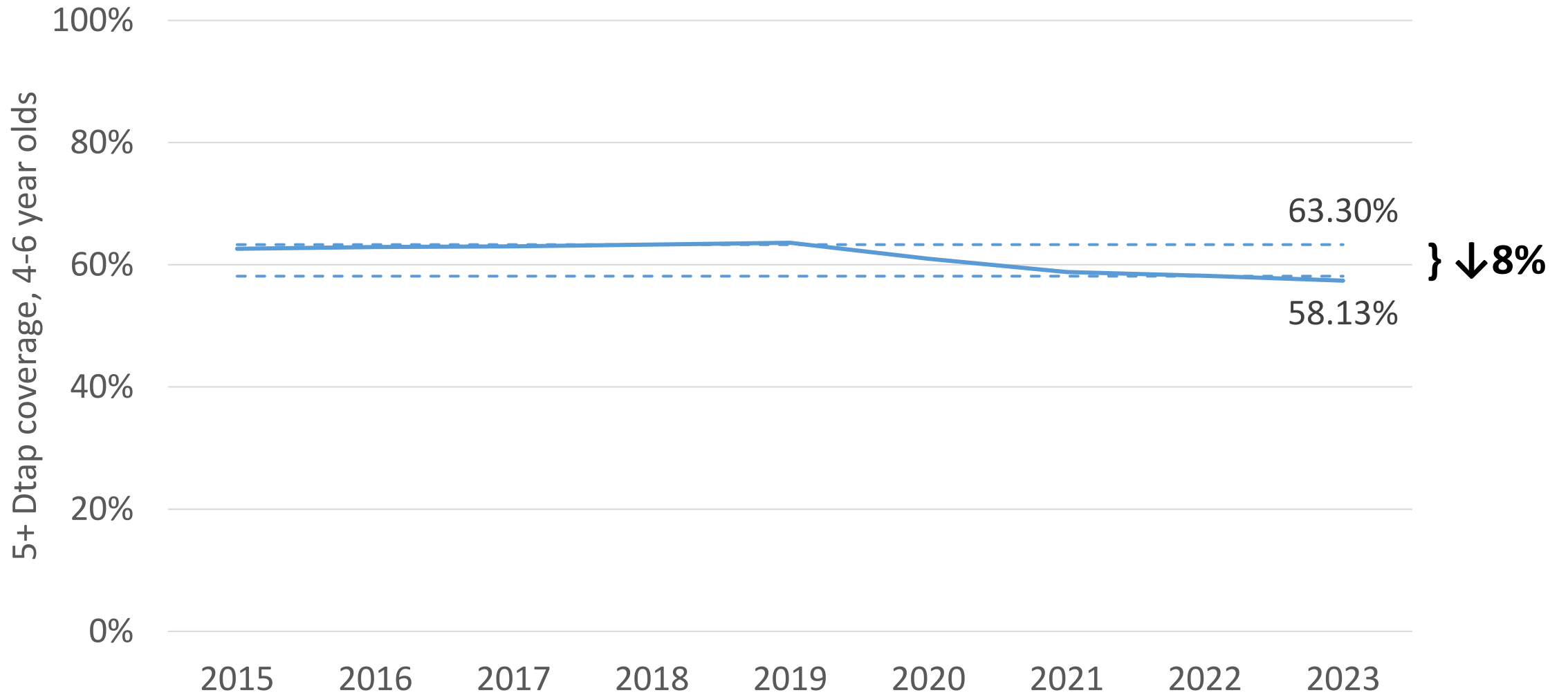


# DTaP administrations among 4-6 year olds, 2015 to 2023

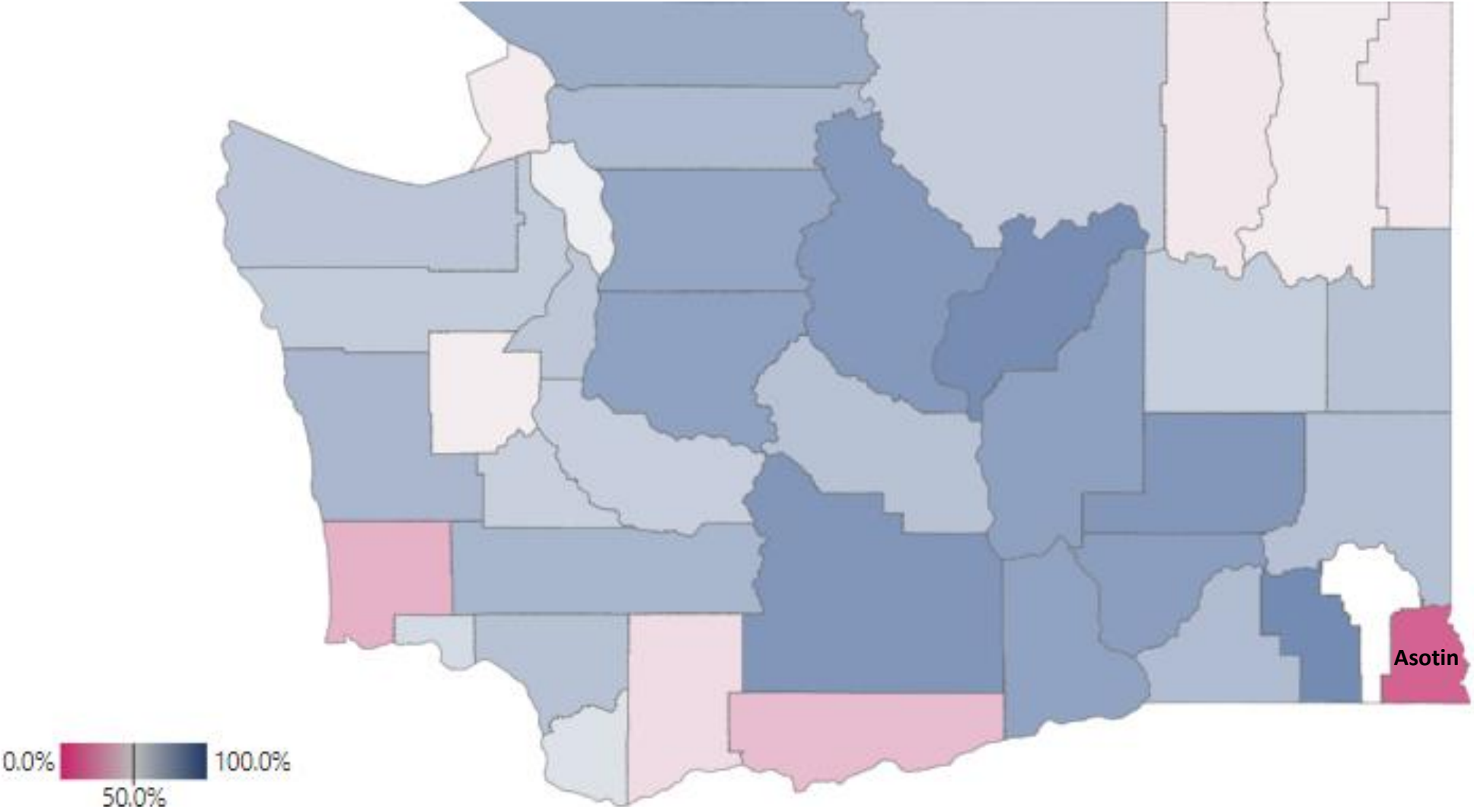




# 5+ DTaP coverage among 4-6 year olds, 2015 to 2023



# Statewide DTaP Coverage Trends Among 19-35 Month-Olds by County, 2023



# Pertussis Immunization Data for the K-12 Population: Washington School Reports

# About School Reported Immunization Data

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## **Data Collection**

- State law requires all public and private schools with any students in grades K through 12 to submit an Immunization Status Report by December 1 of each school year.
  - Submit data in WAIS School Module or through a REDCap report.

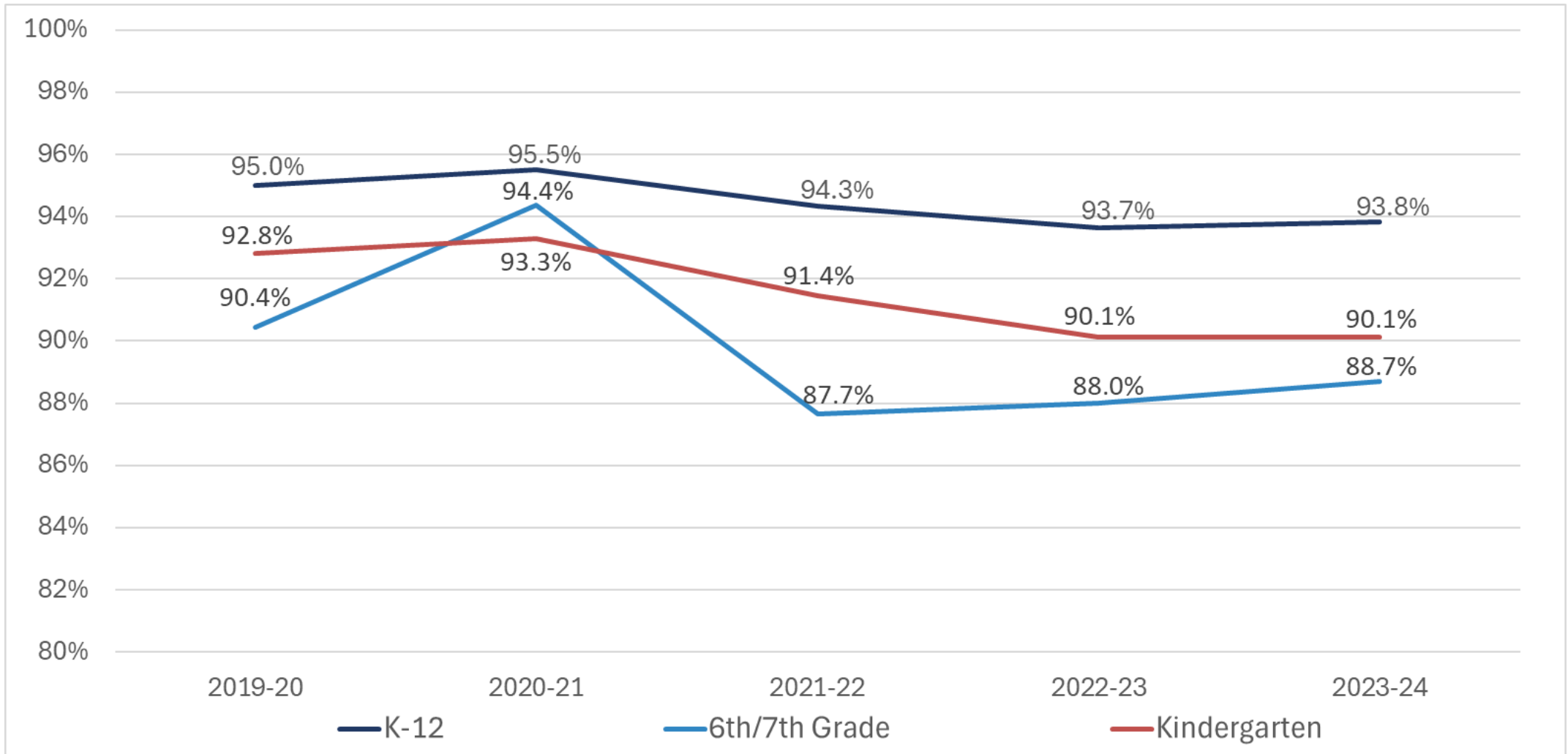
## **Applications**

- Used to assess school and district-level vaccination status
- Provides accurate school-level vaccine coverage data on annual basis

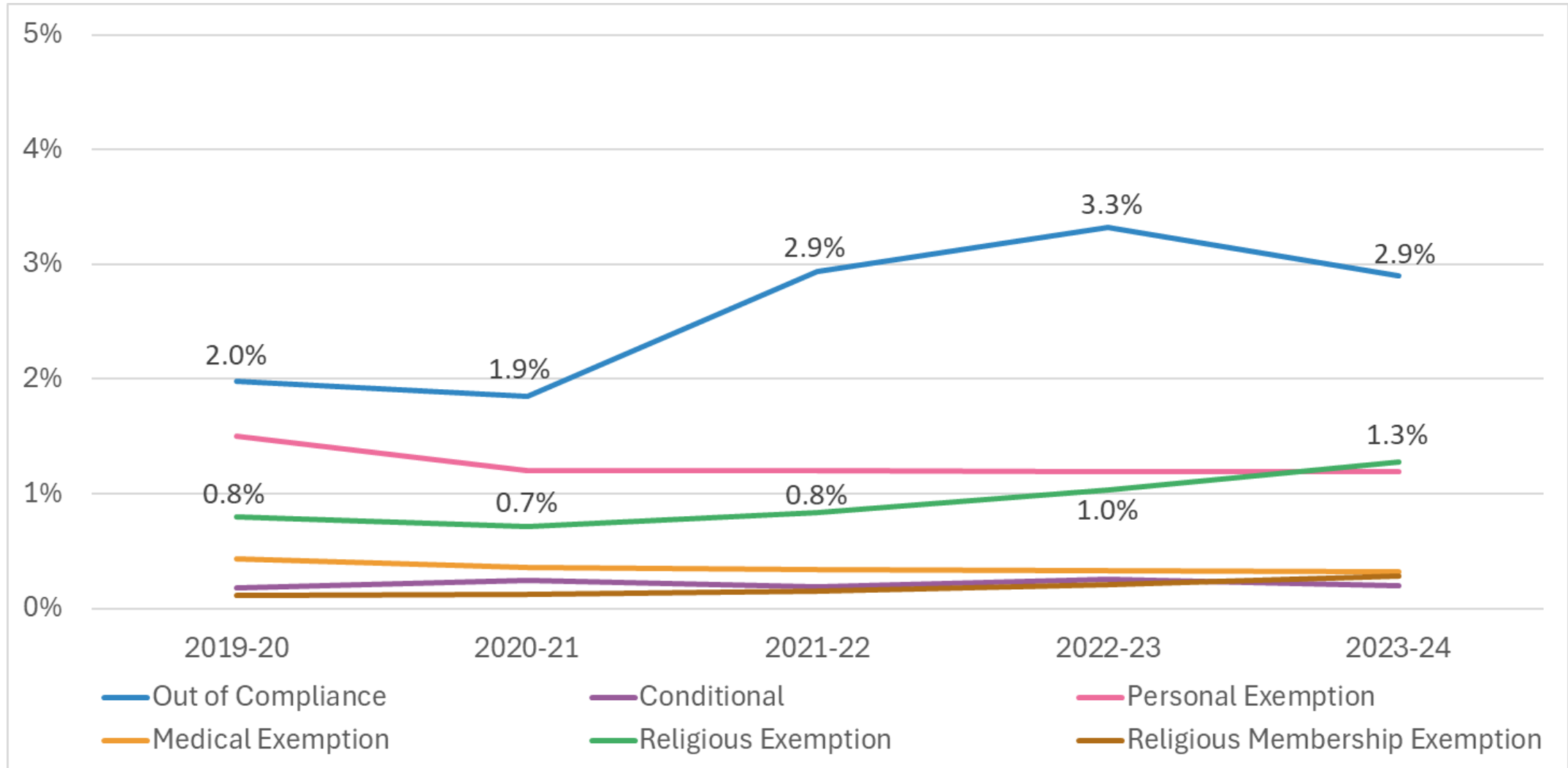
## **Limitations**

- Specific to school-going population
- Limited grade levels and demographics
- Single update at end of year

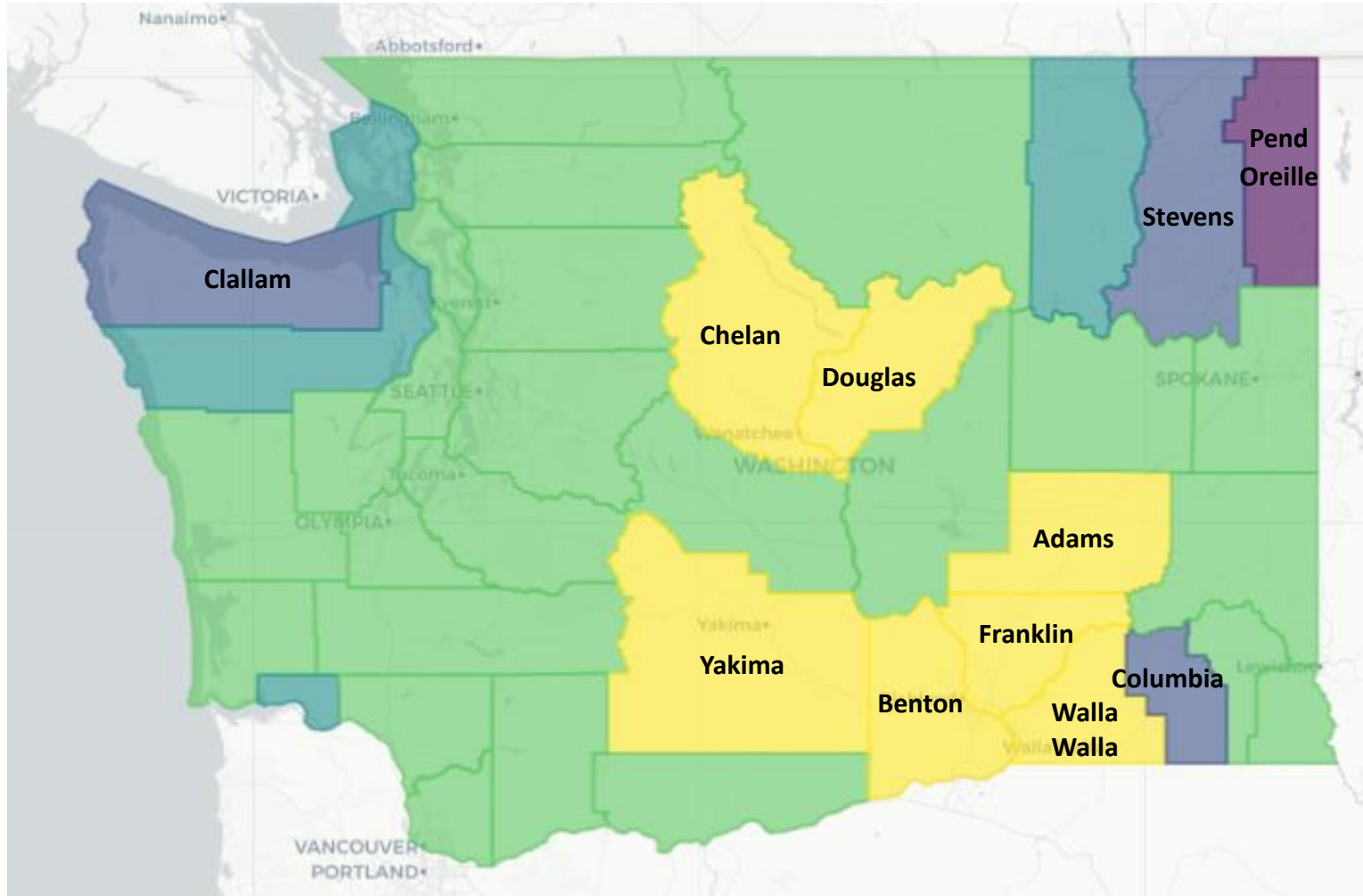
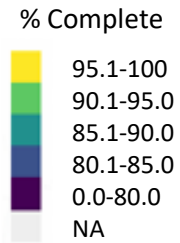
# Pertussis Immunization Compliance by Grade Cohort



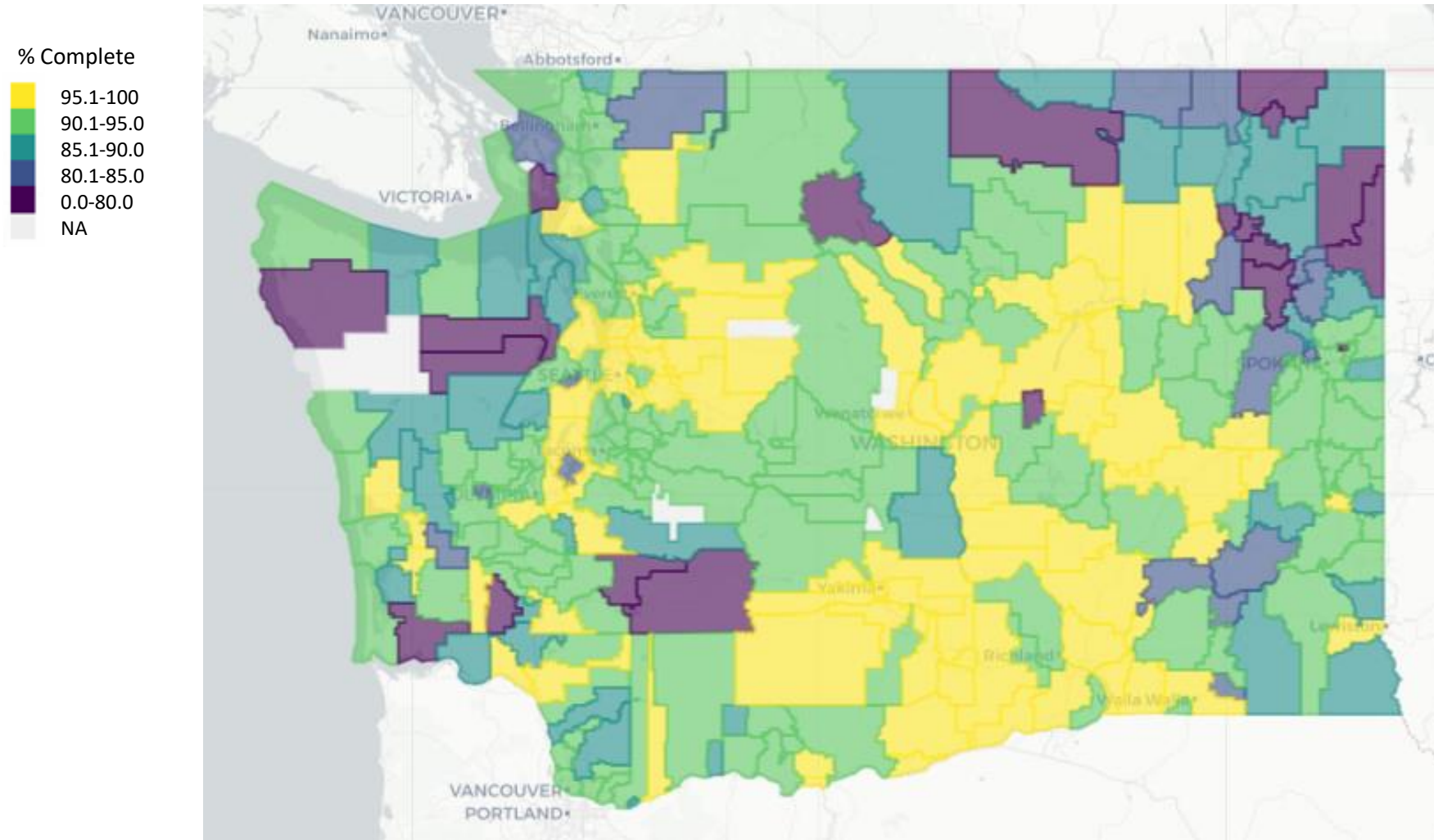
# School Immunization Data: K-12 Pertussis Immunization Status – Non-Compliant



# School Immunization Data – K-12 County Level



# School Immunization Data – K-12 School District Level





Thank you!

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Data can be found on DOH immunization dashboards:

[Immunization Measures by County Dashboard](#)

[School Immunization Data Dashboard](#)

Questions or data requests can be sent to:

[waiisdatarequests@doh.wa.gov](mailto:waiisdatarequests@doh.wa.gov)

# Pertussis Surveillance Update

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ESTHER LAM, MPH

# Surveillance

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## Pertussis

### 1. DISEASE REPORTING

#### A. Purpose of Reporting and Surveillance

1. To prevent illness and death, particularly among infants younger than 1 year, and among persons who may transmit pertussis to infants.
2. To limit transmission of pertussis in settings with infants or others who may transmit pertussis to infants.
3. To monitor the epidemiology of pertussis in Washington state.

#### B. Legal Reporting Requirements

1. Health care providers and facilities: notifiable to local health jurisdiction within 24 hours.
2. Laboratories: *Bordetella pertussis* notifiable to local health jurisdiction within 24 hours; submission of culture isolates required, when available (2 business days).

# Criteria used for classifying pertussis cases

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## Clinical case definition

A cough illness lasting at least 2 weeks, with at least one of the following:

- Paroxysms of coughing
- Inspiratory whoop
- Post-tussive vomiting
- Apnea



## Laboratory diagnostics

- A positive bacterial culture for *B. pertussis*
- Positive PCR test for *B. pertussis*

Serology is not considered a valid test for surveillance purposes.

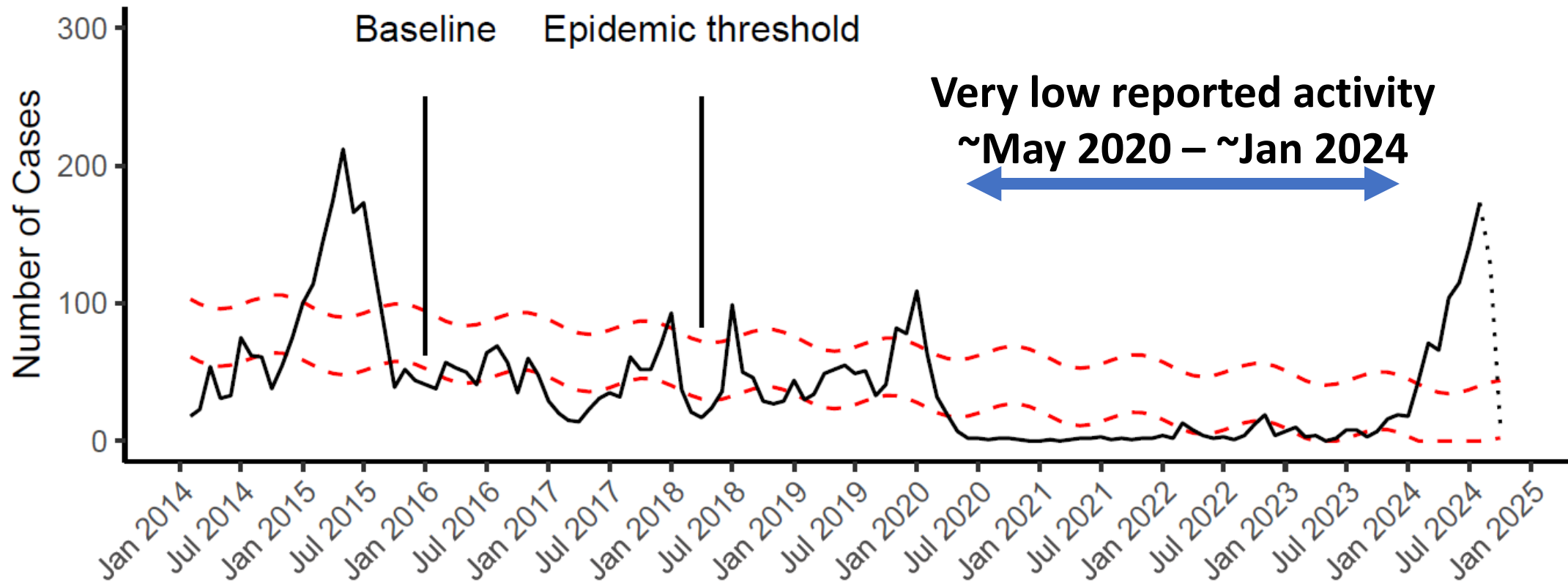
Please note!

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All data presented in the following slides is preliminary and subject to change. Some cases are still under investigation.

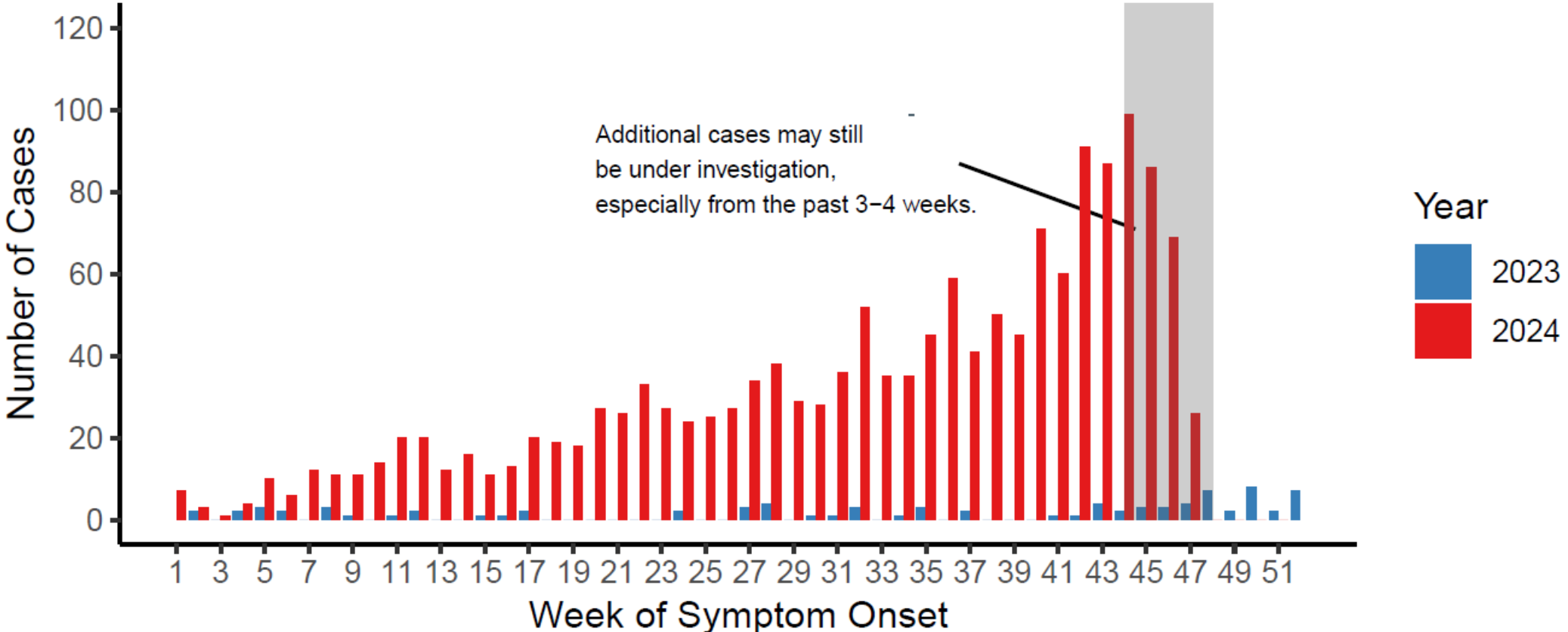
# Monthly Case Counts: 10 years of context

**Figure 2:** WA State Pertussis Cases Reported by Month and Year (black) with Projected Baseline and Epidemic Thresholds (red dashed lines), 2014 through year-to-date 2024<sup>1</sup>. *The most recent 2 months may still be incomplete (dotted line).*



# Weekly pertussis case counts, through 11/23/2024 (week 47) 1,533 cases compared to by the same week in 2023

**Figure 1:** Number of Pertussis Cases Reported in Washington State by CDC Week of Symptom Onset: 2023 (blue) vs 2024 (red)



# Ages of Confirmed and Probable Pertussis Cases

**Table 1:** WA State Pertussis Cases by Age Group, 2024 weeks 1 - 47

Age Group	OFM 2022 Population	Number of Cases	Rate per 100,000 persons	% of cases by age group*
< 1	88,441	144	162.8	9
1 - 4	349,505	316	90.4	21
5 - 9	476,054	262	55.0	17
10 - 13	396,426	181	45.7	12
14 - 18	480,566	355	73.9	23
19 - 24	588,771	121	20.6	8
25 - 44	2,225,672	92	4.1	6
45 - 64	1,911,375	44	2.3	3
65+	1,347,568	18	1.3	1
All ages	7,864,378	1,533	19.5	100

*\*Due to rounding, percentages may not always add up to 100%*



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# Ages of Confirmed and Probable Pertussis Cases

**School age children: 798 cases, 52%**

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## Hospitalization (under 1)

<b>Hospitalized at least overnight for pertussis?</b>	<b>n</b>	<b>%</b>
Yes	13	9.0%
No	130	90.3%
<i>Missing (not yet completed)</i>	1	0.7%
<b>Total</b>	<b>144</b>	

Of the 13 hospitalized infants:

- None were known to have been born to a person who had received Tdap during this pregnancy
- Only one had received any doses of pertussis-containing vaccine (8%)
- Three were old enough to have received one or more doses (23%)

Of the other 131 infants (non-hospitalized or missing hospitalization):

- 21 had received at least one dose of vaccine (16%)

## Hospitalization (all ages)

<b>Hospitalized at least overnight for pertussis?</b>	<b>n</b>	<b>%</b>
Yes	30	2.0%
No	1,485	96.8%
Unknown	3	0.2%
<i>Missing</i>	15	1.0%
<b>Total</b>	<b>1,533</b>	

Only 10 hospitalized patients were known to have ever received a documented dose of pertussis-containing vaccine (33%).

## Summary

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- More than half of cases were among school-aged children (5 – 18 years old).
  - All school-aged children were born when only acellular pertussis vaccine was available.
  - K-12 schools may be a key setting for the transmission of pertussis in WA in 2024.
- A high percentage of pertussis cases have been reported among children 1 to 4 years old.
  - Most of these children were born since 2020, when routine pertussis immunization coverage decreased.
- Most hospitalized patients had no documented history of pertussis vaccination.

# Knowledge Check

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Pertussis cases are rising in all age groups but the majority of cases are among one group. Which group: infants, school aged, or adults?

## Knowledge Check Answer

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More than half of the cases are among school-aged children (5 – 18 years old). K-12 schools may be a key setting for the transmission of pertussis in WA in 2024.

# Thank you!

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Weekly Pertussis surveillance report can be found at:

<https://doh.wa.gov/sites/default/files/legacy/Documents/Pubs/348-254-PertussisUpdate.pdf>

Questions?

Contact: [vpd-cde@doh.wa.gov](mailto:vpd-cde@doh.wa.gov)



# Obtaining Continuing Education

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- Continuing education credit is available for nurses, medical assistants, and pharmacists/pharmacy techs
- There is no cost for CEs
- Expiration date is 3/5/25
- Successful completion of this continuing education activity includes the following:
  - Attending the entire live webinar or watching the webinar recording, and completing the evaluation
  - **On the evaluation, please specify which type of continuing education you wish to obtain**
- **Please note:** CE certificates are NOT generated after evaluation completion—CE certificates will be sent by DOH via email within a few weeks after evaluation completion
- If you have any questions about CEs, contact Trang Kuss at [trang.kuss@doh.wa.gov](mailto:trang.kuss@doh.wa.gov)

Evaluation QR code

<https://www.surveymonkey.com/r/YXDDRBX>



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