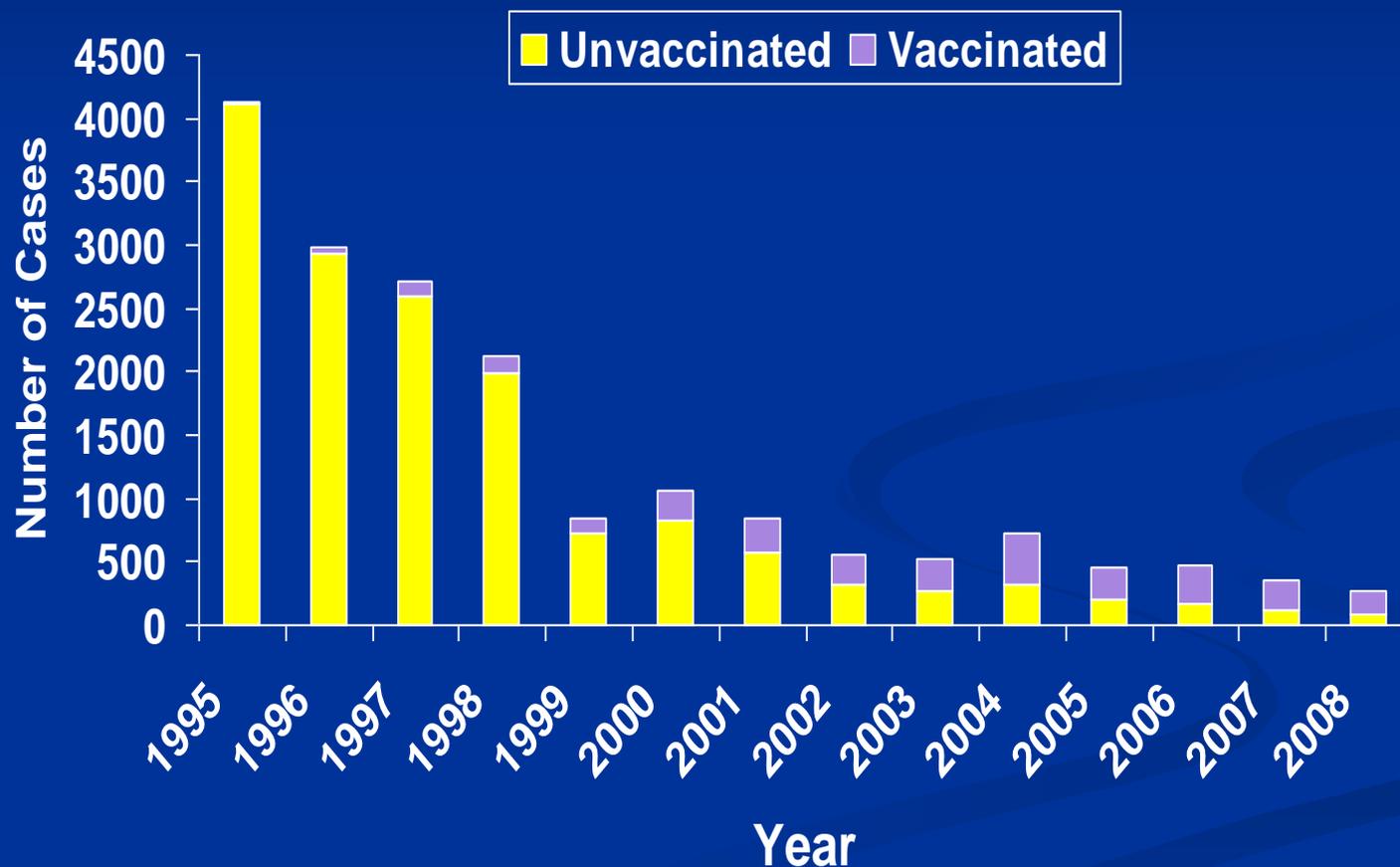


Varicella and Breakthrough Varicella *To Test or Not to Test*

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Changing Varicella Epidemiology: Varicella Cases by Vaccination Status

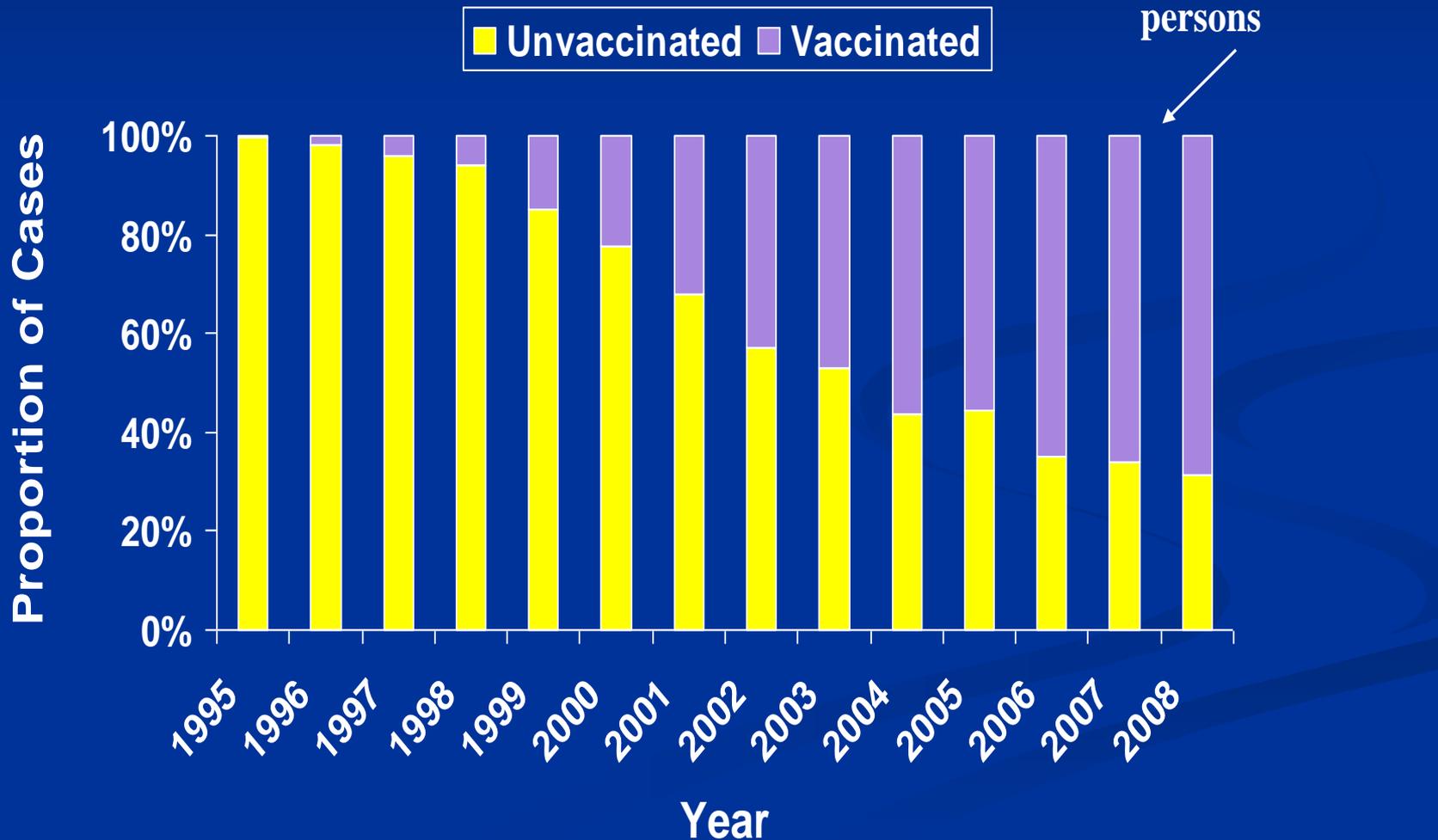
CDC Varicella Active Surveillance Project, 1995-2008



This slide shows data on varicella cases reported to the Varicella Active Surveillance Project between 1995-2008 by vaccination status. Since the 1-dose varicella vaccination program began in 1995, reported varicella cases have declined by greater than 90%, declining from approximately 4000 varicella cases reported in 1995 to less than 300 varicella cases in 2008. Shown in yellow are varicella cases among unvaccinated persons and in purple are varicella cases among vaccinated cases, also known as breakthrough varicella cases. Although cases have significantly declined over time, the proportion of cases among vaccinated persons has increased over time.

Changing Varicella Epidemiology: Varicella Cases by Vaccination Status

CDC Varicella Active Surveillance Project, 1995-2008



This figure shows more detailed data on the proportion of varicella cases among vaccinated persons using data from the Varicella Active Surveillance Project from 1995 to 2008. Similar to the previous graph, shown in yellow are the proportion of cases among unvaccinated persons and shown in purple are the proportion of varicella cases among vaccinated persons, also known as breakthrough varicella cases. As vaccination coverage has increased, the proportion of vaccinated cases has increased over time, from 0.3% in 1995 to 68.7% in 2008.

Changing Clinical Presentation of Varicella After Vaccine Introduction

Unvaccinated Case



- 200-500 lesions
- Mostly vesicular
- 2-4 “crops” of lesions
- Fever, malaise

Breakthrough Case



- <50 lesions
- Atypical appearance
- Few or no vesicles
- Less contagious

This slide shows the clinical presentation of varicella in unvaccinated persons compared to varicella in vaccinated persons, also known as breakthrough varicella. On the left is a picture of an unvaccinated child with varicella disease. They typically have 200-500 lesions that are mostly vesicular. They will have 2-4 crops of lesions, and will often also have fever and malaise. On the right is a picture of a vaccinated child with varicella disease, which is milder than varicella in unvaccinated persons. They typically have < 50 lesions with mainly maculopapular lesions and few or no vesicles. Varicella cases among vaccinated persons are less contagious than varicella cases among unvaccinated persons.

Diagnosing Breakthrough Varicella is Challenging



Varicella disease in vaccinated persons is extremely difficult to clinically diagnose because of its atypical clinical presentation. It can be easily mistaken for bug bites or other rash illnesses. Shown here are 6 photos of 6 different rashes in two rows that closely resemble each other. One of these photos is a vaccinated child with varicella. These photos are shown here to illustrate the challenges with diagnosing varicella in vaccinated persons one of these photos shows breakthrough varicella, which one would you pick?

Diagnosing Breakthrough Varicella is Challenging



On this next slide, we have identified these 6 skin rashes. It is the middle photo in the bottom row that shows varicella disease in a vaccinated child, or breakthrough varicella. On the top row, the upper left photo shows a skin rash due to poison ivy, the middle photo shows a skin rash due to folliculitis, and the upper right photo shows a skin rash due to insect bites. On the bottom row, the lower left photo shows a skin rash due to herpes simplex, and the lower right photo shows a skin rash due to scabies.

Philadelphia Department of Public Health Study of Suspected Breakthrough Varicella in Single Dose Vaccinees: Findings

➤ **411 suspected breakthrough cases:**

- Specimens collected by:
 - Health care providers (54 practices) – 86%
 - VASP staff – 14%
- Laboratory results:
 - VZV confirmed – 31%
 - VZV ruled out – 45%
 - Indeterminate – 24%
- IgM results
 - 4% of suspected cases tested positive

Why is PCR of skin lesions the preferred test for diagnosing varicella?

- Easily implemented
 - 91% patients in Philadelphia study had PCR testing
- Less invasive than drawing blood
- Reliable
 - Most results for patients with specimens collected from 2 lesions had concordant results (40/42, 95%)

The Cons of Serologic Assays

➤ IgM testing

- False negatives: Patients who are not naïve to VZV may not develop IgM response.
- Poor specificity: Few suspected cases had positive IgM results
- Timing of collection: those cases that were IgM positive had specimens collected after the rash had resolved.
- Commercially available tests are not reliable.

➤ Acute and Convalescent IgG testing

- Difficult to detect meaningful differences if acute titers are extremely high.
- Second office visit required.

Where to look for more info

- CDC Webpage on VZV Laboratory Testing
<http://www.cdc.gov/chickenpox/lab-testing/index.html>

Recommendations for Specimen Collection

➤ Timing

- Best results if collected within 5 days of rash onset

➤ Technique

- Vesicles and crusts are preferable but a good “rub” on a papule or macule is preferred to NO test!
- If possible, samples should be taken from ≥ 2 lesions

Where to send the specimen for PCR

- State laboratory if they offer VZV PCR Testing
- CDC National VZV Laboratory
1600 Clifton Rd., NE
MS G-18
Atlanta, GA 30333
 - Also provide state laboratory information if state laboratory will be performing testing

What to Do with the Results

➤ PCR (+)

- Document disease for proof of immunity
- No need for further immunization

➤ PCR (-)

- Determine if patient is eligible for 1st dose of varicella vaccine if unvaccinated or eligible for 2nd dose of varicella vaccine if already vaccinated with 1 dose