

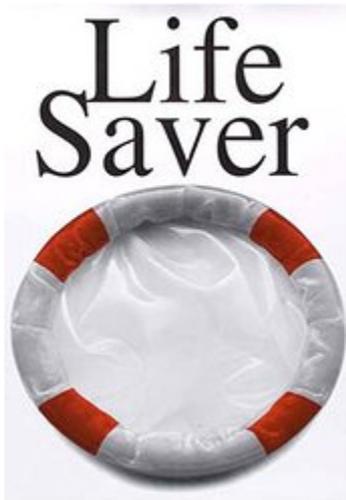
# THE NEW HIV TESTING ALGORITHM IN ARIZONA



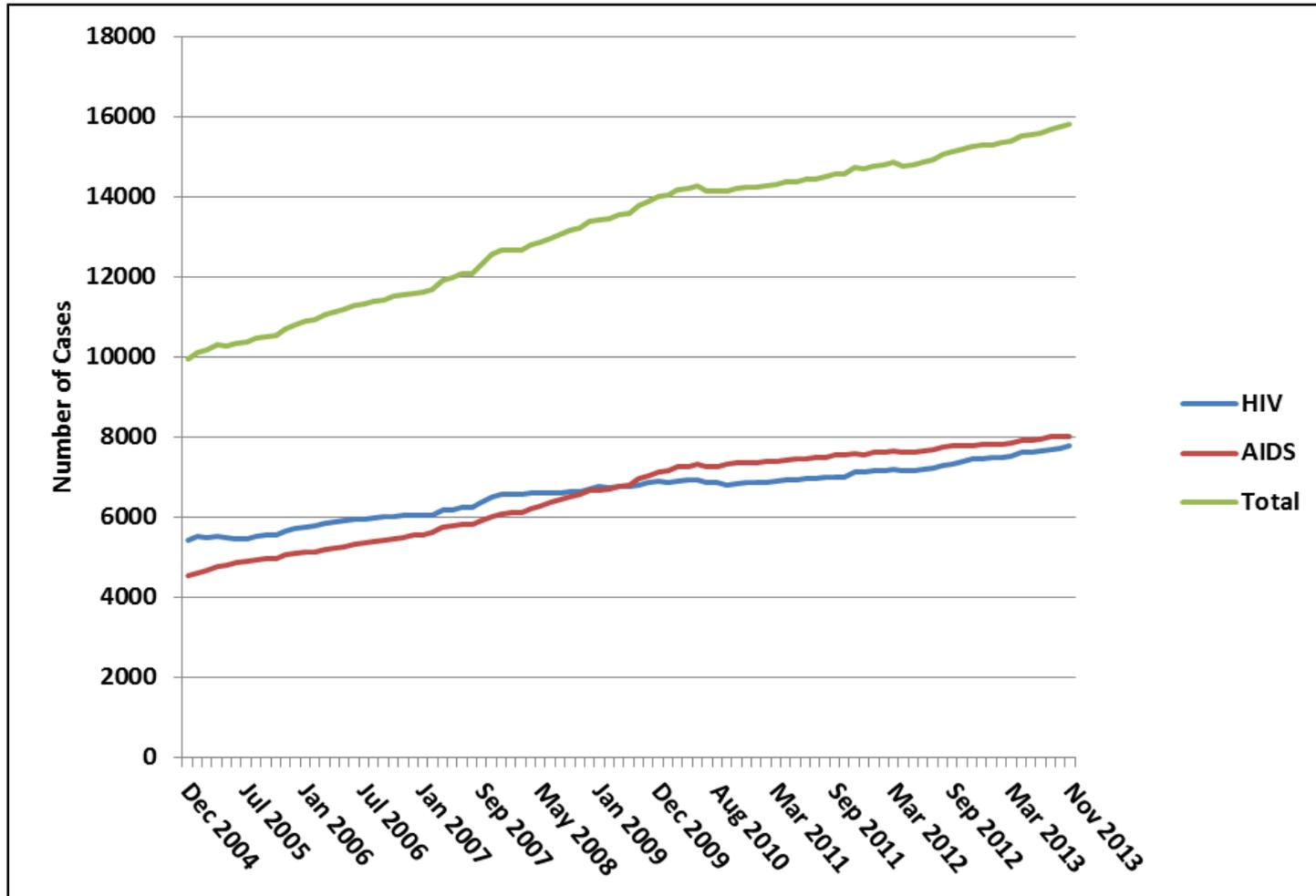
**Megan Swanson, MPH**

**HIV Surveillance ADHS**

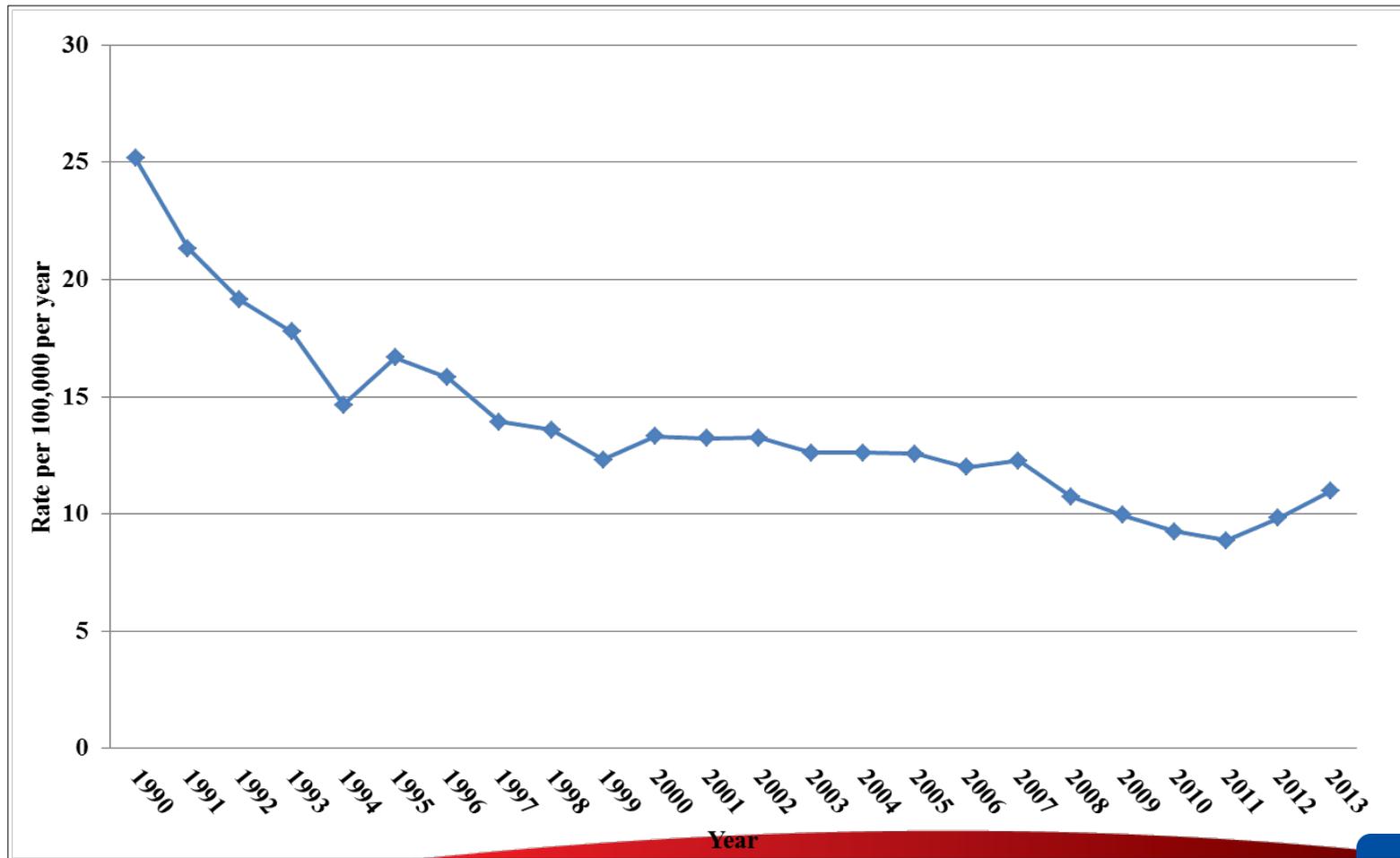
**7/24/2014**



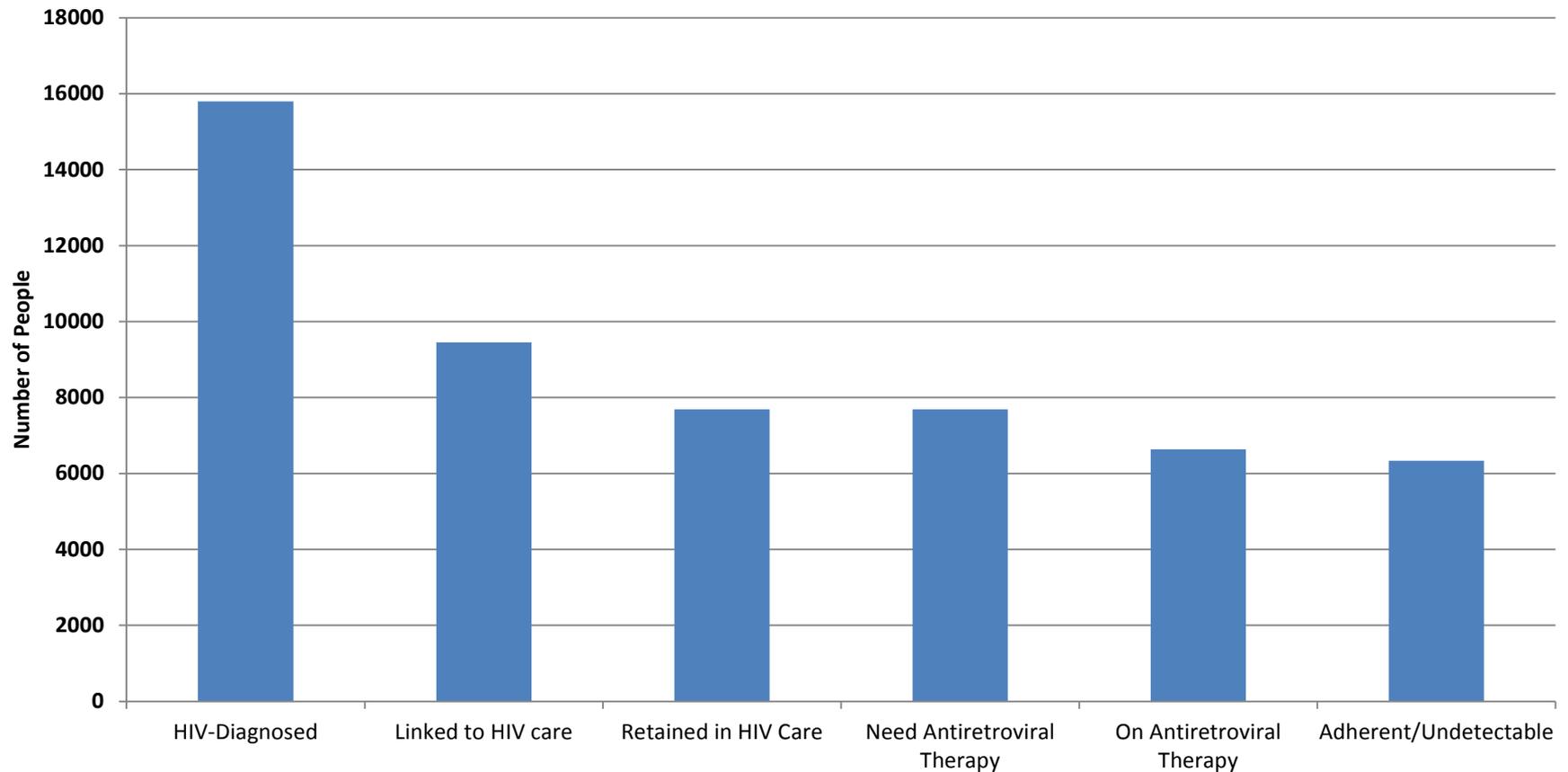
# ARIZONA PREVALENT HIV, AIDS AND TOTAL HIV/AIDS CASES 2004-2013



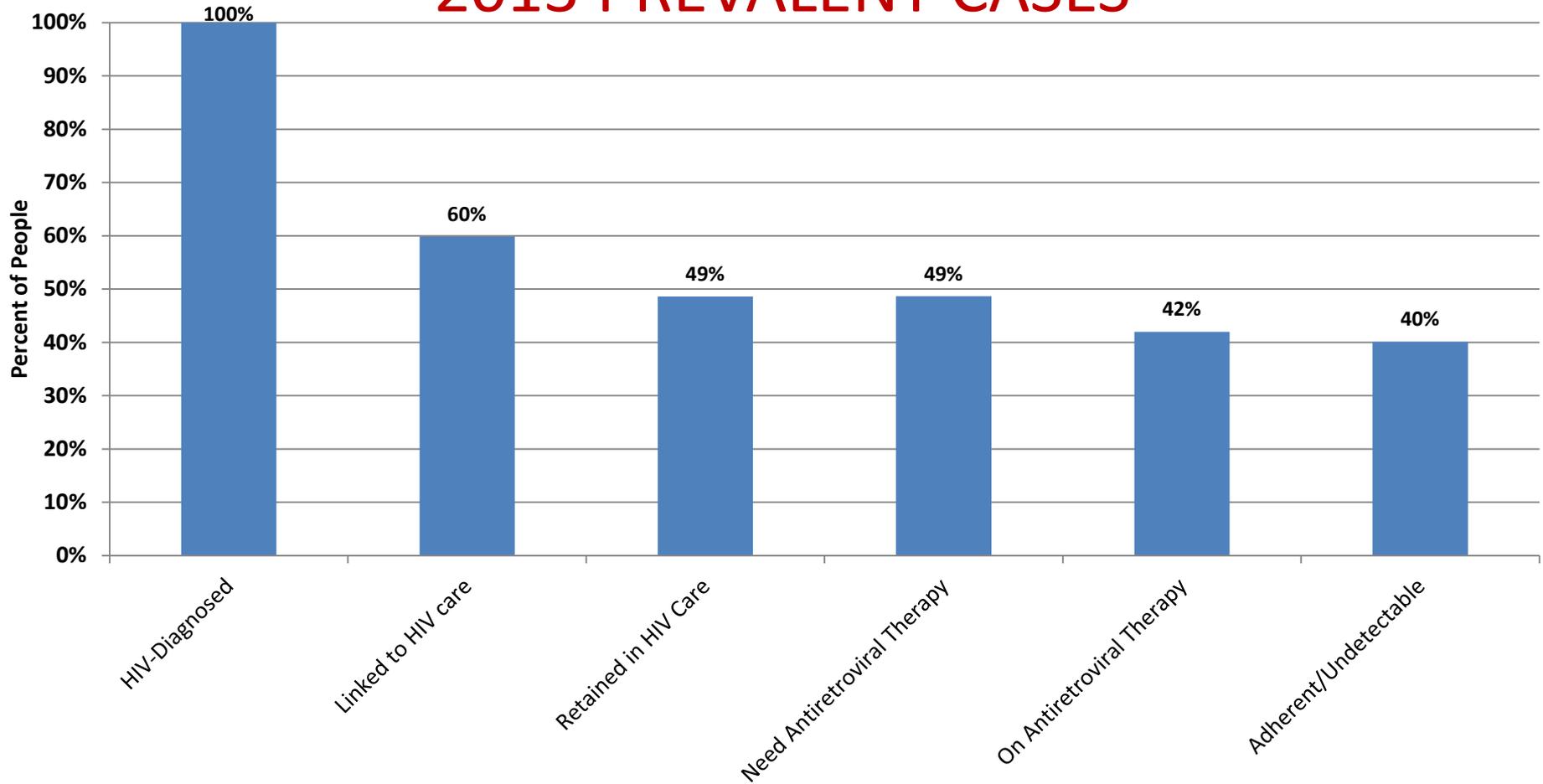
# ARIZONA EMERGENT HIV/AIDS CASES 1990-2013



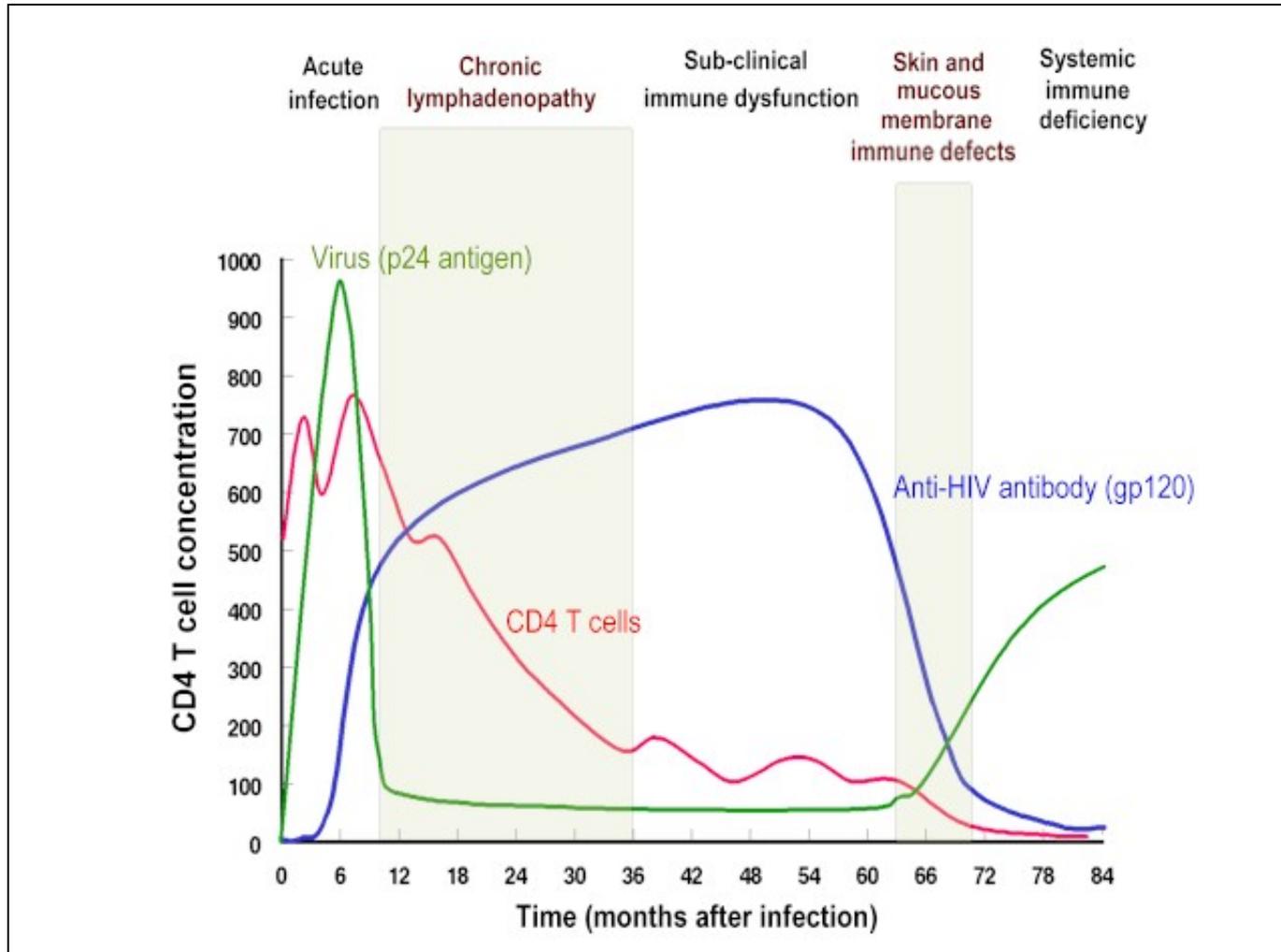
# ARIZONA HIV SPECTRUM OF CARE CASCADE 2013 PREVALENT CASES



# ARIZONA HIV SPECTRUM OF CARE CASCADE 2013 PREVALENT CASES



# HIV DISEASE MARKER TIMELINE



# ACUTE HIV

# ACUTE HIV CHARACTERISTICS

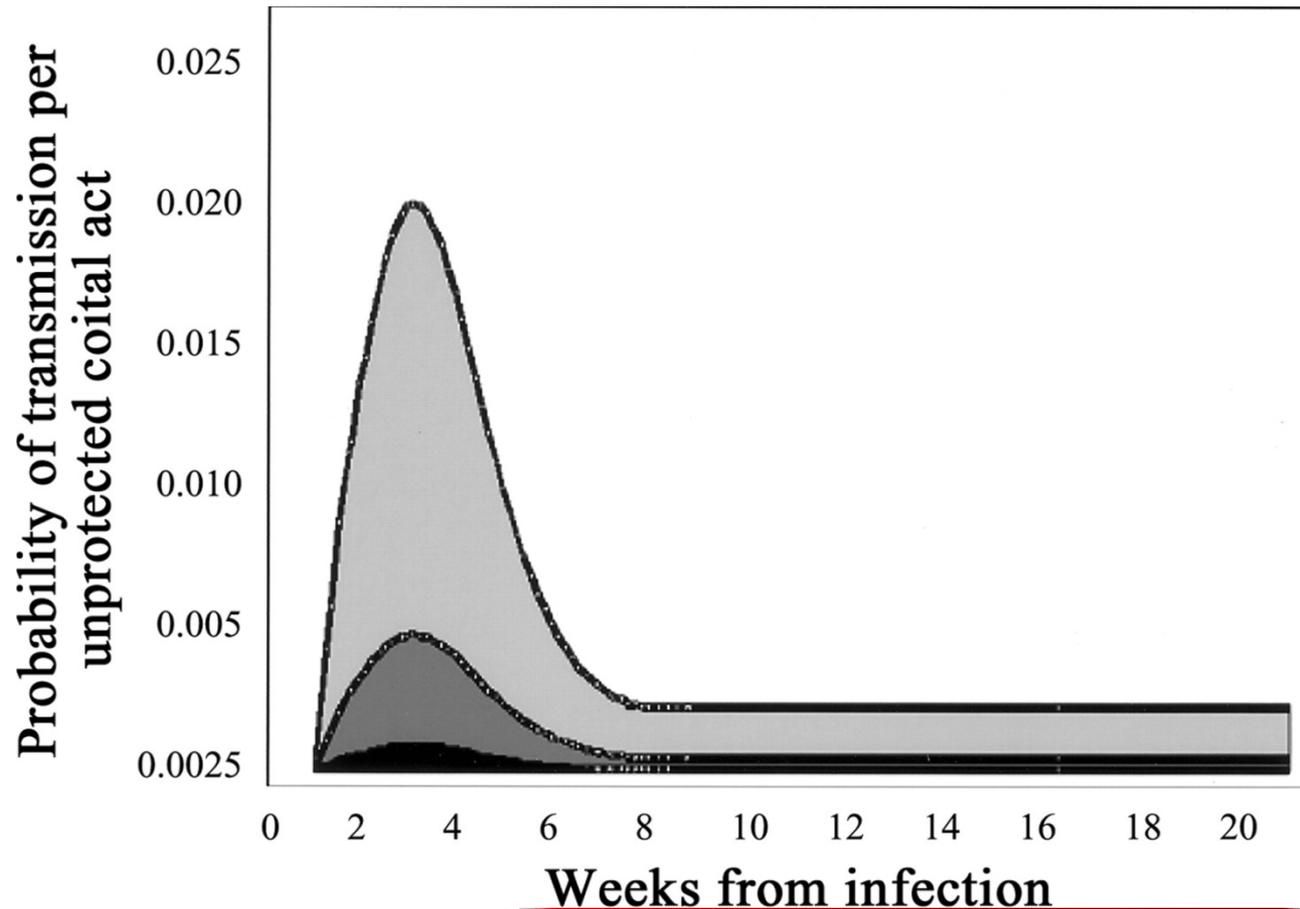
- ✓ Virus newly replicating in the body
- ✓ Early host immune response
- ✓ High viral load
- ✓ Increased chance of spreading the virus



# THE IMPORTANCE OF ACUTE HIV

- The virus itself is thought to be more infectious
  - 75-750 times more infectious in rhesus macaques
  - Per virion (SIV)
- Transmission is more likely in the acute phase
  - Due to increased numbers of virus in blood and semen
  - In a study of discordant couples 43% of transmission that occurred was in the acute stage

# CALCULATED PROBABILITIES OF TRANSMISSION PER COITAL ACT OVER TIME, HETEROSEXUAL CONTACT

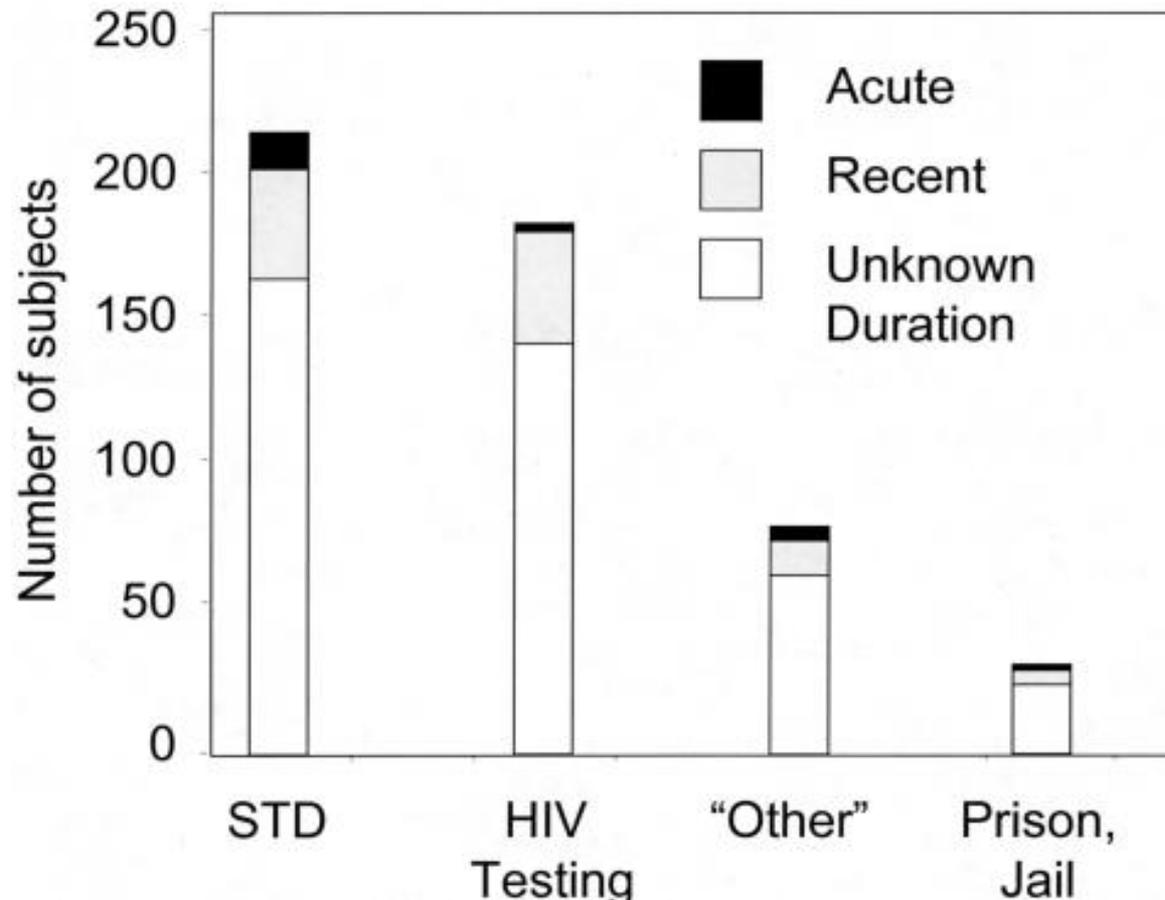


Pilcher C D et al. J Infect Dis. 2004;189:1785-1792



# HOW MUCH ACUTE HIV IS THERE?

NORTH CAROLINA NEW INFECTIONS AT PUBLIC TESTING SITES

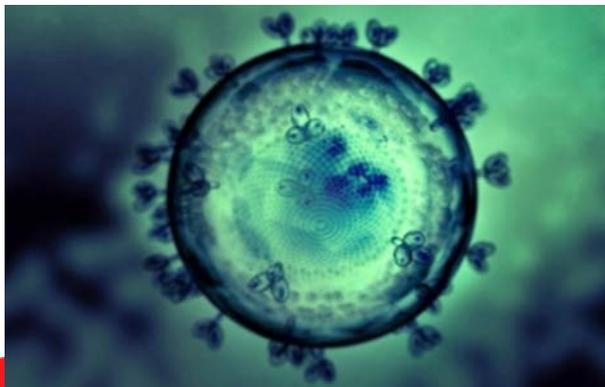


Adapted from Pilcher CD et al. . N Engl J Med. 2005;352:1873–83 by Cohen Trans  
Am Clin Climatol Assoc. 2006; 117: 213–225.



# WHY TESTING IS KEY

- Non specific symptoms- flu like
- Patient awareness early
- Early treatment is important





# EARLY TREATMENT RATIONALE

- Treat symptomatic people
- Stop viral evolution at a key time
- Protect the immune system
- Limit latent pool of infected cells
- **Limit transmission**

# HIV TESTING TIMELINE

# HIV TESTING HISTORY

- First test approved by FDA in 1985 (ELISA test)
- HIV Western blot first approved in 1987
  - Still in use today
  - Was never the ‘gold standard’ of HIV diagnosis—  
Viral Culture
  - Utilizes IgG- late antibodies

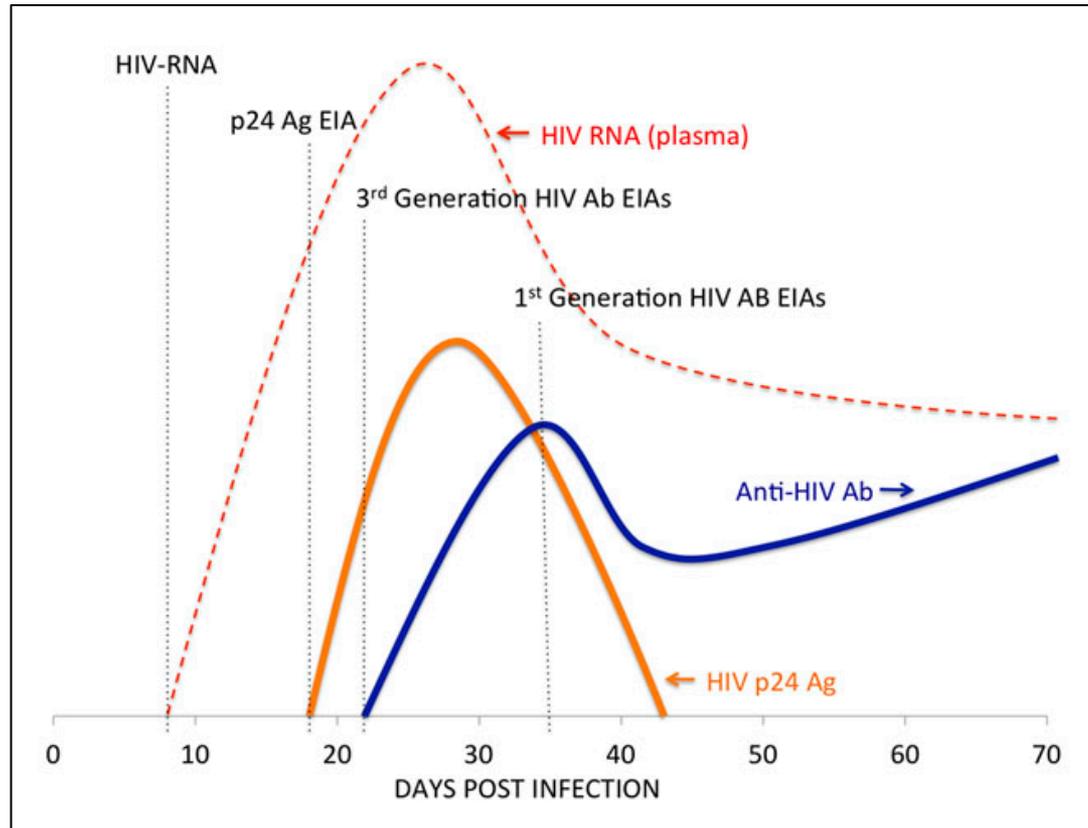
# FROM 1987



# ADVANCES IN HIV TESTING

- Previous CDC testing recommendations from 1989
- New tests approved in
  - 2010 Ag/Ab
  - 2013 Multispot (for diagnosis in new algorithm)
- WB detect infection about a month after infection
- Ag/Ab detect ~18 days before WB
- MS detect ~7 days before WB

# HIV IN THE BODY AND DIAGNOSTIC TESTS



# ADAPTING TO THE NEXT GENERATION OF HIV TESTS

- New testing recommendations using a multitest algorithm and newer tests
- New Case Definition (April 2014)
  - Updated to account for new multitest algorithm
  - Old algorithm specified final test must be a WB or IFA which conflicted with new algorithm

# FROM THE CDC

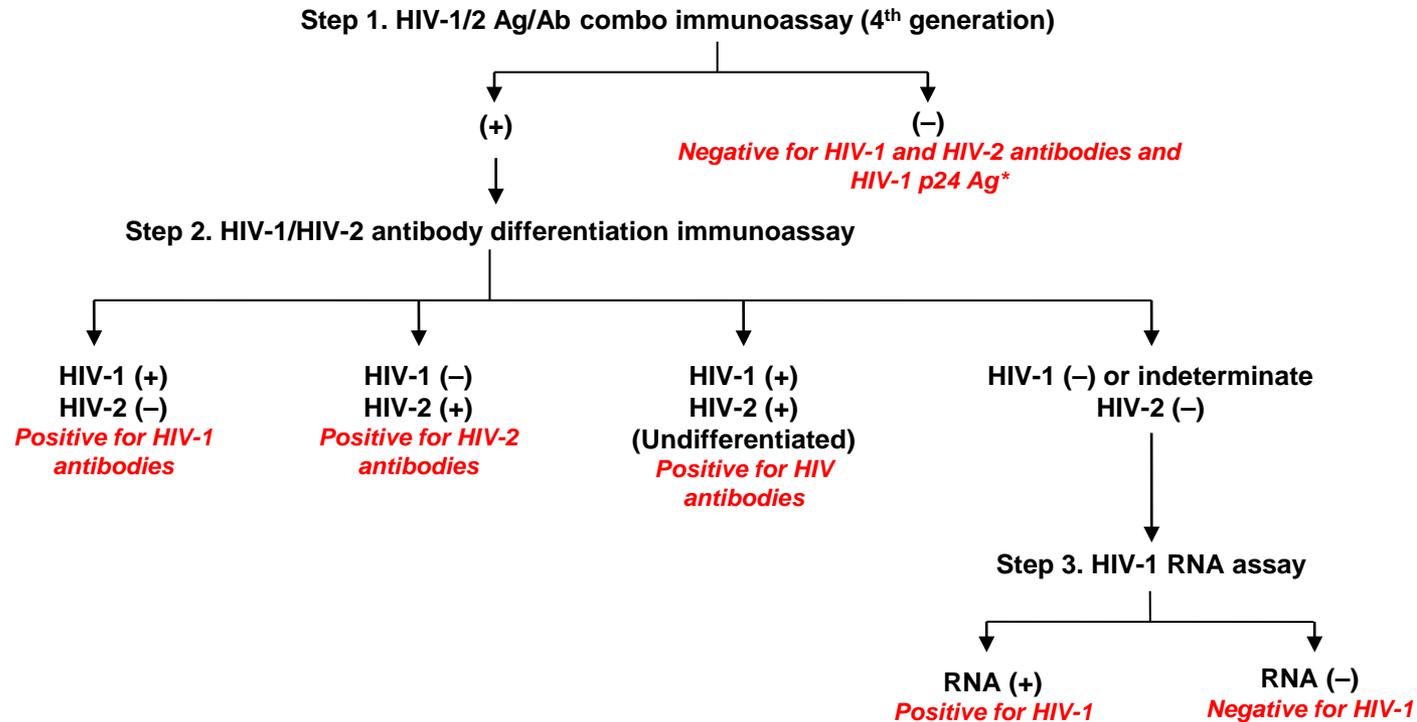
- On June 26<sup>th</sup> 2014 the CDC released new HIV testing recommendations
  - Works in conjunction with new case definition from April 11<sup>th</sup> 2014
  - 4th generation screening test
  - Type differentiating follow-up test
  - NAT to determine final result for discordant antigen and antibody test results
  - **Western blot is no longer recommended**



# WHY THE CHANGE

- Earlier diagnosis is better
- Acute detection
- Not a large number of people in acute phase but they are key to stopping the epidemic
  - Estimated 9%-50% of new infections transmitted from someone in the acute phase of infection

# HIV Diagnostic Testing Algorithm



# NEW ALGORITHM AVAILABILITY IN ARIZONA

- Arizona State Lab
- MIHS
- Labcorp
- Quest (other than SQ)
- ARUP

# ISSUES WITH THE NEW ALGORITHM

- More complicated than old Western blot algorithm
  - WB alone confirmatory MS alone is not
  - Need for RNA test for discordant results
- Reporting of negative results in an overall positive algorithm needed
- New=Scary
  - Results not standardized between labs
  - How do you interpret the results
  - Confusion with regards to what to order, how to report and interpret results

# TAKE HOME MESSAGE-COPING WITH CHANGE

- Acute HIV is an important component of HIV epidemic
- New algorithm allows for the early detection of infection
- Where to go for more information
  - AETC
  - CDC
  - APHL
  - AZDHS
  - Laboratory

# ACKNOWLEDGMENTS

Thank You:

- Rick DeStephens - HIV Epidemiology Program Manager
- Amanda White - HIV Epidemiologist

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# Questions?

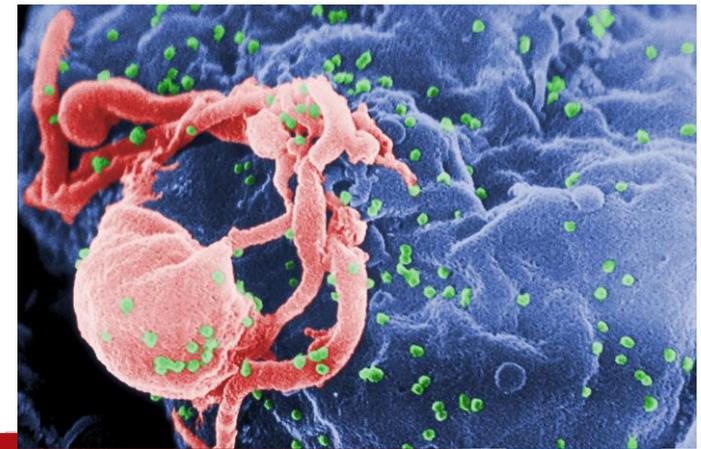
# REFERENCES

- **Revised Surveillance Case Definition for HIV Infection- United States 2014.** MMWR 2014;63(RR03);1-10
- Cohen et al. **HIV Treatment as Prevention: Debate and Commentary—Will Early Infection Compromise Treatment-as-Prevention Strategies?** 10.1371/journal.pmed.1001232.  
<http://www.plosmedicine.org/article/info%3Adoi%2F10.1371%2Fjournal.pmed.1001232>
- Pilcher et al. **Brief but Efficient: Acute HIV Infection and the Sexual Transmission of HIV.** *J Infect Dis.* (2004) 189 (10): 1785-1792. <http://jid.oxfordjournals.org/content/189/10/1785.full>
- Pilcher et al. Original Article **Detection of Acute Infections during HIV Testing in North Carolina.** *N Engl J Med.* 2005;352:1873–83] <http://www.nejm.org/doi/full/10.1056/NEJMoa042291#t=articleResults>
- Cohen **Amplified Transmission of HIV-1: Missing Link in the HIV Pandemic.** *Trans Am Clin Climatol Assoc.* 2006; 117: 213–225. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1500941/#b34>



Ryan White

<http://hab.hrsa.gov/abouthab/ryanwhite.html>



<http://phil.cdc.gov/phil/details.asp?pid=10000>



*Health and Wellness for all Arizonans*