HIV & HCV in TN: State of the State

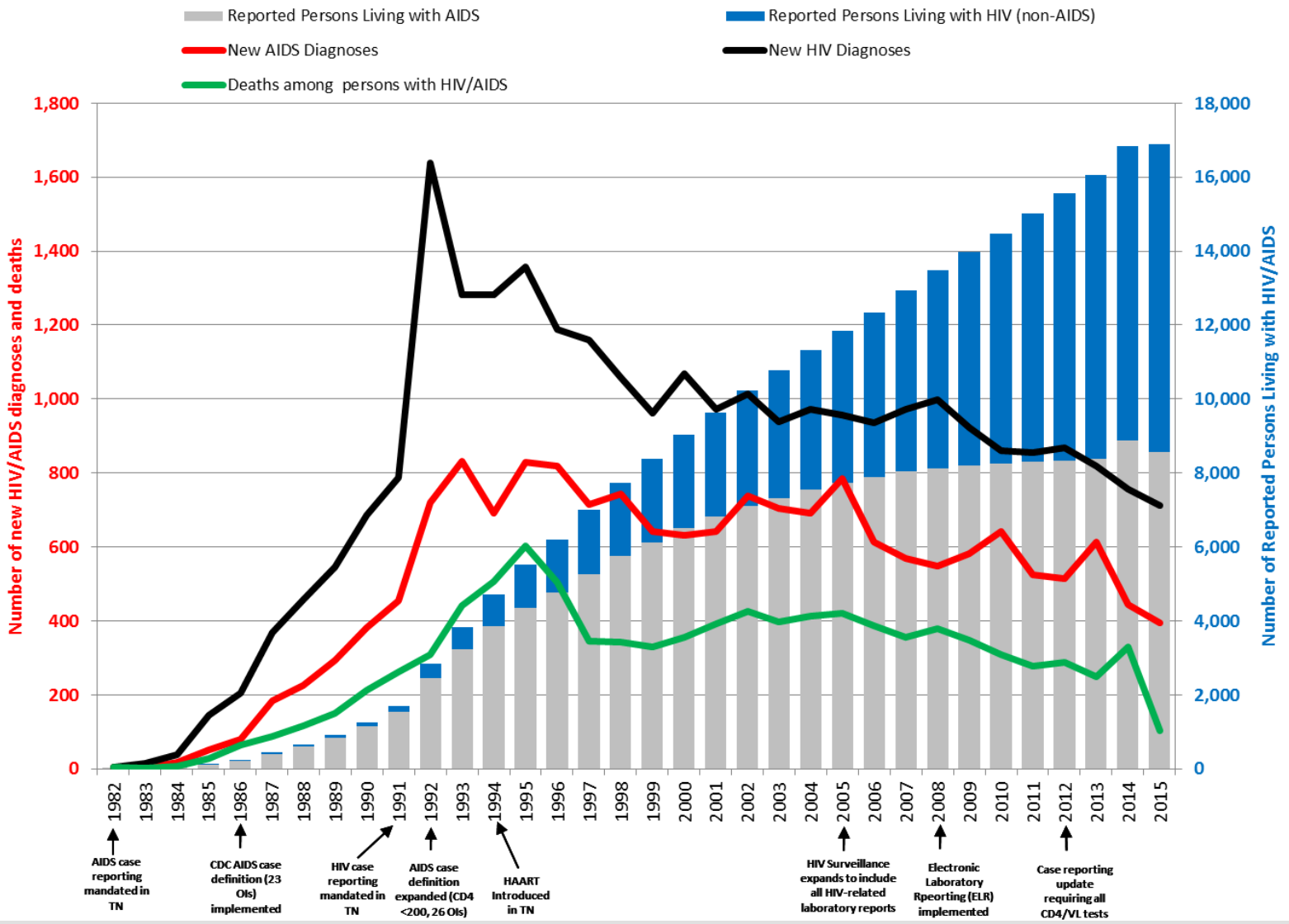
Vanderbilt CCC HIV Symposium
Nashville, TN / November 3, 2017

Carolyn Wester, MD, MPH | TDH HIV/STD/VH Program

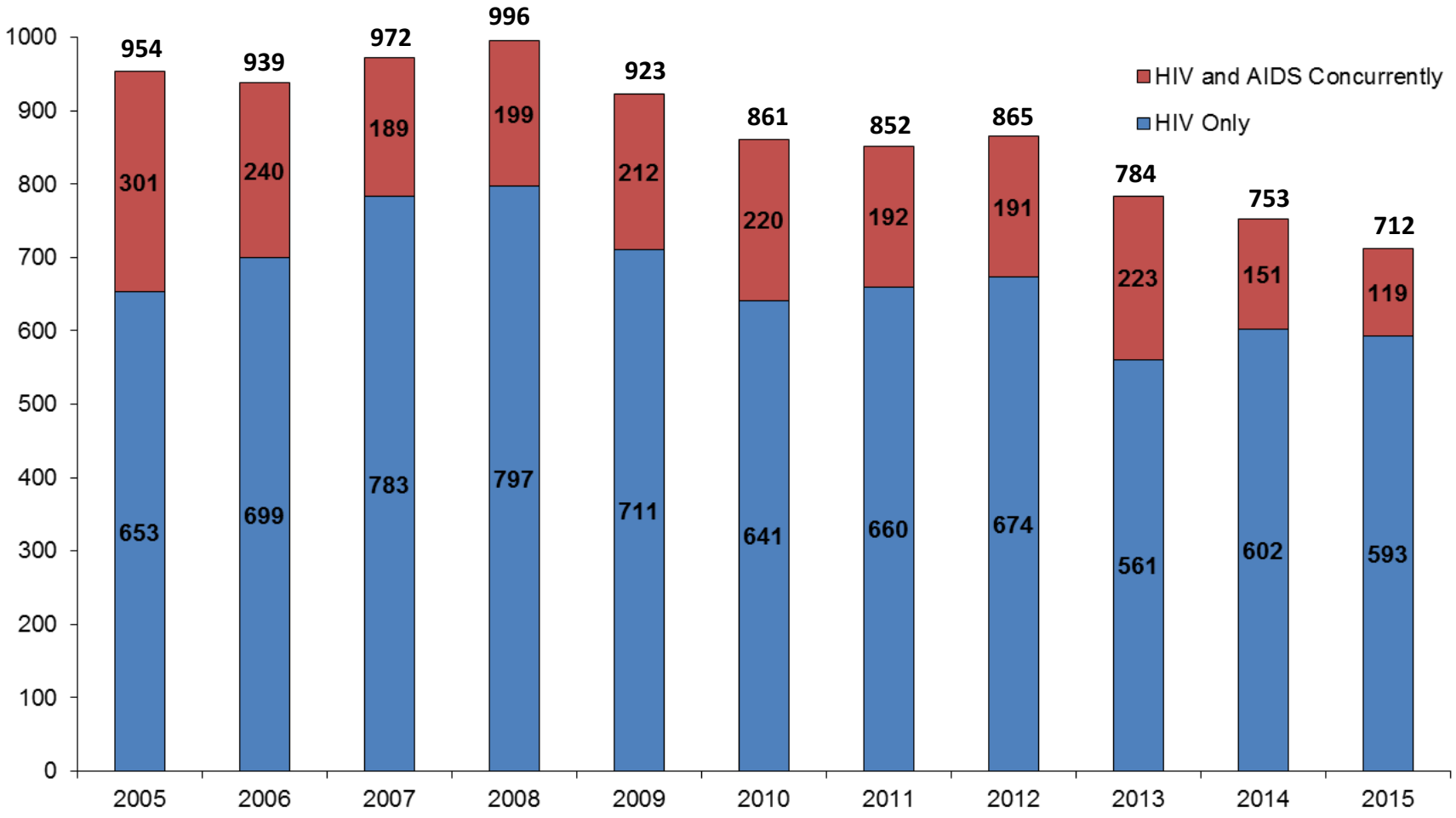
Outline

- HIV Epidemiology
- “Neutralizing” the HIV CoC
- HCV Epidemiology
- HIV Vulnerability
- Outbreak Detection & Response
- HIV & HCV Molecular Surveillance

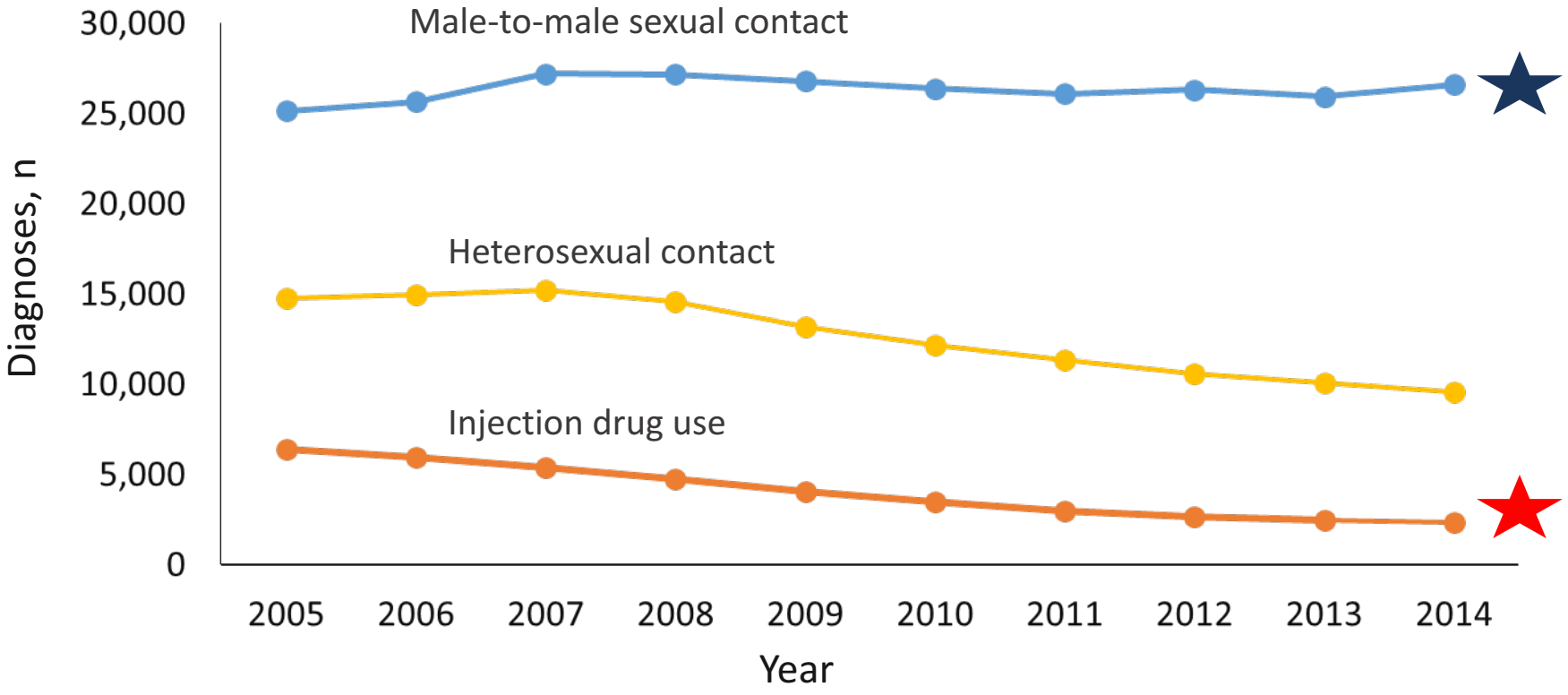
HIV & AIDS in TN (1982-2015)



HIV disease by status and year of diagnosis (TN, 2005-2015)



Newly Diagnosed HIV in the U.S. by Transmission Category (U.S., 2005 – 2014)

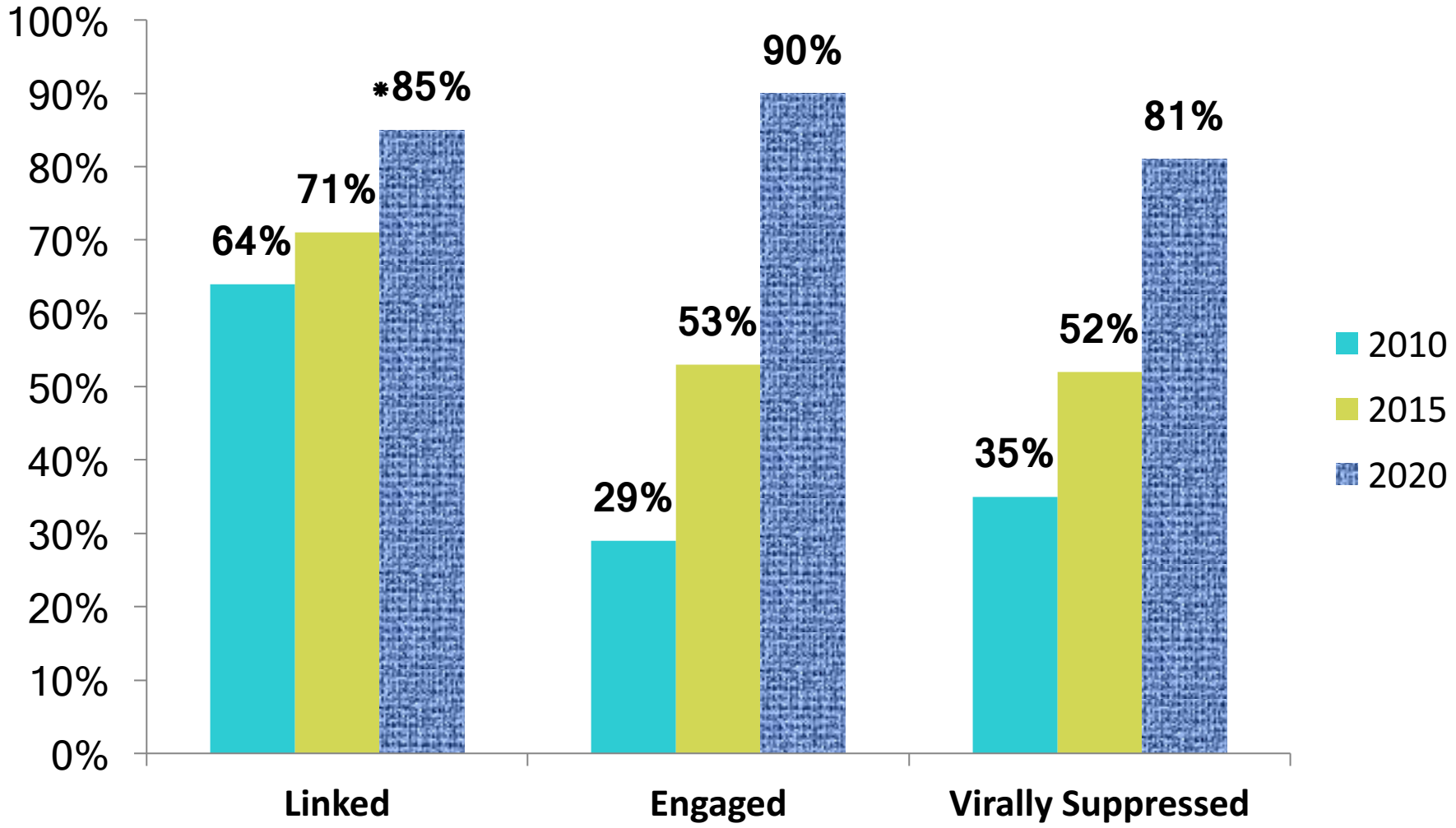


CDC National HIV Surveillance System data

2020 HIV Continuum of Care Goals: NHAS, 90-90-90, & Tennessee

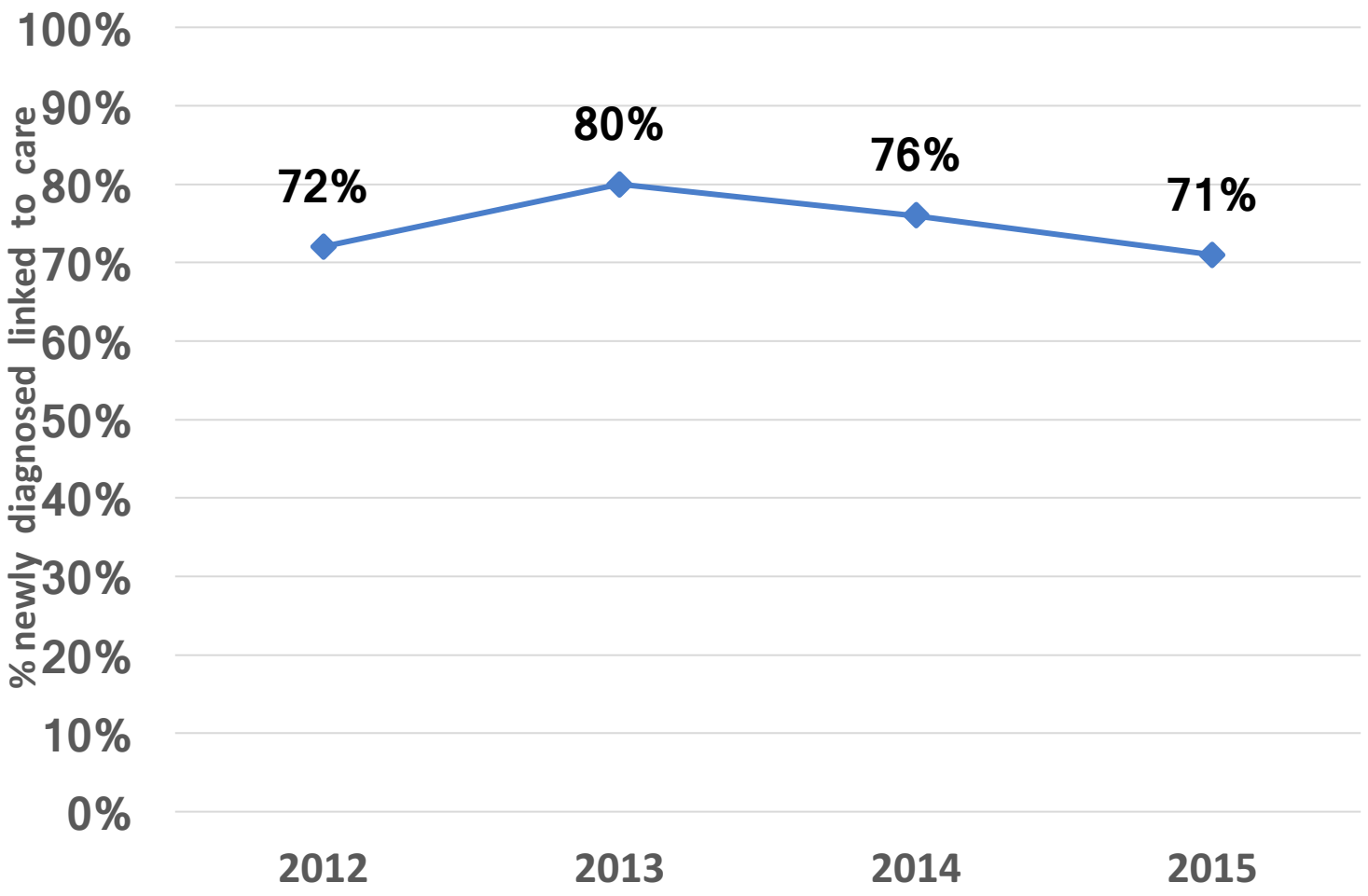
- **NHAS**
  - Reduce new infections by 25%
  - 85% linkage ≤ 1 month of diagnosis
- **90-90-90**
  - 90% diagnosed
    - 90% on treatment
      - 90% virally suppressed
- **TN Goals***
  - 85% newly diagnosed "linked" to care ≤ 1 month diagnosis
  - 90% prevalent diagnosed engaged in care
    - 90% engaged virally suppressed

Tennessee HIV Continuum of Care: 2010, 2015, 2020 Goals)



*2020 linkage goal relates to linkage within 1 month of diagnosis; whereas for 2010 & 2015, linkage is within 3 months of diagnosis.

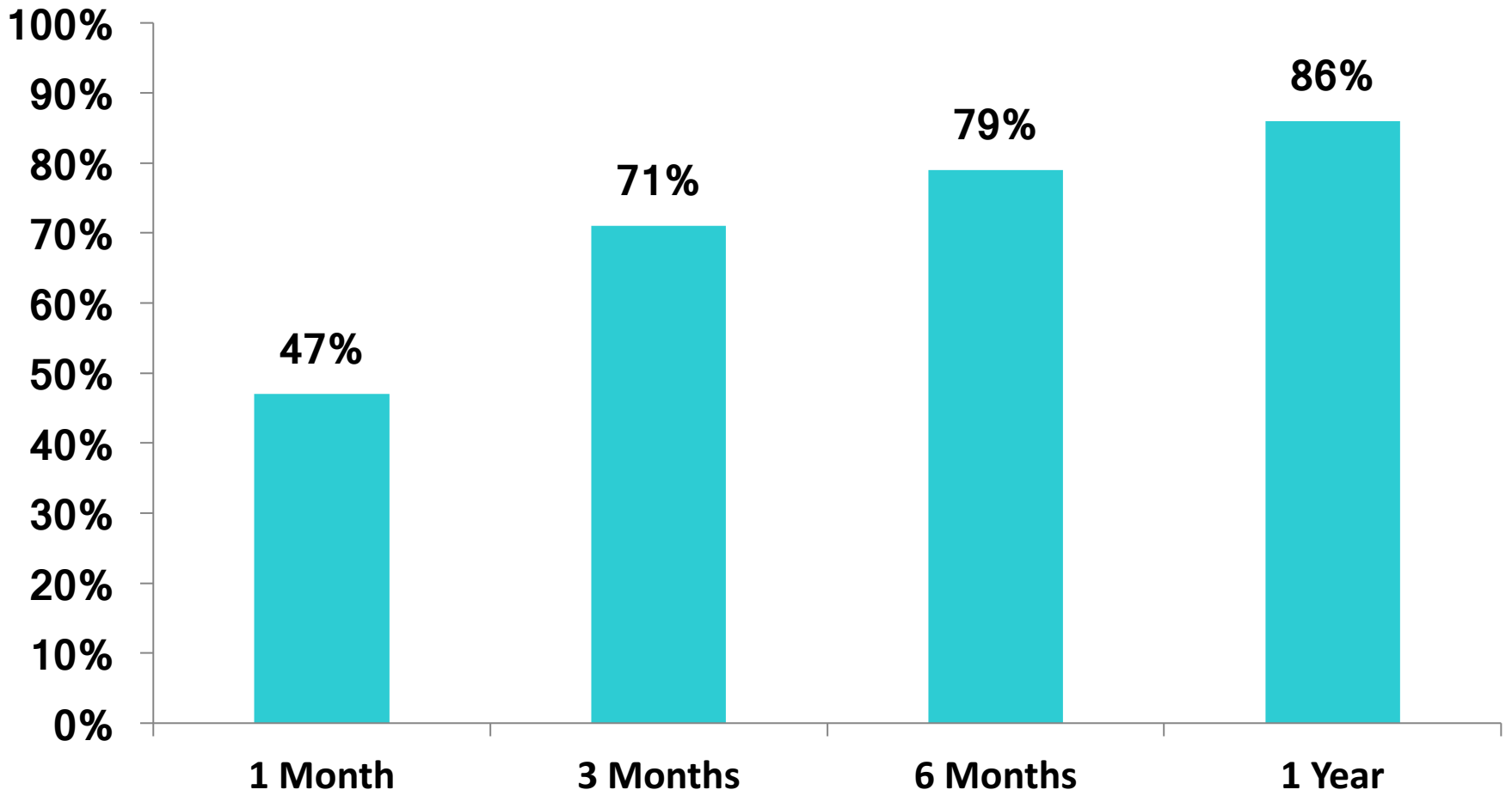
Tennessee HIV Continuum of Care: Linkage to Care ≤ 3 Months of Diagnosis (2012 – 2015)



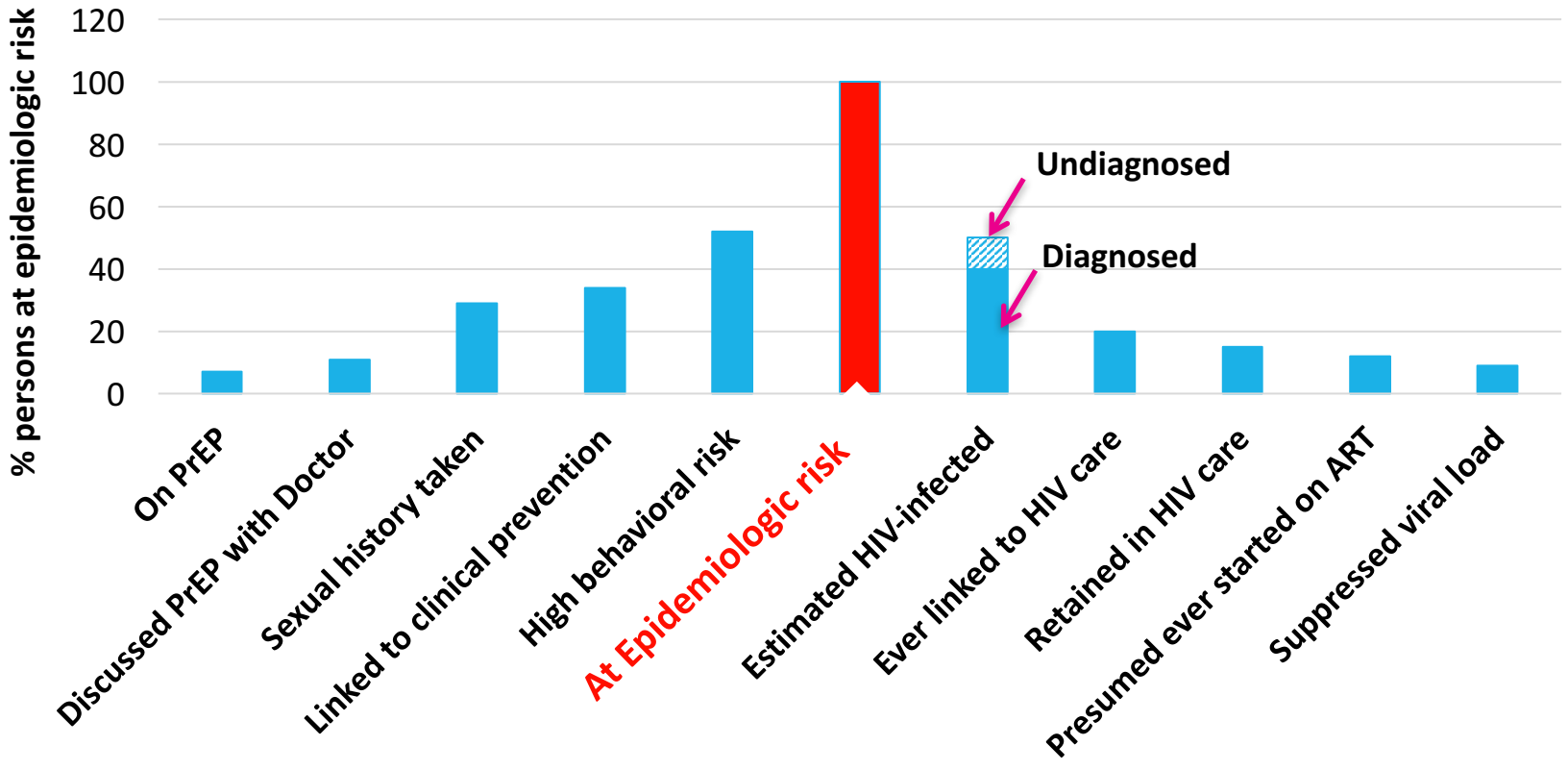
Linkage to care: individuals newly diagnosed with HIV in 2015 and having ≥1 CD4 or VL result reported ≤3 months of diagnosis.

Data source: Tennessee eHARS, accessed June 30, 2017. Provisional data, do not distribute.

Tennessee HIV Continuum of Care: Linkage to Care by Time from Diagnosis (2015)



The HIV Neutral HIV Continuum of Care



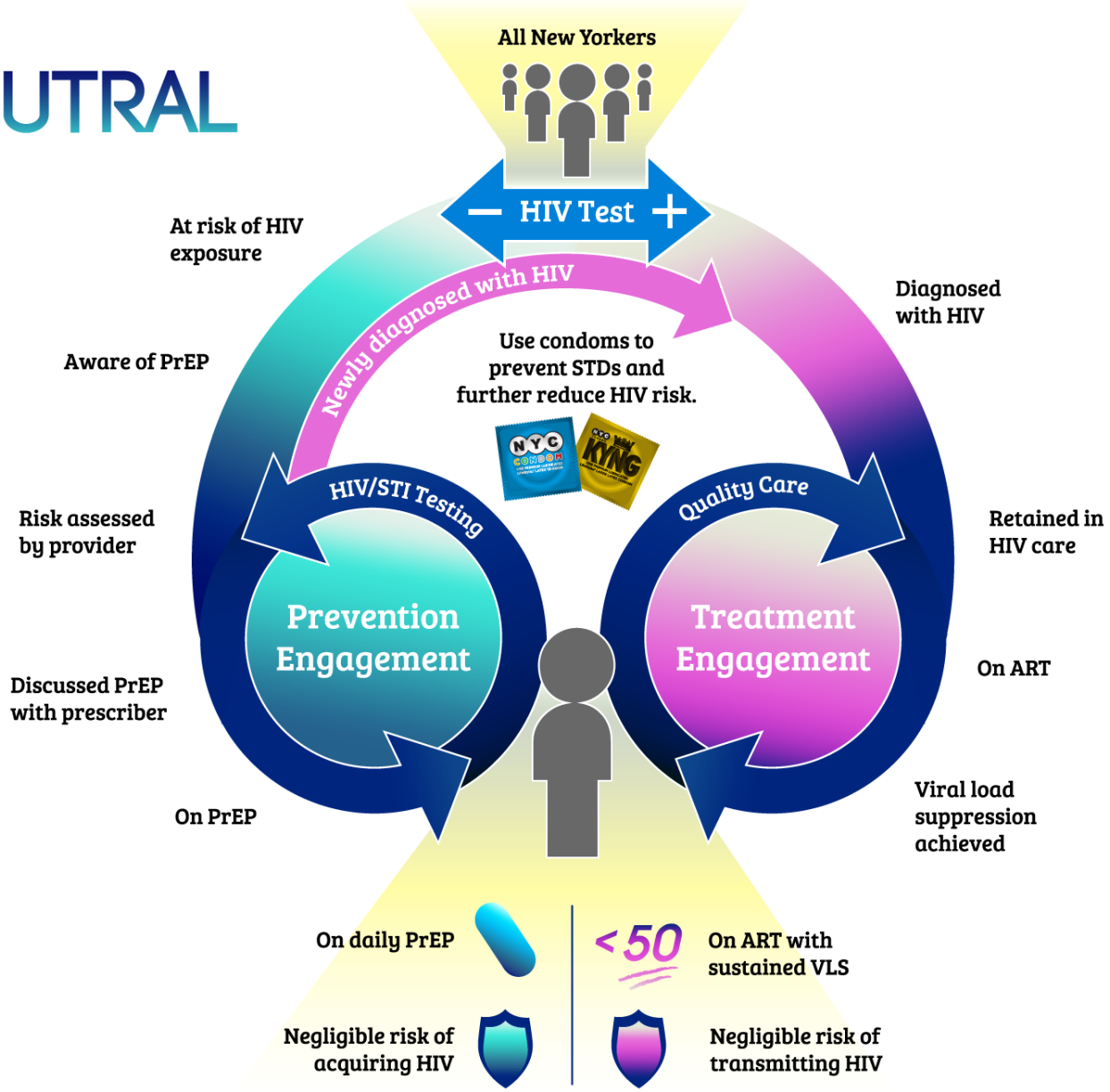
HIV CARE AND PREVENTION ARE THE SAME = GETTING TO HIV NEUTRAL

Slide courtesy of Dr. Demetre Daskalakis (NYC DOH)

TN

NEW YORK CITY'S

HIV STATUS NEUTRAL PREVENTION & TREATMENT CYCLE



People at risk of HIV exposure taking daily PrEP and people with HIV with sustained viral load suppression do not acquire or transmit HIV.

NYC Health

Working the Neutral CoC: What We Have

- **Testing**
  - HDs
  - CBOs
- **Prevention**
  - Treatment
  - PrEP
  - SSP
  - MAT
- **Treatment**
  - Linkage (delinquent)
  - Re-engagement utilizing D2C

Working the Neutral CoC: What We Need

- **Rapid Access to Treatment**
  - "Rapid-Rapid" testing algorithms
  - "Test & Treat" initiatives
- **Augmented Prevention**
  - PrEP
  - nPEP
  - SSP
- **Expanded Re-Engagement Activities**
  - D2C (Re-engagement)

What This Might Look Like: Test & Treat, PrEP, nPEP

- **Who (identify)**
  - HIV testing (rapid – rapid) and STD screening
    - High-risk negatives (history syphilis, rectal GC/Chl)
    - Positives (newly diagnosed, priors OOC)
- **Services**
  - Treatment: MCM, labs, treatment (new dx, priors ART naïve)
  - Prevention: PrEP, nPEP(?)
- **Where**
  - Close proximity to HD activities
- **How**
  - Costumer focused: Hours of operation, limited wait, stigma-free envt
  - On-site staff: MCM, nurse, APN / PA / physician
  - On-site services: Labs, case management, start-up meds
  - Referral to local providers for on-going care

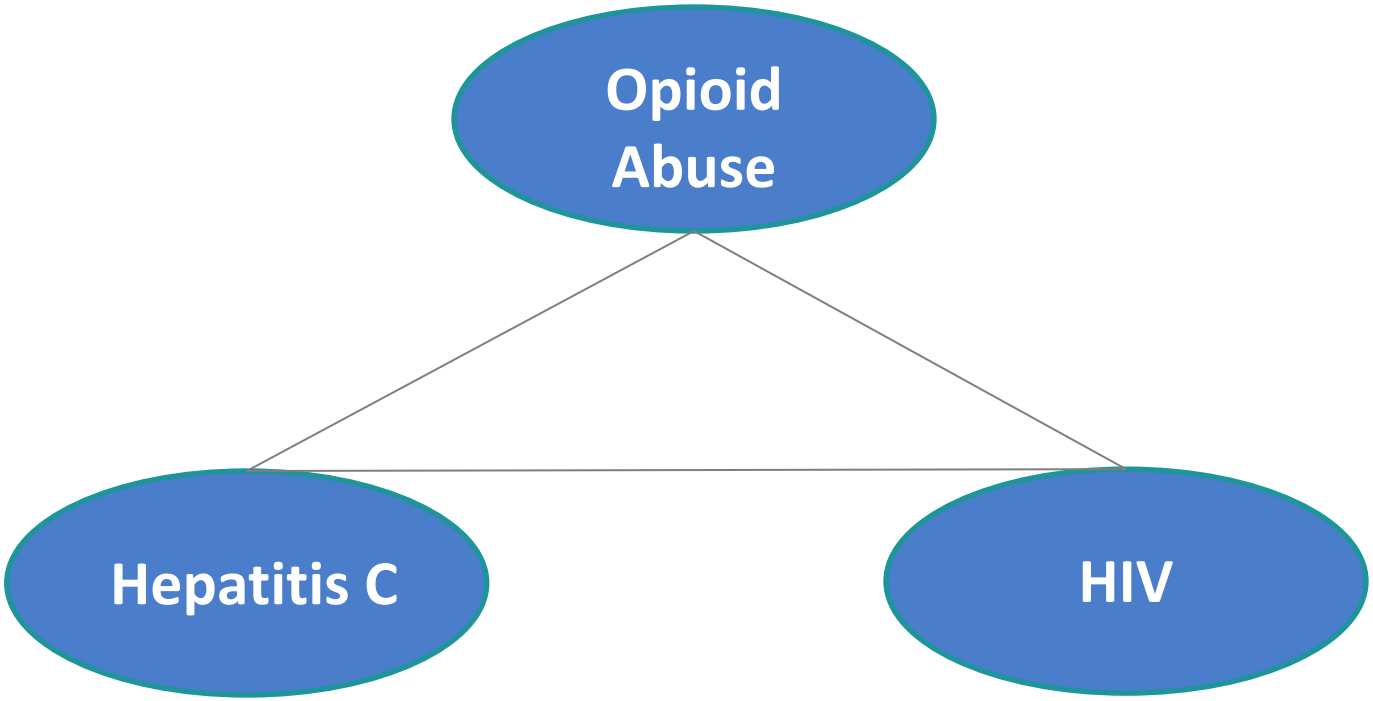
What This Might Look Like: Test & Treat, PrEP, nPEP

- **Funding**
  - State HIV funding??
    - Staff
    - Pre-Ryan White registration
      - Case management
      - Laboratory testing
      - Medications
        - 2 weeks of ARVs
        - 1month of PrEP
        - 1 month nPEP
  - Operationalizing
    - Providers with HIV expertise
    - HD co-location
    - Access to medications at 340b prices (STD Formulary?)
    - Test & Treat: NOT appropriate for treatment experienced clients
    - nPEP: Gateway to PrEP, but demand may overwhelm other activities

Next Steps

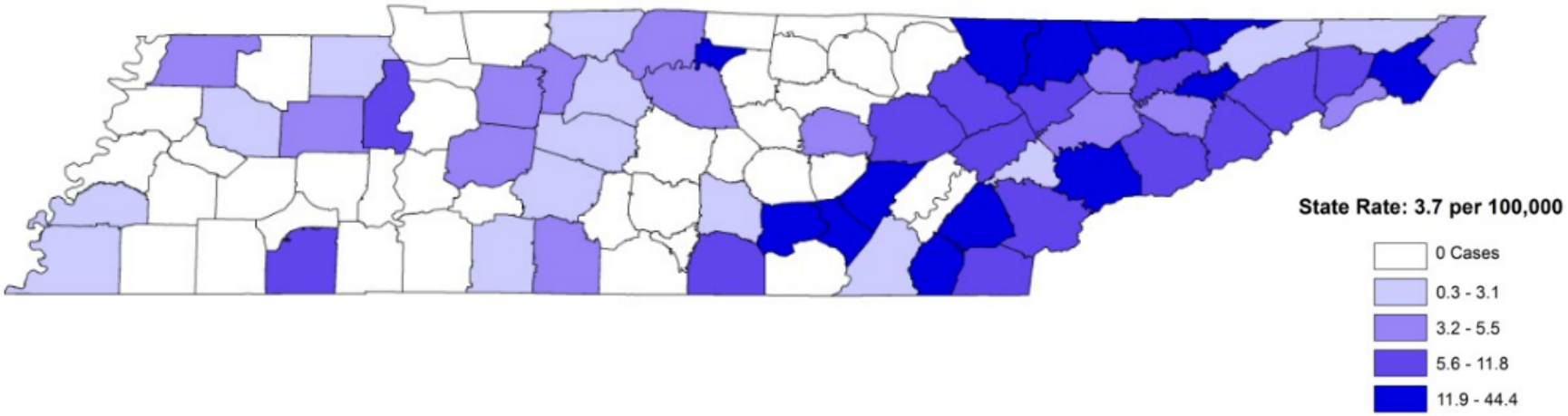
- Secure Funding
- Pilot Test & Treat, PrEP, nPEP
- Establish and scale-up SSPs
- Outbreak preparedness and response

Intersection of Epidemics

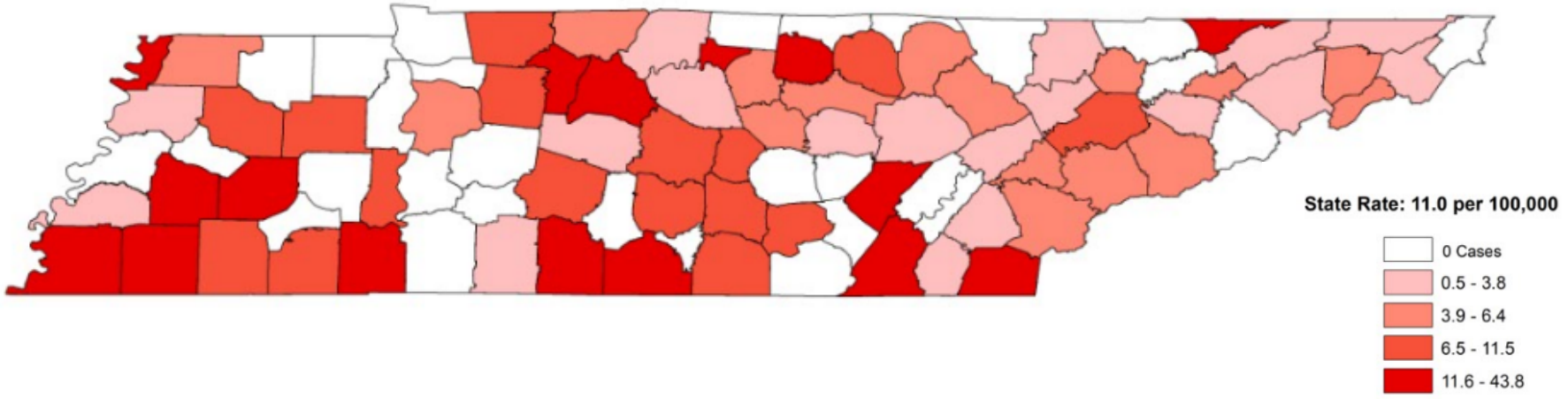


Distribution of Acute HCV & New HIV Case Rates in TN (2016)

Acute HCV Cases



Newly Diagnosed HIV Cases

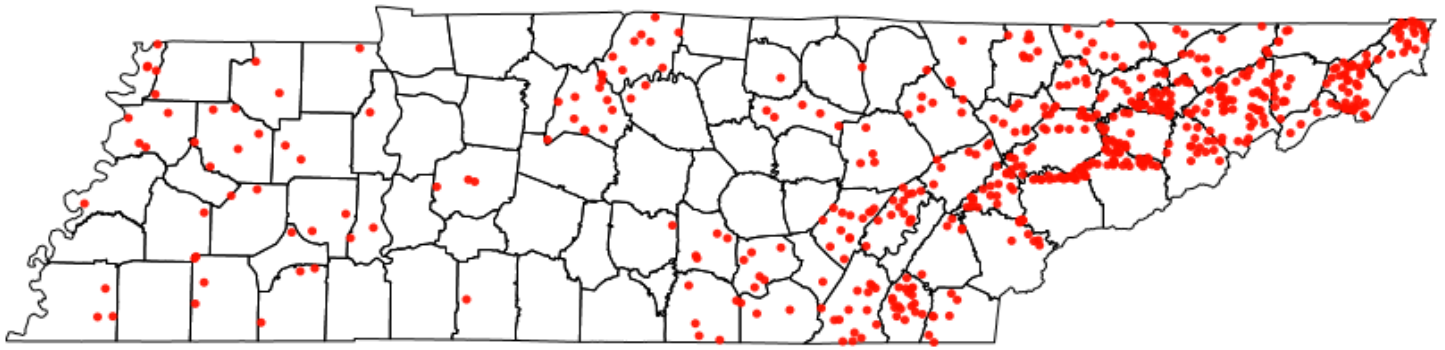


TN Department of Health

Tennessee NBS, accessed February 10, 2017
Tennessee eHARS, accessed June 30, 2017
Population Source, American Community Survey 2011-2015 County Averages

Reported Cases of Acute HCV in TN

		2011	2012	2013	2014	2015
US	case rate	0.4	0.6	0.7	0.7	0.8
	cases	1,229	1,778	2,138	2,194	2,436
TN	case rate	1.3	2.0	1.5	1.9	2.6
	cases	83	129	98	123	173
	rank	**4th**	**4th**	**6th**	**5th**	**4th**



http://www.cdc.gov/hepatitis/statistics/2015surveillance/pdfs/2015hepsurveillancerpt.pdf

* per 100,000 population

TN Department of Health

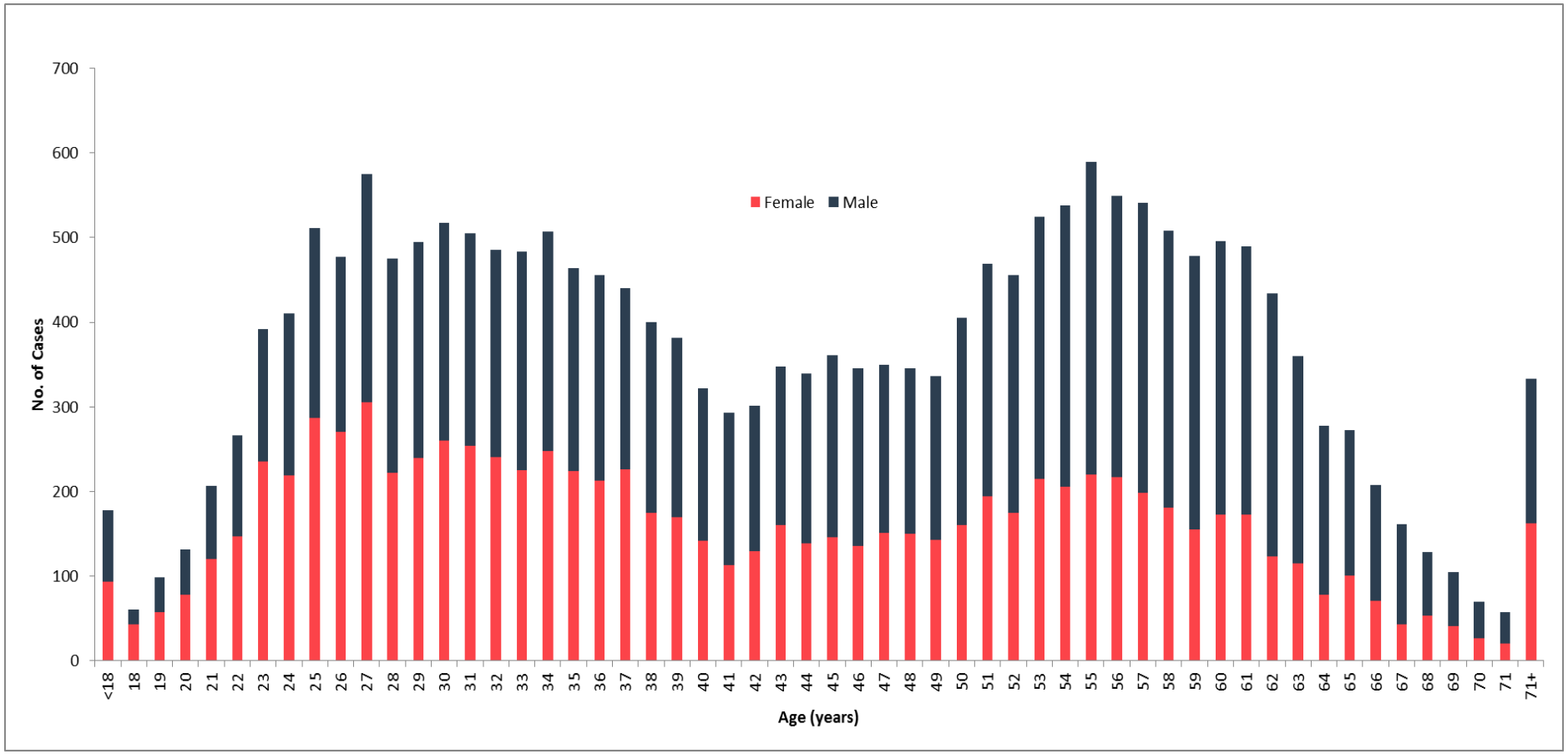
Newly Reported Cases of Chronic HCV in TN

Case Classification	2013	2014	2015*	2016
Confirmed	1,782 (44%)	3,385 (50%)	7,394 (59%)	10,442 (50%)
Probable	2,234	3,421	5,244	10,496
Total (C + P)	4,016	6,806	12,628	20,938

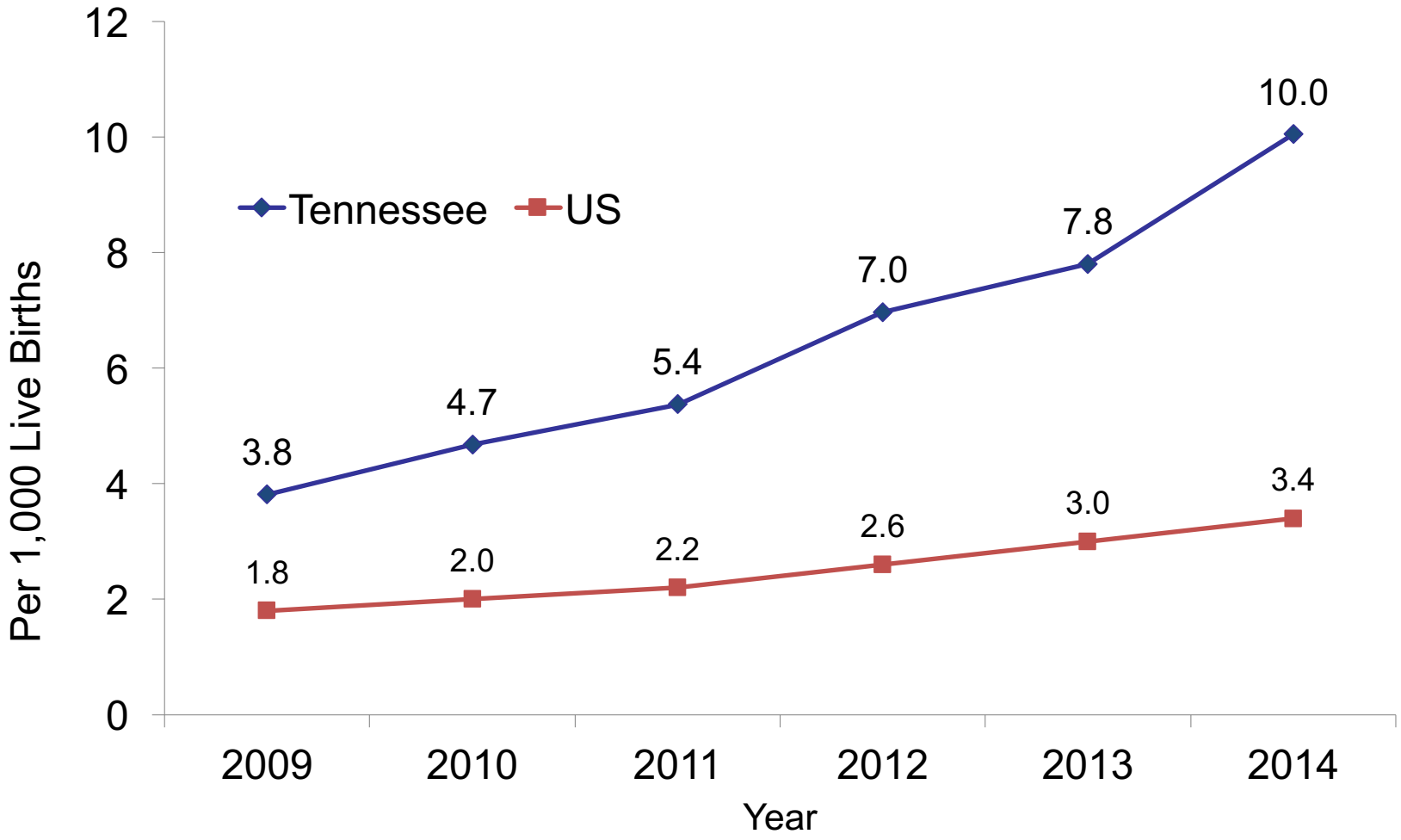
TN Department of Health

*Central office chronic HCV surveillance efforts augmented beginning 7/1/15

Confirmed & Probable Cases of Chronic HCV in TN (2016) (n = 20,938)



HCV Prevalence Among Women with Live Births (TN & U.S., 2009 – 2014)



Department of Health

Patrick S et al, MMWR 2017

Estimating the Total Burden of HCV in TN

- **State level HCV Prevalence Estimates Using NHANES Data**
  - TN population = 6,651,194
  - Estimated rate HCV (+) in U.S. = 1.3%
    - Estimated cases HCV Ab (+) in TN = 86,466
  - Past 5 yrs, acute HCV rate TN 2.1 – 3.3 x higher than U.S.
    - **Initial weighted estimated cases HCV Ab (+) in TN = 233,456**

- **Account for # HCV Ab (+) cases in TN's non-civilian population**
  - ~23% HCV Ab (+) individuals in the U.S. are not accounted for in NHANES*
    - Incarcerated, homeless, hospitalized, nursing homes, military, reservations
  - Adjusting for estimates among non-civilian population…

Final estimate HCV Ab (+) cases in TN = 303,189

*Edlin BR, et al. Toward a more accurate estimate of the prevalence of hepatitis C in the United States. Hepatology 2015; 62: 1353–1363.

Context for Outbreak Planning

ORIGINAL ARTICLE

HIV Infection Linked to Injection Use of Oxymorphone in Indiana, 2014–2015

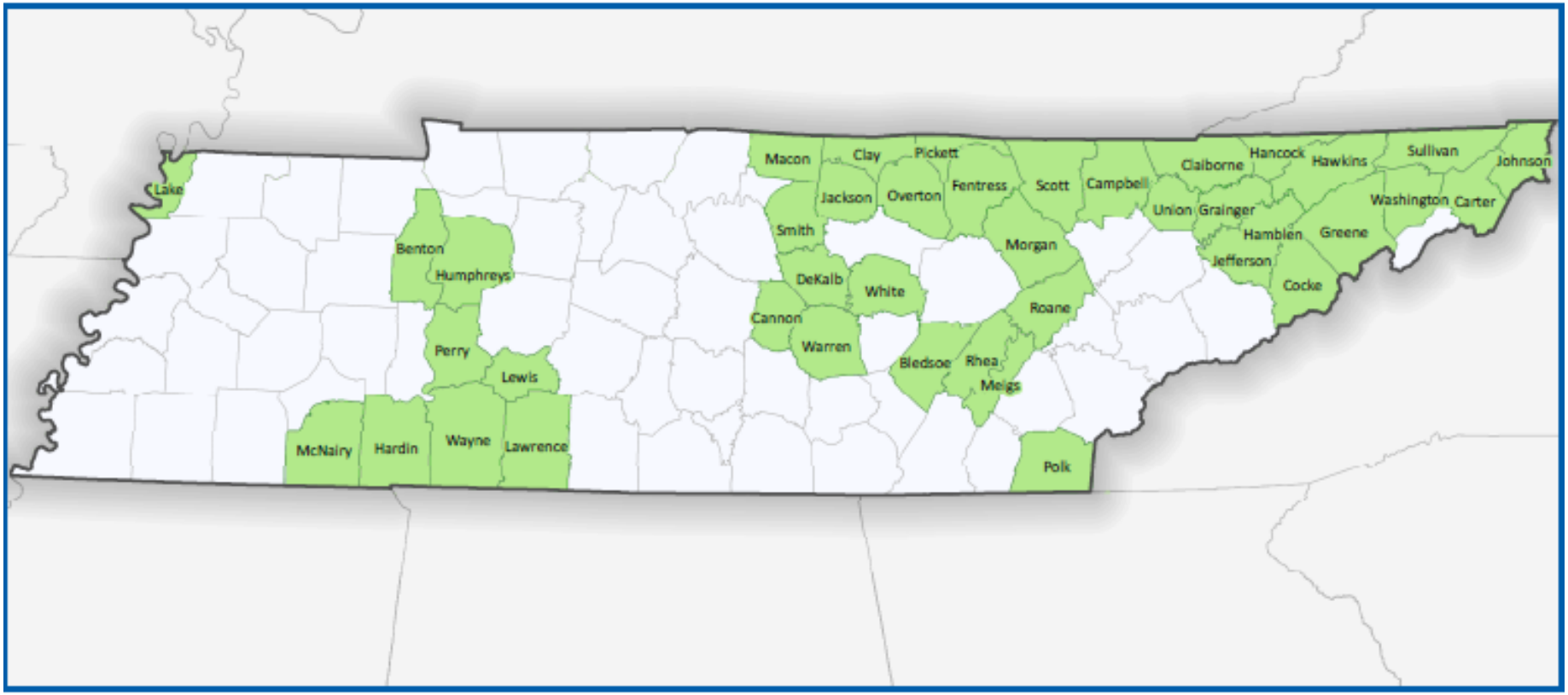
Philip J. Peters, M.D., Pamela Pontones, M.A., Karen W. Hoover, M.D., M.P.H.,
Monita R. Patel, Ph.D., M.P.H., Romeo R. Galang, M.D., M.P.H., Jessica Shields, B.S.

County-Level Vulnerability Assessment for Rapid Dissemination of HIV or HCV Infections Among Persons Who Inject Drugs, United States

Van Handel, Michelle M. MPH; Rose, Charles E. PhD; Hallisey, Elaine J. MA; Kolling, Jessica L. MPH; Zibbell, Jon E. PhD; Lewis, Brian BS; Bohm, Michele K. MPH; Jones, Christopher M. PharmD, MPH; Flanagan, Barry E. PhD; Siddiqi, Azfar-E-Alam MD, PhD; Iqbal, Kashif MPH; Dent, Andrew L. MA, MBA; Mermin, Jonathan H. MD, MPH; McCray, Eugene MD; Ward, John W. MD; Brooks, John T. MD

JAIDS Journal of Acquired Immune Deficiency Syndromes:
1 November 2016 - Volume 73 - Issue 3 - p 323–331
doi: 10.1097/QAI.0000000000001098
Epidemiology and Prevention

TN Counties Highly Vulnerable to HIV/HCV Outbreak Among PWID

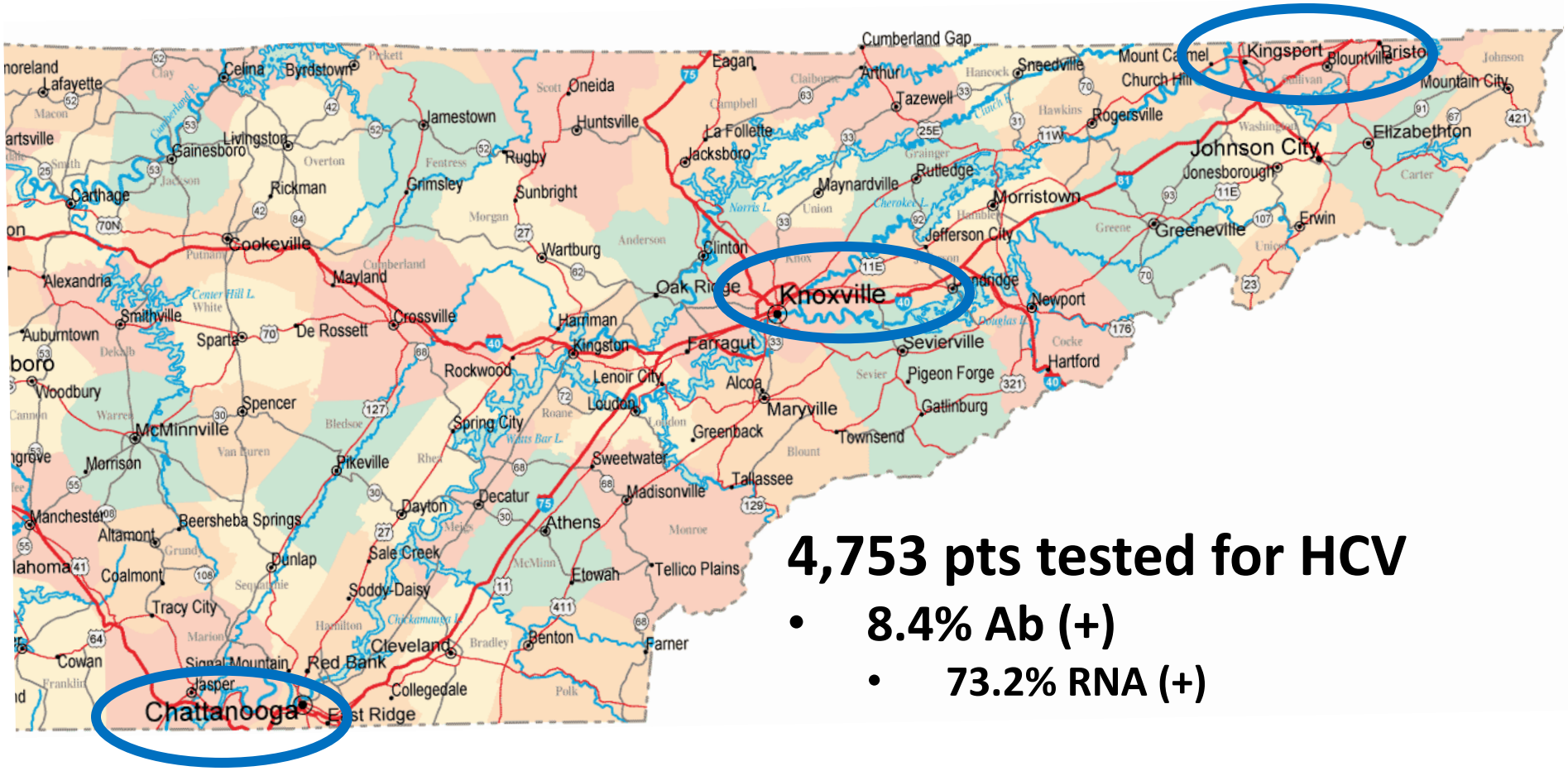


Notes: Map and Analysis provided by the Geospatial Research, Analysis, and Services Program (GRASP), Div of Toxicology and Human Health Sciences, ATSDR (2015). **Data Sources:** American Community Survey 2012-2013; DEA ARCOS 2013; NCHS/NVSS 2012- 2013; SAMHSA DATA 2000 Program Info 2014.

Van Handel MM et al, JAIDS, 2016

HCV Testing & GHOST Pilot in TN

- **June 1 – October 31, 2016**



4,753 pts tested for HCV

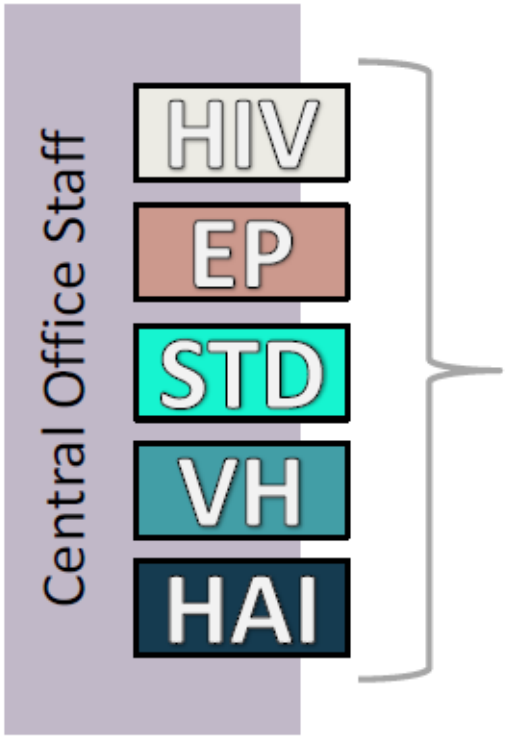
- **8.4% Ab (+)**
  - **73.2% RNA (+)**

HCV Testing: HD Pilot Results (cont'd)

- 4,753 persons tested
  - 8.4% Ab positive
    - 74.1% RNA positive

Risk Factor	Total n (%) N=4753	HCV Ab (+) n (%) N=397	HCV Ab (-) n (%) N=4356	P Value
Injection drug use	425 (8.9)	276 (**64.9**)	149 (35.1)	<0.0001
Intranasal drug use	967 (20.3)	295 (**30.5**)	672 (69.5)	<0.0001
Tattoo / piercing	1092 (23.0)	188 (**17.2**)	904 (82.8)	<0.0001
Incarceration	1309 (27.5)	303 (**23.1**)	1006 (76.9)	<0.0001
Transfusion	62 (1.3)	13 (**21.0**)	49 (79.0)	0.0003
No risk factors	2598 (**54.7**)	39 (1.5)	2559 (98.5)	<0.0001

Outbreak Response Workgroup



Formed in September 2015

Bi-Monthly Meetings until December 2016

Responsible for Developing OR Plan for HIV/HCV 'Rapid Dissemination' Event

Developed Tools

- Outbreak Response Plan
- Outbreak Response Form
- REDCap Database
- SNA R Code
- Specimen Collection and Transport

Regional Cluster Investigation (Apr 2017)

On April 21, 2017

- Notified of uptick in new HIV diagnoses in 2 PHRs
  - 1 pair linked PWID (named as contacts)
- Prompted an investigation into a possible cluster of HIV/HCV

Action Items

- Mobilized Outbreak Response Form and REDCap Database
- Developed HIV Cluster Case Definition
- Developed "Situation Report"
- Established ICS roles & regular call schedule (CO, PHRs, Lab)
- Distributed specimen collection transport guidelines

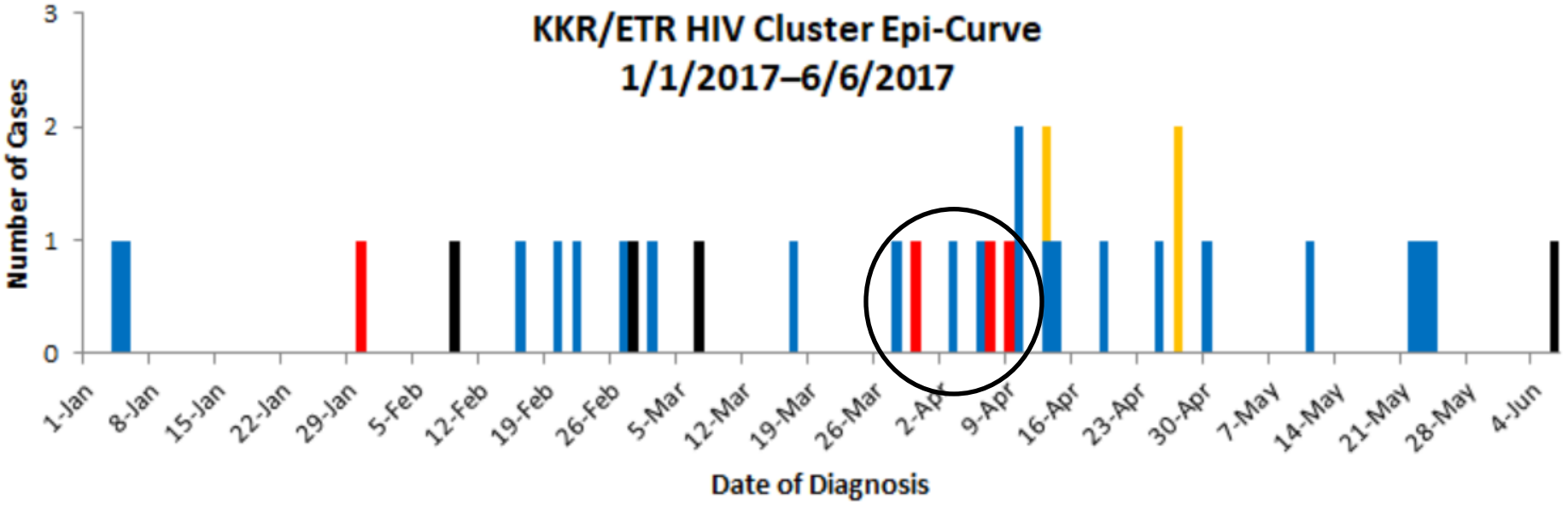
“Situation Report” Elements

- **Current Situation**
  - Definitions
  - # HIV Cases / # Contacts
    - # Interviewed with OBRF
    - # Specimens collected
- **Epi Curve**
- **Line Lists**
  - Cases: HIV Dx, Risk Factors, HCV status
  - Contacts: Contact Type (P1, P2, P3), HCV status
- **Laboratory Test Results**
  - HIV, HCV, HBV testing
- **Action Steps**

“Epi Curve” (HIV Cluster Investigation)

Epidemiology: *Epidemic Curve*

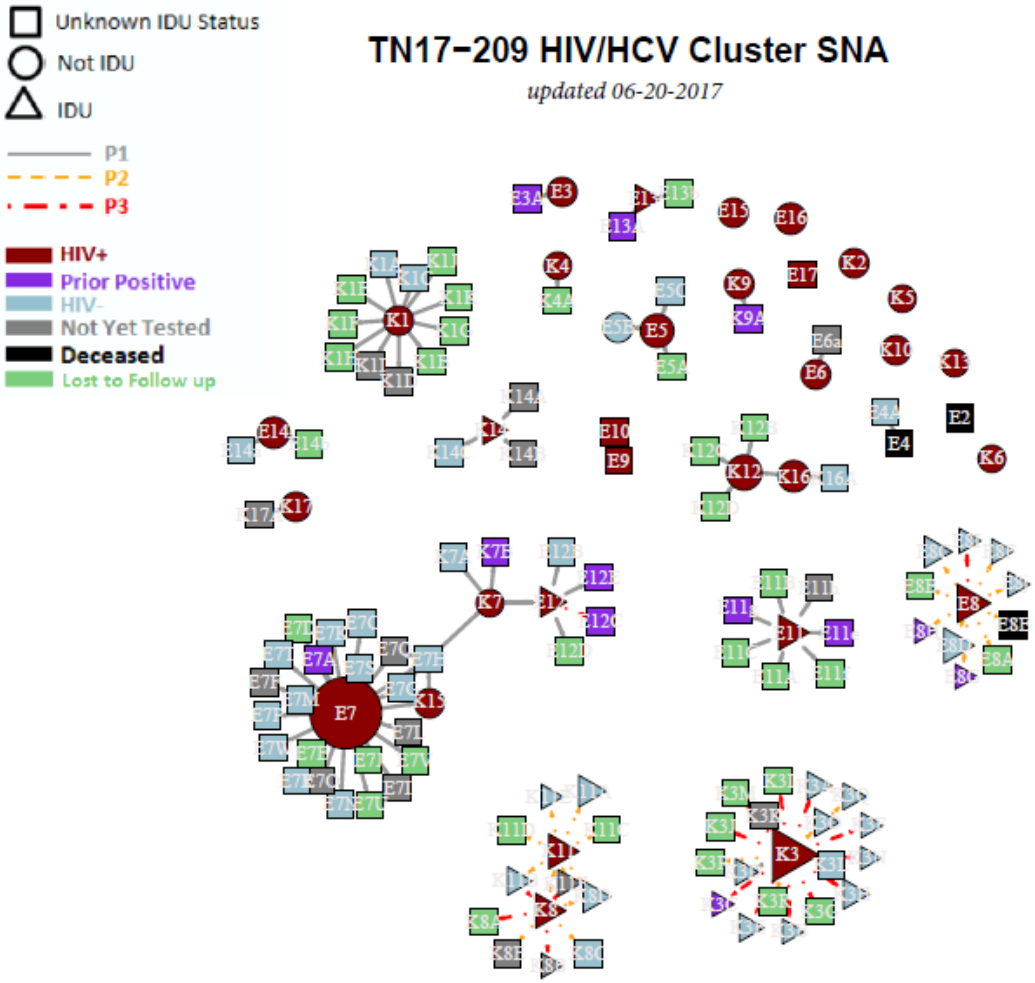
Note: Red = IDU, Yellow = IDU/MSM, Blue = Other or NIR, Black = Unknown



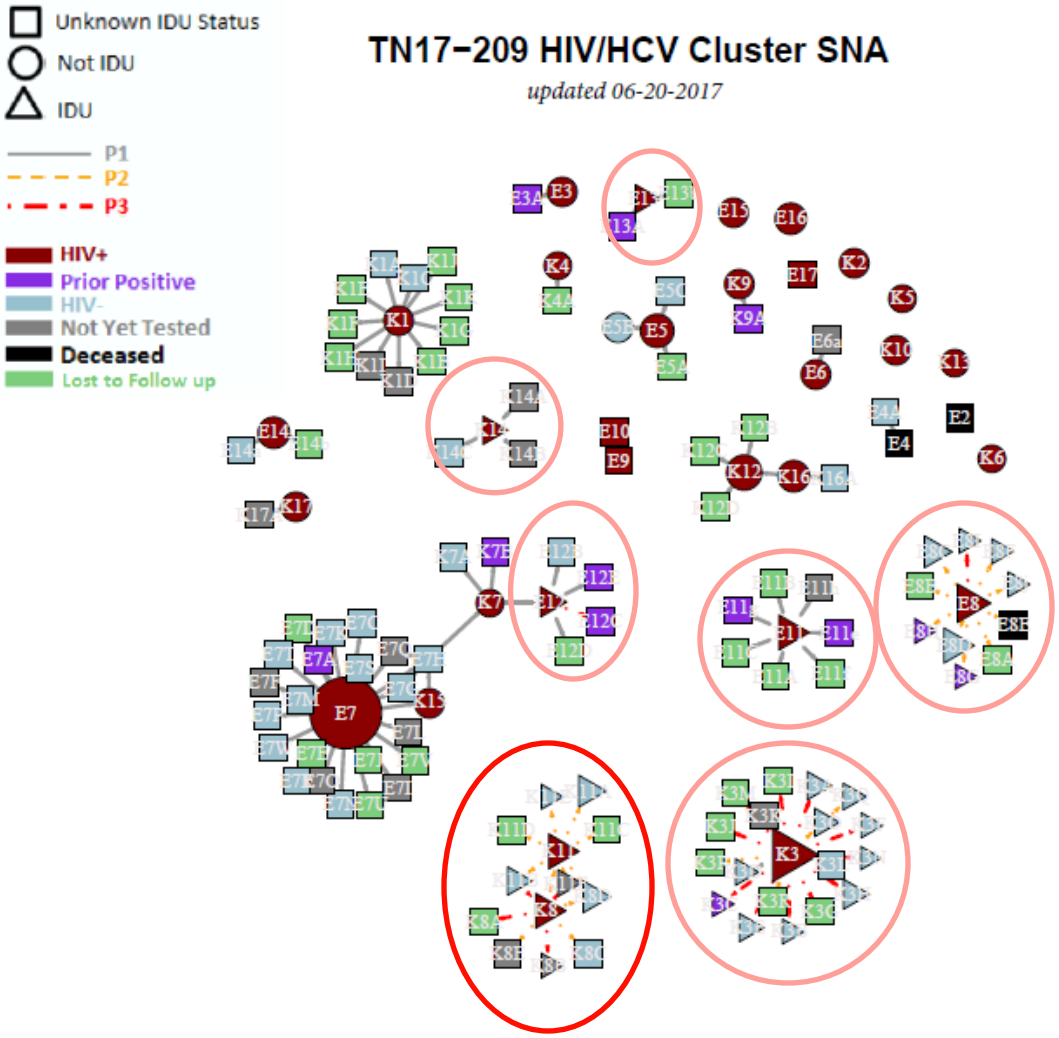
HIV & HCV Molecular Testing

- **Goal**
  - Focus on cases and contacts
    - Interview w/ OBRF
    - Collect specimens
      - HIV testing (HIV molecular surveillance)
      - HCV testing (GHOST testing)
      - HBV screening
- **Reality**
  - "Outreach" testing conducted first weekend of investigation
  - Many contacts with limited info or simply did not want to be found
  - Important to embed phlebotomy in outreach
  - Often not enough specimen for both HIV and HCV molecular testing

Social Network Analysis



Social Network Analysis

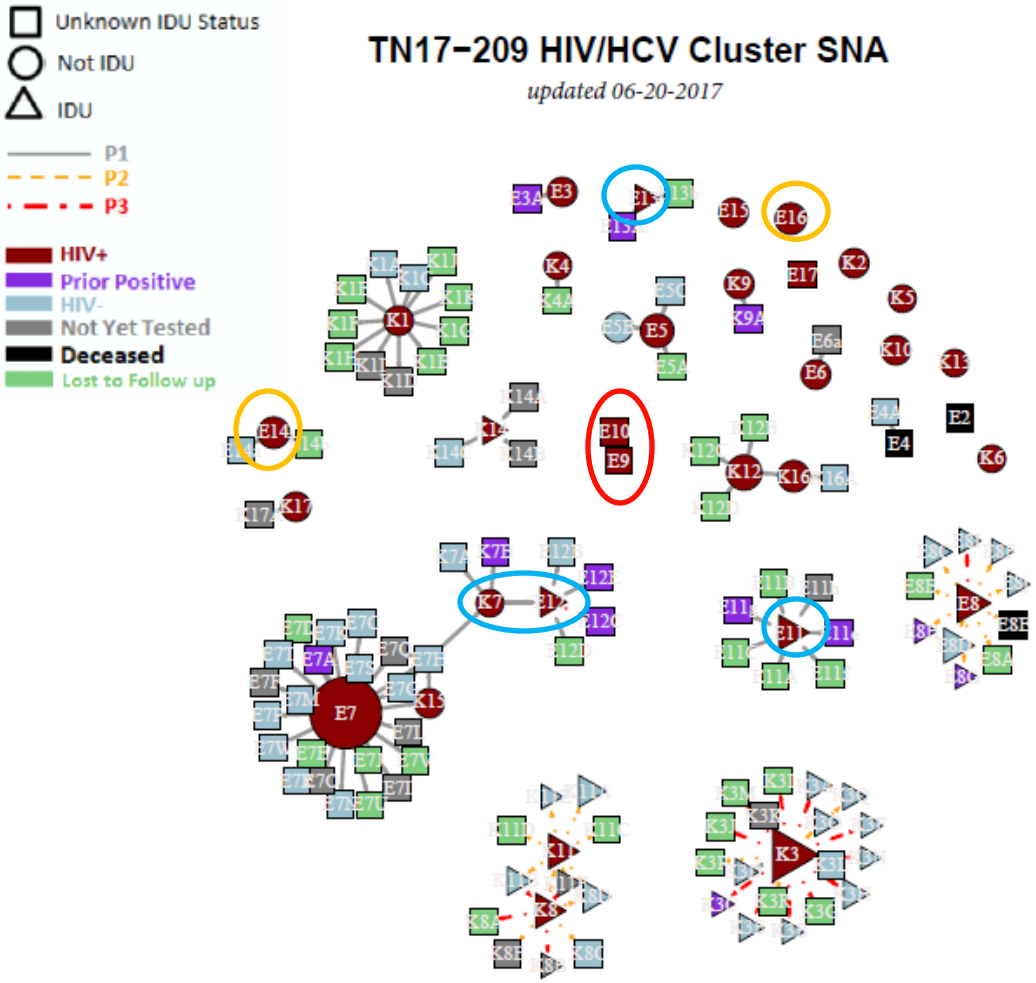


HIV Molecular Testing

- **To identify <u>existing HIV transmission networks</u>**

- **HIV Molecular Testing**
  - 16 cases tested
    - 9 “recent” and 4 “prevalent” HIV infections (3 unknown)
    - 3 clusters identified
      - 2 person cluster (MSM, MSM)
      - 2 person cluster (MSM, NIR)
      - 4 person cluster (MSM/PWID x 3, MSM x 1)

Identifying Linkages: HIV Molecular Testing



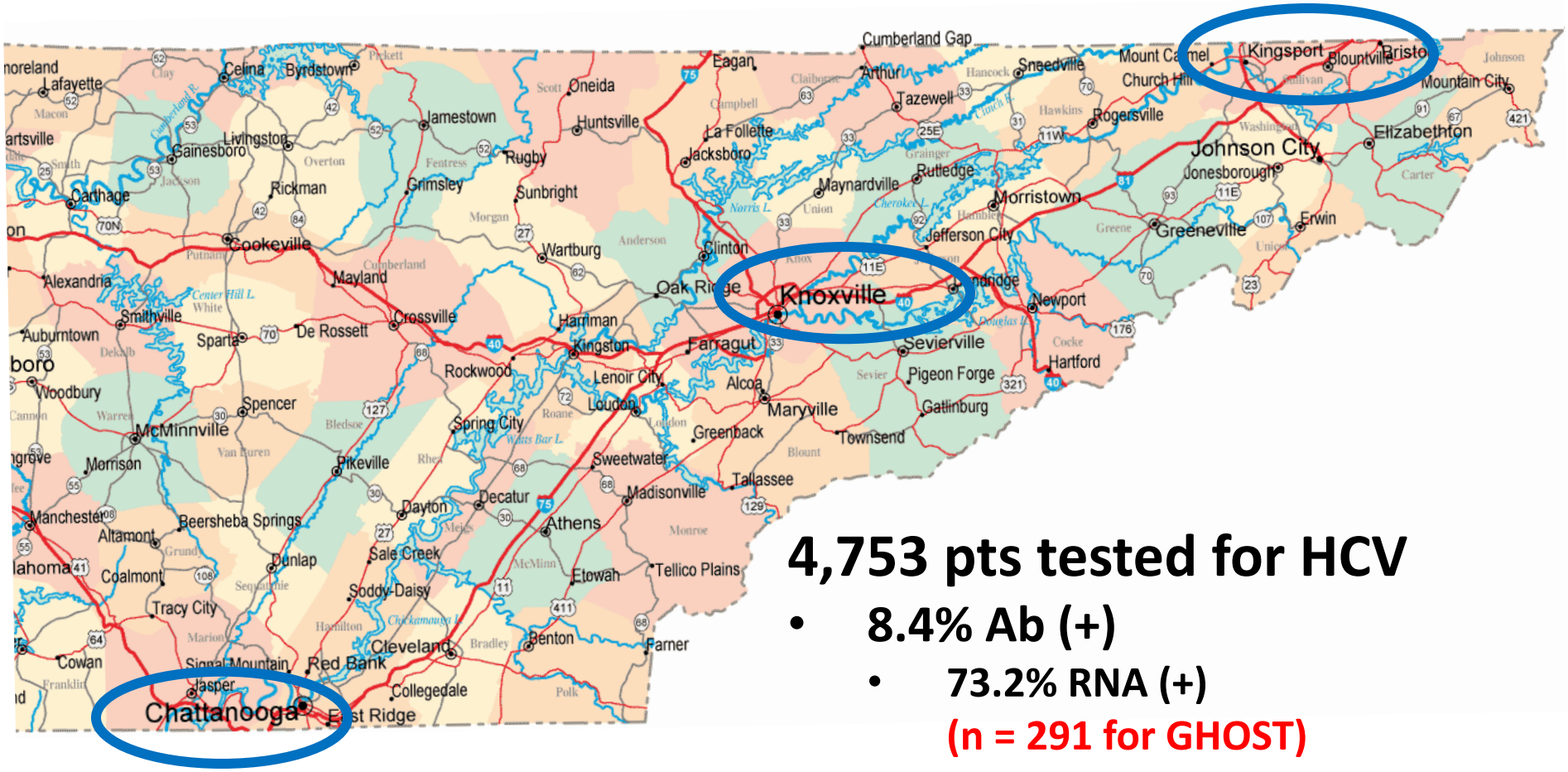
HCV Molecular Testing (GHOST)

- **To identify existing HCV transmission networks as a harbinger of potential HIV transmission networks among PWID**

- **Built lab capacity during 2016 HCV testing pilot in Eastern TN**

HCV Testing & GHOST Pilot in TN

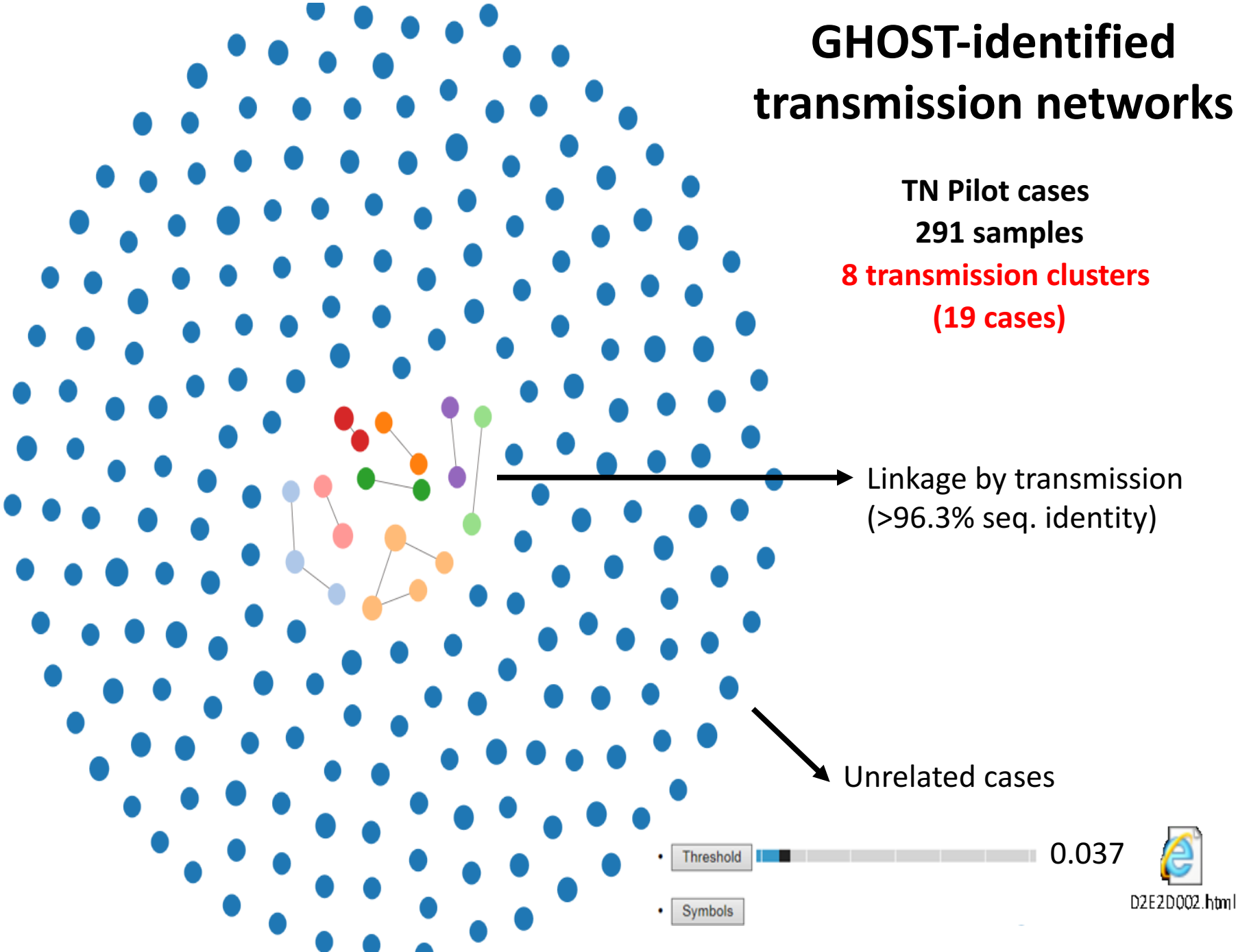
- **June 1 – October 31, 2016**



4,753 pts tested for HCV

- **8.4% Ab (+)**
  - **73.2% RNA (+)**
    (n = 291 for GHOST)

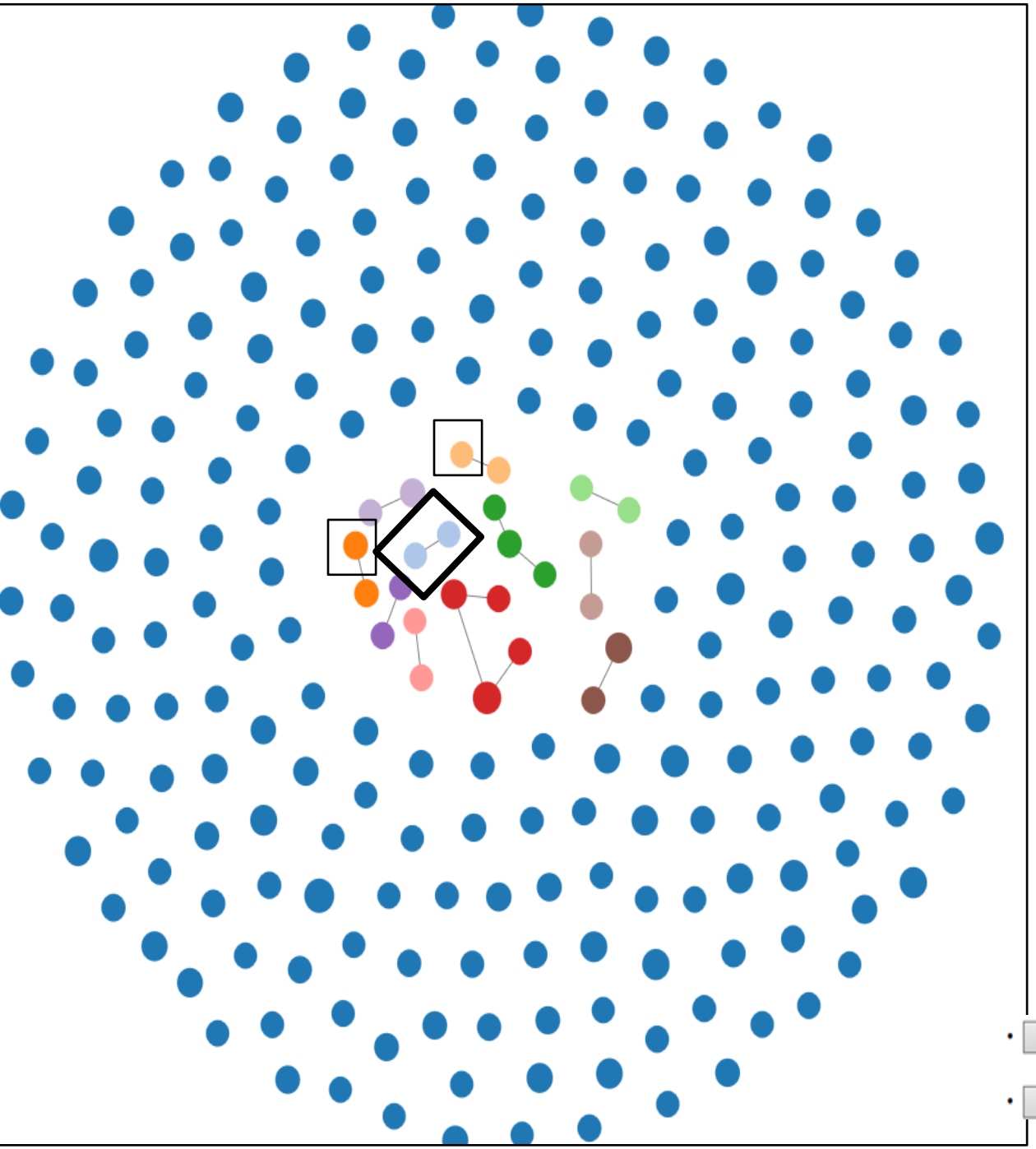
GHOST-identified transmission networks



GHOST: HIV Cluster Investigation

	#	# HCV Tested (PWID)	# HCV Ab(+) (PWID)	# HCV RNA(+)
HIV Cases	33	15 (5)	3 (3)	1
Prior HIV Positives	12	0	0	0
Contacts	95	10 (8)	8 (8)	6
"Outreach"	22	22	15	15

- **22 HCV RNA (+) positive** persons identified
  - 7 from HIV cluster investigation
  - 15 from "outreach" testing
- **4 linkages identified** (all from **"outreach"** testing)
  - 2 person cluster ….. both HIV (-)
  - 1 person linked to 2016 pilot
  - 1 person linked to 2016 pilot



Ongoing TN HCV surveillance

(291) Pilot cases

+

(7) Cluster cases

+

(15) Outreach cases

3 additional clusters
(total of 11)

Threshold 0.037

Symbols

Lessons Learned / Next Steps

Lessons Learned

- Better integration of teams (PHEP / CO / PHRs)
- Missed a lot of testing opportunities
  - Ensure adequate sample collection
  - DB to capture molecular testing results

Next Steps

- Secure software to incorporate molecular testing into SNA
- Secure Epi for outbreak surge capacity
- Intelligent resource allocation
  - GHOST (outbreaks vs. vulnerable counties)
- Develop “One-Stop-Shops”

Thank You!

TDH HIV/STD/VH
Shanell McGoy
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Jennifer Black
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Samantha Mathieson
Melissa Morrison

TDH CEDEP
Mary-Margaret Fill
Rendi Murphree
Corinne Davis
Julia Schaffner

NYC DOH
Demetre Daskalakis

CDC
Yury Khudyakov
Sumathi Ramachandran
Phil Peters
Bill Switzer

TDH State Laboratory
Rick Steece
Jim Gibson
Paula Gibbs
Linda Thomas