Epi-2: Preliminary Epi-Aid Report

Epi-Aid Number:	**2021-004**
Date:	**7/23/2021**
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Through:	Dr. Irene Hall, PhD, MPH, Acting Director, Division of HIV/AIDS Prevention
Subject:	Outbreak of HIV infections among persons who inject drugs in Kanawha County, WV
Location:	Kanawha County, WV

1. What was known about the problem at the beginning of the investigation?

In February 2021, the West Virginia Department of Health and Human Resources (DHHR) Bureau for Public Health (BPH) Office of Epidemiology and Prevention Services' Division of STD and HIV (DSH), in partnership with the Kanawha Charleston Health Department (KCHD), implemented response activities due to an outbreak of new HIV diagnoses among persons who inject drugs (PWID) in Kanawha County, West Virginia. Kanawha County (population 180,000) is home to Charleston, the State's capital city (population 48,000). During January 1, 2019 to May 13, 2021 there were a total of 63 new HIV diagnoses in Kanawha County among persons with infection associated with injection drug use. Prior to 2019, the average number of new HIV cases in Kanawha County associated with injection drug use was <5 per year. PWID newly diagnosed with HIV reported high levels of homelessness and housing instability, and 60% of the diagnoses were made in a hospital setting, indicating potential barriers for PWID to access services and care in other settings. The high rate of substance use disorder (SUD) among people with diagnosed HIV in Kanawha County and their contacts also created significant barriers to continuous engagement in HIV care or pre-exposure prophylaxis (PrEP). As of May 13, 2021, 50% of the 62 persons living with HIV who met the outbreak case definition were linked to HIV care within 30 days of their diagnosis (note: one of the 63 was deceased); however, only 31% had received care within the last 90 days.

Response activities implemented by West Virginia BPH, KCHD, and partners prior to and during the Epi-Aid included increased access to HIV testing, outreach activities, and linkage to HIV care and other social services, which were provided by a collaborative multi-disciplinary county-wide group including public health officials, healthcare organizations, homeless service providers, and community-based organizations. To assist with HIV partner services activities, three CDC disease intervention specialists (DIS) arrived in April 2021 for an initial deployment of 90 days. As a component of the overall response, BPH and KCHD requested an Epi-Aid on May 17, 2021 to:

1. Conduct a rapid assessment with PWID and key stakeholders in Kanawha County to identify factors facilitating HIV transmission and barriers to accessing essential care and prevention services for PWID, to inform improvements to HIV testing, prevention, and care activities and design of additional outbreak response activities.
2. Review, abstract, and analyze data from medical records and other relevant sources (e.g., community service providers, first responders, SUD treatment) to understand engagement with various services before and after HIV diagnosis, identify missed opportunities for intervention, and design improvements for future service delivery.
3. Review and analyze partner services procedures and data from partner services interviews and HIV testing activities to better understand behaviors, networks, and geography of PWID in Kanawha County affected by the outbreak and inform recommendations to improve future partner services and testing outreach activities.

2. What was accomplished in the field (investigation methods)?

During the field investigation (June 1, 2021–June 24, 2021), the CDC Epi-Aid team assisted WV BPH and KCHD by performing the following activities:

Rapid Assessment:

1. In collaboration with WV BPH and KCHD, we developed qualitative interview materials to rapidly assess factors contributing to increases in HIV among PWID, including:
    a. A PWID interview guide to assess drug use behavior, HIV risk behavior (needle and equipment sharing, unprotected sex, exchange sex), and engagement with medical and social services.
    b. Stakeholder interview guides to assess experiences engaging with the PWID community, services provided to the PWID community, and factors contributing to the increase in HIV in the community.
    c. Interview training materials to ensure the integrity of the rapid assessment findings.

2. We conducted qualitative individual or group interviews with 26 PWID with or without HIV in the community (i.e., not necessarily case-patients) and 45 local stakeholders.
    a. We sought to recruit a diverse sample of PWID, including those who have and have not accessed HIV services in the past 12 months, those with and without HIV, those experiencing homelessness and those not experiencing homelessness, and those representative of various demographics (age, gender, race/ethnicity, type of drugs used, and geographic residence).
    b. Eligibility criteria for PWID included: currently living in Kanawha County, aged ≥18 years, and had injected drugs in the past 12 months. PWID were recruited through referrals from DIS and medical or social service providers or through community outreach events.
    c. We also sought to recruit a diverse sample of stakeholders, including medical and social service providers, policymakers, religious leaders, law enforcement personnel, and other community leaders.
    d. Stakeholders were recruited through referrals from WV BPH and KCHD staff and stakeholder participants.

3. We conducted field observations during visits to service agencies and other places that PWID may spend time or congregate (e.g., street corners, gas stations).

4. We conducted preliminary analyses of qualitative data to describe findings on drug use behavior, HIV risk behavior, primary barriers to medical and social services, and participants' suggestions to address the HIV outbreak.[1]
    a. After each interview, the interviewer and notetaker debriefed to document key findings.
    b. All interviewers debriefed at the end of each day to capture key themes across interviews.
    c. Responses were compared across participants for each topic area to identify patterns and differences among participants.
    d. Suggested strategies to address the HIV outbreak shared in each interview were compiled and reviewed.

Individual-Level Medical Records and Public Health Data Review:

1. We developed abstraction tools for medical records and public health data to assess healthcare use and engagement in care prior to and following HIV diagnosis, including collecting information on the following domains: 1) demographics, 2) risk factors for HIV acquisition and transmission, 3) health care encounter data, 4) laboratory test results, 5) HIV care data, and 6) immunization data.

2. HIV surveillance data were reviewed and updated to identify all persons meeting the outbreak case definition as of June 18, 2021. An additional 4 individuals were identified between May 13 and June 18, 2021, bringing the total number of persons meeting the outbreak case definition to

67. Of the 67 individuals identified, we abstracted medical records for 65 persons in the HIV outbreak who met the following criteria: 1) HIV diagnosis date from January 1, 2019 through June 18, 2021, 2) residence in Kanawha County at HIV diagnosis, 3) history of injection drug use, and 4) had at least 1 health care encounter at Charleston Area Medical Center (CAMC) or Health Right during the review period, which extended from 1 year prior to HIV diagnosis to June 18, 2021. Two individuals had no health care encounters at CAMC or Health Right and were thus excluded from the review.
    a. Medical records were abstracted in detail from CAMC and Health Right. CAMC was included because it was the site of diagnosis for approximately 70% of all cases in the outbreak. Health Right was included because it is the only clinic that offers syringe services currently in Kanawha County.
    b. A secondary, limited medical records abstraction was done using the West Virginia Health Information Network (WV HIN), recording only date of encounter, encounter facility, and level of care.
    c. Additional public health data sources from which individual-level data were collected included: 1) the WV HIV surveillance database, 2) HIV partner services data, 3) the WV Statewide Immunization Information System (WV SIIS), 4) the WV Electronic Disease Surveillance System, and 5) the WV viral hepatitis registry.

3. To inform findings and recommendations, we conducted descriptive analyses of:
    a. Demographics and risk factors;
    b. Health care use patterns (including frequency of use, location, level of care, and whether an individual left against medical advice) and diagnoses while in care;
    c. Substances used by individuals in the investigation, receipt of naloxone, and receipt of medication for opioid use disorder (MOUD);
    d. HIV prevention and care related variables including receipt of HIV testing, PrEP, syringe services, and antiretroviral therapy (ART), linkage to and engagement in HIV care, and viral suppression;
    e. Viral hepatitis diagnostic testing and vaccination histories;
    f. COVID-19 diagnostic testing and vaccination histories.

Analysis of Surveillance, Partner Services, and HIV Outreach Testing Data and Review of Partner Services Policies and Procedures:

1. We analyzed data from the following sources:
    a. The WV HIV surveillance system, which includes data for all persons with HIV diagnoses;
    b. The WV BPH partner services Microsoft Access database, which contains contact tracing data for all West Virginia residents with HIV diagnosed during 2017–present;
    c. The WV BPH outreach testing data, which includes information about number of tests and percentage of positive tests for each outreach event since April 6, 2021.

2. We analyzed HIV surveillance data (including HIV molecular sequence data) and preliminary partner services data (limited because not all contact tracing efforts to date had yet been entered into the database) to understand the rapidity of transmission, the presence or absence of connections with a prior HIV outbreak in Cabell County, and the geographic scope of rapid transmission.

3. We met with key BPH staff to understand current partner services policies and procedures and inform recommendations. Staff included:
    a. Local DIS staff and supervisor;
    b. Federal DIS staff deployed to WV to assist with the response;
    c. HIV surveillance staff;
    d. Director of Division of HIV and STDs.

Overall:

1. We facilitated continuous communication through weekly calls with WV BPH and KCHD leadership, an exit presentation on preliminary findings, biweekly internal CDC team update calls, and two presentations to get input from CDC subject matter experts.
    a. Calls included discussion of the details and status of the investigation, including progress on each of the three objectives, upcoming work and requests for state/local partners, and ongoing updates about preliminary Epi-Aid findings.
    b. As requested by BPH, the Epi-Aid team provided a summary of preliminary findings through an exit presentation to staff from public health and community organizations at the conclusion of the field work.

3. What are the initial findings and recommendations?

FINDINGS

1. Qualitative Interview Findings

A. Interviews with PWID

In preliminary analysis of 26 interviews with PWID, qualitative data were analyzed by identifying themes across several main areas of interest: drug use, HIV risk behavior, and views on medical and social services.

Drug use: Methamphetamines and heroin were reported as the most commonly used drugs.

Methamphetamines and heroin were reported as the most commonly used drugs among the interviewed sample, followed by cocaine, illicitly manufactured fentanyl, and non-prescription suboxone. Some noted that illicitly manufactured fentanyl was becoming more common in the area and PWID were knowingly and unknowingly using illicitly manufactured fentanyl. Many PWID described using substances to cope with feelings of hopelessness and despair associated with a confluence of health and social challenges, such as unstable housing, chronic pain, trauma and loss, depression and anxiety, HIV, and unemployment.

HIV risk behavior: People often reuse or share syringes due to low access to sterile syringes.

Most PWID reported low access to sterile syringes, leading many to reuse or share syringes. PWID reported receiving sterile syringes from people with diabetes, drug dealers, other PWID, or online orders (e.g., Amazon, Wish). For many PWID, these sources for syringes were not sufficient to provide sterile syringes for each injection.

HIV risk behavior: People often use HIV risk reduction strategies despite low access to sterile syringes.

Despite low access to sterile syringes, some PWID described using HIV risk reduction strategies, such as disposing their own needles, collecting and disposing syringe litter found in hot-spot injection drug use areas, distributing clean syringes, rinsing syringes with water between uses, and reducing the size of their injection network by only sharing with a close circle of friends or their main sexual partner. PWID with HIV said they stopped sharing syringes once they received their HIV diagnosis.

HIV risk behavior: There are numerous misconceptions about HIV and hepatitis C virus (HCV) transmission, prevention, and treatment.

Although many PWID practiced HIV risk reduction, they also often held misconceptions about HIV and hepatitis C transmission, prevention, and treatment. A common misconception about HIV was that sharing needles was as risky or less risky than unprotected sex for HIV transmission; however, needle-sharing is higher risk for HIV transmission than unprotected sex. This misconception often led people to feel comfortable sharing syringes with sexual partners with whom they were already having unprotected sex. A common misconception about hepatitis C was that people could infect themselves with hepatitis C by reusing their own syringes.

HIV risk behavior: Exchange sex is contributing to the HIV outbreak.

In addition to syringe sharing, PWID who did not report exchange sex often noted that exchange sex is contributing to the HIV outbreak because condom use is uncommon during exchange sex. In contrast, PWID who reported exchange sex described using condoms during penetrative sex with clients.

Views on medical and social services: Numerous barriers to medical and social services were identified.

- **Medical services:** The most prominent barrier to accessing medical services among PWID was their strong negative views towards hospitals due to previous experiences of injection drug use stigma and discrimination by hospital providers.
- **HIV testing:** PWID who accessed HIV testing in the past six months had positive experiences with HIV testing, describing convenient testing locations and gift cards provided as an incentive for testing. While most PWID interviewed had accessed HIV testing recently, PWID often emphasized the importance of improving access to HIV services by expanding mobile outreach services to reach PWID on the streets and other areas where they congregate.
- **HIV care and treatment:** Most PWID with HIV who were interviewed were engaged in HIV care, but some PWID with HIV spoke about delayed initiation of care due to anger or depression following their HIV diagnosis. PWID with HIV engaged in HIV care described positive, supportive interactions with HIV providers and adhering well to ART. Notably, all PWID with HIV engaged in care were stably housed at the time of the interview, which may have influenced their experience taking ART. PWID with HIV who were not engaged in care described several barriers: delays in registration for Medicaid, stolen medications, lack of transportation, length of clinic visit, and difficulty remembering appointments. Some expressed a desire to be in HIV care and felt that taking a medication daily would be easy.
- **Pre-exposure prophylaxis (PrEP) for HIV prevention:** Views on PrEP were mixed among PWID, with some expressing interest (if it was affordable) and others expressing disinterest because they didn't feel they were sexually promiscuous enough to take PrEP.
- **Harm reduction services:** PWID mainly reported having low access to sterile syringes and other injection equipment due to the closure of syringe services programs (SSPs) previously implemented by KCHD and the community group SOAR after losing support from some community stakeholders. Other reasons given for low access to sterile syringes and other injection equipment included: limited knowledge of or access to the one available SSP (i.e., Health Right) and pharmacists' refusals to sell syringes. Some PWID noted low access to naloxone in the community.
- **Substance use disorder (SUD) treatment:** Numerous barriers to SUD treatment services were identified by PWID, including misconceptions about suboxone and methadone as trading one drug for another, low readiness to initiate or re-initiate SUD treatment, community stigma, limited transportation options, delayed enrollment in SUD treatment, and relapse triggers.
- **Public safety:** Some PWID described experiencing injection drug use stigma and discrimination during interactions with law enforcement. As a result, these participants expressed feelings of distrust in law enforcement to provide safety and protection if they asked for help.

B. Interviews with stakeholders

In preliminary analysis of 45 interviews with community stakeholders, we identified several key findings and strategies suggested to enhance the HIV outbreak response (Table 1).

Table 1. Types of stakeholders interviewed (n=45)

Medical or SUD treatment providers*	28
Social service providers	4
Law enforcement personnel	3
Other community leaders**	10

*Includes HIV providers, medication for opioid use disorder (MOUD) providers, primary care clinicians, emergency department and infectious disease clinicians, addiction and harm reduction specialists, and EMS/paramedics.
**Includes religious leaders, policymakers, and public health practitioners.

PWID are facing multiple, co-occurring health and social challenges.

Stakeholders often noted that PWID are facing multiple, co-occurring complex challenges (e.g., SUD, chronic pain, unstable housing, food insecurity, unemployment, mental health issues, and HIV). They noted that solutions need to address overlapping health and social conditions that PWID are facing and that intervening on just one, such as unstable housing alone or HIV alone, will not be effective or

sustainable. Some medical and social service providers spoke about making efforts to address co-occurring health and social issues; for example, a housing services provider spoke about distributing naloxone. To address these co-occurring health and social issues and build relationships and trust with PWID, many participants suggested implementing low-barrier, one-stop shop models and improving service integration and coordination across social and medical service providers. Stakeholders often mentioned the importance of offering sterile syringes, HIV testing, food pantry services, wound care, naloxone, and linkage to substance use, mental health, and HIV care services when implementing a one-stop shop model. When addressing care coordination and service integration, some stakeholders also noted the importance of ensuring all partners are included as decision-makers, including those who serve Black or African American communities. Some noted a need for low-barrier housing services and an "in-between place" such as a crisis stabilization unit for persons awaiting linkage to SUD treatment.

There are misconceptions related to HIV and HCV among PWID and community members.

Stakeholders often noted that there were pervasive misconceptions about HIV and hepatitis C transmission, prevention, and treatment, with some emphasizing that PWID consider HIV a death sentence and are not aware of the advances in HIV treatment. Stakeholders often emphasized the importance of providing health education to PWID that focused on HIV prevention (e.g., transmission risk, safe injection), advances in HIV treatment, overdose prevention (e.g., naloxone training), and SUD treatment options. Some stakeholders also noted the importance of educating community members about the HIV outbreak and evidence-based solutions to address the HIV outbreak.

Medical and social service providers face challenges providing HIV testing, prevention, and engagement and retention in care.

Medical and social service providers often noted that they face difficulties prioritizing HIV testing and linkage to HIV services when serving PWID because they have competing priorities to address, such as unstable housing, food insecurity, unemployment, acute medical conditions, and low readiness to start SUD treatment. Medical providers often noted that PWID were not being routinely screened for HIV in the emergency department and across the hospital because they need to prioritize patients' acute medical conditions and other needs over HIV screening.

- **HIV testing in clinical settings:** Stakeholders commonly mentioned two solutions to address the missed opportunities for HIV testing in the hospital. One suggestion was to train medical providers on SUD, SUD treatment, and stigma reduction to improve patient-provider communication and trust and understanding on how to treat patients experiencing withdrawal symptoms. Another suggestion was to link patients with SUD to the Ryan White HIV/AIDS program for HIV testing and linkage to treatment through a consult service for patients in the hospital.
- **HIV testing in nonclinical settings:** Stakeholders believed that HIV testing outreach events in the community are not reaching people at highest risk for HIV infection due to low awareness, acceptability, and access to the events. To improve the reach of the testing outreach events, participants suggested (1) increasing the focus on hot-spot areas, such as the West Side, Kanawha City, and South Charleston; (2) operating events in the afternoons and evenings; (3) implementing discreet, mobile outreach (i.e., trusted staff on foot in hot-spot injection drug use areas) in addition to scheduled testing events in fixed locations; and (4) providing comprehensive services in addition to HIV testing, such as wound care and linkage to HIV and substance use services. As stakeholders believed that those at highest risk are being missed by HIV testing opportunities, many felt that the size of the outbreak was underestimated at the time of the interviews.
- **Expanding HIV prevention through harm reduction services and PrEP:** While stakeholders provided numerous suggestions to improve HIV testing, some also noted the importance of expanding HIV prevention efforts beyond HIV testing and linkage to care, such as increasing access to harm reduction services and reducing barriers to SUD treatment. Although most stakeholders advocated for increasing access to sterile syringes through SSPs, many noted that the current legislation posed implementation barriers. Stakeholders also often noted the shortage of needle disposal boxes in the community and a police vehicle was observed to be parked near the one existing needle disposal box at KCHD, which might deter people from using it. Additionally, numerous barriers to SUD services were noted by stakeholders, including

delayed linkage to SUD treatment, limited transportation options, limited availability of SUD treatment in correctional settings, enrollment requirements (e.g., medical clearance), and insurance restrictions on length of stay. Stakeholders had mixed views on the role of PrEP in HIV prevention; some felt it would be a crucial HIV prevention tool for PWID, while others felt PrEP is not a good option because they believed that PWID would not adhere and pills would get stolen frequently among PWID experiencing homelessness. Some stakeholders also commented on the cost of PrEP as a potential barrier to access.

- **Barriers to engagement and retention in HIV care:** Medical and social service providers identified multiple barriers to engagement and retention in HIV care, including the need to enroll in Medicaid and get a photo ID before initiating care, low awareness of the Ryan White HIV/AIDS program among providers and patients across the hospital, patients with SUD frequently leaving the hospital against medical advice before linkage to HIV care could occur, long waiting times to complete HIV-related labs and provider visits, stolen medications due to unstable housing, and fear of HIV disclosure and HIV stigma.

2. Medical Records and Public Health Data Review

In total, for the 65 individuals included in the medical records abstraction, 496 health care encounters were abstracted from CAMC and Health Right medical records, and an additional 177 health care encounters were abstracted from WV HIN. The median age of individuals was 34 years. Ninety-two percent were non-Hispanic White, 3% were non-Hispanic Black, and 5% were another race/ethnicity. Eighty-five percent of individuals had Medicaid as their most recent health insurance, 20% received services supported by the Ryan White HIV/AIDS program, and 14% were self-pay. There was a high prevalence of reported current or prior homelessness or unstable housing (62%), history of incarceration (31%), and current or prior mental health conditions (35%). Seventy-four percent of individuals were documented to have injected drugs within 6 months of their last health care encounter. Methamphetamine (82%) and heroin (78%) were the most common substances used, and polysubstance use was high (88%).

Among the 496 health care encounters reviewed from CAMC and Health Right, individuals had a median of 5 health care encounters (interquartile range [IQR] 2–10) in the review period (1 year prior to HIV diagnosis to June 18, 2021). Those visits occurred in the emergency department (42% of all encounters), inpatient setting (20%), the CAMC Ryan White Clinic (16%), other CAMC outpatient clinics (20%), and Health Right (3%). Individuals left emergency department and inpatient encounters against medical advice frequently (26%).

In the year prior to HIV diagnosis (211 total encounters), individuals had a median of 2 health care encounters (IQR 1–4), and the majority occurred in the emergency department (59%) and inpatient (28%) settings. Individuals presented frequently for injection drug use (IDU)-associated infections (50% of pre-HIV encounters), including skin and soft tissue infections (71% of all IDU-associated infections), sepsis (26%), bacteremia (10%), endocarditis (10%), and osteomyelitis (9%). Health care encounters in which overdose (4% of all pre-HIV encounters), intoxication (2%), or sexually transmitted infections (1%) were diagnosed were infrequent. Regarding HIV testing and PrEP provision, only 5 negative tests were recorded during this period, and PrEP was not prescribed to any individuals prior to HIV diagnosis.

After HIV diagnosis (285 encounters), individuals had a median of 2 health care encounters (IQR 1–7). A lower proportion of visits occurred in the emergency department (29%) and inpatient (14%) settings compared to the pre-HIV period, while visits increased in outpatient settings (CAMC Ryan White Clinic, 28%; other CAMC outpatient clinics, 27%; Health Right, 2%). IDU-associated infections represented a lower proportion of visits in the post-HIV period (27%), while overdose (3%), intoxication (1%), and sexually transmitted infections (4%) remained infrequent.

Analyzing WV HIV surveillance data, 46% of individuals received a diagnosis of HIV infection during inpatient hospitalizations, 20% in the CAMC Ryan White Clinic or at their outreach testing events, and

5% in emergency departments. At the time of HIV diagnosis, individuals had a median CD4 count of 436 (IQR 274–616). Eighty-six percent received HIV medical care (as defined by having a documented medical care visit, CD4, viral load, genotype test result or evidence of ART prescription) after HIV diagnosis, but only 19% of individuals had received HIV medical care in the last 3 months. Using data collected from medical records abstraction, 68% of individuals had ever been prescribed ART, and 37% were virally suppressed on their most recent viral load (since January 2021 onward).

To examine overdose prevention efforts in health care settings, we assessed documented use or prescription of naloxone across IDU-related encounters, defined as encounters in which overdose, intoxication, or an IDU-associated infection were diagnosed or syringe services were provided. We found that individuals were prescribed or documented to be taking naloxone infrequently, representing only 10% of all IDU-related encounters (n=198). Across post-HIV encounters that were IDU-related (n=85), individuals were prescribed naloxone in 15% of encounters.

Among encounters in which past or current opioid use was noted or syringe services were provided, individuals were prescribed or documented to be taking MOUD at 20% of encounters across the review period (n=290) and 26% of post-HIV encounters (n=167).

Of the 2 health care organizations included in medical records abstraction, only Health Right provided syringe services during the review period. Among 13 total Health Right encounters, syringe services were provided at 4 (31%) encounters, once each to 4 unique individuals. Two encounters occurred pre-HIV diagnosis, one on the day of diagnosis, and one post-diagnosis. Thus, while 74% of the 65 individuals included in medical records abstraction were documented as injecting drugs within 6 months of their most recent health care encounter, only 6% ever received syringe services from Health Right during the review period (note that KCHD provided syringe services until March 2018 and SOAR provided syringe services from 2019 through early 2021).

Among the 65 individuals included in medical records abstraction, 94% ever tested positive for hepatitis C. Of those testing positive, 89% received a diagnosis of hepatitis C infection prior to HIV and 8% received a diagnosis of hepatitis C infection on the same day as their HIV diagnosis. For individuals whose hepatitis C was diagnosed prior to or on the date of HIV diagnosis, the median time from hepatitis C diagnosis to HIV diagnosis was 46 months (IQR 29–71). Seventeen percent of individuals had ever received a diagnosis of hepatitis B infection, and for individuals whose hepatitis B was diagnosed prior to or on the date of HIV diagnosis, the median time from hepatitis B diagnosis to HIV diagnosis was 30 months (IQR 2–67). Seventeen percent had ever received a diagnosis of hepatitis A infection. Thirty-four percent ever received at least one dose of hepatitis B vaccine and 32% ever received at least one dose of hepatitis A vaccine (note: the WV SIIS was not operational until July 1999 and other vaccinations prior to provider enrollment may not be captured).

Eight percent of the 65 individuals had received a diagnosis of COVID-19 infection and only 15% had received at least one dose of a COVID-19 vaccine.

In a separate analysis examining only health care facility and level of care across CAMC, Health Right, and the WV HIN, 673 health care encounters were abstracted in total. Of those, CAMC was the most frequently visited site of care (72%, n=483) followed by Thomas Health (13%, n=87), Med Express (4%, n=26), and Health Right (2%, n=13). No other site of care documented in the review accounted for more than 2% of visits.

3. Analysis of Surveillance, Partner Services, and HIV Outreach Testing Data and Review of Partner Services Policies and Procedures

A. Analysis of HIV surveillance, partner services, and outreach testing data

HIV molecular sequence data were available for 59% of all persons with HIV diagnosed in WV during January 1, 2019 to July 7, 2021, including for 35% (n=72) of persons who met the outbreak case definition (note: an additional five individuals were identified between June 18 and July 7, 2021,

bringing the total number of persons meeting the outbreak case definition to 72). Of 25 persons meeting the outbreak case definition with sequences available, 19 (76%) were molecularly clustered with at least one other person, in 3 distinct molecular clusters; this molecular clustering indicates the presence of rapid HIV transmission. The majority of these persons (14/19; 74%) were in one large cluster of rapid transmission; this cluster also included 8 additional persons who did not meet the outbreak case definition (7 from other WV counties and 1 from prior to 2019). In this cluster, the estimated transmission rate was 47 transmissions per 100 person-years (12 times the national average) with an estimated 86% of transmissions occurring after January 1, 2019. The available molecular data indicate that this outbreak is distinct from the Cabell County outbreak, meaning that the Kanawha County outbreak is not a result of spread of the Cabell County outbreak.

Many persons involved in the outbreak are experiencing homelessness or housing instability, which has implications for locating persons for the provision of partner services. Of 44 individuals interviewed for partner services for whom housing status was known, 75% were experiencing homelessness at the time of their interview. Review of surveillance data indicates that additional, updated address information is often reported after the time of initial HIV diagnosis, which may present more opportunities to locate people who are still in need of partner services and linkage to HIV care.

Review of data from outreach HIV testing events indicates geographic variability in test positivity rates. Events held on the West Side of downtown Charleston and at a SUD treatment center had higher test positivity rates compared with those held in other locations (West Side testing events: 14.3% test positivity, 3.6% test positivity excluding previous positives; SUD treatment center: 2.9% test positivity, 0.6% test positivity excluding previous positives; other testing events: 0.0% test positivity). Thirteen of the 27 testing events held in Kanawha County during April 6 and July 9, 2021 had fewer than 10 individuals receive an HIV test and no new HIV positive test results.

B. Review of partner services policies and procedures
Partner services (DIS) staffing in Kanawha County was insufficient to manage the increase in reported persons with HIV. Additionally, the partner services program has not traditionally prioritized the intensive locating and investigative activities required to reach PWID or people experiencing homelessness.

Partnerships with community organizations, which serve people experiencing homelessness, food insecurity, and/or need assistance accessing HIV care or drug rehabilitation services, have been instrumental in helping federal DIS locate, interview, and notify persons involved in the outbreak and their partners and to facilitate linkage to supportive services.

The federal DIS noted numerous challenges to HIV testing and linkage to care for people residing in correctional settings, including absence of routine screening, absence of rapid HIV testing, and limited protocols for provision of results and linkage to services.

RECOMMENDATIONS

1. Primary Recommendations:

Expand access to sterile syringes and other injection equipment through comprehensive harm reduction services, such as low-barrier, one-stop shop models in multiple locations that also incorporate mobile or street outreach elements.

- New or existing harm reduction programs should strive to identify and reduce barriers to participation wherever possible and incorporate ongoing input from PWID in the design and delivery of services. To reduce barriers, organizations implementing harm reduction programs with key partners can conduct needs assessments with PWID and stakeholders, engage PWID on community advisory boards, and involve PWID in the development and implementation of harm reduction programs.

- According to HHS guidance, SSPs should be part of a comprehensive service program that facilitates access to and safe disposal of sterile syringes and other services or referrals to include SUD treatment, screening and treatment of infectious diseases, overdose prevention and naloxone and fentanyl test strip distribution, vaccinations, and other social, mental health, and medical services.[2]
- Comprehensive SSPs play an important role in preventing infectious diseases and opioid overdoses and linking PWID with SUD treatment and recovery services.[3, 4] SSPs are associated with an approximately 50% reduction in HIV and hepatitis C incidence.[5]

Improve opportunities for earlier HIV diagnosis through rapid expansion of routine, opt-out HIV and HCV screening in clinical and correctional settings and using non-traditional outreach strategies (mobile services, street medicine).

- Routine, opt-out HIV and HCV screening in hospital settings, including emergency departments, has been shown to increase detection of undiagnosed HIV and HCV infection and linkage to care.[6-8]
- According to CDC guidance, routine opt-out HIV testing should be provided by correctional medical staff during the intake medical exam.[9]
- CDC guidance supports offering rapid HIV testing in nonclinical or community-based settings to facilitate access for those who are not engaged in medical services.[10] Distributing HIV self-tests through community outreach may be another effective strategy to facilitate access to HIV testing.[11]

Improve access to HIV, hepatitis C, substance use, and mental health services through service integration by co-locating services and cross-training service providers.

- HHS and CDC guidance recommends offering integrated prevention services for people who use drugs to increase access to services and improve effectiveness of infectious disease prevention efforts.[12]
- Co-location of services, along with multi-disciplinary teams and intensive case management, can help address important barriers to HIV care. Same-day linkage to HIV care and ART models have been shown to increase ART uptake, decrease time to linkage to care, and improve viral suppression.[13-15]

Implement a comprehensive health communication plan and ongoing community engagement activities to disseminate information about the HIV outbreak and evidence-based interventions, facilitate community discussion about response activities, and address stigma related to HIV and drug use.

- Develop and deliver audience-specific messages using appropriate media and methods; gather input from PWID to tailor messaging to the PWID community. Identify opportunities to strengthen existing partnerships or build new partnerships to support effective outbreak response.
- Community forums held in partnership with key stakeholders can be an opportunity to present evidence-based response activities, listen to concerns, discuss solutions, and disseminate timely data related to the HIV outbreak.

To adequately address service needs for PWID in Kanawha County, analyze existing service use data or gather new data to estimate the size and characteristics of the PWID population. For other West Virginia counties, update and use data indicating vulnerability to HIV and HCV outbreaks to prioritize proactive outreach and partnership with communities at risk, ensure that comprehensive harm reduction services are available in those areas, and promote early detection of and response to HIV transmission.

- Service use data might include data from healthcare billing or delivery of social services; multiple approaches to population size estimation can be considered to inform data-driven planning for prevention and care services.
- HCV infection preceded HIV diagnosis by approximately 4 years or more in this and other recent outbreaks of HIV among PWID, and there are links noted between people meeting the outbreak case definition in Kanawha County and cases among people in other WV counties.

Additional measures of vulnerability identified in prior local analyses should also be updated and considered when prioritizing other West Virginia counties for enhanced testing and service expansion activities.[16-18]

Given evidence of ongoing rapid transmission, response activities should be approached with urgency.

2. Other Recommendations:

Harm Reduction Across Multiple Settings

- Implement low-barrier, one-stop shop models to provide harm reduction services through partnerships with hospitals and federally qualified health centers. Deliver services through mobile and brick-and-mortar settings. In addition to HIV testing and linkage to HIV care, offer needs-based sterile syringes, naloxone, fentanyl test strips, wound care, and linkage to mental health, social, and SUD treatment services. Fentanyl test strips can be used to determine if drugs have been mixed or cut with fentanyl, providing people who use drugs and communities with important information about fentanyl in the illicit drug supply so they can take steps to reduce their risk of overdose.
- Organizations implementing one-stop shop models with key partners should assess the needs of potential clients, their families, key stakeholders, law enforcement, and the community at large to eliminate barriers to implementation of one-stop shop models and to ensure that resources will be used by the persons for whom the program was developed.[1]
- Monitor and evaluate services provided by one-stop shop models and the number of clients served to ensure services are effectively reaching the PWID community to decrease syringe sharing and ensure people can use a clean syringe every time they inject.
- Identify creative approaches to address policy, legal and law enforcement practices that have been identified as barriers to accessing sterile syringes and other injection equipment in this population.
- Minimize improper or unsafe disposal of used syringes using the following strategies: (1) educate PWID on proper syringe disposal and returns and provide sharps containers alongside sterile syringes; (2) increase the number of discreet, strategically placed needle disposal boxes across Charleston and Kanawha County; (3) avoid parking law enforcement vehicles near needle disposal boxes; and (4) organize regular and by-request community syringe sweeps by PWID and other community volunteers.
- Involve PWID in the development, implementation, and monitoring of programs that affect them. Invite them to join community advisory boards and encourage PWID peer involvement in one-stop shop models through employment or incentivized volunteering.
- Provide naloxone to all individuals who are at increased risk of opioid overdose (e.g., individuals who misuse prescription opioids or are using illicit drugs, with prior opioid overdose, opioid use disorder (OUD), people who inject other drugs and may be exposed to illicitly manufactured fentanyl). Naloxone should be provided, whenever possible, directly to participants, family members and friends, and anyone else in a position to assist during a drug overdose. Distribution of naloxone should not be limited to health care settings but also be made widely available by community organizations that serve individuals who use opioids.

Care Coordination

- To improve care coordination across medical and social service providers, prioritize holding regular meetings or calls to discuss ways to support clients with or at risk for HIV (e.g., a client-focused case conference). These meetings should include an appropriate range of staff, including DIS, public health staff, and medical and social service providers.
- Increase the number of trusted outreach workers, case managers, peer educators/recovery coaches, and systems navigators working across medical and social service settings to improve care coordination for PWID.

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- Identify strategies for streamlining enrollment procedures for medical and social services, such as Medicaid enrollment and phlebotomy for laboratory testing for HIV care, photo ID requirements for syringe services and housing services, and medical clearance requirements for in-patient SUD treatment.

Health Department

- Improve HIV testing outreach events to increase reach to PWID at highest risk for HIV infection: (1) offer mobile, discreet testing services to meet people where they are in the community (e.g., trusted staff on foot in hot-spot injection drug use areas); (2) conduct outreach testing in afternoons and evenings; (3) prioritize outreach on the West Side, East End, Kanawha City, and South Charleston; (4) provide comprehensive services in addition to HIV and HCV testing (i.e., sterile syringes, naloxone, wound care, linkage to HIV and hepatitis C care and substance use, mental health, and social services); and (5) refer people who test HIV-negative to PrEP providers, peer recovery specialists, and SUD treatment.
- Routinely monitor and assess testing outcomes and adjust outreach efforts accordingly. Expand testing in other counties at risk for HIV transmission as determined through geographic information about persons linked to this outbreak.
- Implement a community education campaign on HIV, harm reduction, injection drug use stigma reduction, and HIV prevention activities.
- Coordinate with medical and social service providers on HIV outbreak response messaging for community members to ensure key partners are communicating similar messages.
- Using the FY21 PS19-1901 supplemental CDC DIS workforce development funding, increase staffing for partner services by increasing the number of DIS, DIS supervisor, field operations manager, and data analyst positions.
- Expand the use of non-traditional field outreach approaches to locate and interview people with HIV and partners and intensify efforts to link people with HIV and partners to HIV care and other services, focusing on direct linkage rather than passive referral.
- Build relationships between partner services staff and community organizations serving persons who are housing and food insecure, mental health care agencies, and SUD treatment services to assist in locating individuals for partner services, linkage to care and STD treatment.
- Use existing public health data sources (e.g., Medicaid or syndromic surveillance data) to better characterize the size of the PWID community in Kanawha County (to understand the population at risk), care use patterns, and costs of care to inform future resource planning.
- Develop and implement an outbreak response coordination structure with clear roles, responsibilities, and communication with key staff inside and outside the health department. Establish data-driven response objectives and targets and monitor progress towards achieving them.
- Establish or strengthen ongoing collaboration among programs in DHHR which support services for PWID in West Virginia, including but not limited to the Bureau for Behavioral Health, Viral Hepatitis, and the WV BPH HIV/STD program. Identify new or existing opportunities to collaborate in providing services and supporting response activities among programs in DHHR and among external organizations, such as community-based organizations.

Clinical Settings

- Partner with hospitals to develop protocols to routinely screen all patients with SUD for HIV and hepatitis C across all health care settings, and especially in emergency department and inpatient settings. Testing for hepatitis B is also recommended for PWID and for all persons before offering PrEP.[19, 20] Patients who test positive for HIV, or current hepatitis B or hepatitis C infection should be assessed for treatment, and when OUD is identified, they should be offered MOUD and prescribed naloxone (or provided a referral to a prescribing clinician).
- Promote training of healthcare professionals on compassionate treatment of PWID, MOUD and other SUD treatment strategies, harm reduction principles (including safe injection and administration and utility of naloxone), HIV and SUD stigma reduction, and the HIV outbreak.

- Increase clinician awareness and comfort prescribing PrEP and patient awareness of PrEP, expand screening in health care settings to identify PWID with an indication for PrEP, and diversify venues that offer PrEP, including mobile PrEP.[21]
- Consider implementing a same-day linkage to HIV care and ART model, which has been shown to increase ART uptake, decrease time to linkage to care, and improve viral suppression.[13, 14, 22]
- Increase ordering of HIV drug resistance testing for individuals at entry to care. This allows for selection of appropriate treatment regimens, and the reporting of the HIV sequences generated by this testing improves assessment of rapidity of transmission and the extent of this outbreak.
- In the emergency department and inpatient settings when identifying that a patient has SUD, clinicians should routinely assess for opioid withdrawal symptoms and consider treating with opioid medications (e.g., methadone or buprenorphine) and/or adjunctive medications based upon the severity of withdrawal.[23] Where an addiction medicine consult service is available, clinicians should engage this additional resource to support patient care.
- To address individuals leaving care against medical advice, integrate compassionate treatment for SUD (including evaluation for and treatment of acute withdrawal) and related complications into all settings serving PWID. Acute care facilities that have developed patient-centered inpatient addiction treatment report increased provider satisfaction.[24]
- Health care systems may consider establishing a team staffed by a social worker, peer recovery coach, and/or nurse that can engage PWID during emergency department and inpatient visits to address personal needs (e.g., food, clothing, housing), ensure that appropriate screenings (e.g., HIV and hepatitis C) are performed, coordinate with outpatient clinicians to ensure that PrEP or ART are addressed, mental health and SUD-related needs are met, and that there is a plan to support linkage to or re-engagement in care at discharge.
- HIV clinics should integrate evidence-based pharmacotherapy for SUD, including MOUD, as part of comprehensive HIV care services.[13]
- The high frequency of acute care visits before HIV diagnosis suggest that routine preventive health care services are not effectively reaching PWID. Health care organizations should consider strategies to reduce barriers to care including mobile health services or street medicine teams, increased availability of walk-in services, evening hours, and expanded partnerships with social service organizations that serve PWID.

Correctional Settings

- Implement opt-out rapid HIV and HCV testing during intake to correctional settings.[9, 25]
- Increase provision of MOUD for people who are incarcerated or detained who were previously on MOUD or who want to initiate MOUD.
- Improve linkage to comprehensive health and social services, including MOUD, housing services, and provision of naloxone and fentanyl test strips, upon release from correctional settings.
- Establish collaborations between HIV care facilities and correctional facilities to establish a plan of action to ensure care for individuals with HIV once they are released from correctional settings.

Social Services and Other Settings

- Offer spaces for PWID to access drop-in services.
- Establish crisis stabilization units or places to serve as waiting areas while persons are being linked to SUD treatment or mental health services.
- Provide medication storage and consider innovative approaches for convenient, frequent delivery of medications through case managers or outreach workers.[26]
- Expand access to low-barrier housing services and increase the number of case managers to support linkage to and maintenance of housing services.

Public Safety

- Work with public safety groups to develop and implement training of law enforcement and other public safety personnel on compassionate treatment of PWID, MOUD, harm reduction, and the HIV outbreak.

- Consider law enforcement diversion programs to link people to SUD treatment or mental health services during encounters instead of focusing on arrest or incarceration.

4. What still needs to be done?

- CDC will participate in discussions with public health and community partners to communicate findings and recommendations and contribute to the design and implementation of new or improved HIV outbreak response activities, as requested by the WV BPH and KCHD.
- The local and state health departments and CDC will continue to collaborate in qualitative and quantitative data analyses to explore specific risk factors, HIV transmission, and care use. Preliminary analyses have been conducted and additional data cleaning and analyses are planned, including an updated analysis of partner services data.
- Lessons from this outbreak response will be disseminated through public health reports, peer-reviewed journal manuscripts, and public health conference presentations.
- CDC is available to continue to provide technical assistance and ongoing support for the implementation of the recommendations provided in this report.

5. What are the impacts of this investigation thus far? *(Please check all that apply. Additional space is provided below.)*

☒The investigation led to a better understanding of the public health problem

☒The investigation led to improved public health surveillance for either the ongoing response efforts or for future activities

☒The investigation identified an existing gap in a facility or system where a specific targeted intervention might be utilized to prevent further morbidity

☒The findings of the investigation were used to guide policy or other broad public health action to prevent future morbidity

☒Lessons learned from the investigation led to methodologic improvements that might be applied to future studies

☒The investigation team and its preliminary findings helped to increase public awareness of the public health problem either locally or nationally

☐The impacts are unknown at the time of this report

Please use this space to describe any additional impacts not listed above or to provide further details on the investigation's impacts.

How will you continue to track impacts?

☒We will continue to work with internal or external partners to track impacts

☐Future surveys or studies are planned to assess the impacts of the investigation

Please use this space to describe any additional ways the Epi-Aid team will track impacts.

6. Please list the primary state and CDC contact(s) for this investigation in case follow-up is needed. The state contact listed should be the primary person who interacted with the Epi-Aid Team in the field. If multiple contacts are listed, please list the primary contact first.

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This report summarizes the field component of our investigation. Because of the preliminary nature of this report, it is possible that future correspondence or reports might present results, interpretations, and recommendations that differ from those contained in this document.

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