Leveraging a Data to Care Approach to Cure Hepatitis C among People with HIV

IMPLEMENTATION MANUAL

January 2024

SUPPORTED BY GRANT NUMBER: HRSA-20-077 AND CONTRACT NUMBER: 75R60220F34002

HRSA Health Resources & Services Administration

Yale SCHOOL OF MEDICINE

MISSION ANALYTICS GROUP, INC.

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This project is supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) under grant HRSA-20-077 and contract 75R60220F34002. The project is part of an award totaling $2,867,535.29 with 0% percentage of funds financed with non-governmental sources. The contents are those of the author(s) and do not necessarily represent the official views of nor an endorsement by HRSA, HHS, or the U.S. Government. For more information, please visit HRSA.gov.

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BACKGROUND

BACKGROUND

Approximately 21% of people with HIV in the United States are coinfected with hepatitis C virus (HCV).[1] Among people with HIV who inject drugs, the prevalence of HCV coinfection is as high as three in four people.[2] Coinfection with HIV and HCV dramatically increases the risk for serious liver complications and decreases life expectancy, even among people on antiretroviral therapy (ART).[2]

The introduction of direct-acting antivirals (DAAs) in 2011 radically altered the treatment landscape for HCV. Instead of weekly, poorly tolerated interferon injections, which are often prone to failure, current treatment consists of 8–12 weeks of short-course DAAs, which have cure rates of greater than 95%.[3]

Despite these treatment advances, recent data from the Centers for Disease Control and Prevention (CDC) show that among all individuals with HCV, only one-third had evidence of viral clearance.[4] This outcome is far below the goal articulated by the Viral Hepatitis National Strategic Plan: viral clearance (or SVR) of greater than 80% by 2030.[5] Actual rates remain suboptimal in part due to poverty, substance use, stigma, and a lack of consensus regarding screening and treatment.[6,7]

Coinfected individuals should be prioritized for treatment due to their increased risk of negative health outcomes from both conditions. Micro-elimination (i.e., curing coinfected individuals of HCV) involves addressing multiple barriers that exist at the individual, clinic, and system levels.[8] Strategies include the following:

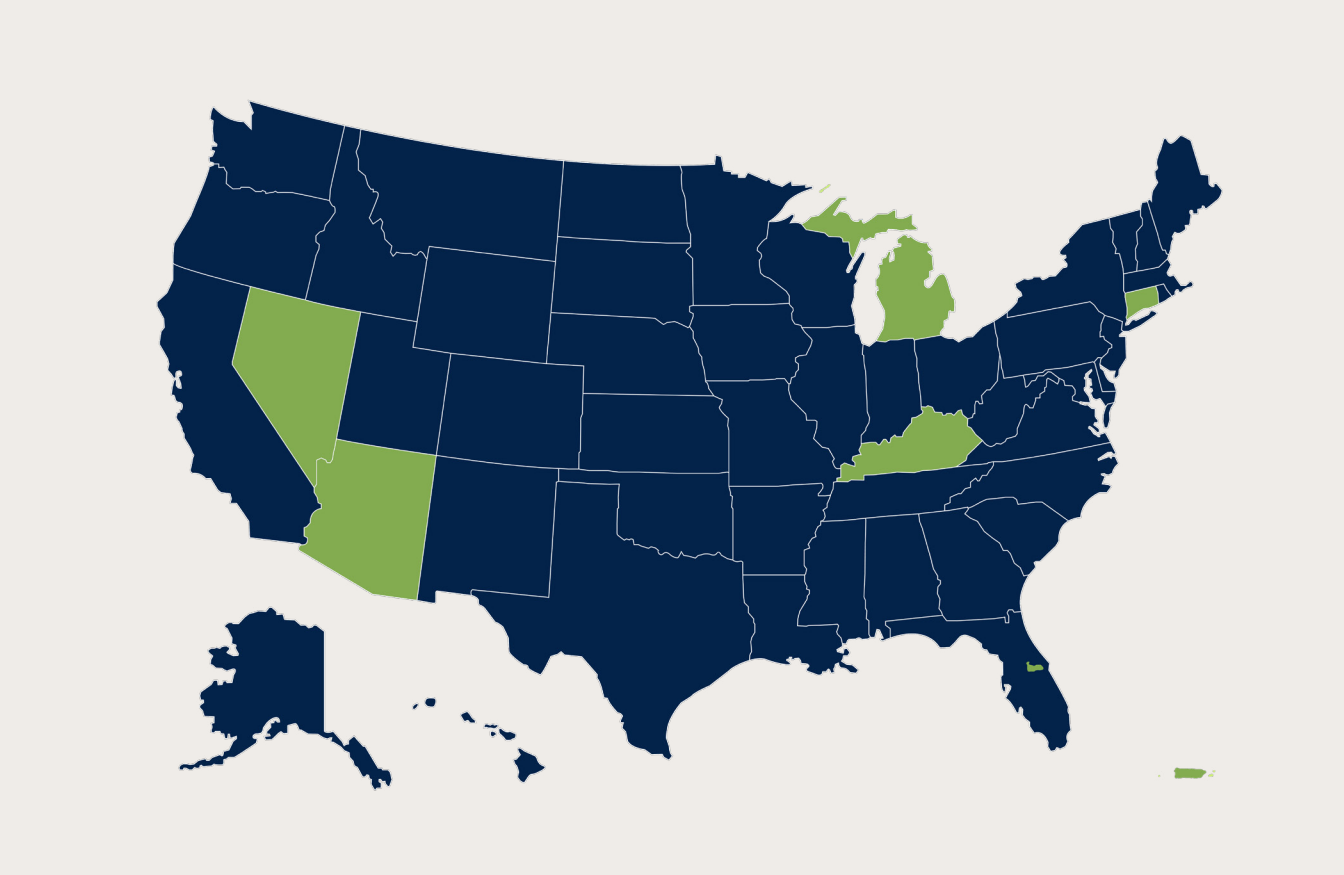
- Removal of Medicaid treatment restrictions, including prior authorization as well as prescriber, fibrosis score, and sobriety requirements.
- Enhanced HCV laboratory reporting requirements that include the reporting of negative PCR results.
- Inclusion of HCV medications on AIDS Drug Assistance Program (ADAP) formularies, particularly in states with limited Medicaid access to treatment.
- State and federal funding specifically on HCV surveillance and micro-elimination activities.
- Adequate number of providers trained in treating HCV.
- Access to treatment regardless of substance use or HIV medication adherence issues.
- Linkage to HCV care, including support and behavioral health services that promote treatment adherence.

For people coinfected with HIV and HCV, Ryan White HIV/AIDS Program (RWHAP) recipients and providers are especially well situated to advance the HCV elimination goal. Many have robust processes for testing, linkage to care, and comprehensively addressing treatment and adherence barriers through multi-disciplinary teams.

The Health Resources and Services Administration HIV/AIDS Bureau (HRSA HAB) has funded multiple projects to support micro-elimination. Most recently, in September 2020, HRSA HAB funded a Special Projects of National Significance (SPNS) cooperative agreement, *Leveraging a Data to Care (D2C) Approach to Cure Hepatitis C Virus (HVC) within the RWHAP.* The purpose of the project was to improve "processes for data sharing and exchange [that would] allow people with HIV and HCV and in need of HCV treatment to be identified, linked, and retained in care."[9] This approach adapts the D2C paradigm, which was originally developed to promote collaboration between public health departments and individual clinics to improve the HIV care continuum by informing strategies for HCV care.[10]

The Yale University School of Medicine was awarded the HCV D2C cooperative agreement to serve as the Technical Assistance Provider (TAP). Yale worked with health departments in seven jurisdictions: Arizona, Connecticut, Kentucky, Michigan, Orange County Florida, Puerto Rico, and the Southern Nevada Health District (SNHD).

FIGURE 1
JURISDICTIONS PARTICIPATING IN THE HCV D2C PROJECT



Jurisdictions first created HCV clearance cascades for coinfected individuals based on HIV surveillance, HCV surveillance, and RWHAP data. They then partnered with one or more RWHAP clinics to develop clinic-based HCV coinfection lists and support outreach and linkage activities. Mission Analytics Group, Inc., in partnership with Isenberg Consulting, was contracted to evaluate the project.

Jurisdictions and their partner clinics used different approaches to implement project activities based on their previous experience, data management infrastructure, ability to share data, and staffing resources. This implementation manual summarizes these approaches, points to lessons learned and best practices for supporting the replication of efforts, and lists key resources for health department jurisdictions to start implementation. It can be a useful resource for jurisdiction and clinic staff interested in HCV D2C, including program managers, epidemiologists, disease intervention specialists (DIS), continuous quality improvement (CQI) staff, and direct services providers, such as clinicians and case managers. They can use this implementation manual as a menu of options, implementing all or only some aspects of HCV D2C.

The first two sections of this manual correspond to an HCV D2C project component: calculating the jurisdiction-wide HCV clearance cascade (Section 1) and developing a clinic-based HCV coinfection list to inform outreach and linkage activities (Section 2). The manual does not provide extensive technical guidance; instead, Section 3 links to available resources to support technical activities. The final section of the manual (Section 4) is a project checklist to help jurisdictions get started.

01 CREATING THE JURISDICTION-WIDE HCV CO-INFECTION CLEARANCE CASCADE

The HCV coinfection clearance cascade is a tool to help jurisdictions visualize diagnosis and treatment milestones and identify gaps in care. It tracks the movement of people with HIV/HCV coinfection from initial HCV infection to cure (and potential reinfection). By regularly calculating the HCV coinfection clearance cascade, jurisdictions can monitor the outcomes of micro-elimination efforts that aim to increase testing, linkage to care, and cure. As part of the HCV D2C project, jurisdictions completed several activities to create HCV coinfection clearance cascades. This section first introduces clearance cascade concepts and then describes these activities and related lessons learned.

A. UNDERSTANDING THE HCV COINFECTION CLEARANCE CASCADE

There are many ways to create an HCV clearance cascade, depending on the available sources of data (e.g., clinic data, surveillance data) and the target population being characterized. The CDC developed a standardized laboratory-based HCV mono-infection clearance cascade, which served as basis for this project.[4,11] The cascade is easily adapted to use for HIV/HCV coinfection. The published guidance requires that jurisdictions have a longitudinal HCV surveillance database that is capable of housing, extracting, and deduplicating all HCV laboratory tests (type of test, result, date) reported. Documentation of HCV negative PCR tests is essential.

The cascade consists of five steps, which are described below:

STEPS 01: Ever Infected

Ever infected includes anyone living in the jurisdiction with a positive HCV test (antibody, RNA, genotype, or antigen test) during a base period. Therefore, the base period reflects people ever infected and living with HCV as of a specific date (e.g., December 31, 2019).

STEPS 02: Viral Testing

Viral testing includes anyone in the ever-infected group who had an HCV viral test regardless of result (RNA, genotype, or antigen test) during a follow-up period. The follow-up period begins at the start of the base period and extends one year beyond the base period in Step 1 **(Figure 2).**

STEPS 03: Initial Infection

Initial infection includes people whose first HCV viral test performed in the follow-up period is antibody positive/PCR detectable. This step excludes people who had spontaneously cleared or had been cured prior to the base period.

STEPS 04: Cured or Cleared

Cured or cleared includes people with initial infection who have a subsequent undetectable HCV viral test during the follow-up period.

STEPS 05: Persistent Infection or Reinfection

Persistent infection or reinfection includes people who had been cured or cleared in Step 4 and have a subsequent detectable HCV viral test following an undetectable HCV viral test, indicating persistent infection or reinfection.

FIGURE 2:
HCV CLEARANCE CASCADE TIME PERIODS

For example, the base period may include people who ever had HCV as of December 31, 2019; the follow-up period would include the same cohort with labs through December 31, 2020.

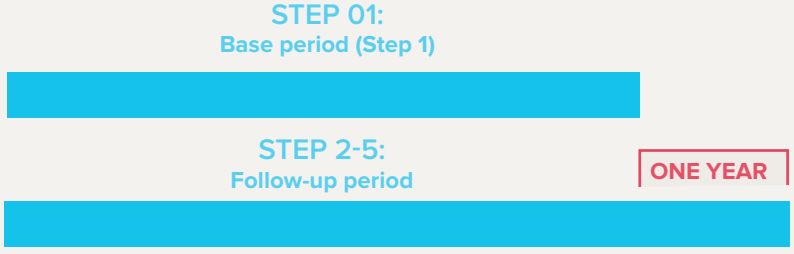
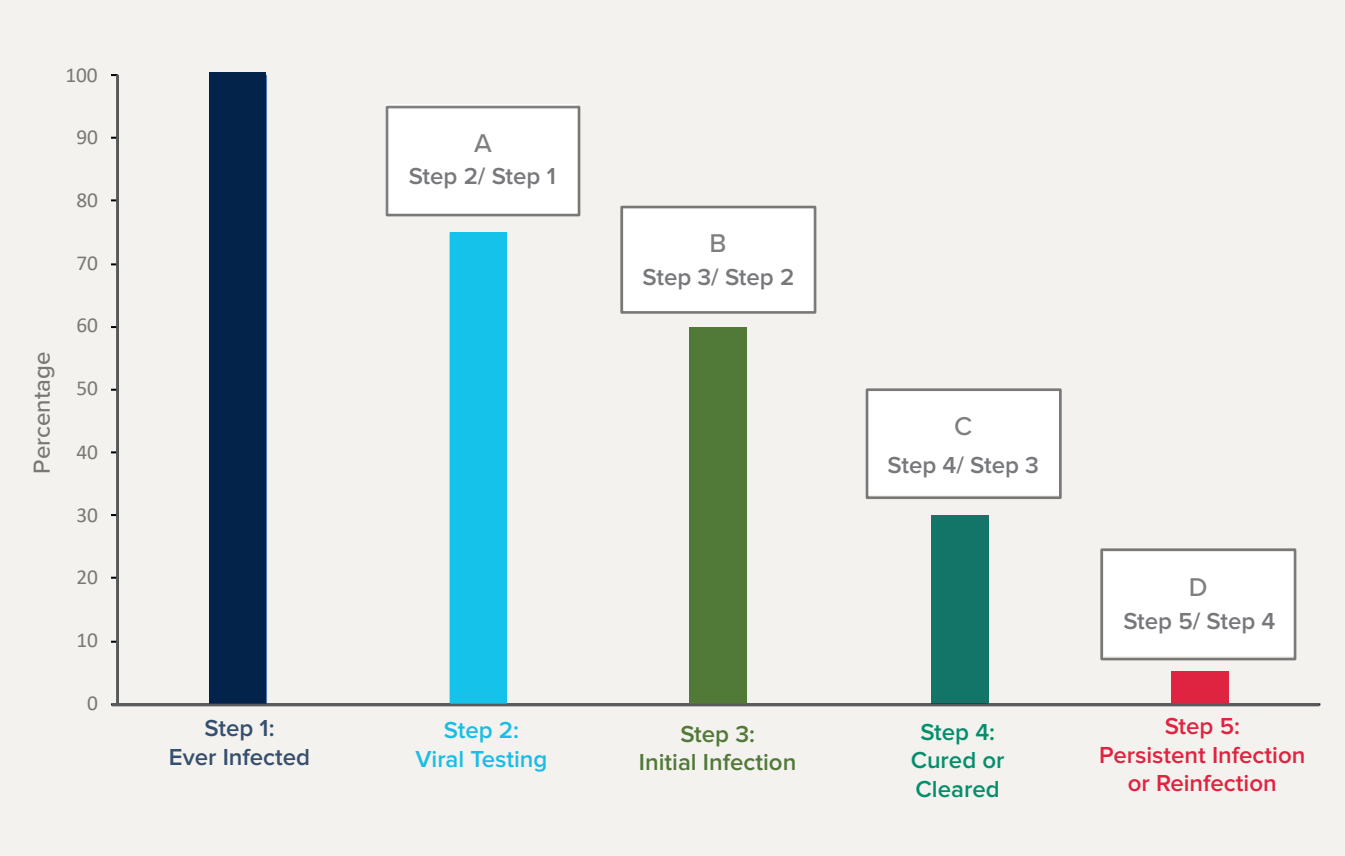


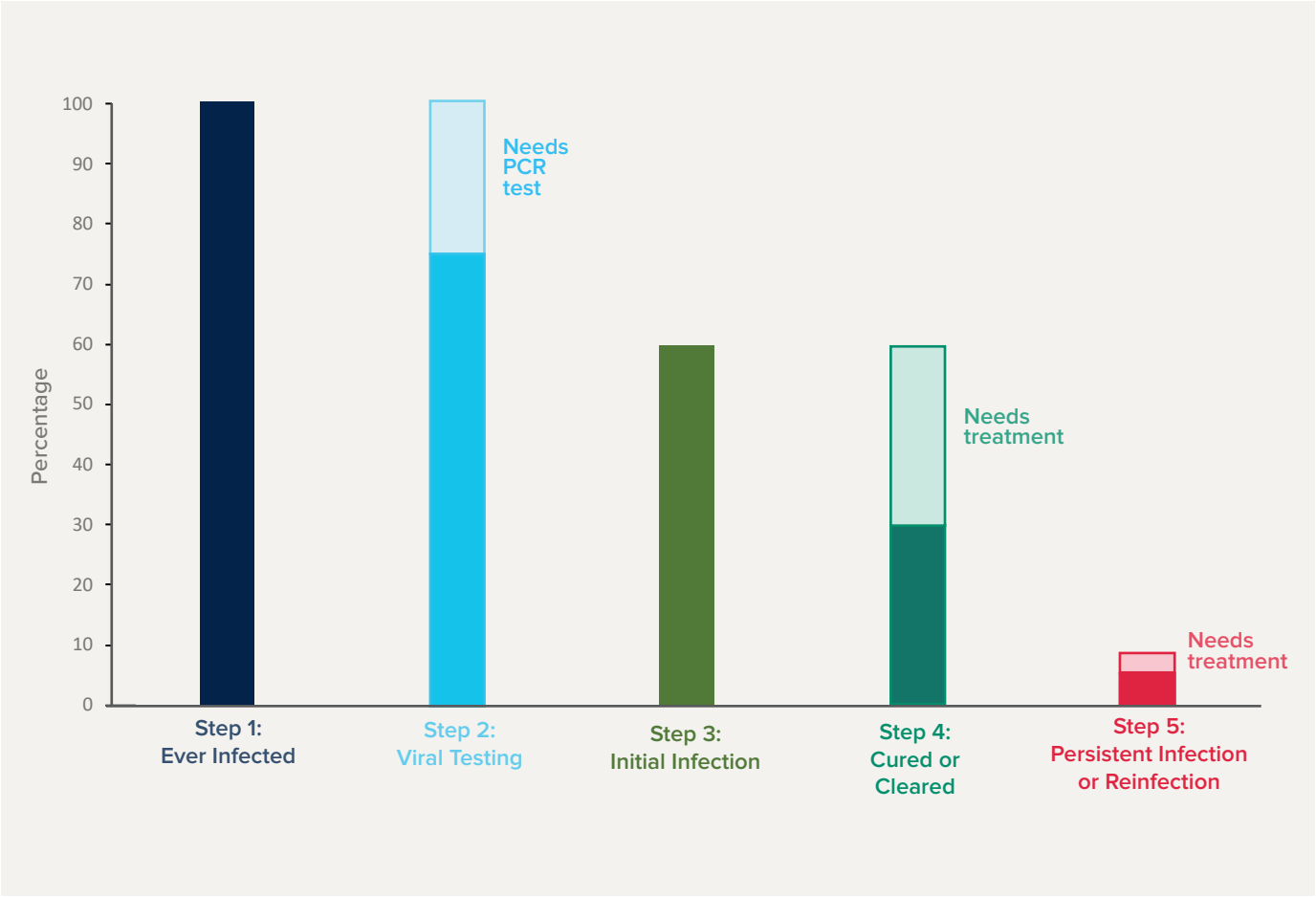
FIGURE 3:
CDC HCV CLEARANCE CASCADE



Source: Montgomery, Sizemore, Wingate, et al. Development of a Standardized, Laboratory Result-Based Hepatitis C Virus Clearance Cascade for Public Health Jurisdictions. *Public Health Rep. May 4, 2023*

This HCV coinfected clearance cascade points to opportunities for intervention, enabling people to receive the care they need. The lighter boxes in Figure 4 highlight these opportunities. The first box identifies individuals who received a positive antibody test but no follow-up PCR test. These individuals should receive a PCR test to confirm their HCV status. The second red box identifies individuals with confirmed HCV who were not treated, meaning there was no undetectable PCR reported after the initial detectable PCR. These individuals need to be connected to HCV treatment so they can be cured of HCV. The final red box identifies people who have been reinfected with HCV and need to be retreated.

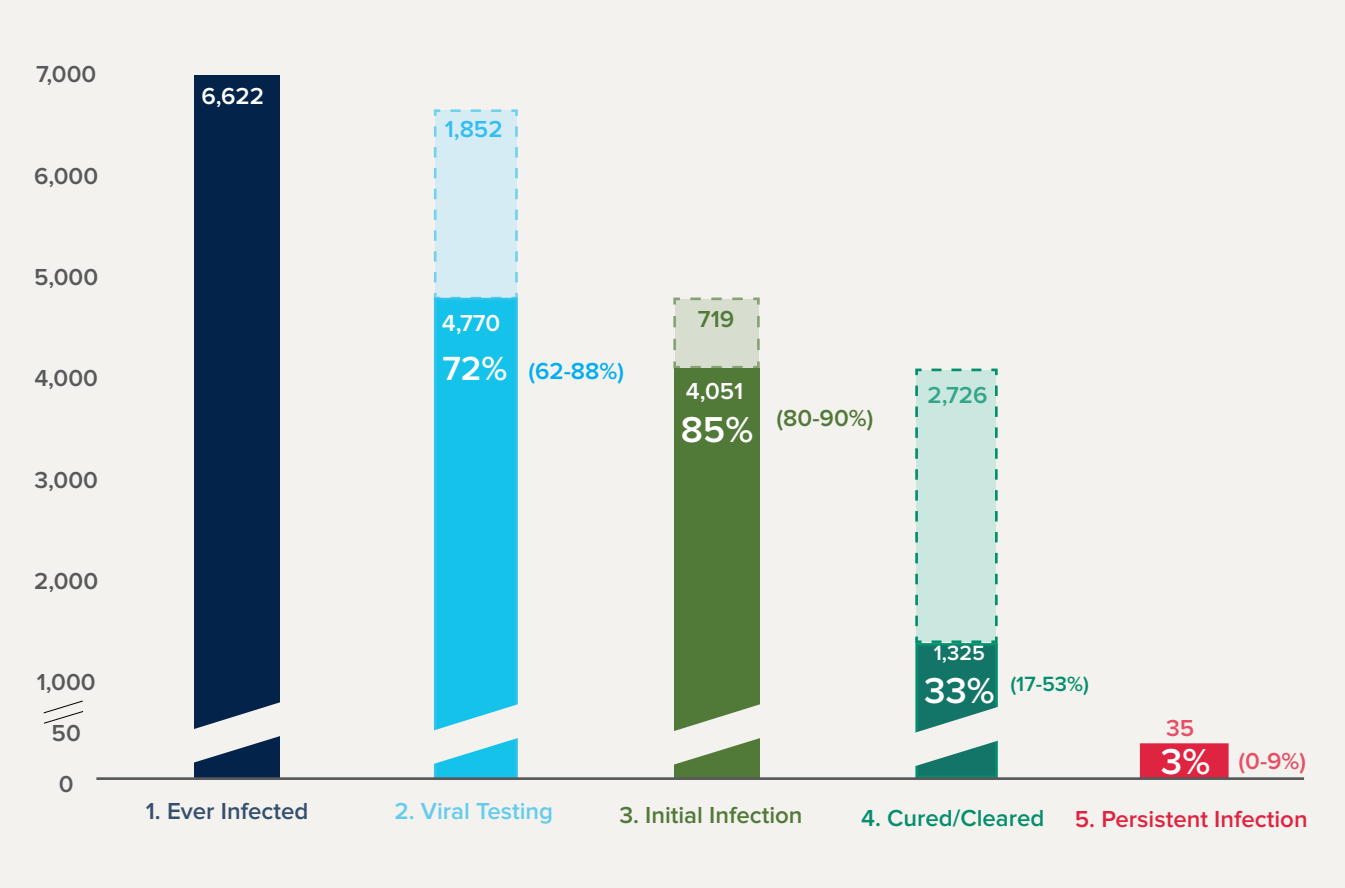
FIGURE 4:
IDENTIFYING OPPORTUNITIES FOR INTERVENTION THROUGH THE CDC HCV CLEARANCE CASCADE



Under the HCV D2C project, jurisdictions calculated HCV clearance cascades for their total populations coinfected with HIV and HCV in addition to the subset of people receiving services through the RWHAP. The cohorts included people diagnosed with HIV and HCV and alive as of December 31, 2019. Most participating jurisdictions submitted a baseline HCV clearance cascade (with lab values through December 31, 2019) and quarterly updates to Yale, gradually updating data with lab values through December 31, 2021.

Across participating jurisdictions, over 6,600 individuals were identified as living with HIV and HCV as of December 31, 2019 (Figure 5). Based on surveillance lab data, 72% received follow-up viral PCR testing, leaving a gap of 1,852 individuals who needed a follow-up PCR test. Of those with initial infection (n=4,051), 33% were cured/cleared, while 2,726 were not treated or had no documentation of clearance. The percentage of individuals cured varied across jurisdictions, from 17% to 53%.

FIGURE 5
HCV CLEARANCE CASCADE FOR HIV/HCV COINFECTED PERSONS (STATUS AS OF 12/31/2019)

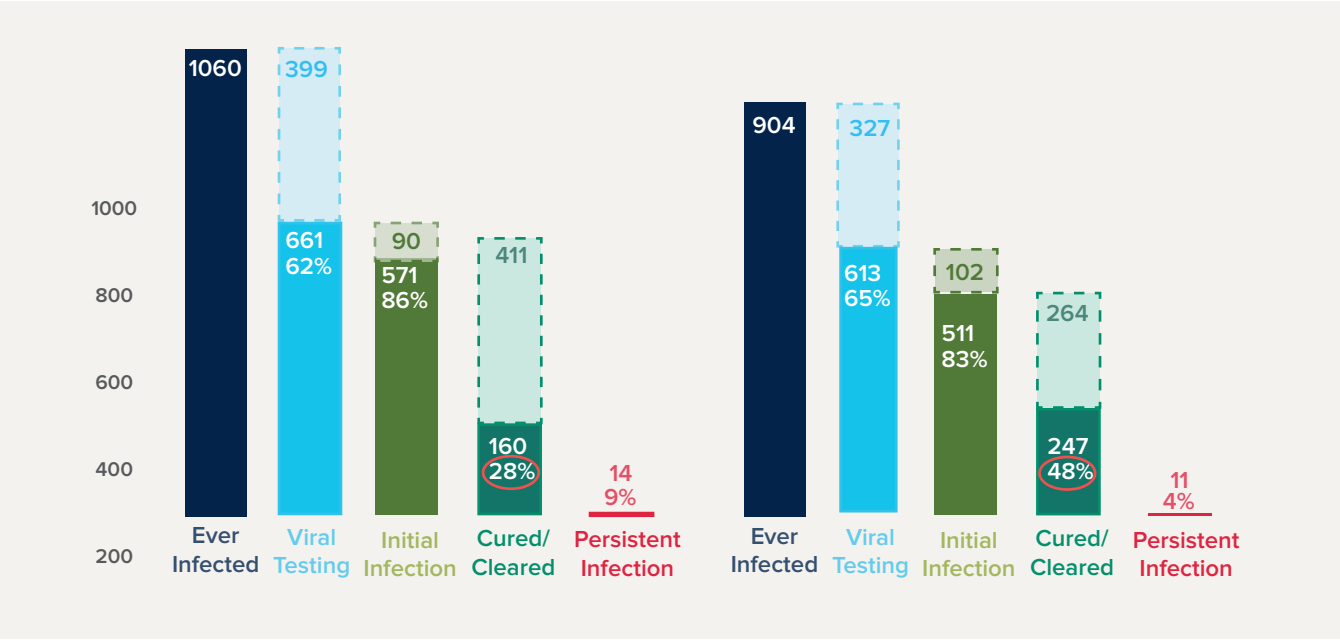


Notes: Cohort defined as persons with HIV/HCV coinfection as of data up to December 31, 2019; data sources primarily included HIV and HCV surveillance data; CAREWare data was used by one jurisdiction

Comparison of the HCV clearance cascade from baseline to subsequent time frames enables visualization of ongoing gaps that need to be addressed or outcomes of elimination efforts.[a] For example, as shown in Figure 6, in Michigan, the percentage of individuals identified as cleared increased from 28% at baseline (labs through December 31, 2019) to 48% in the fourth quarter of data submitted (labs through December 31, 2021). This increase is primarily due to jurisdiction efforts to increase HCV surveillance data completeness, especially negative lab results, and other area efforts, such as improving Medicaid access to HCV treatment.

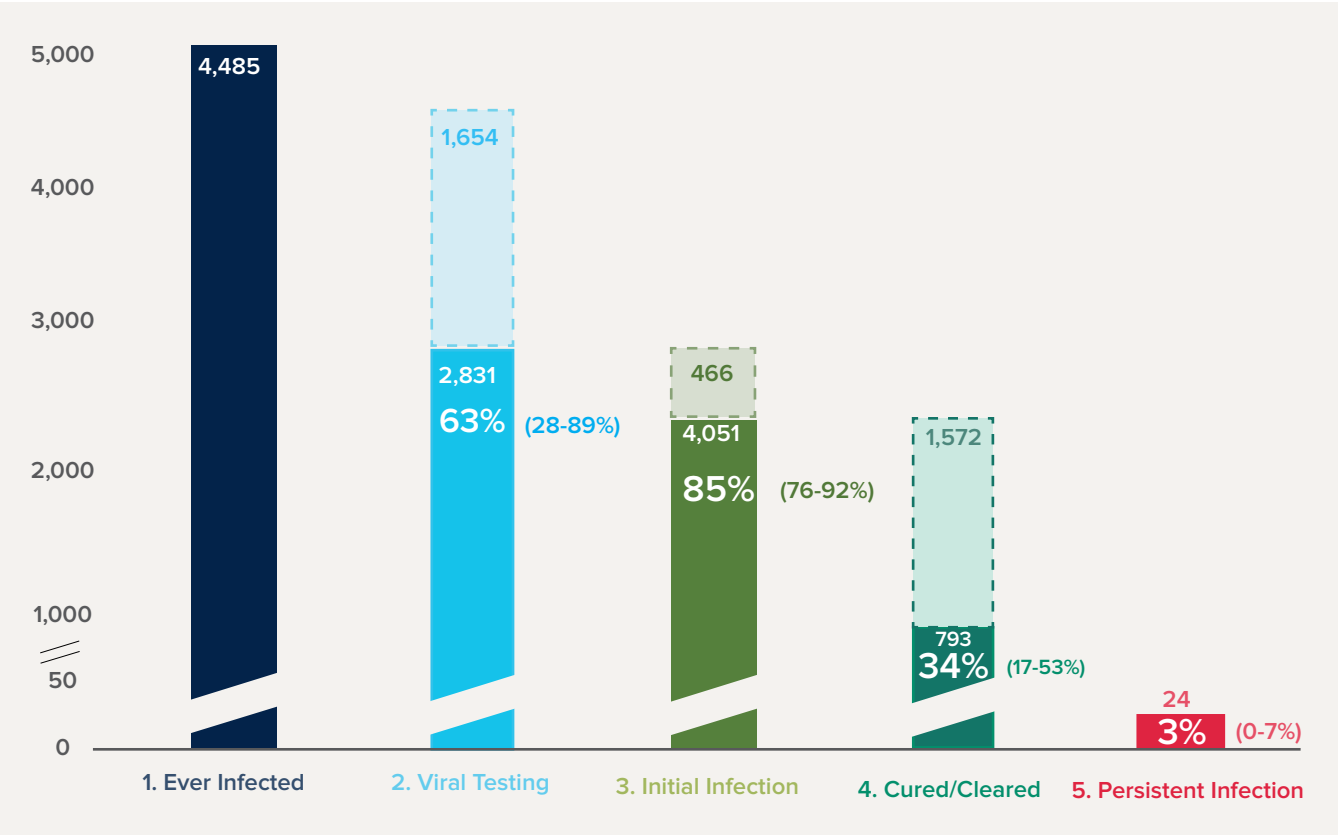
[a] Subsequent timeframes remove individuals who died or moved out of the jurisdiction since baseline.

FIGURE 6:
HCV CLEARANCE CASCADE, COMPARING BASELINE AND QUARTER FOUR, MICHIGAN



Jurisdictions also calculated HCV clearance cascades for their RWHAP populations. These clearance cascades showed similar trends to the jurisdiction cascades but are specific to the RWHAP population (Figure 7).

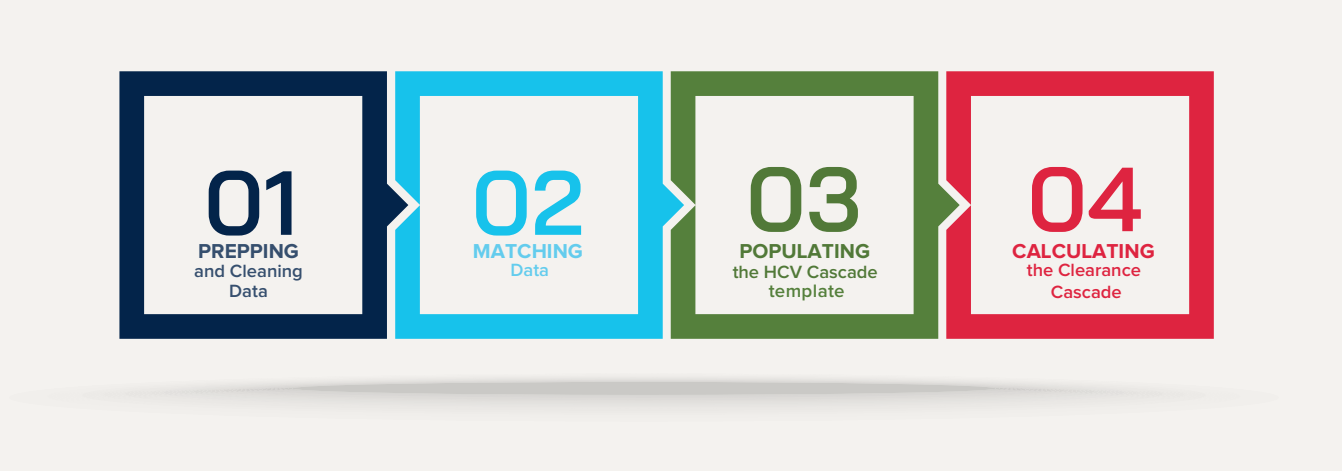
FIGURE 7:
HCV CLEARANCE CASCADE FOR HIV/HCV COINFECTED PERSONS WITHIN RWHAP POPULATIONS (STATUS AS OF 12/31/2019)



B. KEY IMPLEMENTATION STEPS TO CALCULATE THE HCV COINFECTION CLEARANCE CASCADE

Since the HCV D2C project focused on individuals coinfected with HIV and HCV, additional steps were necessary to create HCV clearance cascades for both the jurisdiction and RWHAP populations. Jurisdictions cleaned and matched their HIV and HCV surveillance datasets to create lists of coinfected clients and then populated an Excel template with the coinfected clients' HCV testing statuses. These activities are reflected in Figure 8 and described in greater detail below to help other jurisdictions replicate this work.

FIGURE 8:
STEPS TO CALCULATING THE HCV CLEARANCE CASCADE



Prepping and Cleaning Data

HIV surveillance programs commonly have well-established data management infrastructure and regularly engage in activities that ensure both complete and accurate data. However, these features are less established for HCV surveillance programs. Therefore, the first step is to ensure that data in both the HIV and HCV surveillance databases are as clean and complete as possible through the following activities:

- Remove duplicates, so all cases are **unique.**
- Ensure that data are **complete**, especially the data elements used for matching HIV and HCV surveillance data (e.g., first name, last name, date of birth, and sex at birth).
- Add all lab values to ensure that the clearance cascade **accurately reflects the jurisdiction's treatment needs**. This may require the jurisdiction to input a backlog of paper lab results. Lab values should include positive PCR results for cases added in 2016 or later and signal cutoff ratio prior to 2016 as well as negative PCR results.
- **Reformat** lab values, so they can be correctly interpreted.
- Include data elements for whether a client is **deceased** or lives **outside of the jurisdiction**. While HIV surveillance programs commonly determine clients' vital statuses and most recently known addresses, HCV surveillance programs typically do not. If needed, HIV surveillance data can be leveraged to include this information for coinfected clients.

Matching Data

Once HIV and HCV surveillance data are cleaned, jurisdictions then match the two databases to create a list of individuals coinfected with HIV and HCV. Key activities in matching data include the following:

- **Identify the minimum matching variables from the HIV and HCV databases:** Variables that remain constant throughout a person's life, such as first name, last name, date of birth, sex at birth, and Social Security Number (if available), are most effective. To make the matching approach easier, the format of the matching data elements should be consistent across the HIV and HCV surveillance datasets.
- **Standardize coding for missing and unknown variables across HIV and HCV surveillance databases:** If there is only a standard for HIV surveillance data, it can be applied to the HCV surveillance data (e.g., replacing missing values with NA).
- **Match HIV and HCV surveillance data:** The jurisdiction can use an existing approach for matching data. However, if a method is not already available, the jurisdiction needs to determine whether to use deterministic or probabilistic matching. Deterministic matching looks for an exact match between records, while probabilistic matching assesses the degree of similarity across records, typically by assigning a similarity score. Probabilistic matching is more complex than deterministic matching but also more forgiving of data entry errors or missing data. Under the HCV D2C project, jurisdictions without any matching experience used Match*Pro, an application that uses probabilistic record linkage to identify the same person across data sources.
- **Create the matched dataset:** The matched dataset includes the variables needed for developing the clearance cascade along with the matching variables and demographic information. The HIV and HCV surveillance client identifiers should also be included to facilitate data updates over time.
- **Match combined HIV and HCV surveillance dataset to RWHAP data:** Using the same process, jurisdictions can match these individuals to RWHAP data, creating a new data variable that indicates that an individual is an RWHAP client.

Populating Excel Templates and Creating the HCV Clearance Cascades

With these matched datasets, jurisdictions then populate jurisdictional and RWHAP Excel templates, which automatically generate the HCV clearance cascade through embedded formulas. Populating these Excel templates requires programming code (e.g., SAS, SPSS, R) that creates the desired output. The templates can be downloaded here. The steps include the following:

- **Define base period (i.e., cohort) and follow-up period:** Jurisdictions first select the base period of the analysis, typically taking into consideration known reporting delays. For HIV surveillance, jurisdictions often establish timelines for when they consider a prior calendar's year data to be "complete enough" to be distributed. For example, data for people diagnosed and living with HIV as of December 31, 2021, may be considered ready for release by August 31, 2022. Once the cohort is defined, jurisdictions then establish a follow-up period to evaluate changes in outcomes.
- **Assign individuals dispositions based on HCV labs:** Jurisdictions assign each individual in the matched dataset an HCV disposition, considering all HCV labs within the timeframe of the data being reviewed. Jurisdictions can create a new variable to document the disposition. The companion text to the videos specifies the dispositions used in the HCV D2C project.
- **Select characteristics for subpopulation analyses:** Jurisdictions may want to calculate the clearance cascade for subpopulations to shed light on disparities. The template includes demographic characteristics (race, ethnicity, age, sex at birth, and current gender) and

clinical characteristics (HIV transmission type, HIV suppression status in the last 12 months, time since last HIV viral load, CD4, or HIV genotype, time since first available HCV+ lab result, and time since most recent HCV test). Jurisdictions may choose to leverage HIV surveillance data for this information or select a smaller subset of characteristics to reduce data analysis burden.

- **Populate Excel template:** Using programming code, the jurisdiction then calculates the number of individuals that fall into each cell (i.e., disposition by client characteristic). While the HCV clearance cascade removes individuals from the base period who died or moved out of jurisdiction in the follow-up period, the data for these individuals should still be populated in the template.
- **Review HCV clearance cascade:** Once the template is populated, an HCV clearance cascade is automatically generated based on formulas embedded in the spreadsheet. Longitudinal cascades can be generated based on subsequently selected timeframes.

C. JURISDICTIONAL APPROACHES

Calculating the HCV clearance cascade under the HCV D2C project involved close collaboration between HIV surveillance, HCV surveillance, and RWHAP programs within jurisdiction health departments. There were three distinct approaches used among the seven participating jurisdictions to complete the key steps to calculate an HCV clearance cascade.

KENTUCKY
MICHIGAN
ARIZONA
CONNETICUT

- HIV/HCV surveillance program collaboration
- one program completes match

In one approach, the state HIV and HCV surveillance programs worked together to complete the cascade steps (Arizona, Connecticut, Kentucky, and Michigan). The simplest case was Connecticut, which had one epidemiologist with access to and expertise in both HIV and HCV surveillance data. In the other three jurisdictions, both surveillance programs had a role in preparing data, with one program commonly taking the lead. Co-location reduced the need for data-sharing agreements (DSAs), but in at least one case, agency policy dictated which program could perform the matching (Kentucky). RWHAP data were commonly matched after the HIV and HCV matching was complete so that the RWHAP-specific template could be populated. The scope of available RWHAP data varied by jurisdiction (e.g., Part B only or cross-Part data).

The jurisdictions' experiences with data matching varied. Michigan and Connecticut had conducted routine matching of HCV and HIV surveillance data prior to the project, while Arizona had done some ad hoc matching of HCV and RWHAP data but had not yet implemented routine matching. Kentucky had not previously matched data, so additional staffing and time were needed.

ORANGE COUNTY (FL)
SOUTHERN NEVADA HEALTH DISTRICT (NV)

- County (non-state) lead
- state creates cascade/provides data

Two jurisdictions involved county agencies (Orange County, Florida, and SNHD, Nevada), which required more complex coordination and collaboration with the state. The county was the lead agency but relied on the state to complete the implementation steps (Orange County) or to provide data so that the health district could complete the implementation steps for the entire state (SNHD). In the latter case, additional data cleaning or merging was required at the local level to integrate the local HCV surveillance data with the rest of the state.

In Florida, because the state health department matched data and calculated both the county population and RWHAP cascades, the state RWHAP Part B CAREWare system was used instead of the RWHAP Part A system. SNHD used the state's Part B data but had to develop a DSA to gain access, resulting in project delays.

PUERTO RICO

- RWHAP data system primary data source
- HCV surveillance system under development

Puerto Rico did not have a well-developed HCV surveillance database, so its RWHAP data management system (CAREWare) was used as its data source for the RWHAP clearance cascade. Staff had to manually review HCV data in CAREWare to assign client dispositions, which was time intensive. There are ongoing efforts to create a robust HCV surveillance-based database, as this CAREWare workaround is inherently time consuming and has the potential for error.

D. LESSONS LEARNED

The ability of jurisdictions to complete the HCV clearance cascades was impacted by several key factors, including the quality of HCV surveillance data, level of program integration, matching experience, and resource availability. The lessons learned in implementation are outlined below.

HCV Surveillance Data Quality and Lab Reporting

For all jurisdictions, the HIV surveillance program had more established infrastructure as well as standard national data quality requirements (set by the CDC) in comparison to the HCV surveillance infrastructure. Most jurisdictions noted that the HCV surveillance program receives more labs than HIV surveillance, complicating data management. Despite the volume of lab reports, there were common gaps based on reporting requirements, such as whether negative PCRs had to be reported, the level of electronic versus paper lab reporting (for which there could be varied reporting requirements), and data completeness. The scope of lab reporting requirements and the extent of electronic lab reporting (ELR) had a large impact on clearance cascade results, so understanding this impact by **reviewing current reporting requirements is essential.**

Case investigation to obtain complete data for chronic HCV was not feasible in most cases due to lack of systems and resources. Jurisdictions noted the benefit of **leveraging HIV surveillance data** to improve HCV surveillance data quality.

Several jurisdictions noted that their lab reporting requirements did not include negative PCRs at all or limited negative PCRs to those that were part of reflex testing. Arizona noted that standalone **negative PCR tests** (i.e., PCRs tests that were not part of reflex testing) were not routinely reported, making it difficult to identify HCV cases or SVR statuses. In Arizona and SNHD, negative PCR results were not required, but they were sometimes included in ELR. Michigan enhanced lab reporting in 2019, adding negative PCRs as a requirement. One jurisdiction noted the need to **"unpackage labs"** when working with the data, as HCV labs may be ordered as part of a lab panel but otherwise would not be included in the HCV surveillance data.

Recommendations

Jurisdictions should review their current HIV and HCV reporting requirements at the start of project activities to understand how the data used may impact the clearance cascade. For example, if negative PCR results are not reported for all clients, the jurisdiction may not be able to actively measure clearance/cure.

Jurisdictions should also focus on efforts to enhance lab reporting, which may involve changing reporting statutes to include negative PCR results, expanding electronic lab reporting to improve data completeness, and ensuring that standalone PCR results are reported. Michigan added negative PCR results to required lab reporting in 2019 and noted that it had a large impact on the accuracy of its cascade.

Key questions the jurisdiction should ask include the following:

- Is it required to report both acute and chronic HCV cases?
- What is the reporting requirement in your jurisdiction for HCV labs regarding HCV antibody and PCR results?
- Is it required to report standalone PCR results?
- Is it required to report negative PCR results?
- Do labs in your jurisdiction have algorithms for reflex PCR testing in the event of positive antibody results?
- Are the reporting requirements the same for paper vs. electronic lab reporting? If not, how do they differ?
- What lab reports are incorporated into your HCV surveillance data?
- Do you have a backlog of paper lab results?
- To what extent is reflex testing implemented across providers?

Program Integration and Ongoing Collaboration

HCV D2C relies on strong collaboration across HIV surveillance, HCV surveillance, and RWHAP programs. In most of the seven jurisdictions, the HIV and HCV surveillance programs were or had historically been co-located in the same division. However, even with this co-location, the programs often operated separately. The RWHAP program was usually housed separately rather than co-located with the HIV and HCV surveillance programs, although there were exceptions (Michigan and Arizona). As a result, the data systems and data management were also separate. The ability of the jurisdictions to overcome these silos was affected by the following:

- **Existing Collaborative Efforts:** Jurisdictions that were already integrated or had existing collaborations encountered fewer barriers in calculating the HCV clearance cascades. Historical collaboration was most common between the RWHAP and HIV surveillance programs, with the relationship with HCV surveillance new or still under development.
- **HIV Surveillance, HCV Surveillance, and RWHAP Staff Engagement:** Jurisdictions, especially those with a limited history of collaboration, noted the importance of engaging staff from all relevant programs (HIV surveillance, HCV surveillance, RWHAP) at the beginning of the project and holding regular meetings for strategic planning and activity check-ins.
- **Data Sharing:** Although the programs commonly operated separate systems, most of the jurisdictions did not require DSAs to match HIV surveillance, HCV surveillance, and RWHAP data. Only two programs required a DSA to access internal data. Michigan routinely renewed an annual DSA that was not project specific, and Kentucky established an agreement because HIV surveillance data had not historically been shared with the HCV surveillance program.
- **Organizational Policies and Procedures:** In some cases, organizational policies and procedures impacted the approach to data sharing and analysis. For example, the organizational policy for one jurisdiction (Kentucky) dictated that HIV surveillance data could not be shared with any other internal programs, which meant that the HIV surveillance program had to conduct the match. Jurisdictions should review organizational policies and procedures on data-sharing requirements early in the project and engage a legal/privacy team if needed.
- **Data Integration:** Two jurisdictions had some level of HIV and HCV data integration. The Florida state health department included both a RWHAP identifier as well as HCV labs in its HIV surveillance data, which facilitated the ability to populate the jurisdiction and RWHAP cascade

templates. Puerto Rico also had both HIV and HCV data in CAREWare, enabling staff to complete the RWHAP clearance cascade even though the HCV surveillance data system had not yet been fully implemented. Michigan had integrated the HIV surveillance unique identifier (STATENO) into its CAREWare system.

- **Shared Data Analysis Staff:** The co-location of epidemiologists at SNHD in the same program and a single epidemiologist in Connecticut who managed both HIV and HCV surveillance databases facilitated the matching processes.

Matching History and Approach

Before the start of this project, three jurisdictions, Connecticut, Michigan, and Florida (which conducted the match for Orange County), had been routinely matching HIV and HCV surveillance data. Among the other four, one jurisdiction had matched data but not routinely (Arizona), and three did not have experience matching data between the two surveillance systems (Kentucky, SNHD, and Puerto Rico). Jurisdictions reported that **matching for the first time required additional resources.**

The SNHD identified two important lessons as a first-time data matcher. Staff noted the importance of allotting time to discuss specific match results to determine if clients were a match. They also suggested including a dataset identifier for both HIV and HCV surveillance data to reference the initial lists and update data over time.

The **scope of available RWHAP data** as well as the inclusion criteria can impact the match, so it is important to determine what RWHAP data are available. Arizona, Michigan, and Puerto Rico had cross-part systems, which meant that more clients could be matched than in RWHAP data management systems that were limited to one Part. Since the Florida state health department completed the match for Orange County, Florida, the agency used the RWHAP data system (for Part B and ADAP). Therefore, individuals funded by the Orange County, Florida, Part A program were not included.

Determining the **timeframe and inclusion criteria** for the RWHAP data also impacted the number of clients in the RWHAP matching. Most jurisdictions aligned with the timeframe for the HIV and HCV surveillance data and limited the clients to those who received a service. However, in Florida, the RWHAP data integrated into the HIV surveillance system reflected whether a client was ever entered into the RWHAP Part B/ADAP data system.

Staffing, Resources, and Sustainability

Most jurisdictions had limited staffing and resources for HCV surveillance, particularly in comparison to HIV surveillance. Jurisdictions new to data matching and sharing with HCV and HIV surveillance had a harder time meeting project requirements, underscoring the importance of **planning for more time and staffing resources** if a jurisdiction is new to matching or collaboration.

Several jurisdictions identified the importance of having an HCV champion to keep the process moving forward, particularly given competing priorities. Orange County, Florida, hired a new position solely for the project. While that person served as the **HCV champion**, project sustainability was impacted since the position was no longer funded at the conclusion of the project.

Leveraging existing resources, such as staffing, hardware, and software, was common across participating jurisdictions and can help offset funding limitations for new initiatives. Aligning approaches for HCV D2C activities with existing activities and resources are both important factors in ensuring project sustainability.

Documenting project activities and **developing formal protocols and policies** for HCV D2C was identified as beneficial not only to ensure project sustainability in anticipation of staffing changes but also to review project approaches and identify potential issues.

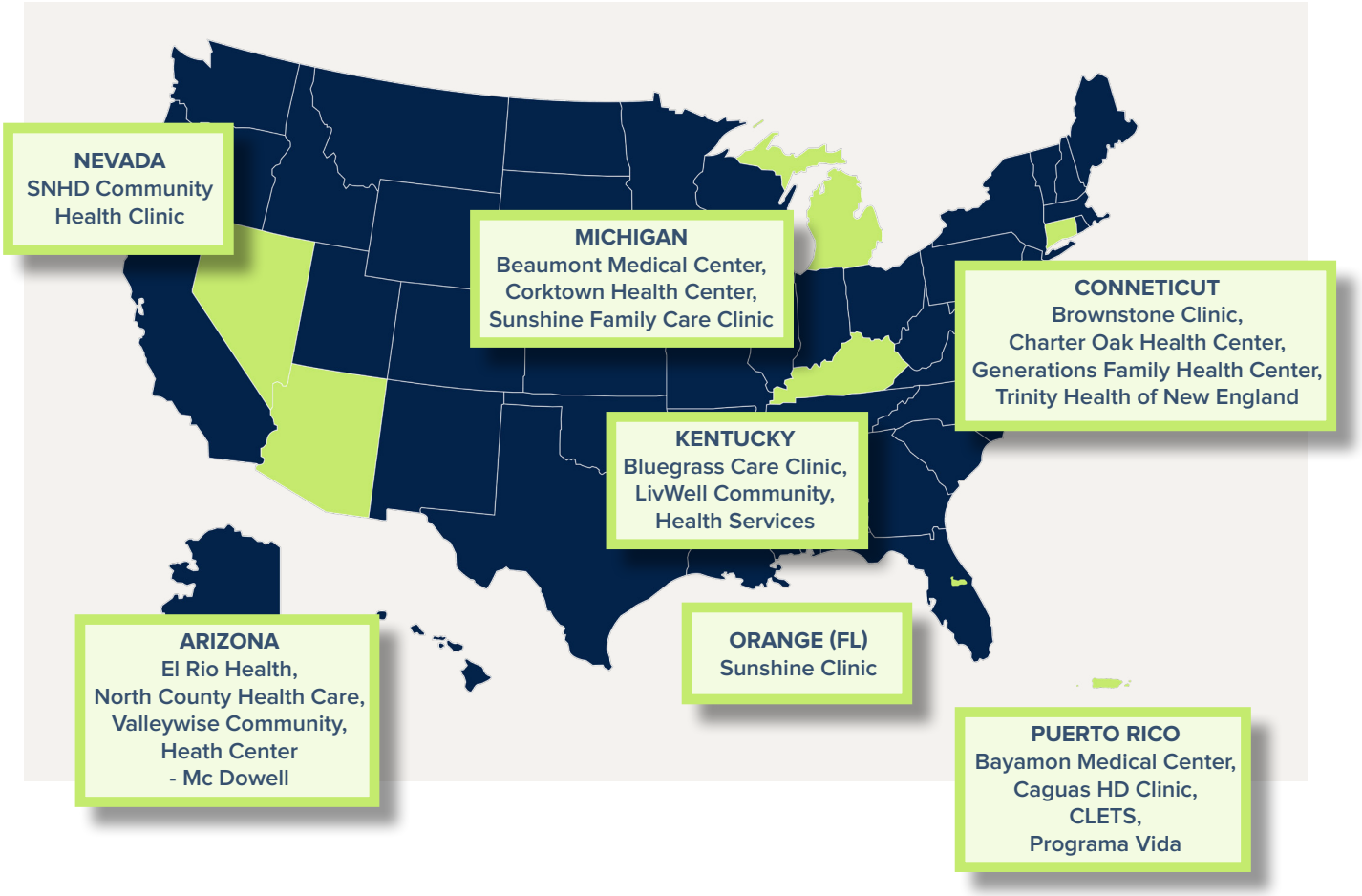
02 CLINIC-BASED OUTREACH AND LINKAGE TO CARE

To respond to the gaps highlighted in the HCV clearance cascades, jurisdictions partnered with RWHAP clinics and created opportunities to identify and reach out to clients who had not received HCV care. Jurisdictions and clinics used an Excel-based Case Conferencing Data Tool to track clinic-level outcomes. The purpose of the tool was twofold: to track client information and clinical outcomes and to generate a clinic-based treatment cascade to measure progress. This section first presents an overview of the case conferencing process implemented under the HCV D2C project, including the Case Conferencing Data Tool. It then provides steps and lessons learned to help other jurisdictions implement a similar process.

A. OVERVIEW OF THE CASE CONFERENCING PROCESS

Jurisdictions first dedicated considerable time and staff resources to recruiting RWHAP clinics to participate in the outreach and linkage phase of the project. A total of 18 clinics, all providing medical care, were successfully recruited (Figure 9).

FIGURE 9:
PARTICIPATING RWHAP CLINICS



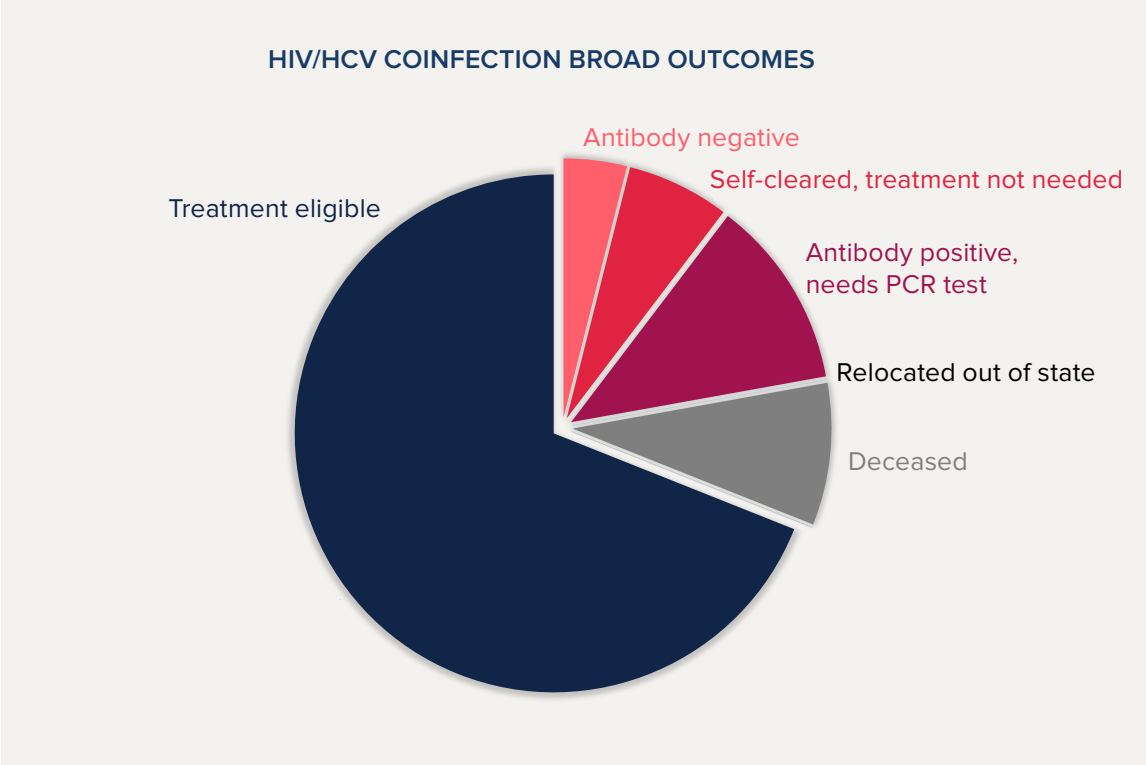
Jurisdictions and clinics then used surveillance and clinic-level data (e.g., from electronic health records) to create clinic-based coinfected lists. Some jurisdictions created lists of clients served by the clinic from their RWHAP data management systems and then matched those lists to HCV surveillance data. In other cases, clinics sent client lists to the jurisdiction for surveillance data matching. The list results were populated in the clinic Case Conferencing Data Tool.

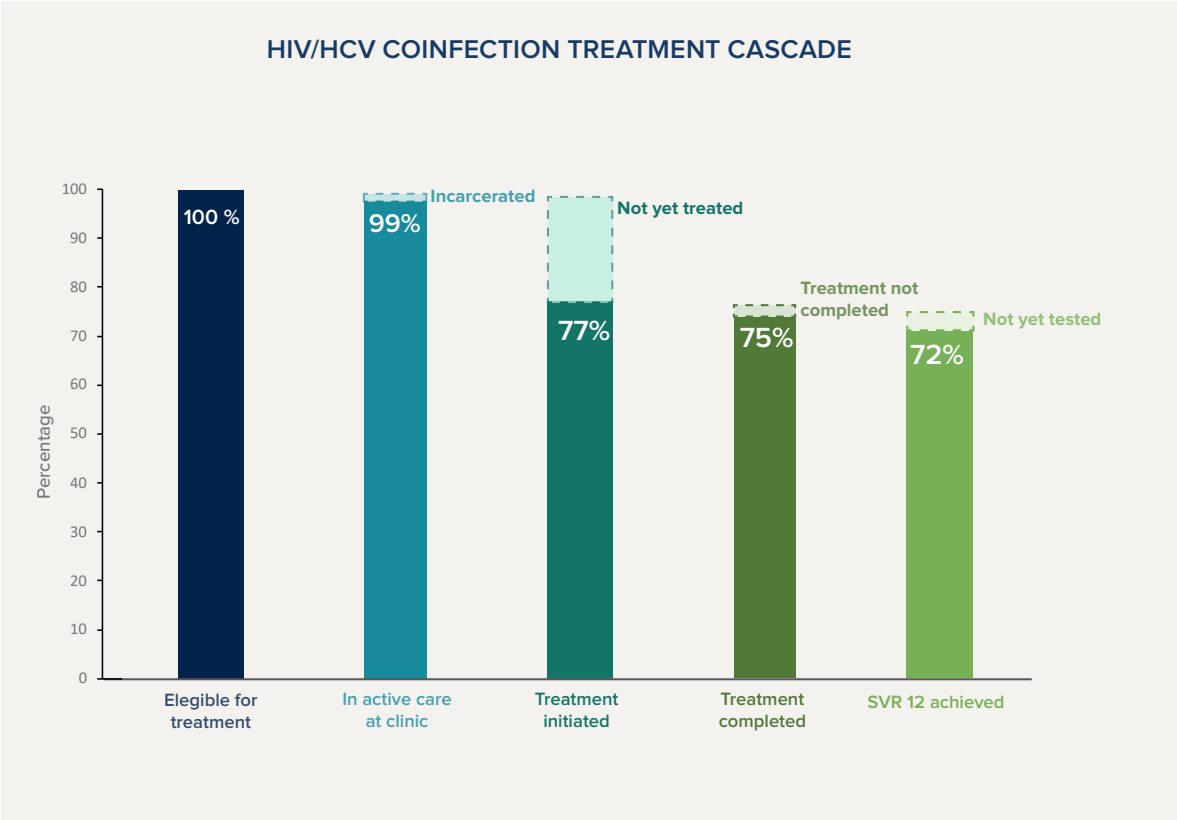
There are three major color-coded sections in the Case Conferencing Data Tool:

1. **White section:** Jurisdictions populated the first section of the Case Conferencing Data Tool with surveillance data for these coinfected clients, including race, ethnicity, gender, and most recent HCV testing information. Jurisdictions sent the tool with this section completed to the clinic using a secure method.
2. **Yellow section:** Clinics then used their electronic health record (EHR) systems to complete the second section of the tool with clients' most recent testing and treatment status. This information helped the clinics determine whether clients needed an intervention, such as PCR testing or HCV treatment. The data in this section automatically generate the clinic's treatment cascade.
3. **Blue section:** This section was only populated for clients who were treatment eligible and in need an intervention. Clinics input information on outreach and linkage activities, including barriers to treatment. This section helped in developing individualized treatment plans.

One example of a clinic-based treatment cascade is shown from El Rio Health in Arizona (Figure 10). The tool generates broad outcomes (e.g., deceased, relocated) and highlights clients who are treatment eligible (in green in the pie chart). This group of clients is the starting point for the treatment cascade. In this example, 72% of treatment eligible persons had documented SVR.

FIGURE 10:
TREATMENT CASCADE FROM EL RIO HEALTH IN ARIZONA





Notes: Cohort of persons in care for HIV at clinic 1/1/2018–8/31/2021; HCV treatment status as of 2/28/2022

B. KEY IMPLEMENTATION STEPS

Jurisdictions interested in working with clinics to link individuals to HCV care may consider the following approaches based on lessons learned from the HCV D2C project.

Select Clinics

To facilitate partnership building and expedite project launch, clinic partnerships can be based on the following:

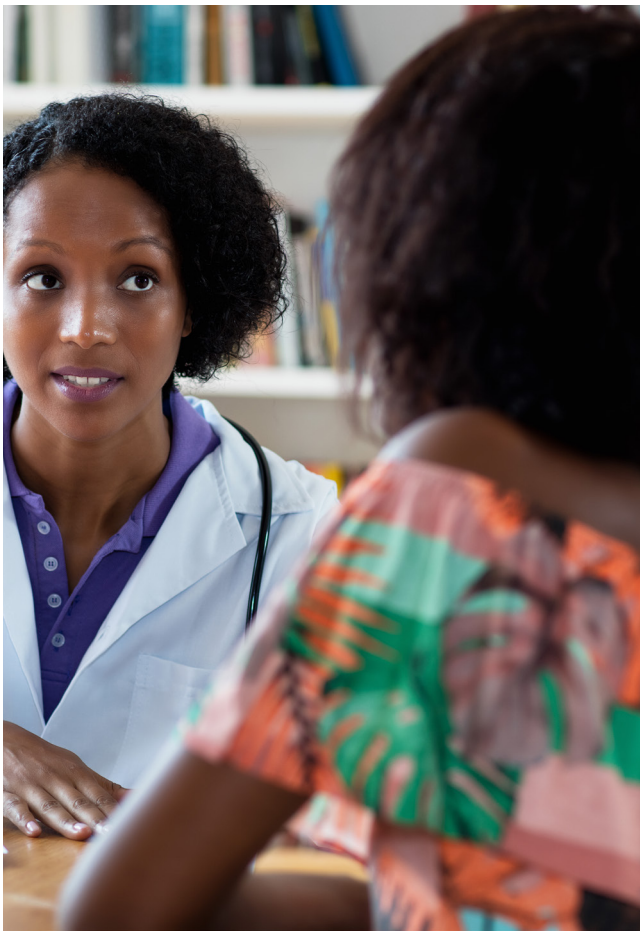
- **RWHAP funding:** RWHAP-funded clinics often have established outreach and linkage programs for HIV care that can be leveraged for HCV D2C activities. In addition, jurisdictions may choose clinics that are funded by the most relevant RWHAP Part to improve access to needed data and leverage existing relationships. For example, a state jurisdiction may work with Part B-funded clinics.
- **Existing relationships:** A strong relationship between the clinic and jurisdiction can facilitate the launch of HCV D2C activities, particularly if these activities are new. Therefore, jurisdictions may choose clinics based within the jurisdictional setting (e.g., health department clinics) or clinics with which the jurisdiction has implemented similar initiatives in the past.
- **Located in areas with a high prevalence of HCV:** Jurisdictions may select clinics in areas with high levels of HCV prevalence to increase the impact of HCV D2C activities. Jurisdictions may also consider geographic diversity, partnering with clinics in different parts of the jurisdiction, or clinic HCV treatment experience and/or desire to build that capacity.
- **Dedicated personnel:** Each clinic should assign staff to spearhead data sharing, gather information from EHR systems, and work with the jurisdiction staff as well as clinicians and/or case managers on outreach and linkage activities. This individual, ideally knowledgeable about HCV and D2C approaches, can keep project activities moving. The jurisdiction and clinic may sign a letter of agreement that describes roles and responsibilities.

Define the Clinic Cohort

Once partnerships are established, jurisdictions and clinics should define the parameters for the client cohort, specifically, the timeframe for the data pull. Clinic data should be recent (e.g., within the past few years). With older data, clinics may spend more time updating data and looking for clients than linking them to care.

Populate the Case Conferencing Data Tool

Jurisdictions and clinics then need to determine how the clinic-based coinfection list will be created. The approach generally involves creating a list of people with HIV who have been served by the clinic and matching that information to HCV surveillance data to determine who is coinfected. Public health statute limitations in sharing surveillance data will likely dictate the specific process used.



Three possible approaches are outlined below.

MODEL A: JUSRISDICTION INITIATED

Model A: The jurisdiction creates lists for clinics leveraging jurisdiction centralized RWHAP data management systems. The jurisdiction uses the RWHAP data management system to create a clinic-specific client list then matches the list to the HCV surveillance data using the matching criteria established earlier in the project. Jurisdictions may also match HIV surveillance data to confirm the accuracy of the RWHAP data management system list and complete missing demographic or clinical information. The list can then be shared securely with the clinic.

MODEL B: CLINIC INITIATED

Model B: Lists of persons with HIV are initiated by the clinic; the lists may be derived from a RWHAP data management system (either managed by the clinic or the jurisdiction) or EHR. The RWHAP data system could be one that the clinic manages or could be part of a centralized RWHAP data system to which the jurisdiction may not have access. Clinics send lists of clients with HIV to the jurisdiction; jurisdiction staff then match these lists against the HCV surveillance system (and potentially the HIV surveillance system). Finally, the jurisdiction securely sends the updated information back to clinics.

MODEL C: CLINIC ONLY

Model C: Through a third approach, the clinic generates the list of co-infected clients solely from a local data system, such as an EHR; these lists are not supplemented with HCV surveillance data. This approach may be the only option if the jurisdiction has limited capacity in creating the clinic-based co-infection list or faces limitations sharing data outside of the health department. However, because this approach does not provide clinics with jurisdictional-level HCV surveillance information, they may not become aware of the HCV status of persons with testing results obtained elsewhere.

Update the Tool based on the Most Recent Disposition

Clinic staff then review client information in local systems, such as an EHR, and update the client disposition to determine whether an intervention is needed. The process can be time intensive depending on the length of the list and the ease of data access in local systems.

Conduct Case Conferencing

Case conferencing provides an opportunity for the jurisdiction and clinic to discuss client needs and interventions, questions regarding completing the tool, and discrepant data between surveillance and local systems. Jurisdictions and clinics can work together to determine the agenda, modality, and frequency of these case conferencing meetings. Regardless, clinics should update the Case Conferencing Data Tool prior to meetings to ensure they respond to active needs.

Conduct Outreach and Linkage Approaches

Clinics then follow up with clients that need an intervention, for example, a follow-up PCR test, HCV treatment, or post-treatment PCR test. Many clinics can leverage existing outreach and linkage programs for this purpose. Clinics that do not have an existing program should develop a plan, including how the client should be contacted and supported in their HCV treatment (e.g., transportation, behavioral health services). Outreach and linkage activities may include engaging jurisdictional disease intervention specialists (DIS), particularly at clinics with limited capacity. The clinic continues to update information in the Case Conferencing Data Tool on these activities, outcomes, and barriers to treatment.

Review Clinic-Specific Treatment Cascade

Clinics and jurisdictions can use the treatment cascade generated by the Case Conferencing Data Tool to track progress and identify opportunities for improvement. They can calculate the treatment cascade by subpopulation to identify disparities and develop approaches that address special needs. Progress in HCV care can be monitored by generating longitudinal treatment cascades.

C. LESSONS LEARNED

Jurisdictions and clinics shared the following lessons to support future replication of HCV D2C work:

Understanding Public Health Statue and Addressing Data-Sharing Issues

Some jurisdictions were limited in their ability to share data with clinics. For example, based on public health statute, health departments in Florida are not allowed to disclose a client's HIV or HCV status to a provider that does not already know the client's status.

Identifying data-sharing issues early in the project was a key lesson learned. Engaging data/privacy staff at both the jurisdictional and clinic levels can assist in identifying issues and developing feasible approaches based on these limitations.

Reviewing existing RWHAP consents to determine if data sharing is covered is also essential. One of the jurisdictions (Arizona) was delayed in project activities because a clinic partner did not feel that the existing RWHAP consent included HCV D2C activities. As a result, the clinic had to obtain client consent for the release of information from each of its coinfected clients. Jurisdictions also suggested including D2C activities in contracts/agreements with RWHAP clinics to proactively address any issues.

Selecting and Preparing Clinics

Jurisdictions **recruited clinics** based on multiple factors. All clinics were RWHAP funded, underscoring the importance of engaging and maintaining RWHAP partnerships throughout the project. Jurisdictions that used RWHAP jurisdiction staff to recruit clinics were able to begin project activities quickly by leveraging existing relationships. Jurisdictions also identified clinics that had D2C experience and/or demonstrated existing HCV treatment capacity (or expressed interest in developing such capacity). Three jurisdictions partnered with health department-affiliated clinics to facilitate data sharing. One clinic needed approval from its institutional review board (IRB) to participate in the project, which delayed implementation. Therefore, jurisdictions should also consider whether IRB approval is needed when recruiting clinics.

Jurisdictions also shared that clearly **outlining project expectations** was important to help clinics understand what was being asked of them, determine necessary resources, and prepare a strategy for D2C activities.

HCV D2C funding did not extend to clinics. Several jurisdictions recommended **funding clinics** given that HCV D2C activities required additional resources. One jurisdiction (Arizona) provided funding to participating clinics from other jurisdictions resources.

Many clinics had to **identify a lead person or champion** to spearhead efforts. These individuals were responsible for completing the coinfection list or gathering information from clinicians and/or case managers to update the tool. Nurse managers, case managers, and quality improvement (QI) leaders often played this role. Regardless, clinics noted that the individuals completing the list need a strong understanding of HCV.

Creating Clinic Lists of People with HIV

Jurisdiction and clinic staff agreed that EHR information was often more up to date than surveillance data or data in the RWHAP data management system. One of the clinics in Arizona noted that the coinfected list appeared to include clients that the clinic had not seen for several years. This highlights the importance of pulling recent data and ensuring that clients are active and received a service within the specified period.

Clinics also noted that clients may need to be added to the list to ensure their outreach and linkage activities include everyone in need of care. In Orange County, Florida, the clinic found a higher number of individuals with HCV in its EHR than initially listed in the clinic-based case conferencing list. This discrepancy is likely because the list was created by the state with people actively in the RWHAP.

Another lesson learned from a clinic in Arizona was the

importance of ensuring that the clinic was providing medical services to clients on the list, as opposed to just case management to ensure better access to clinical data.

Finally, it's important to consider the structure of **the clinic when creating the list.** One participating clinic was RWHAP Parts B and C funded. The clinic had to coordinate internally between the Parts B and C programs, given that Part C funded medical care and Part B worked with the state health department and its CAREWare system.

Using the Case Conferencing Data Tool

All clinics found the Case Conferencing Data Tool useful for managing client lists. However, clinics noted that the lists could be long, so they developed **strategies to improve navigation**, such as dividing the list up by staff or "freezing" columns and rows. Clinics also had varying approaches for completing the list. Some clinics completed the entire tool for one client at a time, meaning data for all columns were completed, whereas others divided the tool by section.

Clinics underscored the importance of having **staff who understood HCV and had relationships with clients** to complete the tool. In many cases, this was the main jurisdiction point of contact or case managers. Clinical providers did not commonly take the lead in completing the tool, although they were often consulted regarding questions about the client's HCV status.

Clinics noted that most resources were dedicated to initially looking up each client in their agency's EHR. One clinic estimated that it took approximately five hours to complete the Case Conferencing Data Tool at baseline because the tool is "comprehensive" and required "digging through chart" to find the information. While populating the Case Conferencing Data Tool was time consuming, the overall process was still manageable because most clients did not need intervention.

Garnering Support and Sustainability

Garnering support for an activity like D2C can be challenging in an environment marked by staffing shortages. When one clinic received pushback from clinicians regarding completing the Case Conferencing Data Tool, staff developed an approach that minimized provider involvement. They also framed the work as a QI project, a known concept integral to RWHAP-funded clinic settings. Another clinic gained support by emphasizing that project participation not only helps clients but can also improve clinic staff morale since they can cure a client of HCV, something that is not feasible for HIV.

HCV D2C activities did not necessarily identify many individuals not previously known to be coinfected or initiate new activities to improve treatment. However, clinics underscored the benefits of project participation, especially related to data cleaning and EHR documentation. All participating clinics that were interviewed said that they planned to continue their HCV D2C activities. Staff at one clinic noted that they had already done the data-related "heavy lifting" and hoped to focus more actively on outreach and linkage to care.

[c] Freezing a row or column in Excel means that the row or column remains visible as the user scrolls through the additional rows or columns of data. This can be helpful in Excel lists with a large number of rows or columns.

03 RESOURCES

The resources described below can help jurisdictions implement HCV D2C activities.

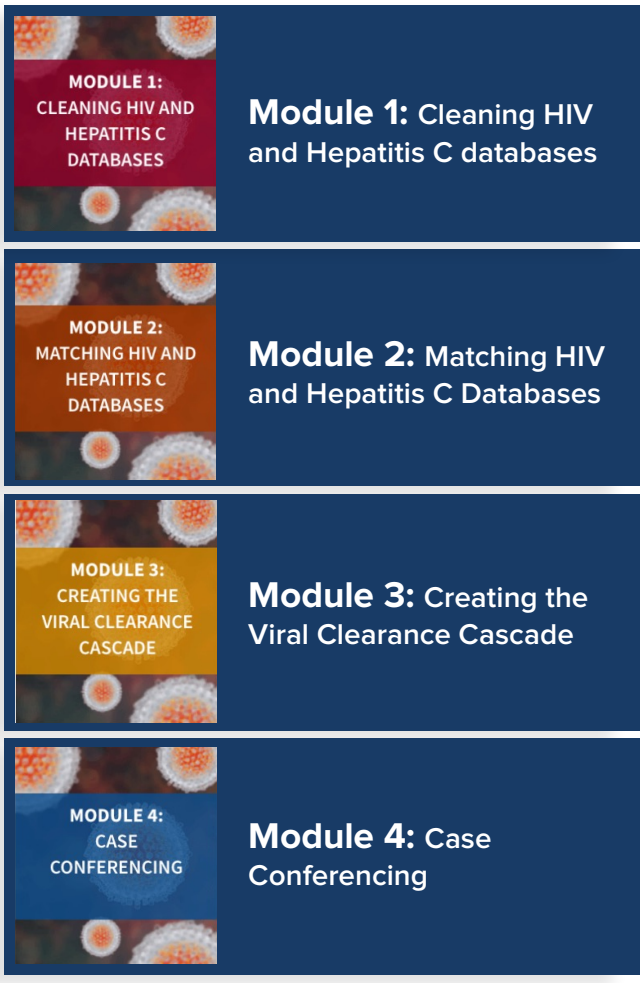
TargetHIV Project Website

The TargetHIV Leveraging a Data to Care Approach to Cure Hepatitis C within the RWHAP website includes the following:

- HCV coinfection clearance cascade template for the overall and RWHAP populations
- Clinic Case Conferencing Data Tool
- SAS code to assign dispositions
- Disposition assignment table
- Recorded webinars

TAP Modules

The TAP has created modules to assist jurisdictions in implementing the key activities. There are four modules in total that correspond to key activities outlined in the manual.



Clearance Cascade

- Hepatitis C Virus Clearance Cascade — United States, 2013–2022 (cdc.gov)
- Development of a Standardized, Laboratory Result–Based Hepatitis C Virus Clearance Cascade for Public Health Jurisdictions (sagepub.com)
- Training videos: https://targethiv.org/library/hiv-hcv-dtc-training

NASTAD Data Matching Resources

- Dataset Matching Toolkit | NASTAD: The Dataset Matching Toolkit provides users with a blueprint for matching datasets, from creating a proposal through the matching process. Included are considerations for DSAs, instructions for data preparation in SAS, R, and Excel, options for matching software, sample matching code for SAS and R that includes various approaches to "fuzzy" matching, and datasets for consideration. The toolkit is useful for individuals in all process steps, from brainstorming to troubleshooting code. The toolkit also provides options for individuals who are not comfortable with coding, including instructions on how to prepare data in Excel, and software options for matching outside of SAS or R.
- Hepatitis VLC: Leveraging Existing Data Sources for Case Matching - YouTube: The July 27, 2022, NASTAD HepTAC Virtual Learning Collaborative session was moderated by Shauna Onofrey, senior epidemiologist in the Office of Research and Evaluation at the Massachusetts Department of Public Health and a member of NASTAD's HepTAC advisory committee. Onofrey was joined by Sarah New, epidemiologist with the Surveillance, Epidemiology, Assessment, and Evaluation Section of the STD Control Branch, and Tony Fristachi, HCV informaticist at the California Department of Public Health.

04 HCV D2C PROJECT CHECKLIST

The scope of this initiative is large. Therefore, jurisdictions interested in HCV D2C may choose to only implement certain components, such as data matching or outreach and linkage using clinic data sources. The following recommendations can support jurisdictions in building a project foundation and implementing aspects most relevant to their needs, data management, and care delivery infrastructure.

Project Management

The complexity of HCV D2C efforts requires strong management and coordination approaches.

- **Identify all relevant staff and involve them in planning from the start:** This includes data and program staff from RWHAP jurisdictions and clinics and HIV and HCV surveillance programs. Jurisdiction staff should have knowledge and technical skills related to RWHAP data and HIV and HCV surveillance systems and analysis. Clinic staff should be willing to champion the project at the clinic and have knowledge about hepatitis C and/or close relationships with clients to support outreach and linkage. Regular meetings help ensure everyone is engaged in program activities and knowledgeable about next steps.
- **Assign a project lead:** A project champion with decision-making power can communicate across RWHAP, surveillance programs, and clinics to move the project forward.
- **Ensure you have sufficient staff and program resources available:** Participating jurisdictions reported that project costs were not a result of direct purchases or new staff hires. Instead, jurisdictions relied on existing staff and infrastructure and estimated a share of staff time and office resources dedicated to HCV D2C activities. On average, year one "costs," which involved clearance cascade development, were $68,000. In the project's second year, during which jurisdictions continued clearance cascade activities and added outreach and linkage to care, project "costs" reached $185,000. The bulk of the costs were related to the time spent by existing staff (not new hires), but jurisdictions did rely on existing licenses for statistical analysis.
- **Prepare for staff turnover:** Developing formal protocols and policies ensures continuity of activities in the event of staffing changes

HCV Clearance Cascade

Data matching and creating accurate clearance cascades rest on a foundation of strong data management practices and positive relationships across agencies, which may take time to establish.

- **Co-fund or co-locate surveillance epidemiologists/data analysts:** Co-funding or co-locating epidemiologists/data analysts can remove data siloes and help enhance data matching, sharing, and analysis capacity.
- **Incorporate negative PCR tests in HCV surveillance:** By requiring all PCR tests, including negative results, jurisdictions can create clearance cascades that more accurately reflect the number of people with chronic HCV and those who are cured.
- **Expand ELR capabilities:** ELR is resource intensive in the short run, as data-importing processes may need to be built for multiple individual lab systems. However, ELR will save time overall by eliminating the data entry of thousands of lab results. In addition, ELR can result in more complete and accurate surveillance data.
- **Explore integration of HIV and HCV surveillance data systems:** Surveillance integration efforts can facilitate data matching on a routine basis. These may include single systems that house surveillance data for multiple diseases, HCV labs/dispositions imported into HIV surveillance systems, and external data repositories, such as data warehouses and data lakes, where data can be merged and analyzed.

With this foundation in place, jurisdictions can get started on data matching and creating clearance cascades.

- **Define your relevant cohorts and timeframe:** The HCV D2C project focused on jurisdiction (i.e., state or county) and RWHAP HCV cases through 2019 with lab updates through 2021. Jurisdictions should choose a period and cohort based on specific project objectives.
- **Define your matching approach:** Jurisdictions may already have matching approaches in place. If not, off-the-shelf products are available to help match HIV surveillance, HCV surveillance, and RWHAP data.
- **Establish data-sharing agreements, if needed:** If RWHAP and HIV and HCV surveillance programs operate outside of different agency programs, jurisdictions may need DSAs to match data. Start establishing agreements early since these processes take time, and engage legal/data security staff from the start.
- **Leverage HIV surveillance data and processes to improve HCV data quality:** HIV surveillance data can improve HCV data quality related to client demographics, risk factors, and latest residence.
- **Modify the clearance cascade tool based on internal needs:** The Yale clearance cascade Excel template comprehensively captures different HCV dispositions for multiple demographic groups. While this breakdown helps identify disparities for focused HCV D2C approaches, it is time consuming and may not be necessary for all jurisdictions. Modifying the tool to better suit the needs of individual jurisdictions may save time.

Outreach and Linkage to Care

Jurisdictions may want to implement foundational activities related to outreach and linkage before starting HCV D2C work.

- **Know your local public health statutes:** Laws often dictate what data HIV and HCV surveillance programs can share with clinics. Knowing public health statutes will help jurisdictions build their HCV D2C approaches. Engage legal/privacy staff early in the discussions.
- **Select clinics based on data-sharing and outreach capacity:** Jurisdictions may choose to start small with three or four clinics that can provide HCV treatment, serve populations with a high HCV prevalence, are motivated to participate, and have data-sharing infrastructure in place. The jurisdiction can then expand efforts to other clinics based on early lessons learned.
- **Identify approaches to create clinic-based HIV/HCV coinfection lists based on the data management infrastructure:** Jurisdictions with direct access to clinic data through shared RWHAP data management systems (e.g., networked CAREWare systems) can create clinic-based case conferencing lists themselves if public health statutes do not limit their ability to share their HIV and/or HCV surveillance data. Those without this infrastructure will likely need clinics to send them lists of their clients with HIV that need to be matched to HCV surveillance data. However, it will be important to identify any data-sharing issues that may arise with the latter approach.
- Explore the integration of RWHAP, HIV, and HCV surveillance data systems: Importing surveillance data into RWHAP data management systems can help clinics identify clients in need of HCV care on a more routine basis.

The following activities can help jurisdictions get started on specific outreach and linkage work:

- **Consider the tradeoffs of using EHR-based clinic lists or surveillance-based lists:** Given the limitations of HCV surveillance data, jurisdictions should consider whether activities should leverage internal clinic EHRs data rather than HCV surveillance data. While surveillance-based processes may result in more clients, EHR data are more likely to be up to date. Decisions should be based on the quality of HCV surveillance data and data-sharing feasibility.
- **Create updated HIV/HCV coinfection lists before starting outreach:** Outreach is very time consuming, so clinic-based case conferencing lists should be restricted to individuals with recent positive PCR tests.
- **Modify the Case Conferencing Data Tool based on internal needs:** The Case Conferencing Data Tool can be modified by adding and removing columns and/or drop-down options. This process can reduce data entry burden and improve outreach tracking. In addition, breaking the tool down into discrete steps may improve usability and minimize the likelihood that clinic staff will feel overwhelmed by the amount of information needed.
- **Use jurisdiction staff with clinical experience to lead outreach and linkage efforts with clinics:** Jurisdiction staff with direct clinical experience can often establish a better rapport with clinic staff. In many cases, the jurisdiction's RWHAP staff have established relationships with RWHAP-funded clinics and can leverage that relationship in HCV D2C activities.
- **Conduct as much work as possible at the jurisdiction level to reduce clinic burden:** If possible, jurisdictions should access clinic information to update case conferencing lists and the Case Conferencing Data Tool, removing this burden from clinics. This is most feasible by either working with clinics that are part of the health department system or by incorporating DIS as part of jurisdictional activities.
- **Break down activities into concrete steps with realistic timelines:** This can help clinic staff stay on task without feeling overwhelmed.
- **Leverage clinic staff who know clients:** Case managers who already work directly with clients may be the best fit for updating case conferencing lists given their existing client knowledge. They also already have the tools to contact and engage clients in care. It may also be helpful to divide the list up by clinical providers to create a shorter list for each clinician to use.

05 QUICK START GUIDE

The Hepatitis C Virus Data to Care (HCV D2C) project was implemented as a collaboration between Ryan White HIV/AIDS Program (RWHAP) Part A or B jurisdictions, HIV and HCV surveillance programs, and RWHAP clinics to leverage data to improve HCV treatment access and outcomes. The project was funded by the Health Resources and Services Administration HIV/AIDS Bureau (HRSA HAB) Special Projects of National Significance (SPNS) from 2020 to 2023.

The project had two components:
Calculation of the **HCV coinfected clearance cascade** for the overall jurisdiction and RWHAP populations using RWHAP and HIV and HCV surveillance data. The clearance cascade can help jurisdictions monitor program impacts and gaps in care by tracking screening, infection, and cure. Excel-based templates, once pre-populated with client status, generate the clearance cascade based on demographic and health status characteristics.

Partnerships with RWHAP clinics to identify people in need of HCV care (e.g., follow-up testing or treatment) and **outreach and linkage to care.** The Excel-based Case Conferencing Data Tool can support the sharing of information across jurisdictions and clinics, track clinic activities and client status, and generate a clinic-based clearance cascade.

A. HCV COINFECTED CLEARANCE

- Clean and deduplicate HCV surveillance data, ensuring that the database comprehensively captures reported HCV laboratory tests (type of test, result, date). Negative PCR tests are essential for tracking people cure because they indicate that an individual has been cleared of HCV and an initial positive diagnosis.
- Link HIV and HCV surveillance data to identify clients coinfected with HIV and HCV. Jurisdictions can use an existing matching algorithm or purchase an off-the-shelf product.

The Yale University School of Medicine served as the Technical Assistance Provider (TAP). Participating jurisdictions included Arizona, Connecticut, Kentucky, Michigan, Orange County Florida, Puerto Rico, and the Southern Nevada Health District (SNHD).
Mission Analytics Group, Inc. and Isenberg Consulting served as the project evaluators.

- Link database to RWHAP data to identify the subset of clients receiving services from RWHAP. Jurisdictions should use the most comprehensive source available, such as a cross-Part RWHAP data management system (e.g., CAREWare).
- Use programming code to populate the Excel-based template with client HCV dispositions. Modify the template to meet your program needs based on local priority populations.
- Review the clearance cascade to identify gaps in screening, follow-up testing, and treatment.

Key Resources for Clearance Cascade Development

CDC Guidance on the HCV Clearance Cascade

- Hepatitis C Virus Clearance Cascade — United States, 2013–2022 (cdc.gov)
- Development of a Standardized, Laboratory Result–Based Hepatitis C Virus Clearance Cascade for Public Health Jurisdictions (sagepub.com)

TargetHIV Website with the Following:

- HCV coinfection clearance cascade template for the overall and RWHAP populations
- SAS code to assign dispositions
- Disposition assignment table

Project Training Modules

- Module 1: Cleaning HIV and Hepatitis C databases
- Module 2: Matching HIV and Hepatitis C Databases
- Module 3: Creating the Viral Clearance Cascade

NASTAD Data Matching Resources

- Dataset Matching Toolkit | NASTAD
- Hepatitis Virtual Learning Collaborative: Leveraging Existing Data Sources for Case Matching - YouTube

B. OUTREACH AND LINKAGE TO CARE

Key Resources for Clearance Cascade Development

- Review local public health statutes to understand data-sharing restrictions across jurisdictions and clinics.
- Identify partner clinics based on data-sharing capacity, existing relationships and Data to Care experience, capacity to provide HCV care (or interest in building capacity), and local HCV incidence.
- Establish a method to securely share data between the jurisdiction and clinic. For example, the clinic may create a list of clients with HIV and share the file with the jurisdiction. The jurisdiction then appends HCV surveillance data and populates the first section of the Excel-based Case Conferencing Data Tool with these data.

Clinic-led Activities

- Update client HCV status in the Case Conferencing Data Tool with more up-to-date information available in electronic health record (EHR) systems. This may be a time-intensive process depending on the number of coinfected clients and the structure of the EHR. The clinic may decide to simplify the tool to reduce data entry burden.
- Develop a plan for client outreach and linkage, including how to contact the client and mechanisms to address barriers to care, such as substance use treatment and transportation services.
- Contact clients based on the plan, and bring them into care.
- Update the Case Conferencing Data Tool with clinic activities and client outcomes to generate a local clearance cascade.

Key Resources for Outreach and Linkage to Care

TargetHIV Website with the Following:

- Case Conferencing Data Tool

Project Training Modules

- Module 3: Creating the Viral Clearance Cascade

03

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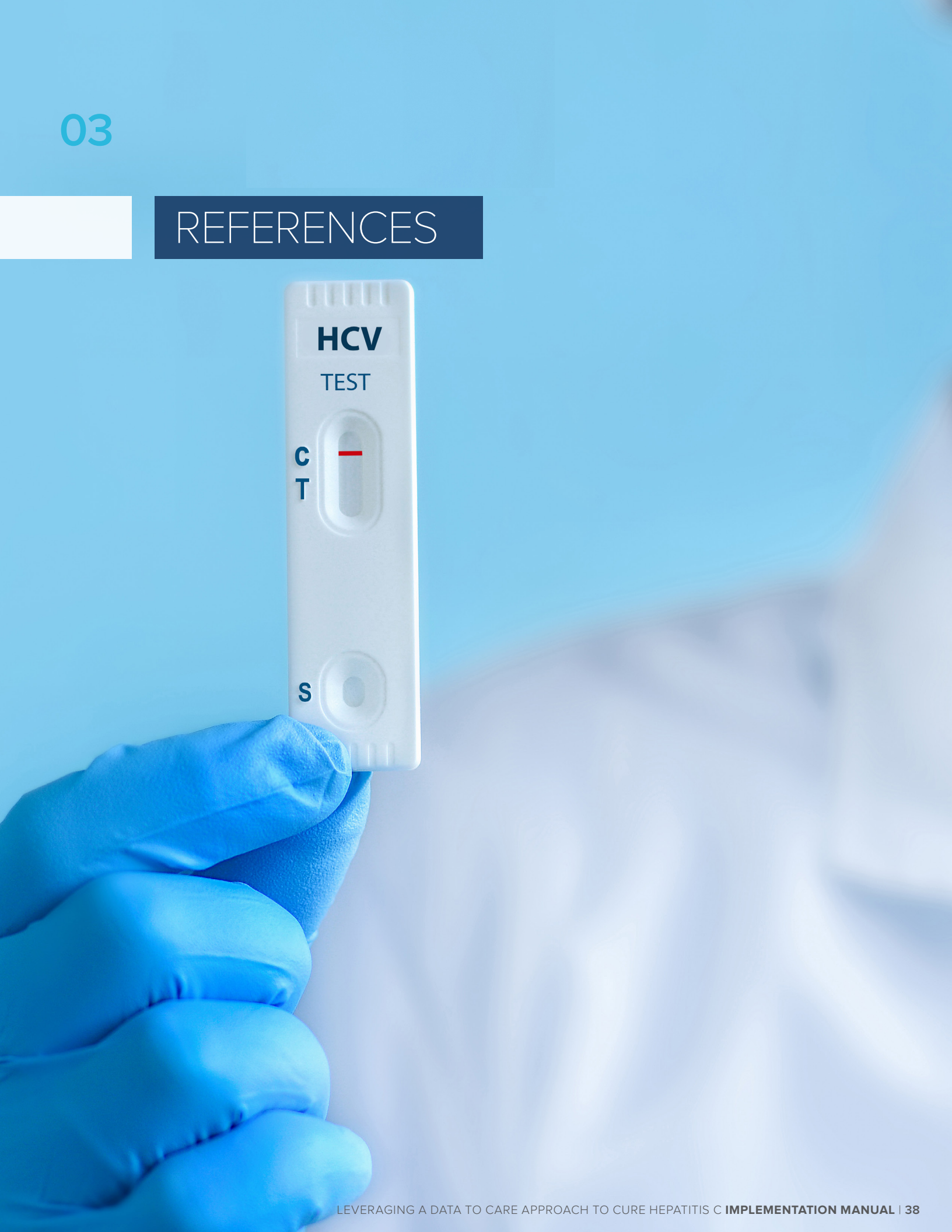

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