

## Living with HIV after Release from Prison: An Evaluation of the Long-term Health of Formerly Incarcerated Individuals who Used Michigan's Community Reentry Service

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**Abstract:** *In 2003, Michigan implemented a reentry service to assist HIV-infected people incarcerated in state prisons in linking to HIV medical care immediately upon their release. We examined whether formerly incarcerated people were linked to care successfully, remained in care, and were in good health 3 years after their date of release. In all, 190 people used the service over the 5 years following its inception. Only a minority of those who were alive and not reincarcerated at the time of the evaluation engaged consistently with medical care. Unsurprisingly given low rates of engagement in care, 3 years after their release only 27% had achieved viral suppression. Concerted efforts to support formerly incarcerated HIV-infected individuals' engagement in care over the long term are urgently needed.*

**Keywords:** *Community Reentry, HIV infection, Engagement in Care*

Mass incarceration in the United States remains a serious social and public health concern (Alexander, 2012). Hundreds of thousands of incarcerated people reintegrate back into the community each year, many of whom have an HIV-positive diagnosis (Maruschak & Beavers, 2009; Meyer, Cepeda, Wu, Trestman, Altice, & Springer, 2014; Springer, Friedland, Doros, Pesanti, & Altice, 2007; Springer, Pesanti, Hodges, Macura, Doros, & Altice, 2004). In 2013, it was estimated that approximately 150,000 Americans living with HIV were released from a correctional facility (National Minority AIDS Council and Housing Works, 2013). According to the Centers for Disease Control and Prevention, approximately 1.2 million United States citizens were living with HIV that same year (Centers for Disease Control and Prevention, 2014). The rate of HIV infection in United States' prisons is approximately five times higher than the national average. Insuring formerly incarcerated people's uninterrupted medical care upon community reentry is critical to their well-being (Baillargeon, Giordano, Harzke, Spaulding, Wu, Grady, et al., 2010; Centers for Disease Control and Prevention, 2017; Dhami, Mandel, Loewenstein, & Ayton, 2006; Travis, 2005; Visher, La Vigne, & Travis, 2004).

Formerly incarcerated people living with HIV who do not have immediate access to medical care or prescriptions may experience treatment interruption (Baillargeon, Giordano, Rich, Wu, Wells, Pollock, & Paar, 2009). Treatment interruptions and disengagement from care poses significant health risks, including the possibility of transmitting the virus to others (Clements-Noelle, Mark, Pendo, Loughran, Estes, & Katz, 2008). Engagement in care refers to a spectrum of patient care and disease management, from initial diagnosis of HIV to full commitment to care and compliance with the medical regimens that suppress viral activity. Left untreated, HIV infection can progress to Acquired Immunodeficiency Syndrome (AIDS). AIDS, the final stage of HIV infection, occurs when oftentimes-fatal diseases and infections develop due to a damaged immune system. Not everyone who contracts HIV acquires AIDS. The degree to which an individual is fully



engaged in their HIV care and compliant with antiretroviral therapy (ART) regimens can affect the manageability of their HIV infection (Gardner, McLees, Steiner, Del Rio, & Burman, 2011). Consistent engagement in care can lead to improved ART adherence and achievement of viral suppression (Gardner et al., 2011; Giordano et al., 2007; Mugavero, 2008). Viral suppression signifies HIV is undetectable and not likely to be transmitted to others (Cheever, 2007; Gardner et al., 2011; Rodger, Cambiano, Bruun, Vernazzo, Collins, Lunzen et al., 2016; Rodger, Cambiano, Bruun, Vernazza, Collins, Corbelli et al., 2018). Inconsistent or lack of engagement in care can lead to further transmission of the virus or escalation of HIV infection to AIDS (Gardner et al., 2011; Giordano, Gifford, White, Suarez-Almazor, Rabeneck, Hartman, et al., 2007; Mugavero, 2008).

In the United States, only an estimated 40% of people living with HIV engage in uninterrupted care (Baillargeon, et al., 2009; Centers for Disease Control and Prevention, 2015). After release from prison, rates of linkage to and retention in care, ART adherence, and viral suppression all significantly drop (Iroh, Mayo, & Nijhawan, 2015). One possible explanation for this disparity is that the prison system provides HIV care, easy access to medications, as well as essentials for survival (e.g. food, housing), resulting in better control of the virus (Meyer, et al., 2014; Springer et al., 2004; Springer, et al., 2007). The challenges in maintaining HIV medical care come upon release. Transitioning from prison to community can be difficult under ordinary circumstances but poses special challenges for HIV-infected formerly incarcerated people because of how quickly they must secure basic resources, such as housing, before (re)establishing benefits and entitlements, enrolling in HIV-medication access programs, and linking to an infectious disease specialist. Succeeding in these tasks may be complicated by lack of income to cover transportation and fees, incomplete medical and other required records for enrollments including proof of HIV status, lack of acceptable forms of identification, low literacy skills, poor mental health, and limited social support (Dennis, Barrington, Hino, Gould, Wohl, & Golin, 2015; Fontana & Beckerman, 2007; Glaze & James, 2006; Luther, Reichert, Holloway, Roth, & Aalsma, 2011; Visher, 2010; Visher, Debus, & Yahner, 2008; Zaller, Holmes, Dyl, & Mitty, 2008).

At release, state polices typically provide that formerly incarcerated people receive up to 30 days of ART medication, leaving them under the best of circumstances with less than 1 month to identify resources to support their care and cover medical expenses (e.g., money for prescription and appointment co-payments, enrollment in insurance and benefit services), enroll into their state's AIDS Drug Assistant Program (ADAP), and find a physician to issue them an ART prescription. For instance, Texas' HIV-infected prisoners are released with a 10-day supply of ART (Baillargeon et al., 2009). Michigan, at the time of the current study, supplied 30 days of medication. Completing (re)enrollment applications for entitlements and securing medical records can be a laborious and complicated process. Some formerly incarcerated individuals may lack the skills needed to navigate these processes, particularly if the system of HIV care outside of prison is unfamiliar because they were diagnosed with HIV while incarcerated (Altice, et al., 2001).

To address these challenges, states have sponsored community-based reentry programs that help address some of the critical needs of the formerly incarcerated after release (Petersilla, 2003). However, the evidence for what these programs can achieve remains mixed. Modest intervention to assist in the transition to medical care improves rates of prescription access and medical visits in the short term. For example, in a study of Texas' formerly incarcerated persons, those who got no help with AIDS Drug Assistance Program (ADAP) applications were least likely to fill their prescriptions within 60 days (Baillargeon et al., 2009). Gardner and colleagues (Gardner, Metsch, Anderson-Mahoney, Loughlin, Del Rio, Strathdee, Samson, et al., 2005) conducted a randomized trial of a modest case management effort versus a passive referral program on short-term linkage to care. They found brief case management improved linkage to care over passive referrals. Avery, Ciomica, Gierlach, and Machekano (2018) observed jail-based case management led to improved retention in care 1 year post-release.

In experimental trials, however, evidence for the superiority of intensive case management over less intensive discharge planning efforts proves less compelling. Wohl and colleagues (Wohl, Scheyett, Golin, White, Matuszewski, Bowling, et al., 2011) compared intensive case management to a standard reentry program using a randomized design. The intensive case management model included pre-release meetings and intensive follow-up for 6 months after release. The standard reentry program relied on correctional nurses to create discharge plans that included linking clients to care, housing, and medication. Among the 93% of study participants who attended one or more post-release follow-up study visits, 54% and 65% of participants in the

standard and intensive arms respectively accessed medical care within 4 weeks; a sizeable minority in each study arm did not obtain care in time to refill ART prescriptions. Rates of access increased over the 6 months following release for both groups. However, Wohl observed no significant differences between the intensive case management and standard discharge release program on critical outcomes including immediate linkage to care. In an observational evaluation study, Arriola and colleagues (Arriola, Braithwaite, Holmes, & Fortenberry, 2007) found no differences in engagement in care when comparing different approaches designed to improve medical care access. Murphree, Batey, Kay, Westfall, and Mugavero (2018) observed poor rates of retention in care for persons transferring care from prison settings to urban clinics. Although the available evidence suggests some discharge planning assistance is probably helpful, if not necessary, too many formerly incarcerated persons do not link to care or do so quickly enough. Moreover, among those linked to care, we know little about the likelihood of their remaining in care and of their longer-term health outcomes.

## Current Study

We report on the results of our mixed-method evaluation of Michigan's Community Reentry Program for HIV-positive formerly incarcerated people. We examined health status and quality of life for the initial 3 years after being released for the HIV-infected formerly incarcerated people who used the state's reentry service over its initial 5 years of operation. Established in 2003, the service relies on community-based medical case managers to facilitate access to care and treatment adherence. Tailored immediate post-discharge plans are developed and coordinated through a centralized statewide telephone intake system. Prison health personnel notify the central reentry medical case manager when an incarcerated person living with HIV is soon to be released. The reentry medical case manager completes a comprehensive intake interview with the incarcerated person by telephone. The reentry case manager identifies and makes an appointment for the incarcerated person with a medical case manager in the community to which s/he will be released and makes a medical care appointment with an infectious disease physician in the community, if possible. The reentry medical case manager shares intake interview results with the community medical case manager assigned to each client, permitting preparation of paperwork for enrollments to begin prior to a person's date of release.

Michigan Department of Community Health (MDCH) officials commissioned the evaluation because they wanted to learn if the program helped people obtain and remain in care. MDCH officials also wanted to know if people remained in good health for the 3-year period following their release and achieved viral suppression. MDCH officials assumed that because their own data suggested safety nets such as the Michigan AIDS Drug Assistance Program (MiDAP), which covers the costs of medication and affordable medical care supported under The Ryan White Comprehensive AIDS Resources Emergency Act, functioned well in Michigan, once linked, formerly incarcerated people would fare as well as the typical middle-to-low-income person living with HIV in the state.

## Method

We used an embedded mixed-method design (Green, 2007; Greene & Caracelli, 1997) and relied on multiple sources and types of data (see Table 1). The combination of data across sources and types permitted us to examine whether former clients had kept their initial appointments (program records); had received viral load and CD4 testing on a routine basis since release (CAREWare); were accessing state insurance or MiDAP (state records); and, through interviews, to compare these records with self-reports. This design also permitted us to address the state's questions as best we could within the limits of the brief 7-month timeframe and a \$39,000 study budget. Our ability to access records was aided by the fact that all clients had signed a Health Insurance Portability and Accountability Act (HIPAA) waiver at intake, permitting access to their client and related medical records for the purposes of program evaluation. As an additional precaution, all evaluation personnel signed confidentiality agreements with the agency that ran the program prior to its granting us permission to access HIPAA-protected client records. All study procedures were approved by the Institutional Review Board at Michigan State University and by the MDCH.

**Table 1.** Data Sources and Data

Data Sources and	Data
Community Re-entry Program Records	Demographics, health status at release, health/other assistance needs, follow up with medical and case management referrals, addresses
Vital Records	Mortality
State Police Records	Re-incarceration status, criminal history, aliases, parole status
Health Department and CAREWare Records	Enrollment in state health insurance, MiDAP enrollment, CD4 counts, viral loads, STIs
Secretary of State Records	Addresses
Interviews with medical case managers and infectious disease physicians	Client needs, barriers to care, satisfaction with the re-entry program
Interviews with ex-offenders	Client satisfaction, health, health care use, mental health, social support, quality of life, housing, employment, unmet needs, adherence, sexual behavior

### Archival Records

We identified all individuals who had used the reentry service ( $N = 190$ ) from its inception in May 2003 through May of 2008 through de-duplicated program records, from which we abstracted information on health at release (e.g., CD4 count, viral load), date of release, history of mental health and substance use disorders, demographics, referrals, and release address. If available, we also obtained contact information on relatives and friends who would know of the person's whereabouts if they ever moved. Information on health service use, health status, parole status, incarceration status, entitlement and MiDAP enrollments, and mortality status came from federal and state databases including the Social Security Death Index, the Michigan State Police's Correctional database, and the Ryan White CAREWare database. We located all records using given names and known aliases. In some cases, records were hand searched by staff in the Department of Health. Secretary of State and public utility records were also used to find addresses when we could not locate someone or their designated contact person through any other means. We supplemented these data with key informant interviews with infectious disease physicians ( $n=2$ ) and case managers ( $n=12$ ) who had served the population.

### In-person Interviews

We located former clients who had used the service, still resided in Michigan, and were not reincarcerated for face-to-face interviews. We identified the probable location of 83% ( $n=157$ ) of the former clients, 111 of whom met our criteria of still residing in the state and who were presumed to be alive and not currently reincarcerated<sup>1</sup> (see Figure 1). We identified addresses for 98 (88%) of these 111 individuals through the program's records and through correctional and state data bases (e.g., Sex Offender Registry, MiDAP).

To recruit these former clients for interviews, we first sent a discretely worded letter to each person's last known address(es). The letter indicated that we were studying state-supported health care services on the MDCH's behalf and that the recipient might have used a program of potential interest. The letter instructed former clients who were interested in learning more about the interview to call a toll-free phone number. We investigated address alternatives for each returned letter using publicly available records and, when this proved unsuccessful, through other state entitlement and Secretary of State records or by contacting relatives who had been identified by the client as a person who could be contacted in order to locate them in the future.

<sup>1</sup> We began data collection with 43 (23%) reincarcerated persons, of whom 11 were ultimately released and five interviewed. For simplicity of presentation, we show the locating and participation data at our data collection endpoint.

We also made 31 home visits when the mail we had sent to an address had not been returned to us and no one in the household had contacted our toll-free phone number. We enlisted case managers and parole officers to distribute letters on our behalf when we could identify that a former client was still on parole or was currently using case management services at an agency.

When formers client elected to call our toll-free telephone number, they were screened by trained study personnel to confirm that we were speaking with the person we were seeking by asking for a combination of pieces of information that would most likely be known only to them and which would uniquely identify them. After verifying their identity, we sought their consent to schedule an interview. It was only at this point that we revealed that we were interested in learning about experiences using the HIV prison reentry service. Of the 98 individuals for whom could locate a reliable address, 64 (65%) ultimately called us. Of these, 60 (94%) consented to an interview. Four declined to be interviewed, citing no desire to talk about HIV. In all, locating and interviewing these individuals took approximately 5 months.

Interviews were scheduled at times and locations convenient to the respondent. Verbal informed consent was obtained at the interview. A waiver of documentation was granted to maximize confidentiality protections. Interviews were audio-recorded and lasted an average of 102 minutes (range = 50 to 210 minutes). During the interview, we provided interviewees with response-set cards and a calendar to aid their recall. Although the interview protocol was structured and relied on closed-ended questions, we posed open-ended questions on all topics discussed.

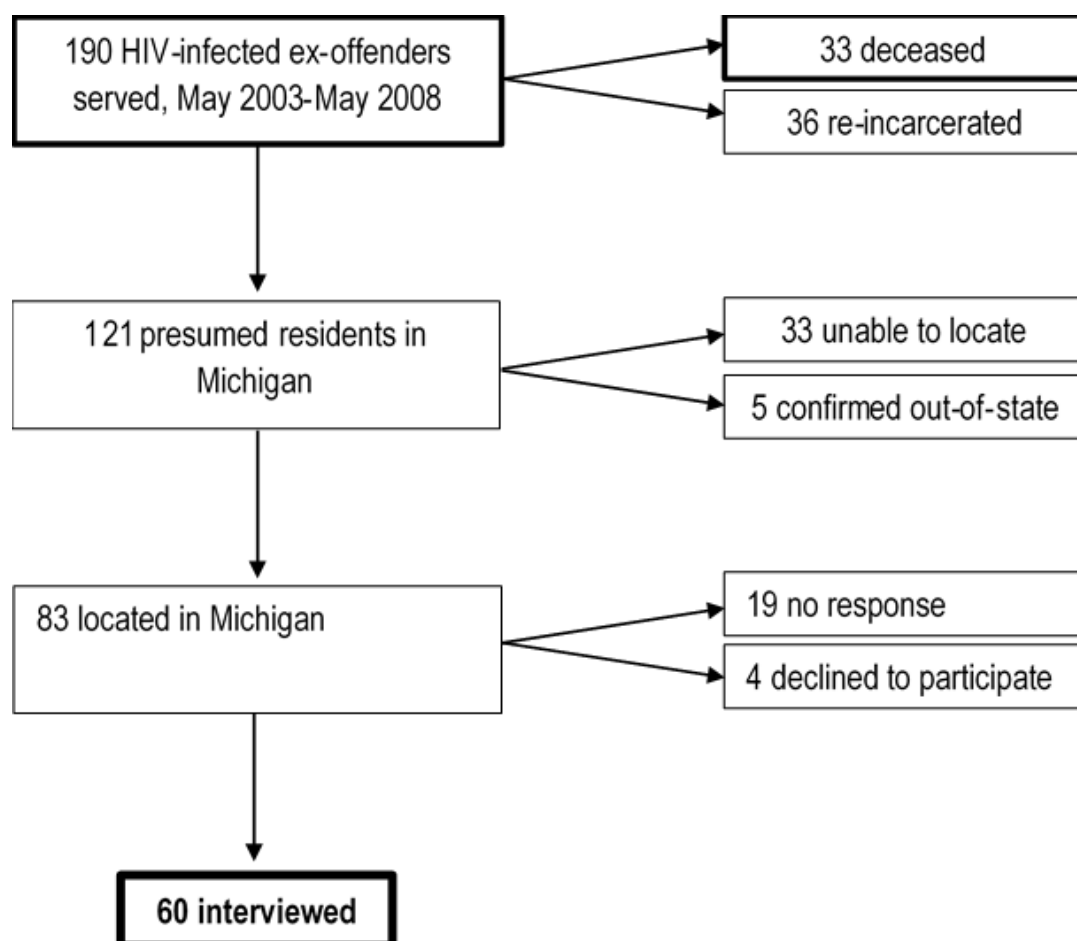


Figure 1. Flow chart of study participation.

## Participants

Over the 5-year service window we investigated (May 2003 - May 2008), 190 people were referred to the reentry service. The overwhelming majority was male (96% male, 3% female, 1% transgender) and Black (82%; white 13%; other 5%). The mean age of formerly incarcerated people who used the service was 47.6 years (range = 25 to 67). About half (51%) had been reincarcerated at least once since the date of release associated with use their first use of the service. Like the full sample, the 60 interviewees were predominately male (96%) and Black (86%). About 65% identified as heterosexual. The highest level of educational attainment reported by the majority of those we interviewed was high-school (77% high school graduate, 22% less than high school, 1% some college education). The average length of their most recent incarceration was 6.1 years (range = 6 months to 30 years). About 82% of those we interviewed were unemployed. The median monthly household income from all sources reported by interviewees was \$874. Roughly 65% had been homeless on at least one occasion since their release for an average duration of 375 days; 95% had moved at least once since their release. The average number of moves reported in the 3-years post-release was three.

## Measures

As noted above, most measures we abstracted from program records or state-managed databases. The interview guide we developed in partnership with the state was primarily composed of fixed-response questions and validated measures. The interview covered diverse topics including: satisfaction with services; unmet needs; employment and housing history; use of HIV-related medical care; patient-provider relationship quality (Bakken, Holzemer, Brown, Powell-Cope, Turner, Inouye, et al., 2000); health-related quality of life (Wu, Revicki, Jacobson, & Malitz, 1997); medication adherence (Fisher, Fisher, Amico, & Harman, 2006; Simoni, Kurth, Pearson, Pantalone, Merrill, & Frick, 2006; Walsh, Mandalia, & Gazzard, 2002); social support (Barrera, 1981); disclosure of HIV status; depression (Radloff, 1977); alcohol and drug abuse (Winters, Zenilman, & Co-Chairs, 1994); AIDS-related stress (Pakenham & Rinaldis, 2002); recent sexual behavior (Fishbein & Cohino, 1997); and demographics. Using data from the interview and the other sources of information available to us, we created multiple dependent measures to address the primary evaluation questions.

**Linkage to care.** A primary program objective was to facilitate timely linkage to medical care upon release (e.g., within 30 days of release). Each formerly incarcerated person was referred by the program to a medical case manager to facilitate linkage. The program scheduled the initial appointment with the case manager on the clients' behalf. We used program records to assess whether the initial case management appointment was kept. We used two means to assess attendance at a medical appointment post-release. First, if a formerly incarcerated person was released to an area where a new patient appointment had been scheduled for them by the service, we used program records to ascertain if that appointment was kept. Second, we used Michigan Department of Health's CAREWare database, which contained a complete history of CD4 counts and viral loads for the 119 individuals (63%) with a CAREWare record. We examined these records to determine if new viral load or CD4 counts were recorded in the initial 6-month period after release. We treated the presence of tests recorded within 30 days of release as an indication of timely linkage to care.

**Engagement in care.** Clinical guidelines recommend routine monitoring of CD4 counts and viral loads for persons living with HIV. For CD4 counts, monitoring guidelines differ for people whose counts are below optimum levels compared with those who are at or above optimum (United States Department of Health and Human Services, 2012). Viral load tests are recommended every 3 months and may be decreased to every 6 months for people who are considered to possess a stable, undetectable viral load. Michigan officials employ a definition of engagement in care based on visit constancy (Mugavero, Davila, Nevin, & Giordano, 2010): one CD4 or viral load test administered 6 months apart within each given 12-month period. For the purposes of our evaluation, we adopted this definition of engagement in care. Participants were classified as not engaged in care (no CD4 or Viral Loads recorded), inconsistently engaged in care (some CD4 or Viral Loads recorded), or consistently engaged in care (at least one CD4 or Viral Load recorded every 6 months and at least 2 months apart in every 12-month period) over the 3-year period post-release. If an individual was reincarcerated or died during the 3-year period, we classified their engagement status based on the pattern of test results up to the date of their death or reincarceration.

**Health status.** We used CD4 and viral load records from MDCH's CAREWare database to determine if formerly incarcerated individuals were in good health. We operationalized good health as having a CD4 count at or above 500 or a viral load at or below 75 cubic milliliters per copy. Mortality records were also used to assess health status. Former clients who were interviewed also reported on their perceived state of health.

## Results

### Initial Linkage to Care

Of the 190 formerly incarcerated individuals referred to the reentry service, 60% ( $n = 114$ ) had met with their medical case manager within 30 days of release. Of the 126 clients (66%) who received a medical appointment referral, 86% of those 126 ( $n = 109$ ) had attended an appointment with that provider within 30 days of release. Out of the total number of those who used the reentry service ( $N = 190$ ), only 50 (26%) had evidence in CAREWare of viral load or CD4 testing within 1 month of release.

### Routine Engagement in Care

About 63% ( $n = 119$ ) of formerly incarcerated individuals had a post-release record of CD4 counts and viral loads in CAREWare, suggest that 37% had no post-release engagement in care. Within 6 months following release, 50% of those with records of tests ( $n = 119$ ) had a CD4 lab test and 45% had a viral load test documented in their record. Beyond the initial 6 months post-release (and excluding those who died after release or were reincarcerated in any given time interval), the proportion with a record of tests in each succeeding 6-month period dropped to 27-33% for viral load testing and 29-37% for CD4 counts. We plotted individuals' CD4 and viral load testing over 3 years to determine their pattern of care engagement. Over the 3-year period post-release, inconsistent engagement in care was the most common pattern among the 119 people with CAREWare records (63%;  $n = 74$ ). Approximately 25% ( $n = 30$ ) had records suggesting that they were never engaged in care once released and had only done so prior to their incarceration. CAREWare records suggesting consistent engagement in care were least common (12%;  $n = 14$ ). Regarding insurance, 67% ( $n = 127$ ) had enrolled in MiDAP or another state-managed insurance assistance program at some point over the 3-year post-release period.

To confirm patterns in the CAREWare data, we asked the 60 interviewees about medical insurance coverage, stability of their primary infectious disease care, degree of engagement in care, and ART adherence. Regarding insurance, 73% reported that they were insured through a public source such as Medicaid; 10% reported no coverage and 4% reported private insurance coverage. The remaining 13% of interview respondents reported that they only had ADAP coverage. Although 85% said they had somewhere to obtain routine care, typically a public hospital or clinic (92%), slightly fewer than half of those we interviewed (48%) had seen the same infectious disease doctor over the 3 years since their release. Among those who had changed providers, 43% had seen between two and five different infectious disease physicians in 3 years. Among those who were in care at the time of the interview, 87% reported that they were currently prescribed ART. Of those on medication, 59% reported forgetting to take their medications. On average, the interviewees reported taking 82% of their medication. Most of those who lacked a prescription for ART also lacked insurance (67%). The remainder perceived they did not need medication or medical care.

### Health Status

At release, 27% of the 163 individuals who had pre-release CD4 data from prison recorded in their client service record had normal CD4 counts ( $> 500$ ); 43% of the 157 with viral load data had undetectable viral loads ( $< 75$  copies per cubic milliliter). Figure 2a plots CD4 counts in CAREWare over 6-month post-release intervals. Figure 2b plots undetectable viral loads, again using CAREWare records. As we show, CD4 counts were low but relatively stable over time. The proportion of persons with an undetectable viral load dropped initially, hitting a low of 16% at 18 months post-release. These two indicators of health were unrelated to having used case management and medical referrals within 30 days of release. Mortality data also provide an indication of health status. Since their initial enrollment in reentry services, we identified 17% ( $n = 33$ ) as deceased. Of these, 22% had died within 1 year of release. Average time to death was 33.2 months; average age at death was 46.4 years (roughly 3 years younger than the United States median among HIV-infected people (Centers for Disease Control and Prevention, n.d.)). Using state records, 13 deaths (39%) were reported as HIV-related. Only 9% ( $n = 3$ ) of the deceased had CD4 and viral load assessments recorded in the months

immediately preceding their deaths.

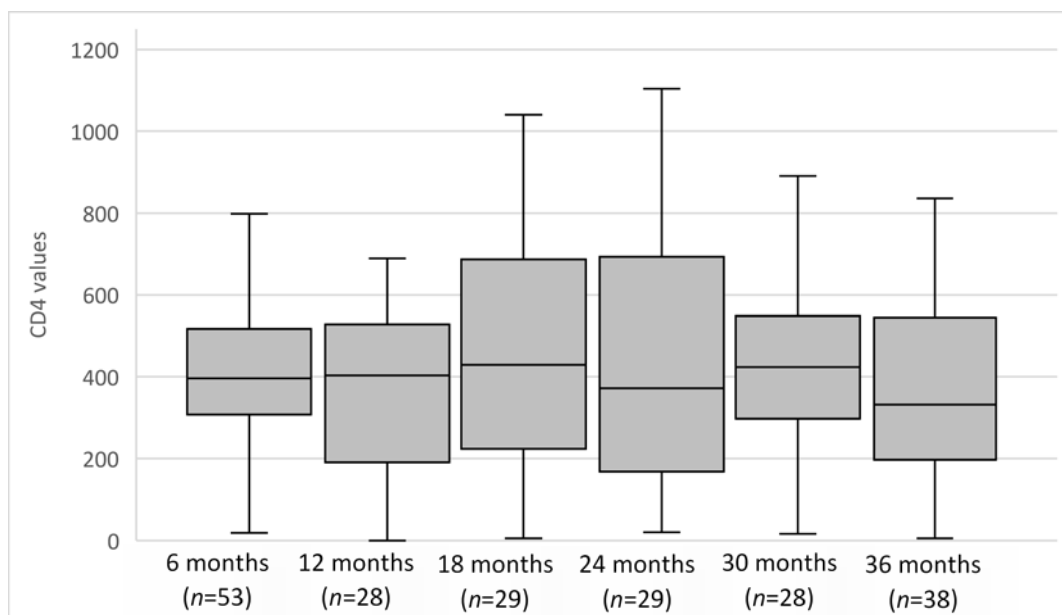


Figure 2a. Box and whisker plot of CD4 values recorded in CAREWare over time (N = 119). Note: Bolded black lines display the median CD4 count, boxes report the interquartile range, the bottom border of the whiskers display 1.5 times the 1st quartile, and the top border displays 1.5 times the 3rd quartile. These data account for deaths and re-incarcerations by removing ex-offenders from the denominator in the intervals that follow their dates of death or that correspond with dates of re-incarceration. The n of living and non-incarcerated persons with CD4 data for each time-period are reported under each box-and-whisker display.

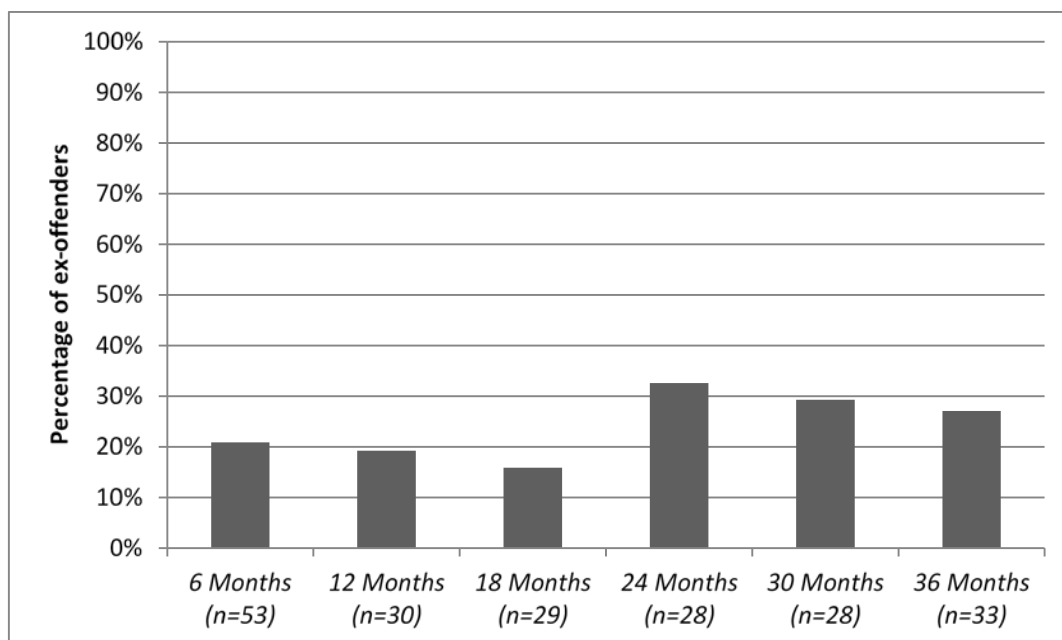


Figure 2b. Percentage of ex-offenders with undetectable viral loads recorded in CAREWare over time (N=119). Note: These percentages account for deaths and re-incarcerations by removing ex-offenders from the denominator in the time intervals that follow the dates of death or date of re-incarceration. The n of persons who were alive, not re-incarcerated, and who had viral load data recorded during the relevant time interval are reported below each bar.



## Discussion

Understanding linkage to and engagement in HIV care following community reentry is crucial to improve health outcomes for formerly incarcerated individuals. Failure to engage in care in the years immediately after release from prison may have fatal consequences for HIV-infected individuals and increases the odds of their transmitting the virus to others because they have not achieved viral suppression (Mugavero et al., 2010; Baillargeon et al. 2009; Dennis et al., 2015). In this study, we examined whether formerly incarcerated HIV-infected individuals who had used the sole community reentry service in the state for HIV-infected prisoners had linked to and remained engaged in care for 3 years following their release from prison. We also assessed their health status via medical records and self-report.

We observed that although a majority of formerly incarcerated clients followed-up on referrals to medical case managers and infectious disease specialists within 30 days, most failed to engage in care over time. Roughly one-third of released individuals had no record indicating receipt of medical care after their release. Over the 3-year period following their release, only 12% were consistently engaged in care, roughly half of what one might expect to see in the general population of people living with HIV and considerably fewer than previously published literature on formerly incarcerated people (Iroh et al., 2015; Palpeu, Tyndall, Chan, Wood, Montaner, & Hogg, 2004; Stephenson, Wohl, Golin, Tien, Stewar, & Kaplan, 2005; Wohl et al. 2011; Baillargeon et al. 2009). As Murphree and colleagues note, 30% to 60% of people released from prisons fail to establish care (Murphree et al., 2018). A majority of the former reentry program's clients engaged in HIV care inconsistently or failed to engage in care at all. Furthermore, follow-up on referrals was not associated with accessing care routinely over the 3 years following release and was also unrelated to indicators of longer-term health status, including CD4 and viral load levels, mortality, and self-reported health status. Although we found high rates of initial linkage to care among those who received referrals to a medical provider, we found little difference in their long-term quality of health. These findings suggest that short-term assistance to access care immediately upon release may be insufficient to assure longer-term engagement in care.

The reentry service we examined only monitored linkage to care for 30 days. By its design, there was no follow-up assistance to those who might need longer-term help and to document the challenges they encountered. Those individuals who did not access care quickly and consistently encountered the more significant set of challenges in re-engaging with care. Among those we interviewed, those who were not engaged in care at all were most likely to report they had unmet needs at release. These findings add support to guidelines urging ongoing monitoring of engagement in care and aggressive follow-up with individuals who fail to engage in care to address access challenges and minimize treatment interruptions (Thompson, Mugavero, Amico, Cargill, Chang, Gross et al., 2012).

A minority of formerly incarcerated people accessed care consistently over the time-period we examined and could be considered optimally engaged in care 3 years after release. The small proportion of persons accessing care routinely augurs poorly for the health of the population of community-dwelling HIV-positive formerly incarcerated people. Even among those accessing care on a semi-routine basis (predominant among those we interviewed) we found poor rates of medication compliance. Indicators of well-being, including CD4 and viral load measures, mortality rates, and self-reports of physical and mental health characterized the majority as in poor to fair health. These health data are alarming, yet consistent with the outcomes one might expect given the irregular use of care we observed. Coupled with the sub-optimum pattern of ART adherence among those we interviewed, our evaluation suggests the need for ongoing intervention among this population to support medical regimen compliance, in addition to care engagement.

## Limitations

A key limitation of the current study concerns the lack of baseline information for Michigan's community-residing HIV-positive formerly incarcerated population prior to the inception of the reentry service. Because these data were not available, we were unable to judge the extent to which the rates we observed on key indicators reflect an improvement, decrement, or no change. Similarly, because we lacked the ability to construct retrospectively a comparison sample of formerly incarcerated people who had not used the service, we cannot judge whether the individuals who used the service fared better than those to whom it may not have been offered.

We were unable to determine whether those who used the service comprised the entire population of HIV-positive persons released during the time-period we examined. Because all HIV-positive incarcerated people in the state's prisons were to be referred to the service, at least in theory, we could assume that our data captured the entire population. However, we have reason to doubt this is so. First, it is possible that not all prisoners were willing to participate in the phone intake prior to their release and that records failed to document these refusals. Second, we suspect that not all HIV-infected prisoners were referred to the service as they were supposed to be. Women appear to be underrepresented among those who had access to the service. The national prevalence of HIV among women in prison is generally higher than it is among men, at roughly 3.5% (Greenfeld & Snell, 2000) and Michigan has a large population of imprisoned women compared with most states. Black women are overrepresented in Michigan's prisons and among women infected with HIV in Michigan. The very small number of women referred to the program during the time-period we studied gives cause for concern that these data underrepresented formerly incarcerated women living with HIV. The single interview we conducted with a woman and our key informant interviews (data not reported) affirmed our suspicion that women were less likely to receive referrals to the program. This is concerning given that what little data we have on women suggests that they fared worse than men upon release. For instance, half of the women in the study were deceased compared with 17% of the men. Studies on women are necessary to better understand their post-release experiences accessing care.

A third limitation concerns the quality and completeness of the various records we had available to us. Michigan State Police records were generally complete. By contrast, records maintained by MDCH contained multiple incomplete fields, missing cases, and data entry errors (e.g., viral load values input in CD4 fields). Records maintained by the organization funded to provide the service did not always contain information such as pre-release lab values or demographic information; what information was recorded and how it was noted also changed over time. Equally important, these databases were not designed to produce real-time person-level reports easily and across substantive domains. Taken together, we could fill in missing information from one source to another and we could corroborate information from one source as generally consistent with another. However, the lack of an integrated, complete, and reliable state-level database across correctional and health domains limits the degree to which the implementation of programs such as this can be routinely, easily, and accurately monitored. Integrated databases to aid engagement in care efforts represent an urgent priority for this and other populations at high-risk of poor health outcomes (Mugavero, Norton, & Saag, 2011).

## **Conclusion**

We relied on multiple sources of evidence to understand whether HIV-infected ex-offenders were in reasonable health, maintained in care, and medically compliant 3 years after they had been released. We found many ex-offenders were in poor health. Moreover, compliance with medical regimens was poor. Simple programs aimed at discharge planning and immediate linkage to medical case management are insufficient to address these long-term personal and systemic barriers to health faced by formerly incarcerated people. Formerly incarcerated people living with HIV are at critical disadvantage when released from prison. The population is more likely than the general population of HIV-infected persons to never link to care (Baillargeon et al., 2010) or to fall out of care (Baillargeon et al., 2009). Absent from routine care, formerly incarcerated people with HIV cannot achieve an undetectable viral load, the inability to transmit the virus to others, and optimum health. With thousands of HIV-infected inmates being released from prison each year, intervening to support their engagement in care during the reentry period is crucial for their well-being and for the larger public health of the communities in which they reside.

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