

## ORIGINAL PAPER

## General

# Detailing the process of identifying and the outcomes of efforts to address lawfully “owed” DNA

Rachel E. Lovell PhD 

Criminology Research Center, Cleveland State University, Cleveland, Ohio, USA

**Correspondence**

Rachel E. Lovell, Criminology Research Center, Cleveland State University, Cleveland, OH, USA.

Email: [r.e.lovell@csuohio.edu](mailto:r.e.lovell@csuohio.edu)**Funding information**

Bureau of Justice Assistance, Grant/Award Number: 2016-AK-BK-K011 and 2019-AK-BX-0029

**Abstract**

While missed DNA sample collection has been an identified problem for decades, there has yet to be a scholarly publication related to a large-scale effort to address lawfully “owed” DNA outside of a prison system. Lawfully owed DNA samples are DNA samples that legally should have been collected and entered into Combined DNA Index System (CODIS) based upon a qualifying offense but were not. As the first jurisdiction funded by the Bureau of Justice Assistance's Sexual Assault Kit Initiative to address lawfully owed DNA, this case study fills this knowledge gap by answering four key questions: What was the scope of the problem in this jurisdiction? What was the process by which individuals who owe were identified? What were the outcomes of these efforts? And what were the lessons learned and recommendations for other jurisdictions? Findings from this case study indicate widespread DNA sample collection issues in this jurisdiction, with nearly 15,000 identified as owing DNA over the span of approximately 7 years. Efforts to collect lawfully owed DNA samples from those who owe over a duration of approximately five and a half years have resulted in about one-fifth now being in CODIS, about 4% of these newly collected DNA profiles resulted in a forensic hit, and a quarter of those hits have resulted in a prosecution. This study serves as an important blueprint for other jurisdictions and underscores the importance of having effective policies and practices to help ensure that all who should lawfully have their DNA collected and uploaded into CODIS do.

**KEYWORDS**

CODIS, DNA, DNA sample, DNA sample collection, lawfully owed DNA, Sexual Assault Kit Initiative

**Highlights**

- Over 7 years, 14,931 individuals failed to have their DNA collected in one urban county (lawfully “owed” DNA).
- Efforts to collect lawfully owed DNA over 5½ years resulted in 3069 of the 14,931 (21%) now being confirmed to be in CODIS.
- 116 forensic hits resulted from the DNA profile entries of the 3069 (4%) individuals.
- To date, 27 (23%) of the forensic hits resulted in the case being prosecuted.
- Findings highlight the importance of jurisdictions assessing and ensuring DNA is being lawfully collected.

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2022 The Author. *Journal of Forensic Sciences* published by Wiley Periodicals LLC on behalf of American Academy of Forensic Sciences.

## 1 | INTRODUCTION

The federal DNA database, the Combined DNA Index System or CODIS, began in 1990 as a pilot project across 12 US states to help identify suspects and link crimes via DNA uploads. A DNA “upload” entails adding a unique profile to CODIS to an existing DNA sample in the database for a possible match or “hit.” In simplistic terms, there are two types of hits: (1) an offender hit—the DNA profile matches a named individual already in CODIS and (2) a forensic hit—the DNA profile matches a sample(s) in CODIS that is collected from a crime scene.

CODIS has taken decades to populate. As of October 2021, CODIS contained approximately 20 million DNA profile uploads connected to individuals in the offender and arrestee index and 1.1 million profile uploads connected to crimes in the forensic index [1]. As a result, CODIS has become a powerful law enforcement tool for providing investigative leads, as profiles remain in the database extending beyond the crime in question to help solve past and current crimes and prevent future crimes [2]. In addition to aiding in adjudicating unsolved crimes by identifying potential suspects (also known as cold hits), CODIS hits are useful in conviction integrity by confirming the identities of individuals who were already adjudicated or named suspects (warm hits). CODIS hits can also exclude suspects (e.g., consensual partners or those determined not to be suspects in the crimes) [3]. Beyond hits, DNA databases produce an estimated cost savings of between \$1566 and \$19,945 per profile [4] and effectively detect offenders and deter future crimes [5].

As of 2009, all 50 US states participate in CODIS [6]. However, states differ dramatically on which criminal justice entity is responsible for collecting, when in the criminal justice process the DNA sample is mandated to be collected and/or uploaded into CODIS, and from whom DNA samples can be collected. All US states collect DNA from persons convicted of felony crimes, but according to a database developed by the Rape, Abuse, & Incest National Network (RAINN), as of March 2020, 32 states allow DNA sample collection of lawfully owed samples (hereafter referred to as DNA sample collection) from those convicted and arrested for serious felonies, and 19 states allow DNA sample collection from those convicted and arrested for all felonies. Some states also allow DNA sample collection from those arrested for certain misdemeanors, depending upon the nature of the offense and whether the crime has been repeated [7]. A key benefit of collecting a DNA sample for felony arrests and convictions is that the more DNA profiles uploaded into CODIS, the more those profiles can be linked to other crimes, thereby increasing CODIS' robustness. Lastly, states' DNA sample collection statutes vary widely as to when in the criminal justice process a DNA sample can first be collected—at booking, at or after probable cause hearing, at or after issuing a warrant, at arraignment, after a preliminary hearing, prior to release (bail), or after a grand jury hearing [7]. (See Ref. [8] for a summary of RAINN's database related to the US state's DNA sample collection statutes). Therefore, while all states contribute to CODIS, the patchwork of DNA sample collection laws across the states affects the size of state DNA databases, which affects

the size of federal DNA data. This patchwork of laws also speaks to the complexity of collecting DNA samples from individuals who should have their DNA in CODIS based upon a qualifying arrest and/or conviction (“lawfully owe”) [9], and with greater complexity comes increased potential to have collection issues (“misses”) from those who should have their DNA in CODIS but do not [10]. Large-scale issues with collecting lawfully owed DNA have been identified within several states, such as Michigan [11] and Ohio [12], but pertain to collections within prison systems.

Several federal funding programs have worked to address issues with lawfully owed DNA, including the US Department of Justice's (DOJ) National Institute of Justice's Capacity Enhancement for Backlog Reduction (CEBR) (which was later administered as a CEBR initiative by the DOJ's Bureau of Justice Assistance, or BJA) and BJA's Sexual Assault Kit Initiative (SAKI). BJA's SAKI, which began in 2015, has provided hundreds of millions of dollars (and counting) in funding to jurisdictions seeking to address their unsubmitted and/or untested (sometimes referred to as “backlogged”) sexual assault kits (SAKs). A SAK consists of a set of items used by medical professionals to collect and preserve evidence (e.g., vaginal swabs and fingernail clippings) from a victim of sexual assault. This SAK contains, at times, the only evidence that links a suspected perpetrator to the sexual assault; however, this linkage requires testing the DNA potentially contained within the SAK, yet hundreds of thousands of SAKs across the United States have (until recently) remained untested [13]. These untested SAKs represent a missed opportunity to populate CODIS with potentially hundreds of thousands of profiles connected to suspected sexual assault offenders. Lawfully owed DNA represents a missed opportunity to populate CODIS with potentially hundreds of thousands of profiles connected to arrestees, a portion of which are predicted to link to the now tested SAKs.

Traditionally, when SAKs were submitted for forensic testing, it was primarily for cases where victims were sexually assaulted by strangers *and* actively participating in the investigation and/or prosecution [14], which resulted in a limited and unrepresentative number of sexual assault offenders being entered into CODIS [15, 16]. However, research from SAKI has demonstrated that by testing all the SAKs—those associated with sexual assaults committed by non-strangers, from incidents that occurred outside the statute of limitations, and from victims who did not want to prosecute—law enforcement has continued to populate CODIS, identify previously unknown suspects, and connect previously unconnected crimes. For example, in one SAKI jurisdiction, testing 5000 previously untested SAKs resulted in nearly 1000 new profiles being added to CODIS; additionally, in the same jurisdiction, two-thirds of all SAKs containing DNA returned a CODIS hit [17]. Furthermore, research from SAKI has shown that serial sexual assault offenders are more common than once thought [2, 18], and suspected sexual assault offenders identified from testing the SAKs were also frequently linked to other types of crimes, in particular, violent crimes [2]. These findings suggest a strong link between testing SAKs and the probative value of CODIS in generating investigative leads for various crimes, not just sexual

assault. However, lapses in offender DNA sample collection serve to undermine these outcomes.

To address this, in 2016, BJA's SAKI began funding current SAKI grantees to address issues of "lawfully owed" DNA samples, which are DNA samples that legally should have been collected and entered into CODIS based upon a qualifying offense but were not. This was done with the recognition that the more (lawful) profiles uploaded into CODIS, the more robust the database becomes, thereby increasing the probative value in testing the SAKs via the increased probability of DNA matches in CODIS. Cuyahoga County's (Cleveland, Ohio) SAK Task Force, led by the Cuyahoga County Prosecutor's Office (CCPO), was SAKI's first lawfully owed grantee. The grant was awarded in October 2016. The four main activities associated with this award were: completing a census (defined as a list of individuals who should have had their DNA in CODIS based on a qualifying offense but did not); lawfully collecting DNA samples from individuals identified in the census; ensuring collected DNA samples were submitted for testing; and following up on any resulting forensic hits or matches.

Given that the Cuyahoga County SAK Task Force was SAKI's first lawfully owed DNA grantee, prior to the initiative described in this study, there was little existing guidance as to how to assess the scope of the issue, how to effectively tackle the collection issues, and what outcomes could be expected from these efforts. Moreover, most efforts to collect lawfully owed DNA were based on DNA sample collections within state prison systems. This distinction is important because ensuring DNA is collected from those currently incarcerated presents fewer logistical issues than those under supervision within the community or those no longer under any criminal justice supervision. Little was known about how to tackle arrestee DNA sample collection misses—those not currently incarcerated [19]. This case study fills this knowledge gap by answering four key questions: What was the scope of the problem in this jurisdiction? What was the process by which individuals who owe were identified? What were the outcomes of these efforts? And what were the lessons learned and recommendations for other jurisdictions seeking to address their DNA sample collection misses?

## 1.1 | DNA sample collection statutes in Ohio

With the passage of Ohio Senate Bill 5 in 1995 (effective 1996), Ohio began collecting DNA from individuals *convicted* of felony offenses for upload into CODIS [9]. However, the law regarding eligibility for inclusion in CODIS dramatically changed with Ohio Senate Bill 77 in 2010. In addition to collecting DNA from individuals convicted of felony offenses, Ohio Senate Bill 77 (effective July 1, 2011) began collecting DNA from individuals *arrested* for all felony offenses. Thus, since mid-2011, Ohio has been a DNA sample collection at felony arrest state [20].

In Ohio, the DNA sample collection statute provides multiple opportunities for an individual to have their DNA collected if missed at a qualifying arrest [21]. However, different agencies are responsible

for collecting at different steps or stages in the criminal justice process, complicating the collection process. Table 1 details the stages of the criminal justice process when DNA sample collection should occur, the entity responsible for collecting, and the type of collectible offense.

There are a few important notes about the DNA sample collection statute and process. First, there is attrition within the criminal justice system, so not all people who are arrested are arraigned, not all who are arraigned proceed to sentencing, and not all who are sentenced complete their supervised release. Thus, as individuals advance in the criminal justice system, there are numerous opportunities to miss collection for those who fail to proceed. Second, Ohio's DNA collection statute provides several opportunities for collection to occur throughout the criminal justice process [21]; however, the collection is contingent upon later stages in the process ensuring or having information as to whether DNA samples were collected or missed at earlier stages—a substantial barrier to DNA sample collection that has identified in other jurisdictions as well [8].

Third, what qualifies as a collectible offense changes as individuals advance through the process. At arrest, it is a felony arrest. At arraignment, pre-trial, plea, and sentencing, it is a felony indictment, and at conviction, it is a felony conviction. However, in most instances, the severity level of the offense(s) decreases as it proceeds in the process, for example, what might have started as a felony arrest is reduced to a misdemeanor at the time of a plea or sentencing. This presents additional opportunities to miss DNA sample collection if not completed at the earliest possible stage.

Finally, Ohio's DNA collection statute does not include a provision by which an individual could legally be compelled to submit to DNA sample collection if they should have had their DNA collected for a prior offense but did not—unless they are currently in custody or under supervision (of the criminal justice system) or are suspects/defendants in a pending case. In other words, not all offenders who lawfully owe their DNA can be compelled to provide a DNA sample in Ohio.

The following section details what was known about how widespread the DNA sample collection issues might have been in the jurisdiction when applying for the grant—all of which suggested wide-ranging issues with lawful DNA sample collection, including DNA sample collection misses from prison inmates, highly publicized misses of specific offenders, the Cleveland Police Department's DNA collection policies, and misses within Cuyahoga County SAK Initiative.

## 1.2 | Evidence suggesting a widespread problem with collecting lawfully owed DNA in Ohio

### 1.2.1 | Collection issues of inmates: high-profile misses

The identification of two high-profile Cleveland-area serial rapists and murderers, Anthony Sowell and Larry McGowan, who should

| Stages in the criminal justice system | Agency responsible for collecting  | When collection should occur   | Type of collectible offense    |
|---------------------------------------|--|--|--------------------------------|
| Felony arrest                         | Arresting agency   | Booking or intake  | Felony arrest                  |
| Arrestment/first court appearance     | Court; Prosecutor can file motion to obtain  | If charged with felony without a formal arrest or if missed earlier <sup>a</sup> | Felony indictment              |
| Pre-trial                             | Court; Prosecutor can file motion to obtain  | If missed earlier  | Felony indictment              |
| Guilty plea and/or sentencing hearing | Court; Prosecutor can file motion to obtain  | If missed earlier  | Felony conviction <sup>b</sup> |
| Incarceration (where applicable)      | Detention facility (Dept. of Rehabilitation and Corrections)   | If convicted of felony and missed earlier  | Felony conviction              |
| Parole or probation                   | Agency overseeing supervised release (Dept. of Rehabilitation and Corrections [parole] or Court [probation]) | If convicted of felony and missed earlier  | Felony conviction              |

<sup>a</sup>Sometimes referred to as "straight to indictment."

<sup>b</sup>Plus a few qualifying misdemeanors.

TABLE 1 Details of Ohio's DNA sample collection statute

have been in CODIS based on qualifying offenses, indicated there could be a systemic DNA sample collection problem in the jurisdiction. In 2009, after discovering the bodies of 11 decomposing women in and around the home of Sowell, officials also discovered that Sowell should have been in CODIS for a 15-year prison sentence for rape but was not. McGowan's DNA had been linked to six SAKs tested as part of this jurisdiction's SAKI efforts (including the murder of one of the victims), but he remained an unknown suspect until a DNA sample was taken for a 2012 rape arrest in Akron, Ohio (in a neighboring county). McGowan had been in and out of prison for over a decade for various felony convictions, so his DNA should have been in CODIS before he was released in 2012. Both individuals went on to commit violent crimes that could have possibly been prevented had their DNA been entered into CODIS in a timely manner.

Subsequent investigations indicated that both Sowell and McGowan had been his DNA collected in prison, but their DNA from those DNA samples was not entered into CODIS [12, 22]. As part of their investigation, prison officials uncovered several significant lapses in the process, including prison officials mailing samples to the Ohio Bureau of Criminal Investigation or BCI via prison mailrooms that inmates staffed; prison officials asking inmates before release if they had already had their DNA collected and if they responded yes, no DNA was collected (as officials had no way of knowing who had their DNA already collected); and the discovery of 200 untested samples by a private laboratory that had been contracted to test the DNA samples [12].

In response to these high-profile failures, prison officials announced changes to practice, which included sending DNA samples collected in prison via certified mail to ensure delivery confirmation, BCI sending notification of a failed sample to a central location rather than an individual agency to reduce the chances that the notification was overlooked, and the inclusion of a "DNA checkbox" in an offender's electronic record. Both law enforcement and prison officials have access to this checkbox through the Ohio Law Enforcement Gateway, an electronic, statewide criminal justice database managed by the Ohio Attorney General's Office. With the addition of this DNA checkbox, prison officials were tasked with checking a prisoner's DNA status before releasing them, and law enforcement officers were tasked with checking at the time of booking [12].

### 1.2.2 | Cleveland Police Department's DNA samples of those arrested for felonies

While these high-profile misses highlighted known issues with DNA sample collection in the prison system, there was strong evidence to suggest issues with DNA sample collections were not limited to the prison system but were also occurring much earlier in the process—at the time of arrest. At the time of the application for the 2016 SAKI award, Cuyahoga County knew that contrary to state law, the largest law enforcement agency in the county and with the largest number of felony arrests was not consistently collecting DNA samples upon arrest. From July 2011 to May 2015, it was the Cleveland Police's

policy to allow offenders arrested for felonies to opt out of having their DNA collected [23]. Felony arrestees were allowed to refuse to have their DNA collected via a cheek swab in exchange for a misdemeanor obstruction of official business charge. However, Cleveland Police did not document the number of people who refused DNA sample collection nor did they document whether offenders were charged with obstruction of official business. According to data obtained by the *Plain Dealer*, in 2013 and 2014, Cleveland Police averaged approximately 10,000 felony arrests a year, but in those same years only 2000 samples, on average, were submitted to BCI for testing a year (with an unknown number already in CODIS) [24].

As of May 2015, Cleveland Police amended its DNA sample collection policy, mandating the collection of DNA samples for all felony arrests. Their revised policy stated that if an individual in custody refused to have their DNA collected, officers must note this in the police report and have the offender sign an affidavit affirming the refusal. In addition, the offender must be informed that they will go before a municipal judge who could compel a DNA sample. Booking officers were also to check the DNA checkbox [25]. However, following this change, few police reports noted these refusals, and few were charged for refusing to submit in municipal court [24]. Based on this information, likely thousands of offenders might have been missed over this time period. The exact number was unknown.

### 1.2.3 | Missed DNA sample collections from those identified via previously untested SAKs in Cuyahoga County

While following up on thousands of previously untested SAKs, the SAK Task Force uncovered several instances where an offender should have had their DNA in CODIS but did not. George Young was one of those offenders. In April 2013, the SAK Task Force indicted Young's DNA profile after it was found in two previously untested SAKs ("forensic hit")—one from 1993 and one from 1996. His was the first "John Doe indictment" of the initiative, where his profile was indicted as a way to "stop the clock" on the statute of limitations, as he was not yet identified. Several months before the John Doe indictment, in August 2012, Young was arrested for shooting into a habitation that injured several people but did not have his DNA collected at the time of arrest. His DNA was finally collected and entered into the offender side of CODIS by Ohio prison officials after his conviction for the 2012 shooting. Once entered into CODIS, his profile matched to two rapes—one in 1993 and one in 1996. As a result, the SAK Task Force amended the indictment, whereby John Doe #1 became George Young. He was convicted of these rapes and sentenced to 11 years in prison [26].

### 1.3 | Significance and aim of the study

As of 2016, these big misses, existing data, and police DNA sample collection practices indicated that Cuyahoga County might have had a substantial issue with collecting lawfully owed DNA; however, the

full extent of the issue remained unknown. With funding provided by SAKI, the Cuyahoga County SAK Task Force and their research team, led by the author of this study, collaborated on efforts to tackle the issue of lawfully owed DNA. However, there was limited information and no empirical evidence in the scholarly literature to guide these efforts, especially related to DNA sample collection issues outside the prison system. How many missed profiles could reasonably be expected? How many individuals who owe could reasonably have their DNA collected? After the owed profiles were uploaded to CODIS, how many forensic hits could reasonably be obtained? And what if there were no (or very few) forensic hits after all these efforts?

This study addresses these questions. More specifically, this study has two main aims:

- To explain the processes by which the census was conducted, and the DNA samples were collected and entered into CODIS, and
- To articulate the outcomes of these efforts—the number of DNA sample collection misses, the number of DNA samples collected, the number of forensic hits resulting from the collected DNA samples, the types of crimes connected to the forensic hits, and the outcomes of those hits.

To the best of our knowledge, this is the first case study in the scholarly literature related to a jurisdiction addressing lawfully owed DNA outside of the prison system, thereby filling an important knowledge gap and providing a blueprint for other jurisdictions seeking to address their collection issues. This study contributes to the literature by advancing our understanding of the issue of lawfully owed DNA, what can be done to address it, and the importance of ensuring DNA is lawfully collected. The following section describes the methodology employed to complete the census and the data, presents the outcomes of these efforts, and discusses lessons learned in this process. The discussion concludes by expanding on how this study informs our understanding of lawfully owed DNA, including future policies and practices.

## 2 | METHOD

### 2.1 | Census data

The presented data are based on a census conducted as part of a 2016 SAKI grant award to identify those who lawfully owe DNA in Cuyahoga County. Part I of the census began with data provided to the CCPO by the Ohio Bureau of Criminal Investigation (discussed in greater detail in the proceeding section). BCI is the CODIS administrator for the state. BCI provided data in early 2017 to CCPO on all individuals who were arrested for qualifying offenses in the two largest law enforcement agencies in the county—the Cleveland Police and the Cuyahoga County Sheriff's Department (CCSD)—and whose DNA was not in CODIS between July 1, 2011, and

December 31, 2016. These agencies were chosen for two reasons. First, given the size of these two agencies, these data represent the vast majority of felony arrests in the county. Second, if other law enforcement agencies from across the county were to be included, permission would have had to be obtained individually from each law enforcement agency in the county (50+ law enforcement agencies). Compared with Cleveland Police and CCSD, many of these agencies make considerably fewer felony arrests. Thus, to maximize our “return on effort,” the census was limited to these two agencies. Part II of the census was based on data provided by CCPO on all felony convictions in the county from the start of their electronic management system until June 30, 2011, described in greater detail in the results section.

The SAK Task Force, led by the CCPO, also received a 2019 SAKI lawfully owed DNA award to, among other tasks, continue ensuring DNA samples from census members are uploaded to CODIS and follow-up on results of the DNA being entered in CODIS. The data presented here include outcome information as of June 30, 2022. For the forensic hits, data were collected on the type of crime associated with the hit, if the crime was committed within Cuyahoga County (giving CCPO potential jurisdiction over the prosecution of the case), whether it was a “cold” hit (meaning the individual was not previously named as a suspect in the crime), and the outcomes of the case associated with the hit. The outcomes include: case closed without an indictment, case resulted in an indictment, investigation ongoing as of the end of the observation period, the case was previously disposed (suspect already prosecuted for the crime without the use of DNA), case outside of the statute of limitations, and the individual named in the CODIS hit was ruled out as a suspect.

### 3 | RESULTS

#### 3.1 | Process of conducting the census

##### 3.1.1 | Part I of the census

Given the previously stated knowledge gap of how to go about identifying those who owe, below is a thorough account of how the census was conducted. Conducting the census was complex because to know whether someone owed, several key data points were required, but different law enforcement entities had access to these data points. BCI had access to information about whether someone was in CODIS or not, but local law enforcement agencies and the prosecutor's office had access to information regarding the nature of the qualifying offense and/or criminal history of the suspect. As discovered, it was not always clear at the time of arrest whether the offense was a felony or not. For example, were the pills confiscated from a suspect an illegal substance or aspirin?

The census was conducted in two parts based on the two important changes in Ohio's DNA sample collection statutes—DNA sample collection at felony conviction and DNA sample collection

at felony arrest. Part I's data extract from BCI contained 16,213 unique individuals arrested for a potential felony from July 1, 2011 (the effective date for the DNA sample collection at felony arrest statute in Ohio) through December 31, 2016, and were not in CODIS as of December 31, 2016. However, not everyone on this list lawfully owed DNA. An additional step had to be completed to confirm whether they lawfully owed DNA because BCI provided arrestee data using the Ohio Revised Code section number, many of which could be misdemeanors or felonies. For example, an arrest for domestic violence could be a misdemeanor or felony depending on whether the individual had prior convictions for similar offenses or whether the victim was pregnant at the time of the offense [27]. BCI was unable to confirm whether or not these 16,213 individuals were arrested for qualifying (i.e., collectible) felony offenses.

Confirmation of owing DNA was accomplished through several steps. First, the list of 16,213 unique individuals was merged with the CCPO's electronic case management system, as the CCPO only handles felony cases, not misdemeanors. If an individual was on both lists, they were indicted on a felony in the county—meaning they were confirmed to owe DNA. This merged confirmed that 8126 of the 16,213 individuals lawfully owed DNA. Second, the offense type for the remaining 8807 individuals was examined. If the offense was always a felony (e.g., felonious assault, robbery, and burglary), even if the individuals were not indicted on the felony, they still owed. This step resulted in an additional 1084 individuals being added to the census. Third, personnel at CCPO with access to law enforcement electronic records management systems reviewed police reports and arrest documentation for 571 individuals on the “not yet confirmed” list for offenses that are often but not always felonies (e.g., carrying a concealed weapon, possession of drugs, improper handling of firearms in a motor vehicle, and discharge of a firearm on or near prohibited premises). Of those, 121 were confirmed felony arrests.

In the end, 9332 unique individuals were confirmed to owe DNA based on a prior felony arrest between July 1, 2011, and December 31, 2016. If unable to determine whether the offense was a felony, the person was not included in the census. This marked the conclusion of the first part of the census.

##### 3.1.2 | Part II of the census

Part II of the census focused on individuals convicted of a felony in Cuyahoga County. The bookends for Part II of the census were 2008 (the year the CCPO began using their electronic case management system) through December 31, 2016. However, the CCPO's case management system was not regularly populated with cases until approximately 2010. Thus, most individuals in Part II were connected to prosecutions that occurred in the year or so before July 1, 2011 (effective date for the change in DNA sample collection statute). CCPO provided a complete list of all felony convictions to BCI to obtain their DNA status (in CODIS or not). This resulted in a list

of people with felony convictions but not in CODIS. As a result, an additional 7270 individuals were confirmed to owe DNA in Part II.

Overlaps between Part I and Part II were identified via names, dates of birth, and (later in the grant) social security numbers. Of note, in earlier grant reports from this initiative, the census was reported to have 15,370 individuals. Duplicates census members were subsequently identified and removed. This process required a manual lookup of approximately 1000 people who appeared on both parts of the census to confirm whether they were the same. Additionally, during the observation period, there was a small number of census members who were in CODIS and then removed or who were in CODIS, removed, and then re-entered into CODIS, as people can be removed from CODIS for a number of reasons. This study reflects the most current number of non-duplicative census members as of June 30, 2022. *The completed census comprised 14,931 individuals confirmed to owe DNA in Cuyahoga County.*

### 3.2 | Process of collecting DNA samples from suspects who owe and ensuring entry into CODIS

After conducting the census, the next step entailed collecting DNA samples from census members and ensuring the DNA from those samples were entered into CODIS. Since Ohio has no legal provision by which to compel a suspect to submit a DNA sample unless the suspect has a pending case, is currently in custody, or otherwise under the supervision of the criminal justice system, DNA sample collection efforts focused on identifying census members who were under supervision and therefore could have or recently did have their DNA sample collected as part of the recent arrest/charge. These are referred to here as “sweeps” because they entailed catching individuals who were in or who became under the supervision of the criminal justice system. The sweeps involved regularly collecting data from various criminal justice entities to see if their data included census members and then asking those criminal justice entities to collect a DNA sample from the identified census members. Below is an expanded accounting of the process of conducting the sweeps. *As of June 30, 2022, 26 sweeps were completed, and 3069 census members now have their DNA entered into CODIS.*

Upon discovering the larger-than-expected census early in the initiative, CCPO organized a series of meetings with key decision makers within BCI and several criminal justice agencies in the county charged with DNA sample collection according to Ohio's DNA collection statute (which states that these entities *shall* collect or *shall* order the collection of DNA). In those meetings, data were presented on the scope of the issue, and potential short-term solutions were discussed regarding the DNA sample collection from those currently in custody (so as to not lose the ability to collect). Given these entities' statutory obligation to collect and upon the request of and in collaboration with CCPO, the Cuyahoga County Sheriff's Department, CCSD (the agency that at the time was recently responsible for both the city and county jail) and Cuyahoga County Common Pleas Court (felony-level court) provided lists of

all of those currently detained in the county jail or on court-order probation to the CCPO. This was the genesis of the jail and probation sweeps discussed below.

#### 3.2.1 | Jail sweeps

We conducted two sweeps of the Cuyahoga County jail, which entailed merging a list of all of those currently in jail with our list of census members. Once matches were identified, CCPO requested that CCSD collect DNA samples from those individuals and submit those DNA samples to BCI for entry into CODIS. A total of 77 people were identified and had a DNA sample collected from the jail sweeps only.

#### 3.2.2 | Arraignment/bail sweeps

Given the large number of individuals who owed their DNA in the jurisdiction, as a direct result of this grant, the CCPO developed and implemented an internal policy that tasked prosecutors with ensuring that defendants in new and active cases submit to a DNA sample (as CCPO only handles felony cases). Prosecutors were required to check the DNA status of indicted defendants prior to the defendant's first court appearance (generally, the arraignment hearing but sometimes a bail hearing) via the DNA checkbox in the Ohio Law Enforcement Gateway. If the DNA check box recorded that the defendant's DNA was not in the state DNA database, the defendant lawfully owed DNA. In that event, the prosecutor motioned the arraignment room judge to order the defendant to submit to a DNA sample collection procedure within 24h per Ohio's DNA collection statute [21]. Information on who was ordered to submit a DNA sample in the arraignment room was collected and provided regularly to BCI to obtain whether they were in CODIS. This provided information on how many census members had a DNA sample collected as a direct result of this policy. Seven sweeps from these data were conducted. A total of 413 people were identified and had a DNA sample collected from the arraignment/bail sweeps only.

#### 3.2.3 | Probation sweeps

Similar to the jail sweeps, two sweeps were conducted of those currently under the supervision of the probation department in Cuyahoga County and on the census. For someone to be sentenced and on probation but not have a DNA sample in CODIS meant they were missed numerous times as they proceeded through the criminal justice system (e.g., arrest, arraignment, pre-trial, and sentencing). Once matches between the probation list and the census were identified, CCPO requested the probation department collect DNA samples from those individuals and submit those DNA samples to BCI for entry into CODIS. A total of 546 people were identified and had a DNA sample collected from the probation sweeps only.

### 3.2.4 | Overlap of sweeps

Overlaps were identified between these three types of sweeps as people proceeded through or reentered the criminal justice system. In most instances, overlap implied being identified more than once for owing because they were going through the criminal justice system faster than the crime laboratory could test and process the DNA sample and report the results (e.g., DNA sample collection at entry into the jail and again at arraignment). In a few instances, individuals picked up a new charge (e.g., an individual on probation may also have been ordered to have their DNA sample collected at a new arraignment for a different crime). A total of 77 people appear in more than one of the jail, probation, or arraignment sweeps. For those confirmed to have their DNA in CODIS but not identified as part of a jail, probation, or arraignment/bail sweep, their DNA was obtained via the DNA in CODIS sweeps, as discussed below.

### 3.2.5 | DNA in CODIS

Starting in mid-2018 and throughout 15 sweeps, data from BCI were requested regularly whether census members were now in CODIS—either from a new charge and/or had their DNA sample collected by some criminal justice entity in Ohio. This allowed for tracking the DNA status of individuals who were not necessarily associated with crimes in the county or were not included in the other sweeps conducted as part of this project. Also, regular DNA status updates from BCI provided a check to ensure the DNA samples were not just collected but also entered into CODIS—a key deliverable for the SAKI award. By far, these types of sweeps were the most successful at identifying census members who now had their DNA in CODIS—1956 people were identified and had a DNA sample collected from the DNA in CODIS sweeps only.

### 3.2.6 | Obtaining forensic hits

Once confirmed to be in CODIS, BCI provided information to the SAK Task Force regarding any forensic hits that resulted from the profiles being uploaded in CODIS. The Task Force then reached out to the assigned detective on the case in the hit memorandum to either offer to take the lead in investigating the hit or offer assistance in investigating the hit. For the investigations not led by the SAK Task Force, investigators on the SAK Task Force would follow up semi-annually with the assigned detective to collect information regarding the status of pending cases.

The proceeding section expounds on the outcomes of conducting the census and collecting DNA samples from census members, including the number and nature of the census, the number of DNA samples collected from census members, the forensic hits, and the result of the forensic hits (see [Figure 1](#); [Tables 2](#) and [3](#)).

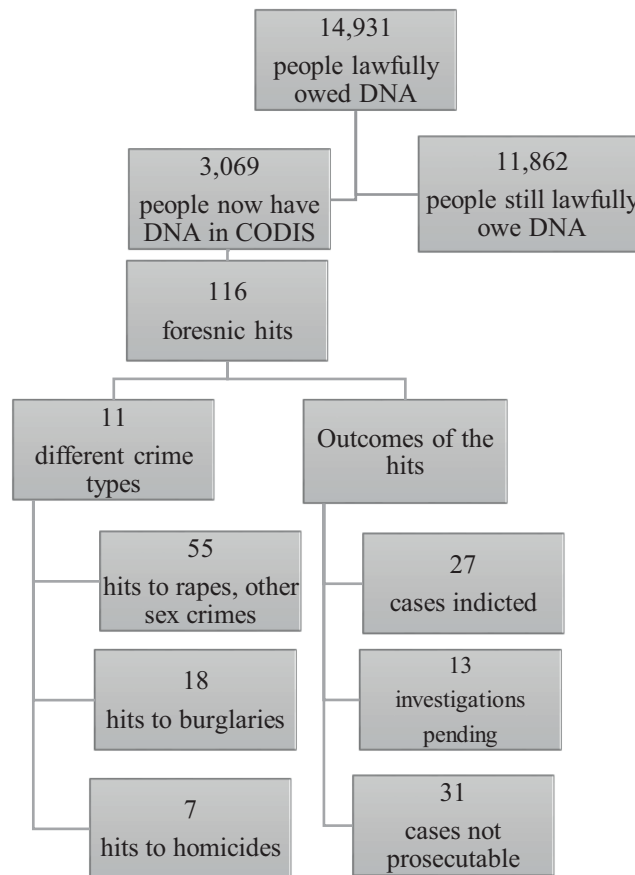


FIGURE 1 Illustration of the key outcomes from the Cuyahoga County lawfully owed DNA initiative, as of June 30, 2022.

## 3.3 | Outcomes of initiative

### 3.3.1 | The extent of the collection issue

Given that this was the first large-scale effort to identify individuals who owed in the county, there was no baseline understanding of how many “misses” would be uncovered or even how many misses would indicate substantial issues with collection. In the span of primarily 7 years, these efforts identified nearly 15,000 individuals who owed, which was much larger than anticipated.

To contextualize the size of the census, as of December 2018, Ohio had approximately 248,800 arrestee profiles in CODIS. Had the profiles from all census members been collected and uploaded, just Cuyahoga County could have increased the number of arrestee profiles for all of Ohio by 6% [9]. Data on the number of felony arrests in Cleveland Police or CCSO were requested but unfortunately not available since the distinction between felony versus misdemeanor was not readily provided by those agencies (again, often because this is determined in or around the time defendants were charged). Since completing the census, data collected by the Marshall Project from the public docket of felony cases in Cuyahoga County indicated that in the final year of our census, 2016, approximately 11,500 felony cases were charged in the county [28]. This is an undercount of cases since more would have been eligible for having their DNA



**TABLE 2** Type of crimes connected with the CODIS hits from individuals who lawfully owed DNA and had a DNA sample collected from the Cuyahoga County lawfully owed DNA initiative, as of June 30, 2022

| Types of crime                    | Total<br>f (%) |
|-----------------------------------|----------------|
| Arson                             | 1 (1%)         |
| Auto theft                        | 6 (5%)         |
| Assault (felonious)               | 3 (3%)         |
| Breaking and entering             | 12 (10%)       |
| Burglary (including 2 aggravated) | 21 (18%)       |
| Drug abuse                        | 1 (1%)         |
| Fleeing and eluding               | 1 (1%)         |
| Homicide (including 1 attempted)  | 7 (6%)         |
| Robbery (including 2 aggravated)  | 6 (5%)         |
| Rape/other sexual offense         | 55 (47%)       |
| Theft                             | 3 (3%)         |
| Total                             | 116 (100%)     |

Abbreviation: CODIS, Combined DNA Index System.

**TABLE 3** Investigative and prosecutorial outcomes of the CODIS hits, as of June 30, 2022

| Result   | Total<br>f (%) |
|--|----------------|
| Investigation closed without indictment                      | 44 (38%)       |
| Case subsequently indicted                                   | 27 (23%)       |
| Open investigation is pending                                | 13 (11%)       |
| Previously disposed  | 12 (10%)       |
| Ruled out as suspect (consent partner, victim, not involved) | 13 (11%)       |
| Outside statute of limitations                               | 6 (5%)         |
| Missing  | 1 (1%)         |
| Total  | 116 (99%)      |

Note: The total adds up to 99% due to rounding error. The missing hit is connected to a suspect who was later identified as not owing their DNA due to errors in identifying criminal justice information.

Abbreviation: CODIS, Combined DNA Index System.

sample collected—not all who are arrested for a felony are charged with a felony.

Analysis of our census indicated a roughly equal proportion of people were missed each year or about 2100 misses a year over 7 years. While it was unknown how many of those 11,500 cases [28] were connected to individuals who were already in CODIS, if assuming that cases roughly match with individuals and none were in CODIS—an extremely conservative assumption—then at the very minimum, one in five people did not have a DNA sample collected. If assuming that a third of these 11,500 cases were connected to individuals in CODIS (a more likely approximation), then about one in two people was missed. In other words, collection issues were

widespread and not limited to one agency or one criminal justice entity.

### 3.3.2 | Outcomes of collecting DNA samples

As demonstrated in Figure 1, in the 5 years from the first sweep until the end of the observation period (mid-2017 through mid-2022), 3069 of the 14,931 (20.6%) census members have been confirmed to now be in CODIS. From these 3069 individuals, 116 (4%) forensic hits were obtained.

### 3.3.3 | Outcomes of forensic hits

The vast majority of the 116 forensic hits were connected to crimes within Cuyahoga County (90%,  $n = 104$ )—meaning the CCPO had jurisdiction to potentially prosecute. Over two-thirds of all the forensic hits were “cold” hits (70%,  $n = 81$ ). Table 2 indicates that the hits were connected to a total of 11 different types of crimes, with rape/sexual offense being the most common (47%,  $n = 55$ ), in support of the assumption that hits to sexual assaults would be made upon entering in the DNA profiles for those that owe. The second most common type of crime from these hits was burglary (18%,  $n = 21$ ). Lastly, 6% ( $n = 7$ ) of the hits were connected to homicides/attempted homicides.

Table 3 presents the investigative and prosecutorial outcomes of the hits—38% ( $n = 44$ ) of the hits had cases that were closed without an indictment, 23% ( $n = 27$ ) of the cases resulted in an indictment, and 11% ( $n = 13$ ) had pending investigations. Over a quarter of the cases could not be prosecuted because they were previously disposed (10%,  $n = 12$ ) (serving as an avenue of conviction integrity); were ruled out as suspects in the cases (11%,  $n = 13$ ) because the CODIS hit was to a consensual partner (in the rape cases), to the victim in the case, or to someone determined to not be involved with the crime; or were outside of the statute of limitations (5%,  $n = 6$ ).

Below are three examples of cases that were successfully prosecuted as a direct result of the efforts to collect DNA from individuals who owe.

**Example 1** In August of 1997, an unknown man raped a 17-year-old girl while the victim was walking down the street. The suspect ordered her into his vehicle at gunpoint, then drove to a park where he raped her. As a result of the SAK Initiative, the SAK from this 1997 rape was tested and a single male DNA profile was developed, but the DNA did not result in a hit to any named suspect in CODIS. In 2017, SAK Task Force prosecutors presented the case to a grand jury and obtained a “John Doe” indictment, becoming the SAK Task Force’s “John Doe #124.” Meanwhile, in 2012, Antonio Huffman was arrested and charged with felonious assault. His DNA should have been collected in 2012 for this offense but was not. In 2015, he was again arrested and charged with illegally possessing a firearm, and his DNA should have been collected but was not. In 2017, Huffman’s

DNA was collected while on probation for the 2015 firearm possession as part of the first probation “sweep.” His DNA matched the DNA of indicted defendant “John Doe 124” in the 1997 victim’s SAK. The SAK Task Force investigated and prosecuted this case, and in October 2018, Antonio Huffman entered a plea of guilty to one count of felonious assault and one count of abduction and was sentenced to 2 years of community control on each count.

**Example 2** In March 2012, a 14-year-old female victim was raped on the street in Cleveland Heights, an inner ring suburb of Cleveland, by an unknown man. A SAK was collected and tested by BCI. The testing produced a single male DNA profile, but the DNA did not result in a hit to any named suspect in CODIS. Meanwhile, in 2014, Marquice Miller was arrested and charged with felony theft. In 2015, he entered a plea of guilty to one count of felony theft. His DNA should have been collected for this offense but was not, and it was this offense that resulted in him being listed on the census. In October 2017, also as part of the first probation “sweep,” Marquice Miller had his DNA collected, which resulted in a forensic hit to the 2012 victim’s SAK. The SAK Task Force investigated and prosecuted this case, and in July 2019, Miller pled guilty to rape and attempted kidnapping and was sentenced to 8 years in prison.

**Example 3** In 2014, Matthew Ramey was sentenced to 1 year of probation from a theft and aggravated theft arrest. When arrested for this in 2013, Ramey should have had a DNA sample collected but did not, resulting in him being included in the census. As part of these efforts, the SAK Task Force received two forensic hits for the same individual, Matthew Ramey—one auto theft and one theft. The CCPO prosecuted the cases, and he has since been sentenced for both 2017 crimes [29].

## 4 | DISCUSSION

While missed DNA sample collection has been an identified problem among forensic laboratories and law enforcement for decades [10], there has yet to be a scholarly publication related to a large-scale effort to address outside of a prison system. The efforts described in this case study were based on an initiative to tackle lawfully owed DNA in Cuyahoga County, led by the CCPO with funding provided by the Bureau of Justice Assistance’s SAKI. The CCPO applied for SAKI funding to address lawfully owed DNA because of known issues with DNA sample collection in the jurisdiction, including DNA sample collection misses from prison inmates, highly publicized misses of specific offenders, Cleveland Police’s DNA sample collection policies, and misses within the Cuyahoga County SAK Initiative. Funding was also sought in hopes of potentially identifying suspects in the previously untested SAKs by collecting DNA samples from census members. When the lawfully owed DNA initiative described here began, there was a very limited “blueprint” to follow to determine who lawfully owed DNA, how to obtain a DNA sample from them, and what would be the results of these efforts. As the first SAKI

lawfully owed DNA initiative, this study fills an important knowledge gap in the literature related to the process and outcomes and serves as that blueprint for other jurisdictions seeking to address their issues with lawfully owed DNA outside of a prison system.

DNA sample collection statutes vary greatly by state and often involve a substantial amount of complexity; however, the federal DNA system relies on all entities within each state to do their part. Missed opportunities to collect lawfully owed DNA samples limit the full probative power of CODIS in helping solve past, current, and future crimes [30], deter crime, reduce crime rates, and produce a cost savings [4, 5, 30]. The more robust the DNA database, the greater the probability of a CODIS hit and the greater the return on investment [30]. This robustness extends to SAKs—the more robust the DNA database, the greater the opportunities to obtain a CODIS hit from testing the SAK and having the DNA in the SAK link to various other types of crimes [2]. Moreover, due to the nature of sexual assault, SAKs frequently include sufficient DNA to extract a profile eligible for CODIS [31], thereby highlighting the interconnectedness of CODIS and SAKs. While not every jurisdiction would have the same outcomes as what is presented here, these findings suggest that efforts to ensure DNA is lawfully collected are a worthwhile endeavor to undertake to identify unnamed suspects, maintain conviction integrity, and serve as a check on the implementation of the state’s DNA sample collection laws.

This lawfully owed DNA initiative provided several lessons learned and recommendations for practice. First, the DNA sample collection processes for collection-at-arrest states are complicated. The criminal justice system is a sequential process. Each subsequent step serves as a check on earlier step(s) in the process. Ensuring suspects have a DNA sample collected takes a concerted effort among many agencies within the criminal justice system. For example, if Step C in the process is not checking whether collection occurred in Step A or B, then DNA sample collection misses will occur and likely continue to occur [8]. The current system is inefficient and prone to user error (e.g., failed samples and missed samples). Collection issues can be mitigated if states account for this complexity by allowing DNA to be collected at different points in the criminal justice process (e.g., arraignment, pre-trial, sentencing, and parole/probation) and by having a “catch-all” provision that allows for DNA to be lawfully collected from individuals who owe and who do not have a pending case or are not on probation or in prison. For instance, Florida’s DNA sample collection statute allows for the collection of DNA from such individuals by court order [32].

Second, given that a substantial portion of census members re-engaged with the criminal justice system in a relatively short period of time, criminal justice entities charged with ensuring DNA is collected could benefit from having a more passive way to collect DNA from those who owe, such as creating a “watch list”/flagging system to ensure they have a DNA sample collected for subsequent offenses. This was implemented within the CCPO’s electronic management system and is regularly updated in collaboration with BCI. When a defendant’s DNA is owed, an “action required” email

is triggered with the assigned prosecutor, letting them know that the individual should have a DNA sample collected.

Third, as evidenced by the criminal histories of the suspects who have been prosecuted as a direct result of this grant, suspected sexual offenders are not necessarily linked to other sexual crimes. Neither Miller nor Huffman had sexual offenses in their criminal history. Recent research from the SAKI suggests that because so few reported rapes result in convictions, the majority of suspected sexual offenders do not have prior convictions for rape in their criminal histories, and most are “generalists” (committing a variety of offenses) as compared to “specialists” (committing only sexual offenses) [2]. States that only collected DNA samples for the most violent/serious felony arrests might miss substantial opportunities to identify sexual and other types of violent suspects.

Fourth, more and frequent training is needed to ensure compliance with state law. Jurisdictions should work to have DNA sample collection be as standardized as fingerprinting (in accordance with their state law). Ohio's DNA checkbox in the statewide law enforcement database is bright red and is right above the individual's name. Any law enforcement agent can look up any person in the database to see whether their DNA is already in the statewide database. While not a permanent fix to the issue of lawfully owed DNA, the findings suggest that all states should have a system that allows all in law enforcement to have real-time access to a person's DNA status and avoid duplicative samples, as some crime laboratories report receiving thousands of duplicate samples [8]. Every law enforcement agent (e.g., police officer, sheriff's deputy, prosecutor, and probation officer) should make it standard practice to look up the DNA status of each person at their first point of contact. Current technological DNA advances, such as rapid DNA (where DNA profiles can be generated in as little as 90 minutes), also might mitigate many of the discussed collection issues and prevent duplicative DNA sample collections.

And fifth, without a shared system between the state CODIS system and local law enforcement agencies, prosecutor's offices, and the courts, it is difficult to have updated data to determine whether there is a DNA sample collection problem and how to effectively address the problem. Therefore, there is a need for all criminal justice entities charged with collecting DNA to work closely with the state CODIS administrator to receive regular updates on who owes DNA to ensure their DNA is subsequently collected.

#### 4.1 | Limitations and future directions

The census described here was not a comprehensive list of all who owe DNA, as it largely pertained to those who could be confirmed to owe within the two largest law enforcement agencies during the observation period. Moreover, as a case study, the outcomes detailed here cannot be generalized to all jurisdictions and would differ depending upon the nature and complexity of the state's DNA sample collection statutes, the size of the state's DNA database, and the nature and extent of missed DNA sample collection in a jurisdiction. In this jurisdiction, the size of the census and the data from

the sweeps indicated that DNA sample collection was a widespread problem and that collection failed to occur at several opportunities (e.g., arrest, arraignment, pre-trial, and sentencing).

These data suggest that several criminal justice entities were not ensuring DNA samples were collected, but it was very difficult to answer the question most people wanted to know: *why were they missed? Or more accurately, where in the process did a breakdown in the collection occur?* Identifying why something did not happen proved to be quite difficult in this initiative. Currently, this jurisdiction is working to answer these questions, assess if there have been improvements in the process since the census was conducted, evaluate whether the implemented policy within the CCPO (that tasks prosecutors with ensuring defendants' DNA are collected) is working as intended, and finally, exploring what steps can be taken to ensure the fewest number of misses. The results of this follow-up study are set to be disseminated at the end of the current SAKI grant award.

## 5 | CONCLUSION

This study detailed how this jurisdiction identified individuals who lawfully owe DNA and the outcomes of efforts to ensure DNA samples from these individuals were entered into CODIS. The list of individuals who owe DNA—the census—was conducted in two parts. Part I focused on those who could be confirmed to owe DNA based on a qualifying felony arrest between July 1, 2011 (effective date for the DNA sample selection at felony arrest statute in Ohio) and December 31, 2016, in the two largest law enforcement agencies in Cuyahoga County—Cleveland Police and the Cuyahoga County Sheriff's Department. Part II focused on those who could be confirmed to owe DNA based on a qualifying felony conviction in the county, primarily from 2010 until June 30, 2011 (based on available data and the DNA sample selection at felony conviction statute in Ohio). From these efforts, 14,931 people were confirmed to owe DNA in the span of approximately 7 years, indicating a widespread problem with missed DNA sample collection.

After completing the census, the next step involved collecting DNA samples from those who owed and ensuring the DNA samples were entered into CODIS. Due to Ohio's DNA sample collection statute, if a person was missed after being released from custody/supervision, they could not be compelled to provide a DNA sample. Therefore, the collection process detailed here focused on: conducting “sweeps” of those in custody/supervision (e.g., jail and probation); enacting policies with the Prosecutor's Office to ensure DNA samples were collected at the arraignment/bail hearing, pre-trial, upon conviction, or at sentencing; and obtaining the DNA status of all census members from the state CODIS administrator, the Ohio Bureau of Criminal Investigation or BCI (a catch for anyone who had their DNA collected statewide).

Over an observation period of approximately five and half years, as of June 30, 2022, by conducting these sweeps, 3069 of the 14,931 (21%) census members have now been confirmed to be in CODIS. Once confirmed to be in CODIS, BCI provided information

regarding any forensic hits that resulted from the profile being uploaded in CODIS. From these 3069 individuals who now had a DNA sample in CODIS, 116 forensic hits were obtained—meaning 4% of all DNA samples collected produced a forensic hit. Given that the forensic index in CODIS is much smaller than the offender and arrestee index, a relatively sizable number of forensic hits resulted.

The majority of the hits were connected to crimes within Cuyahoga County. Over two-thirds of all the forensic hits were “cold” hits. The hits were connected to a total of 11 different types of crimes, with rape being the most common, followed by burglary, and breaking and entering. The findings highlight the association between the SAKI and CODIS, as rape was the most common crime from the forensic hits. This likely also speaks to the increased probability of obtaining a DNA profile from a SAK compared with other types of crimes and the value of testing SAKs for populating CODIS. Approximately a quarter of hits were connected to cases that were not prosecutable—because they were previously disposed, ruled out as suspects, or were outside the statute of limitations. For the other cases connected to hits (all prosecutable), 38% were closed without being indicted, 23% had been indicted, and 11% had pending investigations.

#### ACKNOWLEDGMENTS

This paper is based on the efforts of the Cuyahoga County SAK Task Force, including Mary C. Weston, Shannon Musson, Richard A. Bell, several SAK Task Force investigators, and a team of researchers including Joanna Klingenstein, Duoduo Huang, Laura Overman, and Daniel Flannery, much of which has been disseminated in grant reports.

#### FUNDING INFORMATION

This project was supported by Grant Nos. 2016-AK-BK-K011 and 2019-AK-BX-0029 awarded by the Bureau of Justice Assistance. The Bureau of Justice Assistance is a component of the Department of Justice's Office of Justice Programs, which also includes the Bureau of Justice Statistics, the National Institute of Justice, the Office of Juvenile Justice and Delinquency Prevention, the Office for Victims of Crime, and the SMART Office. Points of view or opinions in this document are those of the author and do not necessarily represent the official position or policies of the US Department of Justice.

#### DISCLOSURES

The authors of this paper have no financial disclosures to report. This research received Institutional Review Board approval.

#### ORCID

Rachel E. Lovell  <https://orcid.org/0000-0002-8998-6173>

#### REFERENCES

1. Federal Bureau of Investigation. CODIS – NDIS statistics. 2018. <https://www.fbi.gov/services/laboratory/biometric-analysis/codis/ndis-statistics>. Accessed 9 Sep 2022.
2. Lovell R, Huang W, Overman L, Flannery D, Klingenstein J. Offending histories and typologies of suspected sexual offenders identified via untested sexual assault kits. *Crim Justice Behav*. 2020;47:470–86. <https://doi.org/10.1177/0093854819896385>
3. Lovell R, Klingenstein J. Outcomes from efforts to swab offenders who lawfully “owe” DNA in Cuyahoga County. Cleveland, OH: The Begun Center for Violence Prevention Education and Research at the Jack, Joseph and Morton Mandel School of Applied Social Sciences at Case Western Reserve University. 2019. <http://hdl.handle.net/2186/ksl:2006061453>. Accessed 9 Sep 2022.
4. Doleac JL. The effects of DNA databases on crime. *Am Econ J Appl Econ*. 2017;9:165–201. <https://doi.org/10.1257/app.20150043>
5. Anker AST, Doleac JL, Landerso R. The effects of DNA databases on the deterrence and detection of offenders. *Am Econ J Appl Econ*. 2021;13:194–225. <https://doi.org/10.1257/app.20190207>
6. Nelson M. Making sense of DNA backlogs, 2010-myths vs. reality. Washington, DC: U.S. Department of Justice, National Institute of Justice. 2011. Report No.: Special Report NCJ 232197. <https://www.ojp.gov/pdffiles1/nij/232197.pdf>. Accessed 9 Sep 2022.
7. RAINN | Rape, Abuse and Incest National Network. <https://apps.rainn.org/policy/compare/lawfully-owed-dna.cfm>. Accessed 23 Jun 2022.
8. Forensic Technology Center of Excellence. Perspective on addressing the collection, tracking, and processing of lawfully owed DNA samples. Washington, DC: U.S. Department of Justice, National Institute of Justice, Office of Investigative and Forensic Sciences. 2021. <https://www.ojp.gov/library/publications/perspectives-addressing-collection-tracking-and-processing-lawfully-owed-dna>. Accessed 9 Sep 2022.
9. Lovell R, Klingenstein J, McGuire MJ, Luminais M. Completing a census of individuals who lawfully “owe” DNA in Cuyahoga County. Cleveland, OH: The Begun Center for Violence Prevention Education and Research at the Jack, Joseph and Morton Mandel School of Applied Social Sciences at Case Western Reserve University. 2019. <http://hdl.handle.net/2186/ksl:2006061454>. Accessed 9 Sep 2022.
10. National Institute of Justice. Report to the Attorney General on delays in forensic DNA analysis. 2003 Mar. Report No.: NCJ 199425. <https://www.ojp.gov/textfiles1/nij/199425.txt>. Accessed 9 Sep 2022.
11. Hausman JS. MDOC gets DNA samples from all prisoners statewide, a collection pioneered in Muskegon. *mlive*. 2011 Oct 5. [https://www.mlive.com/news/muskegon/2011/10/mdoc\\_gets\\_dna\\_samples\\_from\\_all.html](https://www.mlive.com/news/muskegon/2011/10/mdoc_gets_dna_samples_from_all.html). Accessed 5 Jul 2022.
12. Dissell R. State officials have plans to fix inmate DNA collection problems. *The Plain Dealer*. 2013 Feb 1. [https://www.cleveland.com/metro/2013/02/state\\_officials\\_have\\_plans\\_to.html](https://www.cleveland.com/metro/2013/02/state_officials_have_plans_to.html). Accessed 5 Jul 2022.
13. Strom K, Scott T, Feeney H, Young A, Couzens L, Berzofsky M. How much justice is denied? An estimate of unsubmitted sexual assault kits in the United States. *J Crim Justice*. 2021;73:101746. <https://doi.org/10.1016/j.jcrimjus.2020.101746>
14. Lovell R, Overman L, Huang D, Flannery DJ. The bureaucratic burden of identifying your rapist and remaining “cooperative”: what the sexual assault kit initiative tells us about sexual assault case attrition and outcomes. *Am J Crim Just*. 2020;46:528–33. <https://doi.org/10.1007/s12103-020-09573-x>
15. Luminais M, Lovell R, Flannery D. Perceptions of why the sexual assault kit backlog exists in Cuyahoga County, Ohio and recommendations for improving practice. Cleveland, OH: Begun Center for Violence Prevention Research and Education at the Jack, Joseph and Morton Mandel School of Applied Social Sciences at Case Western Reserve University. 2017. <http://hdl.handle.net/2186/ksl:2006061457>. Accessed 9 Sep 2022.
16. Campbell R, Pierce SJ, Sharma DB, Feeney H, Fehler-Cabral G. Should rape kit testing be prioritized by victim-offender

- relationship? Empirical comparison of forensic testing outcomes for stranger and nonstranger sexual assaults. *Criminol Public Policy*. 2016;15:555–83. <https://doi.org/10.1111/1745-9133.12205>
17. Lovell RE, Singer M, Flannery DJ, McGuire MJ. The case for “investigate all”: assessing the cost-effectiveness of investigating no CODIS hit cases in a sexual assault kit initiative. *J Forensic Sci*. 2021;66:1316–28. <https://doi.org/10.1111/1556-4029.14686>
  18. Campbell R, Feeney H, Goodman-Williams R, Sharma DB, Pierce SJ. Connecting the dots: identifying suspected serial sexual offenders through forensic DNA evidence. *Psychol Violence*. 2020;10:255–67. <https://doi.org/10.1111/1745-9133.12205>
  19. Augenstein S. Hidden in prison: thousands of inmates not in DNA databases. *Forensic Magazine*. 2017 Nov 7. <https://www.corrections1.com/products/police-technology/investigation/biometrics-identification/articles/hidden-in-prison-thousands-of-inmates-not-in-dna-databases-8r9qlgaNHXfvA4aJ/>. Accessed 24 Jun 2022.
  20. Sub. Senate Bill 77, 128th General Assembly. 2010. <https://www.lsc.ohio.gov/documents/gaDocuments/analyses128/10-sb77-128.pdf>. Accessed 9 Sep 2022.
  21. 29 Ohio Rev. Code. § 2907.07.2012. <https://codes.ohio.gov/ohio-revised-code/section-2901.07>. Accessed 9 Sep 2022.
  22. Atassi L, Dissell R. Rape kit indictment 100: Larry McGowan accused of raping 5 Cleveland women and killing 1. *Cleveland.com* & *The Plain Dealer*. 2014 May 2. [https://www.cleveland.com/rape-kits/2014/05/rape\\_kit\\_indictment\\_100\\_larry.html](https://www.cleveland.com/rape-kits/2014/05/rape_kit_indictment_100_larry.html). Accessed 5 Jul 2022.
  23. Cleveland Division of Police. General police orders. 2015. [https://www.clevelandohio.gov/sites/default/files/forms\\_publications/GPO\\_Book11-24-15.pdf](https://www.clevelandohio.gov/sites/default/files/forms_publications/GPO_Book11-24-15.pdf). Accessed 9 Sep 2022.
  24. Dissell R. DNA from thousands of arrests not collected in Cuyahoga County. *The Plain Dealer*. 2017 Jun 16. [https://www.cleveland.com/metro/2017/06/dna\\_from\\_thousands\\_of\\_cuyahoga\\_county\\_felony\\_arrests\\_never\\_taken\\_not\\_in\\_codis\\_crime-solving\\_database.html](https://www.cleveland.com/metro/2017/06/dna_from_thousands_of_cuyahoga_county_felony_arrests_never_taken_not_in_codis_crime-solving_database.html). Accessed 5 Jul 2022.
  25. Cleveland Division of Police. General police order, policy number 7.1.09. 2015. <https://www.clevelandohio.gov/sites/default/files/gpo/7.1/7.1.09%20Prisoner%20DNA%20Collection.pdf>. Accessed 9 Sep 2022.
  26. Dissell R. Cleveland police failed to collect DNA belonging to suspected rapist John Doe #1. *The Plain Dealer*. 2014 Feb 21. [https://www.cleveland.com/rape-kits/2014/02/post\\_6.html](https://www.cleveland.com/rape-kits/2014/02/post_6.html). Accessed 5 Jul 2022.
  27. 29 Ohio Rev. Code. § 2919.25. 2019. <https://codes.ohio.gov/ohio-revised-code/section-2919.25>. Accessed 9 Sep 2022.
  28. The Marshall Project. Answering your questions about Cleveland's court system. *The Marshall Project*. 2022 May 9. <https://www.themarshallproject.org/2022/05/09/we-re-answering-your-questions-about-cleveland-s-court-system>. Accessed 27 Jul 2022.
  29. Lovell R, Klingenstein J, Huang D, Weston M. Final report: outcomes from efforts to swab individuals who lawfully “owe” DNA in Cuyahoga County. Cleveland, OH: Begun Center for Violence Prevention Education and Research, The Mandel Center for Applied Social Sciences, Case Western Reserve University. 2020 Jul. <https://digital.case.edu/islandora/object/ksl%3A2006068202>. Accessed 9 Sep 2022.
  30. Wickenheiser RA. Expanding DNA database effectiveness. *Forensic Sci Int Synerg*. 2022;4:100226. <https://doi.org/10.1016/j.fsisyn.2022.100226>
  31. Lovell R, Luminais M, Flannery DJ, Bell R, Kyker B. Describing the process and quantifying the outcomes of the Cuyahoga County sexual assault kit initiative. *J Crim Justice*. 2018;57:106–15. <https://doi.org/10.1016/j.jcrimjus.2018.05.012>
  32. 943. Florida Statutes – DNA database. § 943.325. 2019. [http://www.leg.state.fl.us/statutes/index.cfm?App\\_mode=Display\\_Statute&URL=0900-0999/0943/Sections/0943.325.html](http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&URL=0900-0999/0943/Sections/0943.325.html). Accessed 9 Sep 2022.

**How to cite this article:** Lovell RE. Detailing the process of identifying and the outcomes of efforts to address lawfully “owed” DNA. *J Forensic Sci*. 2022;67:2321–2333. <https://doi.org/10.1111/1556-4029.15142>