APPENDIX G

CODIS Hit Counting Guidelines

Combined DNA Index System (CODIS)

Hit Counting Guidelines
(An Element of Performance Measurement)

FBI Laboratory

Forensic Science Systems Unit

Created: Friday, July 24, 1998 1:11 PM

Revised:

Revision History

Date	Author	Comments
May 15, 1998	Steve Niezgoda	Original draft. Content based on email from Taylor Scott (Illinois State Police) and discussions with Bill Eisenberg (SAIC) and Dave Coffman (FDLE Tallahassee).
June 25, 1998	Clare Searby	Performed major revisions and added examples.
July 2, 1998	Clare Searby	Clarified definitions based on peer review. Added aggregate counting.
July 9, 1998	Steve Niezgoda Clare Searby	Incorporated feedback from Jim Bixby, David Coffman, Florencio Dasalla, Barbara Evans, Keith Inman, George Li, Don MacLaren, and Taylor Scott at the CODIS GDIS 5.1 training on July 9, 1998.
July 23, 1998	Clare Searby	Incorporated additional feedback from David Coffman, Keith Inman, Ken Konzak, and Taylor Scott.

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Oh No! (Or, the introduction)

It's 3:00 pm and you are finally starting to relax. Since this morning, you've been hammered by three prosecutors who want lab reports yesterday, coerced into giving a lab tour because your boss was "too busy", continued the lengthy process of validating the latest DNA technology, and argued with your information technology people about why CODIS is running so slowly. (The FBI swears the problem is not CODIS!) So far, just another day in the lab.

Thinking that you might actually get home before the beginning of your favorite TV show, you start feeling pretty good. The telephone rings and your fantasy vanishes like a puff of smoke. As you listen to the harried voice at the other end, you stifle that pang of angst that always precedes a crisis. Your mind races as you catch fragments of the conversation:

> *"… from the press is doing a story on DNA and wants an interview …"*
>
> Oh great, another opportunity to be misquoted.
>
> *"… under a tight deadline. The reporter needs to talk with you this afternoon …"*
>
> Thanks for the short notice! How am I gonna get this ketchup stain off my clothes? I knew I shouldn't have had french-fries with lunch.
>
> *"… shouldn't take more than 15 minutes …"*
>
> When was the last time anything around here took less than 15 minutes?
>
> *"… just some simple questions, you know, things like how many cases we work each year, how many hits we've had …*
>
> What? 'How may hits we've had?' Oh no! Not that! Anything but that! THE FBI STILL HASN'T GIVEN US ANY GUIDELINES FOR COUNTING HITS!

As you reach for your Maalox, you hope that these guidelines provide a simple, straightforward approach to counting CODIS hits.

Counting is not Easy (Or, the problem statement)

Why in the world is counting hits so difficult? Why has it taken so long to develop straightforward, consistent hit counting guidelines? The problem is simple: counting is not easy! The trick to good hit counting is to give credit to all the participants, without inflating the total number of hits. The inflation problem is real: if two local laboratories link their cases through a hit at State, both local labs and the state lab all want to claim hits -- a total of three hits. Although it is reasonable for all three organizations to claim some credit, only one hit occurred!

> The effectiveness of CODIS is ultimately measured by the crimes it helps solve. Therefore, the number of "investigations aided" is a better measure of program performance than the number of "hits".

To solve this dilemma, we need to track two metrics. The primary metric is the number of investigations aided by CODIS. This is ***the*** primary metric: the effectiveness of CODIS is ultimately measured by the crimes it helps solve. The secondary metric is the number of hits made by CODIS. Counting the number of hits gives laboratories credit for their investment in CODIS, and indirectly shows the value CODIS adds to fighting crime. In the past, "Investigations

Aided" may have been treated as subordinate to "hits". This is incorrect! The better measure of CODIS's value to society is the number of criminal investigations it assists.

The previous paragraph was important, read it again.

Laboratories may also wish to experiment with variations of these metrics. For example, casework labs may want to describe how their CODIS database has assisted other labs in the State/country. State labs may want to show how their convicted offender program has helped solve crimes in other states. State labs may also want to compute a tally of all CODIS activity for the state, including hits and Investigations Aided in local labs. The counting approach outlined in this document handles these, and other, variations.

What's in a Name? (Or, definitions)

Casework Laboratory

A casework laboratory is a forensic DNA lab responsible for developing DNA profiles from crime scene evidence. A casework laboratory counts metrics using the Casework Scorecard (scorecards are explained later).

Convicted Offender Laboratory

A convicted offender laboratory is a forensic DNA lab responsible for developing DNA profiles from samples provided by known convicted offenders. This document assumes that the convicted offender laboratory is also the state repository, or SDIS. A convicted offender laboratory counts metrics using the Convicted Offender Scorecard. Although convicted offender laboratories may also perform casework, Offender Hits should always be counted using the Convicted Offender Scorecard, and Forensic Hits should always be counted using the Casework Scorecard.[1]

Although convicted offender laboratories may also perform casework, Offender Hits should always be counted using the Convicted Offender Scorecard, and Forensic Hits should always be counted using the Casework Scorecard.[1]

Hit

A hit is a confirmed match between two or more DNA profiles discovered by CODIS software at a single instant in time. Hits may occur at any level in the CODIS hierarchy, LDIS, SDIS, or NDIS. There are two categories of hits:

- A Forensic Hit (**FH**) occurs when two or more forensic samples are linked at LDIS, SDIS, or NDIS. Forensic Hits are sometimes called case-to-case hits.
- An Offender Hit (**OH**) occurs when one or more forensic samples are linked to a convicted offender sample at SDIS or NDIS.

Sometimes, hits may be classified as both Offender Hits and Forensic Hits. When this occurs, always call the hit an Offender Hit.

[1] There is one exception: states having only one DNA laboratory should use the Entire State Laboratory Scorecard for tracking all metrics. (See Appendix A)

Offender Hits are sometimes called case-to-offender hits.

Sometimes, hits may be classified as both Offender Hits and Forensic Hits. For example, two unknown suspect cases match each other and a convicted offender. When this occurs, always classify the hit as an Offender Hit.

We no longer make a distinction between cold and warm hits, since both add value to the investigative process.

There are several important concepts not stated in this definition. First, hits are identical to matches - there is no difference! Second, hits result from searching CODIS databases. *Hits are not created by matching known samples to unknown samples on the laboratory workbench!* Finally, we no longer make a distinction between cold and warm hits, since both add value to the investigative process.[2] Hits are hits - count them all!

Investigations Aided

Each CODIS hit typically assists one or more criminal investigations. For the purposes of hit counting, a criminal investigation equates to a case, which equates to a submission to a laboratory. *This document uses the terms "cases" and "investigations" interchangeably.* Although a single case may have multiple submissions, and you can probably contrive scenarios where a "case" represents more than one investigation (like a serial rapist task force), equating these three terms is awfully convenient for hit counting. (If anything, this approach understates the value of a CODIS hit.) The metric for counting the number of Investigations Aided is **IA**:

A good rule of thumb for determining whether an investigation has been aided is to ask, "Did the CODIS hit add value to the investigative process?" If the answer is yes, take credit for aiding an investigation.

- **IA (Investigations Aided)**

  For casework laboratories (LDIS): The number of cases submitted *to your lab* that were assisted by a CODIS hit.

  For convicted offender laboratories (SDIS): The number of cases submitted *to labs within your State* that were assisted by a CODIS hit.

The following terms are synonymous: Investigations Aided, Investigations Assisted, Cases Aided, and Cases Assisted. In other words,

Investigations Aided = Investigations Assisted = Cases Aided = Cases Assisted.

[2] In a cold hit, there is no prior indication that the DNA profiles are related. Cold hits add value by linking cases that are previously unlinked, or by providing investigators with the identity of a known convicted offender. In a warm hit, investigators have a hunch that there may be a match in CODIS. A typical example of a warm hit is when a police officer develops a suspect in a case, obtains a blood sample, and has a qualified DNA analyst use CODIS to search the profile against other unsolved cases. In this example, the warm hit adds value by saving the investigative resources required to link the cases without DNA.

Finally, it is important to recognize that sometimes you may inadvertently undercount Investigations Aided because of missing information. For example, the police may never notify you that a single CODIS hit assisted several investigations that they had linked through other means. All you can do is your best! A good rule of thumb for determining whether an investigation has been aided is to ask, "Did the CODIS hit add value to the investigative process?" If the answer is yes, take credit for aiding an investigation.

Sometimes, you may inadvertently undercount Investigations Aided because of missing information.

The Rules

The following three rules must be followed to properly count Investigations Aided and hits.

Rule #1

The level in the CODIS hierarchy (LDIS, SDIS, NDIS) at which the hit occurs gets credit for the hit.

If you did not personally run Searcher, AutoSearcher, or Batch Search in your laboratory, you cannot claim a hit. However, if a DNA profile developed in your laboratory is part of a hit made in another laboratory, you can claim that you *participated* in a hit. The following metrics track hit participation.

- **FH_s:** A Forensic Hit made at SDIS that includes one or more profiles developed by a casework laboratory. (This metric only applies to casework laboratories.)

  Casework laboratories can use this metric to help describe their participation in a statewide CODIS program. For example, the director of a casework laboratory might say, "Our laboratory takes great pride in being part of the statewide CODIS program. We believe that sharing data with other laboratories through CODIS is a great way to solve crimes. And we have provided investigative leads to other labs in the State: our laboratory has participated in ___ Forensic Hits made at SDIS."

- **FH_n:** A Forensic Hit made at NDIS that includes one or more profiles developed by a casework laboratory. (This metric applies to both casework and convicted offender laboratories.)

  Laboratories can use this metric to help describe their participation in the National DNA Index System. For example, a casework laboratory administrator might say, "In addition to participating in a statewide CODIS program, we also share our data with the rest of the forensic community by participating in the FBI's National DNA Index System. Our laboratory has been part of ___ Forensic Hits made at NDIS."

- **OH_s:** An Offender Hit made at SDIS that matched one or more profiles developed by a casework laboratory. (This metric only applies to casework labs.)

  Casework laboratories can use this metric to help describe their participation in a statewide CODIS program. For example, a casework laboratory spokesperson might say, "It is our policy to share our forensic DNA data with other crime

laboratories in the State in an effort to solve crimes that would otherwise go unsolved. The State's convicted offender database has been particularly helpful, producing ___ hits that have aided ___ investigations for our laboratory."

- **OH_n:** This metric has two definitions, one for casework laboratories and one for offender laboratories.

  Casework Laboratory: An Offender Hit made at NDIS that matched one or more profiles developed by the casework laboratory.

  Casework laboratories can use this metric to help describe their participation in the National DNA Index System. For example, a casework laboratory spokesperson might say, "As you know, in an effort to solve as many crimes as possible, we participate in the FBI's National DNA Index System. This participation has paid off: to date, there have been ___ Offender Hits at NDIS that have aided ___ investigations in our laboratory."

  Convicted Offender Laboratory (SDIS): An Offender Hit made at NDIS that matched a convicted offender profile developed by the State.

  Convicted offender laboratories can use this metric to help describe how their convicted offender database contributes to solving crimes throughout the Country. An SDIS administrator might say, "Our convicted offender DNA program has aided law enforcement in other states, too. To date, there have been __ Offender Hits at NDIS as a result of our convicted offender program. These __ hits have aided __ investigations in other states."

Rule #2

A single hit may aid more than one investigation.

That's right. A hit linking five separate crimes is still only one hit. However, laboratories may claim credit for all of the cases they have assisted, including cases inside and outside of their jurisdiction. For each case that is assisted by a CODIS hit, the laboratory that worked the case is credited with one "Investigation Aided" (IA). Additionally, laboratories receive participation credit for assisting investigations at the state (IA_s) and national (IA_n) levels.

- **IA_s (Investigations Aided Elsewhere in the State):** The number of cases belonging to other laboratories in your State that you assisted through an SDIS hit. (This metric only applies to casework laboratories.)
- **IA_n (Investigations Aided Elsewhere in the Nation):** The number of cases belonging to other laboratories in the U.S. (outside of your State) that you assisted through an NDIS hit. (This metric applies to both casework and convicted offender labs.)

Rule #3

An investigation may be aided only once.

Rule #3 states that we count how many investigations CODIS has aided. We ***do not*** count the number of times CODIS has aided investigations. This is a subtle but important distinction –

read it again! There may be instances where a particular investigation is part of multiple hits. For example, a serial rapist may cause several CODIS hits over the course of a crime spree. However, each Investigation Aided is counted only once. The following example illustrates this rule:

> On Day #1, two unknown suspect cases (Case 1 and Case 2) are matched by CODIS at LDIS. The resulting score is 1 Forensic Hit and 2 Investigations Aided. On Day #2, another unknown suspect case (Case 3) is entered into CODIS and searched. Case 3 is found to match Cases 1 & 2. The result of the search on Day #2 is 1 Forensic Hit and 1 Investigation Aided. The total score for the laboratory is 2 Forensic Hits and 3 Investigations Aided. *Although Cases 1 & 2 were aided twice (once for each hit), they were only counted as Investigative Assists once.*

While you might argue that this method understates the "value" of a CODIS hit, it simplifies hit counting. Finally, Rule #3 makes it is possible to have a hit that assists no investigations (IA = 0). See Scenario #6 for an example.

Scorecards

We have created scorecards to facilitate the counting process. (Sample forms are provided in Appendix A.) Note that there are three different scorecards, one for casework laboratories, one for convicted offender laboratories, and one for laboratories that perform all DNA analysis for the State (called an Entire State Lab). Remember that laboratories performing both convicted offender analysis and casework should score each activity on separate scorecards (except for Entire State Labs). The scorecards are designed to be updated on a regular basis.

Casework Scorecard

Following is a sample scorecard for casework:

Date	FH	IA	FH_s	FH_n	OH_s	OH_n	IA_s	IA_n
Total								

Fields are defined below.

Field Name	Description
FH	Forensic Hit made by searching your CODIS database. (One hit can link multiple cases.)
IA	Cases belonging to your laboratory that were assisted by a CODIS hit at LDIS, SDIS, or NDIS. (Each case is counted only once!)
FH_s	Forensic Hit made at SDIS that matched one or more cases from your laboratory.
FH_n	Forensic Hit made at NDIS that matched one or more cases from your laboratory.
OH_s	Offender Hit made at SDIS that matched one or more cases from your laboratory.
OH_n	Offender Hit made at NDIS that matched one or more cases from your laboratory.

IA_s	Cases belonging to other laboratories in your State that were linked to one or more cases from your lab through an SDIS hit. (Each case is counted only once!)
IA_n	Cases belonging to other laboratories in the country (outside of your State) that were linked to one or more cases from your lab through and NDIS hit. (Each case is counted only once!)

Convicted Offender (SDIS) Scorecard

Following is a sample Convicted Offender Scorecard:

Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Total						

Since the SDIS administrator receives a copy of all NDIS match reports, the SDIS scorecard can also be used to track all NDIS activity within the state. Note: In order to confirm the disposition of an NDIS hit, the SDIS administrator must contact the local lab(s) that participated in the hit.

Fields are defined below.

Field	Description
FH	Forensic Hit made by searching your SDIS database. (One hit can link multiple cases within the State.)
OH	Offender Hit made by searching your SDIS database. (One hit can link multiple offenders and cases.)
IA	Investigations Aided in the State by an SDIS or NDIS hit.
OH_n	Offender Hit made at NDIS linking an offender from your State to one or more cases in other states.
FH_n	Forensic Hit made at NDIS linking a casework sample from your State to one or more cases in other states.
IA_n	Cases belonging to other laboratories in the U.S. (outside of your State) that were linked to one or more cases from your State through an NDIS hit.

Entire State Lab Scorecard

In some states, there is only one laboratory that conducts ALL convicted offender and casework analysis for the State. For the purpose of counting hits, these laboratories will be considered "entire state laboratories." Following is a sample scorecard for tracking both convicted offender and casework activity in an entire state lab:

Date	FH	OH	IA	OH_n (1)	OH_n (2)	FH_n	IA_n

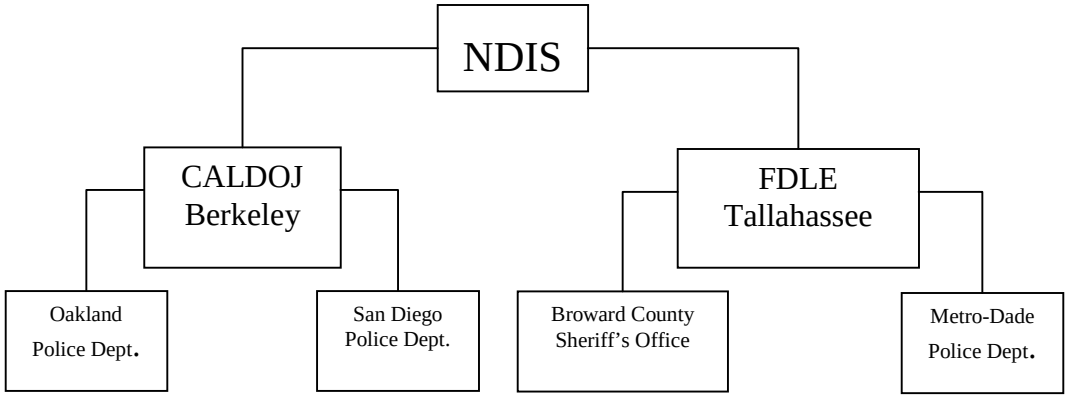
Note: This scorecard is to be used by entire state labs only. It is not intended to be used by laboratories that function as both the state repository and a casework lab. Labs that function in this capacity should use both a Casework and Offender Scorecard to track CODIS hits.

Fields are defined below.

Field	Description
FH	Forensic Hit made by searching your SDIS database. (One hit can link multiple cases within the State.)
OH	Offender Hit made by searching your SDIS database. (One hit can link multiple offenders and cases.)
IA	Investigations Aided in the State by an SDIS or NDIS hit.
OH_n (1)	Offender Hit made at NDIS that matched one or more cases from your laboratory.
OH_n (2)	Offender Hit made at NDIS linking an offender from your State to one or more cases in other states.
FH_n	Forensic Hit made at NDIS linking a casework sample from your State to one or more cases in other states.
IA_n	Cases belonging to other laboratories in the U.S. (outside of your State) that were linked to one or more cases from your State through an NDIS hit.

Examples

The following examples use the laboratories listed in the diagram below. The Florida Department of Law Enforcement (FDLE) Tallahassee and California Department of Justice (CALDOJ) Berkeley laboratories are convicted offender (SDIS) laboratories, while the other four laboratories are casework laboratories (LDIS).



Scenario #1

On Day #1, Metro-Dade uses CODIS to discover a match between two previously unlinked cases. On Day #2, a new case is submitted to Metro-Dade, and CODIS matches it to the two cases linked on Day #1.

The scorecard below outlines the credit the laboratory receives:

Metro-Dade Police Department (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1	1	2						
Day #2	1	1						
Total	**2**	**3**	**0**	**0**	**0**	**0**	**0**	**0**

Explanation: Matching the first two cases (Day #1) produced one Forensic Hit, or "FH" and two Investigations Aided, or "IA". When the third case was linked to Cases 1 and 2, another hit was recorded, but only Case 3 was assisted (1 IA) as the first two cases had been aided once before. (This is an application of Rule #3.) Thus, after Day #2, the Metro-Dade laboratory can report a total of two Forensic Hits and three Investigations Aided.

Scenario #2

On Day #3, SDIS at the CALDOJ Berkeley laboratory links a case from the Oakland Police Department to a case at the San Diego Police Department. (Neither case has been previously assisted.)

The scorecards below show how to credit each participating laboratory:

CALDOJ Berkeley (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #3	1		2			
Total	**1**	**0**	**2**	**0**	**0**	**0**

Oakland Police Department (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #3		1	1				1	
Total	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**0**

San Diego Police Department (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #3		1	1				1	
Total	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**0**

Explanation: Only the Berkeley laboratory can claim direct credit for the hit because it occurred at SDIS. However, both local laboratories can claim that they participated in a Forensic Hit at SDIS (1 FH_s apiece), and that they aided one investigation in their own laboratory (1 IA apiece) and one investigation in another California laboratory (1 IA_s apiece). Additionally, Berkeley receives credit for aiding two investigations in the State (2 IA).

Scenario #3

On Day #4, a new case from the San Diego Police Department matches a convicted offender sample from the FDLE Tallahassee laboratory at NDIS.

The scorecards below show how to credit each participating laboratory:

San Diego Police Department (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #3		1	1				1	
Day #4		1				1		
Total	**0**	**2**	**1**	**0**	**0**	**1**	**1**	**0**

FDLE Tallahassee (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #4				1		1
Total	**0**	**0**	**0**	**1**	**0**	**1**

NDIS				
Date	**FH**	**OH**	**IA**	**Participating Labs**
Day #4		1	1	FDLE Tallahassee / San Diego PD
Total	**0**	**1**	**1**	

Explanation: Since NDIS is responsible for the hit, NDIS gets direct credit and a "1" is recorded under the Offender Hit, "OH" column. NDIS is additionally credited with one Investigation Aided at the national level (1 IA). Both participating laboratories receive credit for contributing to a national Offender Hit (1 OH_n apiece). Furthermore, the San Diego laboratory aided an investigation in its own jurisdiction (1 IA), and the Tallahassee laboratory aided an investigation in another State (1 IA_n).

Scenario #4

On Day #5, a new case from the Oakland Police Department laboratory in California matches a new case in the Metro-Dade Police Department laboratory in Florida at NDIS.

The scorecards below show how to credit each participating laboratory:

Oakland Police Department (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OHn**	**IA_s**	**IA_n**
Day #3		1	1				1	
Day #5		1		1				1
Total	**0**	**2**	**1**	**1**	**0**	**0**	**1**	**1**

CALDOJ Berkeley (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #3	1		2			
Day #5			1		1	1
Total	**1**	**0**	**3**	**0**	**1**	**1**

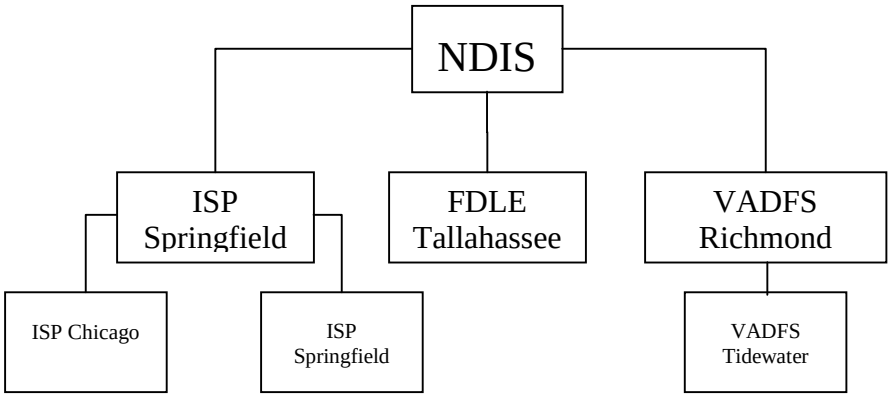
Metro-Dade Police Department (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1	1	2						
Day #2	1	1						
Day #5		1		1				1
Total	**2**	**4**	**0**	**1**	**0**	**0**	**0**	**1**

FDLE Tallahassee (SDIS)						
Date	**FH**	**OH**	**IA**	**OHn**	**FH_n**	**IA_n**
Day #4				1		1
Day #5			1		1	1
Total	**0**	**0**	**1**	**1**	**1**	**2**

NDIS				
Date	**FH**	**OH**	**IA**	**Participating Labs**
Day #4		1	1	FDLE Tallahassee / San Diego PD
Day #5	1		2	Metro-Dade PD / Oakland PD
Total	**1**	**1**	**3**	

Explanation: Both local laboratories receive credit for assisting one case in their respective laboratories (1 IA apiece) and one investigation in another State (1 IA_n apiece), and for participating in a Forensic Hit at NDIS (1 FH_n apiece). Since NDIS is responsible for the hit, only NDIS receives direct credit for producing the hit (1 FH). Additionally, NDIS is credited with assisting two investigations nationally (2 IA). Having received a hit report about this national Forensic Hit, the two convicted offender laboratories can track the Investigations Aided by the hit. Each lab records one national Forensic Hit (1 FH_n), one Aided Investigation in their respective states (1 IA), and one Aided Investigation in another state (1 IA_n).

For the following examples we will use the laboratories listed in the diagram below. The FDLE Tallahassee, Virginia Division of Forensic Science (VADFS) Richmond, and Illinois State Police (ISP) Springfield laboratories are SDIS labs, while the other three laboratories are casework labs (LDIS). *It is important to note that in this diagram, the Springfield laboratory plays a dual role as the state repository and as a local casework laboratory. Offender laboratories that also perform casework must maintain separate scorecards for the two activities.*



Scenario #5

The ISP Chicago laboratory has an unsolved case from 1994 stored in LDIS. The ISP Springfield (LDIS) laboratory develops an unknown suspect case in 1998. On Day #1 the Springfield (SDIS) laboratory matches the profiles from the two laboratories.

The scorecards below show how to credit each participating laboratory:

ISP Springfield (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1	1		2			
Total	**1**	**0**	**2**	**0**	**0**	**0**

ISP Chicago (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1	1				1	
Total	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**0**

ISP Springfield (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1	1				1	
Total	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**0**

Explanation: Only the Springfield state laboratory (SDIS) can claim credit for the hit (1 FH). Both local laboratories receive credit for participating in a state hit (1 FH_s apiece), and for aiding one investigation in their respective laboratories (1 IA apiece). The local labs also receive credit for aiding investigations in one another's laboratories (1 IA_s apiece). Additionally, the state laboratory is credited for aiding two investigations within Illinois (2 IA).

Scenario #6

A new offender profile is entered into (SDIS) at the Springfield laboratory. On Day #2, this profile matches with the two previously linked cases from Chicago and Springfield.

The scorecards below show how to credit each participating laboratory:

ISP Springfield (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1	1		2			
Day #2		1				
Total	**1**	**1**	**2**	**0**	**0**	**0**

ISP Chicago (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1	1				1	
Day #2					1			
Total	**0**	**1**	**1**	**0**	**1**	**0**	**1**	**0**

ISP Springfield (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1	1				1	
Day #2					1			
Total	**0**	**1**	**1**	**0**	**1**	**0**	**1**	**0**

Explanation: Only hit points are awarded because both investigations have already been aided. (Remember Rule #3 says that an investigation can be aided only once.) The state lab (SDIS) is credited directly with the hit (1 OH), and the local labs get participation points (1 OH_s apiece).

Scenario #7

On Day #3, the FDLE Tallahassee lab works the same convicted offender that ISP Springfield worked in Scenario #6. (The offender's blood was collected in both states.) The FDLE profile is uploaded to NDIS, where it matches the Chicago and Springfield cases. Since ISP Springfield already solved these cases back in Scenario #6, there are no score changes. Although this may seem unfair, by crediting only the ISP Springfield lab with the hit you avoid double counting.

Scenario #8

On Day #4, a case from VADFS Tidewater is linked to the Illinois group of cases (and the convicted offender which solved them) at NDIS (see Scenario #6).

The scorecards below show how to credit each participating laboratory:

ISP Springfield (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1	1		2			
Day #2		1				
Day #4				1		1
Total	**1**	**1**	**2**	**1**	**0**	**1**

ISP Chicago (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1			1		1	1
Day #2					1			
Day #4						1		1
Total	**0**	**1**	**0**	**0**	**2**	**1**	**1**	**2**

ISP Springfield (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1	1				1	
Day #2					1			
Day #4						1		1
Total	**0**	**1**	**1**	**0**	**1**	**1**	**1**	**1**

VADFS Tidewater (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #4		1				1		
Total	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**

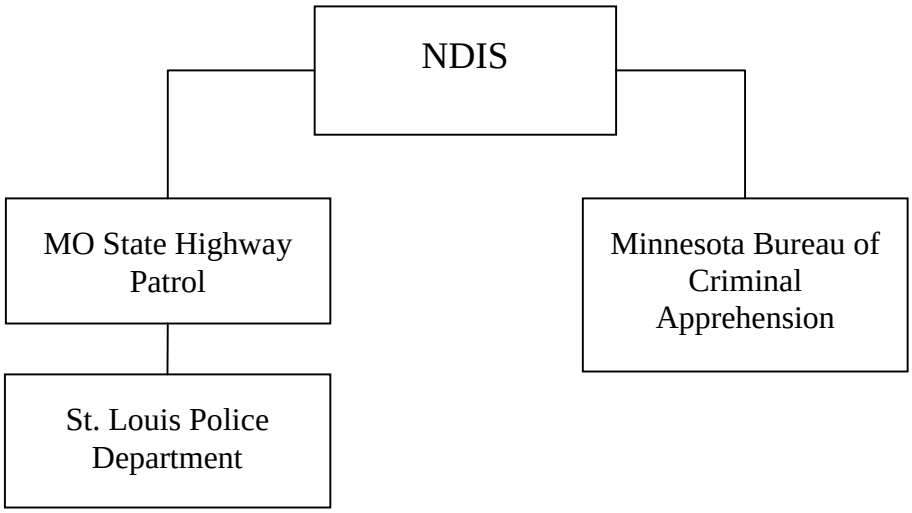
NDIS				
Date	**FH**	**OH**	**IA**	**Participating Labs**
Day #4		1	1	ISP Chicago / ISP Springfield / VADFS Tidewater
Total	**0**	**1**	**1**	

Explanation: Once again, since NDIS is responsible for the hit, it receives direct credit (1 OH). Only the new case from VADFS Tidewater is aided by the hit, so Tidewater receives 1 IA and 1 OH_n. Each of the three Illinois

laboratories receive 1 IA_n and 1 OH_n for their contribution to the national Offender Hit. NOTE: Although this hit could be considered a Forensic and Offender Hit, it should only be counted once, as an Offender Hit.

More Examples

The previous section provides examples of basic hit counting scenarios. This section provides exceptional cases. For the following scenarios, we will use the laboratories listed in the diagram below. The Missouri State Highway Patrol is an SDIS lab, the Minnesota Bureau of Criminal Apprehension is both an SDIS and LDIS lab, and the St. Louis Police Department laboratory is a casework lab (LDIS).



Scenario #1

An examiner at the St. Louis Police Department laboratory links three cases by comparing DNA profiles on the laboratory workbench, without using CODIS searching. Later that week, one of the cases is entered into the CODIS Forensic index. On Day #1, the case entered into CODIS hits a convicted offender profile at the Missouri State Highway Patrol's SDIS.

The scorecards below show how to credit each participating laboratory:

St. Louis Police Department (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		3			1			
Total	**0**	**3**	**0**	**0**	**1**	**0**	**0**	**0**

Missouri State Highway Patrol (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1		1	3			
Total	**0**	**1**	**3**	**0**	**0**	**0**

Explanation: Since the hit occurred at SDIS, only the MO State Highway Patrol laboratory is credited with the hit. Missouri receives one Offender Hit (1 OH) and three Investigations Aided within the State (3 IA). The St. Louis PD lab can claim participation in one Offender Hit at SDIS (1 OH_s), and receives three Investigations Aided (3 IA). NOTE: Although the three cases had previously been linked using DNA, the hit still produces three Investigations Aided (3 IA) because it provides additional information to each investigation (i.e., each investigation in now linked to the convicted offender). Even though this could also be considered a Forensic Hit, it should be classified as an Offender Hit because Offender Hits take priority over Forensic Hits.

Scenario #2

Five rapes occur in St. Louis and are linked using latent fingerprints. DNA examiners at the St. Louis Police Department lab develop a profile from one of the cases, and enter it into CODIS. On Day #2, the profile matches a profile from a solved Minnesota case at NDIS.

The scorecards below show how to credit each participating laboratory:

St. Louis Police Department (LDIS)

Date	FH	IA	FH_s	FH_n	OH_s	OH_n	IA_s	IA_n
Day #1		3			1			
Day #2		5		1				
Total	**0**	**8**	**0**	**1**	**1**	**0**	**0**	**0**

Minnesota Bureau of Criminal Apprehension (SDIS & LDIS)

Date	FH	OH	IA	OH_n	FH_n	IA_n
Day #2					1	5
Total	**0**	**0**	**0**	**0**	**1**	**5**

NDIS

Date	FH	OH	IA	Participating Labs
Day #2	1	0	5	Minnesota Bureau of Criminal Apprehension / St. Louis Police Department
Total	**1**	**0**	**5**	

Explanation: NDIS gets a Forensic Hit (1 FH) and five Investigations Aided (5 IA). Minnesota contributed to a national Forensic Hit (1 FH_n) and aided five cases in another State (5 IA_n). No credit is given for aiding the case from

Minnesota: since the case was already solved, the hit added no value![3] St. Louis receives a national Forensic Hit (1 FH_n) and five Aided Investigations (5 IA). Although the cases had previously been linked by means other than DNA, the hit still produces five Investigations Aided (5 IA) because new information is provided to each case.

Aggregate Counting

Up to this point, we have focused exclusively on how individual laboratories count Investigations Aided and hits. In the real world, however, officials may be asked to describe the performance of CODIS across an entire state. To respond to this question, we must tally results across laboratories. (This is called aggregate counting.) The counting approach we have been using thus far readily adapts to aggregate counting.

Rules

1. Summing the Investigations Aided (IA) from each casework laboratory (LDIS) provides an exact count of all Investigations Aided in the State. Do ***not*** add in the IA_s and IA_n values, or the IA value at the offender laboratory (SDIS) – you will double count!
2. Summing all of the Forensic Hits (FH) made by casework labs in the State with the total number of Forensic Hits (FH) made at SDIS provides an exact count of all Forensic Hits within the State. Again, do ***not*** add in the FH_s and FH_n, values – you will double count.
3. Adding the total number of Forensic Hits in the State (from #2) to the number of Offender Hits (OH), provides an exact count of the total number of hits within the State. Again, to avoid double counting, do not add in FH_s, FH_n, and OH_n.

Example

Examples of aggregate counting are provided in ***What Would You Say?***

What Would You Say?

This section contains questions that may be asked by the press, budget personnel, or your boss. Each question is followed by a description of how to formulate an answer, a sample scorecard, and a sample response (calculated by summing the highlighted cells on the sample scorecard).

[3] In reality, hitting a solved case may add value – knowledge of an additional hit may be used at sentencing, etc. However, for the purpose of hit counting, we do not consider this added value.

Casework Labs

For this group of questions pretend you work for a casework laboratory (LDIS), and that the following scorecard shows the hits and Investigations Aided for your laboratory.

Casework Laboratory (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1				1		1
Day #2		2	1				1	
Day #3		1			1			
Day #4		1			1		1	
Day #5	1	2						
Total	**1**	**7**	**1**	**0**	**2**	**1**	**2**	**1**

1. How many cases submitted to your laboratory has CODIS assisted?

Report the number in the "total" row under the "IA" column.

Casework Laboratory (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1				1		1
Day #2		2	1				1	
Day #3		1			1			
Day #4		1			1		1	
Day #5	1	2						
Total	**1**	**7**	**1**	**0**	**2**	**1**	**2**	**1**

Your response: Seven of our cases have been assisted by CODIS.

2. How many hits have you made in your laboratory?

Report the "total" number under the "FH" column.

Casework Laboratory (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1				1		1
Day #2		2	1				1	
Day #3		1			1			
Day #4		1			1		1	
Day #5	1	2						
Total	**1**	**7**	**1**	**0**	**2**	**1**	**2**	**1**

Your response: Our laboratory has made one internal CODIS hit.

3. How many cases submitted to your laboratory has SDIS assisted?

Sum the numbers in the "IA" column that correspond to SDIS hits (OH_s and FH_s).

Casework Laboratory (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1				1		1
Day #2		2	1				1	
Day #3		1			1			
Day #4		1			1		1	
Day #5	1	2						
Total	**1**	**7**	**1**	**0**	**2**	**1**	**2**	**1**

Your response: Four of our cases were assisted by SDIS.

4. *How many hits (Forensic and Offender) have you made at SDIS?*

   Sum the totals under the "FH_s" and "OH_s" columns.

Casework Laboratory (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1				1		1
Day #2		2	1				1	
Day #3		1			1			
Day #4		1			1		1	
Day #5	1	2						
Total	**1**	**7**	**1**	**0**	**2**	**1**	**2**	**1**

   Your response: Our laboratory has participated in three hits at SDIS.

5. *How many cases submitted to your lab has NDIS assisted?*

   Sum the numbers in the "IA" column that correspond to any NDIS hits (OH_n and FH_n).

Casework Laboratory (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1				1		1
Day #2		2	1				1	
Day #3		1			1			
Day #4		1			1		1	
Day #5	1	2						
Total	**1**	**7**	**1**	**0**	**2**	**1**	**2**	**1**

   Your response: NDIS assisted one case that was submitted to our lab.

6. *How many hits (Forensic and Offender) have you made at NDIS?*

   Sum the totals under the "FH_n" and "OH_n" columns.

Casework Laboratory (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1				1		1
Day #2		2	1				1	
Day #3		1			1			
Day #4		1			1		1	
Day #5	1	2						
Total	**1**	**7**	**1**	**0**	**2**	**1**	**2**	**1**

   Your response: Our laboratory participated in one hit at NDIS.

7. *How many cases submitted to other labs in the State has your laboratory assisted?*

   Report the number in the "total" cell under the "IA_s" column.

Casework Laboratory (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1				1		1
Day #2		2	1				1	
Day #3		1			1			
Day #4		1			1		1	
Day #5	1	2						
Total	**1**	**7**	**1**	**0**	**2**	**1**	**2**	**1**

   Your response: Our lab aided two cases in other labs within the State.

8. *How many cases elsewhere in the U.S. (outside of your State) has your laboratory assisted?*

   Report the number in the "total" cell under the "IA_n" column.

Casework Laboratory (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1				1		1
Day #2		2	1				1	
Day #3		1			1			
Day #4		1			1		1	
Day #5	1	2						
Total	**1**	**7**	**1**	**0**	**2**	**1**	**2**	**1**

   Your response: Our laboratory assisted one case in another State.

9. *How many times have you matched against the State's Convicted Offender Index?*

   Report the number in the "total" row under the "OH_s" column.

Casework Laboratory (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1				1		1
Day #2		2	1				1	
Day #3		1			1			
Day #4		1			1		1	
Day #5	1	2						
Total	**1**	**7**	**1**	**0**	**2**	**1**	**2**	**1**

   Your response: Our laboratory has participated in two Offender Hits within the State.

10. How many of your cases were assisted by the State's Convicted Offender Index?

Sum all of the numbers under the "IA" column that correspond to any SDIS Offender Hits.

Casework Laboratory (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1				1		1
Day #2		2	1				1	
Day #3		1			1			
Day #4		1			1		1	
Day #5	1	2						
Total	**1**	**7**	**1**	**0**	**2**	**1**	**2**	**1**

Your response: Two cases submitted to our lab were assisted by the State's Convicted Offender Index.

11. How many times have you matched against another state's Convicted Offender Index?

Report the number in the "total" cell of the "OH_n" column.

Casework Laboratory (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1				1		1
Day #2		2	1				1	
Day #3		1			1			
Day #4		1			1		1	
Day #5	1	2						
Total	**1**	**7**	**1**	**0**	**2**	**1**	**2**	**1**

Your response: Our lab has participated in one interstate Offender Hit.

12. How many cases were assisted by another State's Convicted Offender Index?

Sum the numbers under the "IA" column that correspond to any NDIS Offender Hits.

Casework Laboratory (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1				1		1
Day #2		2	1				1	
Day #3		1			1			
Day #4		1			1		1	
Day #5	1	2						
Total	**1**	**7**	**1**		**2**	**1**	**2**	**1**

Your response: One case submitted to our lab was assisted by another State's Convicted Offender Index.

Convicted Offender Labs (SDIS)

For this group of questions, pretend you work for an offender laboratory, and that the following scorecard shows the hits and Investigations Aided for your laboratory.

Convicted Offender Laboratory (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1	1		2			
Day #2		1	2			
Day #3				1		3
Day #4		1	3			
Day #5	1		1			
Day #6			2		1	3
Total	**2**	**2**	**10**	**1**	**1**	**6**

1. *How many Offender Hits have you made at SDIS?*

   Report the number in the "total" cell under the "OH" column.

Convicted Offender Laboratory (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1	1		2			
Day #2		1	2			
Day #3				1		3
Day #4		1	3			
Day #5	1		1			
Day #6			2		1	3
Total	**2**	**2**	**10**	**1**	**1**	**6**

   Your response: There have been two Offender Hits at SDIS.

2. *How many Forensic Hits have you made at SDIS?*

   Report the number in the "total" cell under the "FH" column.

Convicted Offender Laboratory (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1	1		2			
Day #2		1	2			
Day #3				1		3
Day #4		1	3			
Day #5	1		1			
Day #6			2		1	3
Total	**2**	**2**	**10**	**1**	**1**	**6**

   Your response: There have been two Forensic Hits at SDIS.

3. How many hits have you made at SDIS?

Sum the "total" numbers under the "FH" and "OH" columns.

Convicted Offender Laboratory (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1	1		2			
Day #2		1	2			
Day #3				1		3
Day #4		1	3			
Day #5	1		1			
Day #6			2		1	3
Total	**2**	**2**	**10**	**1**	**1**	**6**

Your response: There have been four hits at SDIS.

4. How many cases have been assisted by your SDIS?

Sum the numbers under the "IA_n" column that correspond to any national Offender Hits with the "total" number under the "IA" column.

Convicted Offender Laboratory (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1	1		2			
Day #2		1	2			
Day #3				1		3
Day #4		1	3			
Day #5	1		1			
Day #6			2		1	3
Total	**2**	**2**	**10**	**1**	**1**	**6**

Your response: Our SDIS has assisted 13 investigations.

5. *How many cases within your State have been assisted by your Convicted Offender Index?*

   Sum the numbers under the "IA" column that correspond to any Offender Hits within your State ("OH" column).

Convicted Offender Laboratory (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1	1		2			
Day #2		1	2			
Day #3				1		3
Day #4		1	3			
Day #5	1		1			
Day #6			2		1	3
Total	**2**	**2**	**10**	**1**	**1**	**6**

   Your response: Our Convicted Offender Index has aided five cases in the State.

6. *How many cases within your State have been assisted by your Forensic Index?*

   Sum the numbers under the "IA" column on your scorecard that correspond to any SDIS Forensic Hits ("FH" column).

Convicted Offender Laboratory (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1	1		2			
Day #2		1	2			
Day #3				1		3
Day #4		1	3			
Day #5	1		1			
Day #6			2		1	3
Total	**2**	**2**	**10**	**1**	**1**	**6**

   Your response: Our Forensic Index has assisted three cases within the State.

7. *How many cases in other states have been assisted by labs in your State?*

   Report the number in the "total" cell under the "IA_n" column on your scorecard.

Convicted Offender Laboratory (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1	1		2			
Day #2		1	2			
Day #3				1		3
Day #4		1	3			
Day #5	1		1			
Day #6			2		1	3
Total	**2**	**2**	**10**	**1**	**1**	**6**

   Your response: Our state laboratories have assisted six cases in other states.

8. *How many NDIS hits have been made because of your Convicted Offender Index?*

   Report the number in the "total" cell under the "OH_n" column.

Convicted Offender Laboratory (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1	1		2			
Day #2		1	2			
Day #3				1		3
Day #4		1	3			
Day #5	1		1			
Day #6			2		1	3
Total	**2**	**2**	**10**	**1**	**1**	**6**

   Your response: Our Offender Index was responsible for one interstate hit.

9. How many Forensic Hits has your State participated in at NDIS?

Report the number in the "total" cell under the "FH_n" column.

Convicted Offender Laboratory (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1	1		2			
Day #2		1	2			
Day #3				1		3
Day #4		1	3			
Day #5	1		1			
Day #6			2		1	3
Total	**2**	**2**	**10**	**1**	**1**	**6**

Your response: Our State has participated in one national Forensic Hit.

10. How many hits has your SDIS made for other states?

Sum the numbers in the "total" cells under the "OH_n" and "FH_n" columns.

Convicted Offender Laboratory (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1	1		2			
Day #2		1	2			
Day #3				1		3
Day #4		1	3			
Day #5	1		1			
Day #6			2		1	3
Total	**2**	**2**	**10**	**1**	**1**	**6**

Your response: Our SDIS has made two interstate hits.

11. How many cases in other states have been assisted by your Convicted Offender Index?

Sum the numbers in the "IA_n" column that correspond to any national Offender Hits ("OH_n" column).

Convicted Offender Laboratory (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1	1		2			
Day #2		1	2			
Day #3				1		3
Day #4		1	3			
Day #5	1		1			
Day #6			2		1	3
Total	**2**	**2**	**10**	**1**	**1**	**6**

Your response: Our Convicted Offender Index has assisted three investigations in other States.

12. How many cases in other states have been assisted by your cases in your State?

Sum the numbers in the "IA_n" column that correspond to any national Forensic Hits ("FH_n" column).

Offender Laboratory (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1	1		2			
Day #2		1	2			
Day #3				1		3
Day #4		1	3			
Day #5	1		1			
Day #6			2		1	3
Total	**2**	**2**	**10**	**1**	**1**	**6**

Your response: Three investigations in other states have been aided by cases in our State.

13. How many cases in your State were assisted by other states' Forensic Indexes?

Sum the numbers in the "IA" column that correspond to any Forensic Hits that occurred at NDIS ("FH_n" column).

Convicted Offender Laboratory (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1	1		2			
Day #2		1	2			
Day #3				1		3
Day #4		1	3			
Day #5	1		1			
Day #6			2		1	3
Total	**2**	**2**	**10**	**1**	**1**	**6**

Your response: Two cases in our State have been assisted by other States' Forensic Indexes.

Aggregate Questions (Answered by SDIS)

Aggregate questions apply to all laboratories in the State. Aggregate totals based on this methodology are guaranteed not to double-count. In order to determine aggregate totals, state laboratories must combine SDIS data with data from casework laboratories in the State. To answer the following questions, we will refer to data from two casework laboratories and a convicted offender laboratory. Once again, pretend you work for the convicted offender laboratory.

1. How many cases in your State have been assisted by CODIS?

Sum the numbers in the "total" cell under the "IA" columns on Casework Laboratory A's and Casework Laboratory B's scorecards.

Casework Laboratory A (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1				1		1
Day #2		2	1				1	
Day #3		1			1			
Day #4		1			1		1	
Day #5	1	2						
Total	**1**	**7**	**1**	**0**	**2**	**1**	**2**	**1**

Casework Laboratory B (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1	1	3						
Day #2		1	1				2	
Day #3		1		1				1
Day #4		1				1		
Total	**1**	**6**	**1**	**1**	**0**	**1**	**2**	**1**

Your response: Thirteen investigations in our State have been aided by CODIS.

2. *What is the total number of Forensic Hits in your State?*

Sum the "total" numbers for the "FH" column on Casework Laboratory A's, Casework Laboratory B's, and the Offender Laboratory's scorecards.

Casework Laboratory A (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1				1		1
Day #2		2	1				1	
Day #3		1			1			
Day #4		1			1		1	
Day #5	1	2						
Total	**1**	**7**	**1**	**0**	**2**	**1**	**2**	**1**

Casework Laboratory B (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1	1	3						
Day #2		1	1				2	
Day #3		1		1				1
Day #4		1				1		
Total	**1**	**6**	**1**	**1**	**0**	**1**	**2**	**1**

Offender Laboratory (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1	1		2			
Day #2	1		3			
Day #3			1		1	1
Day #3		1	1			
Day #4		1	1			
Day #5	1		1			
Total	**3**	**2**	**9**	**0**	**1**	**1**

Your response: There have been five Forensic Hits in our State. (Note: Two entries are listed under Day #3 on the offender laboratory's scorecard because a national Forensic Hit and a state Offender Hit both occurred on the same day.)

3. *What is the total number of Offender Hits, at SDIS and NDIS, in which your State participated?*

Sum the "total" numbers for the "OH_n" column on Casework Laboratory A's and Casework Laboratory B's scorecards with the numbers in the "total" cells under the "OH" and "OH_n" columns on the Offender Laboratory's scorecard.

Casework Laboratory A (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1		1				1		1
Day #2		2	1				1	
Day #3		1			1			
Day #4		1			1		1	
Day #5	1	2						
Total	**1**	**7**	**1**	**0**	**2**	**1**	**2**	**1**

Casework Laboratory B (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1	1	3						
Day #2		1	1				2	
Day #3		1		1				1
Day #4		1				1		
Total	**1**	**6**	**1**	**1**	**0**	**1**	**2**	**1**

Offender Laboratory (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1	1		2			
Day #2	1		3			
Day #3			1		1	1
Day #3		1	1			
Day #4		1	1			
Day #5	1		1			
Total	**3**	**2**	**9**	**0**	**1**	**1**

Your response: There have been a total of four Offender Hits to which our State contributed.

Sample Statements

Casework Lab (LDIS)

The Casework Scorecard below will be used for the sample statement that follows:

Casework Laboratory (LDIS)								
Date	**FH**	**IA**	**FH_s**	**FH_n**	**OH_s**	**OH_n**	**IA_s**	**IA_n**
Day #1	1	2						
Day #2	1	1						
Day #3	1	3						
Day #4		1		1				1
Day #5		1			1			
Day #6	1	4						
Day #7		1				1		
Day #8	1	2						
Day #9	1	3						
Day #10		1			1			
Day #11		1	1				2	
Day #12		1				1		
Day #13		1			1			
Day #14			1				3	
Day #15	1	2						
Day #16	1	2						
Day #17		2	1					
Day #18		1			1			
Day #19	1							
Day #20			1				1	
Day #21		1	1				1	
Day #22		1			1			
Day #23		1			1			
Day #24	1	3						
Day #25		2				1		
Total	**10**	**37**	**5**	**1**	**6**	**3**	**7**	**1**

As many of you are aware, our laboratory has been using DNA to solve crimes involving biological evidence for several years. In addition to comparing evidentiary samples collected at

crime scenes to samples from known suspects collected by the police, we also have an initiative targeted at solving cases with no suspects. This initiative, known as the Combined DNA Index System, or CODIS, is a collaborative effort among our laboratory, the Federal Bureau of Investigation, and other DNA laboratories throughout the US.

CODIS enables state and local crime laboratories to exchange and compare DNA profiles electronically, thereby linking serial violent crimes to each other and to known sex offenders.

Within our laboratory, CODIS has produced 10 hits (***FH***), aiding 22 investigations (***IA for FH***). Each of these hits was made from evidence submitted to our laboratory.

We are also committed to sharing our data with other laboratories in the state in an effort to fight crime. We periodically send our data to Laboratory X where it is compared against the State's convicted offender database, as well as cases submitted from other laboratories. This sharing initiative has paid-off: we have made six hits against the offender database (***OH_s***), aiding six cases in our lab (***IA for OH_s***). We have also made five hits with cases from other laboratories in the state (***FH_s***). These five hits have aided four of our cases (***IA for FH_s***), and seven cases belonging to other laboratories (***IA_s***).

We also share our data with the rest of the country by participating in the FBI's National DNA Index System, or NDIS. We have made four NDIS hits, three against individuals convicted of sex offenses in other states (***OH_n***), and one against another unsolved case in State Z (***FH_n***). These NDIS hits have assisted a total of five cases in our laboratory (***IA for FH_n and OH_n***), and one case in another State (***IA_n***).

In conclusion, by using CODIS, we have aided 37 cases submitted to our laboratory (***IA***), as well as eight cases from other jurisdictions (***IA_s plus IA_n***).

Convicted Offender Lab (SDIS)

The Offender Scorecard below will be used for the sample statement that follows:

Offender Laboratory (SDIS)						
Date	**FH**	**OH**	**IA**	**OH_n**	**FH_n**	**IA_n**
Day #1		1	2			
Day #2	1		3			
Day #3		1				
Day #3					1	
Day #4				1		2
Day #5	1		1			
Day #6		1	3			
Day #7		1	1			
Day #8			2		1	
Day #9		1	1			
Day #10					1	1
Day #11	1		2			
Day #12		1	2			
Day #13	1		1			
Day #14	1		1			
Day #15				1		1
Day #16	1		1			
Day #17			1		1	1
Day #18		1	1			
Day #19		1	2			
Day #20		1				
Day #21				1		1
Day #22	1		2			
Day #23	1		2			
Day #24		1	3			
Day #25		1				
Day #26	1		1			
Day #27		1	1			
Total	**9**	**12**	**33**	**3**	**4**	**6**

In addition to working DNA cases, our laboratory performs two other important crime-fighting functions. First, we collect and analyze DNA samples from individuals convicted of felony sex offenses, like rape. Second, our laboratory is the central repository for all of the forensic DNA profiles in the State. Combined, these two functions allow us to solve violent crimes that would otherwise go unsolved.

Using the Combined DNA Index System, or CODIS, which was developed by the Federal Bureau of Investigation, we search DNA profiles from unsolved cases against DNA profiles from convicted offenders and other cases. Matches made against other cases can link crime scenes together; possibly identifying serial offenders. Based on a match, police in multiple jurisdictions can coordinate their respective investigations, and share the leads they developed independently. Matches made against the Convicted Offender indexes provide investigators with the actual identity of the perpetrator(s).

We believe that our CODIS program has proven to be an effective tool for solving violent crimes. Our convicted offender database has produced 12 hits (***OH***) aiding 16 investigations in our State (***IA for OH***). That's 16 times we have provided the police with the name of a putative perpetrator! The convicted offender program has also proven useful to the rest of the U.S. – producing three hits (***OH_n***) and aiding four investigations in other states (***IA_n for OH_n***).

CODIS has also helped link serial cases across laboratories in the State. CODIS has produced nine hits among separate laboratories in the State (***FH***), aiding 14 separate investigations (***IA for FH***).

Our laboratory shares all of the DNA profiles with the rest of the U.S. by participating in the FBI's National DNA Index System, or NDIS. This data-sharing initiative has also proven effective: we have made four hits with other states (***FH_n***), assisting three investigations in our State (***IA for FH_n***) and two investigations elsewhere in the U.S. (***IA_n for FH_n***).

In conclusion, our State CODIS database has assisted 33 cases submitted to laboratories in our State (***IA***), as well as six cases from other jurisdictions (***IA_n***).

Other Metrics

The hit counting methodology presented in this document is flexible and easily adapts to other metrics. For example, Offender and Forensic Hits can be further subdivided into cold and warm hits. Or, you can distinguish between hits that provide the police with names of suspects and hits that link unknown-suspect crime scenes. The definitions and rules provided in this document are flexible enough to accommodate any additional metrics you may use to measure the "value" of CODIS.

Appendix A: Scorecards

Casework Scorecard

CASEWORK

HIT COUNTING SCORECARD

Date	FH	IA	FH_s	FH_n	OH_s	OH_n	IA_s	IA_n
Total								

FH Forensic Hit made by searching your CODIS database. (One hit can link multiple cases.)

IA Cases belonging to your laboratory that were assisted by a CODIS hit at LDIS, SDIS, or NDIS. (Each case is counted only once!)

FH_s Forensic Hit made at SDIS that matched one or more cases from your laboratory.

FH_n Forensic Hit made at NDIS that matched one or more cases from your laboratory.

OH_s Offender Hit made at SDIS that matched one or more cases from your laboratory.

OH_n Offender Hit made at NDIS that matched one or more cases from your laboratory.

IA_s Cases belonging to other laboratories in your State that were linked to one or more cases from your lab through an SDIS hit. (Each case is counted only once!)

IA_n Cases belonging to other laboratories in the Country (outside of your State) that were linked to one or more cases from your lab through and NDIS hit. (Each case is counted only once!)

Convicted Offender Scorecard

Convicted Offender
Hit Counting Scorecard

Date	FH	OH	IA	OH_n	FH_n	IA_n
Total						

FH Forensic Hit made by searching your SDIS database. (One hit can link multiple cases within the State.)

OH Offender Hit made by searching your SDIS database. (One hit can link multiple offenders and cases)

IA Investigations Aided in the State by an SDIS or NDIS hit.

OH_n Offender Hit made at NDIS linking an offender from your State to one or more cases in other states.

FH_n Forensic Hit made at NDIS linking a casework sample from your State to one or more cases in other states.

IA_n Cases belonging to other laboratories in the country (outside of your State) that were linked to one or more cases from your State through an NDIS hit.

Entire State Lab Scorecard

Entire State Lab
Hit Counting Scorecard

Date	FH	OH	IA	$OH_n(1)$	$OH_n(2)$	FH_n	IA_n
Total							

FH Forensic Hit made by searching your SDIS database. (One hit can link multiple cases within the State.)

OH Offender Hit made by searching your SDIS database. (One hit can link multiple offenders and cases)

IA Investigations Aided in the State by an SDIS or NDIS hit.

OH_n (1) Offender Hit made at NDIS that matched one or more cases from your laboratory.

OH_n (2) Offender Hit made at NDIS linking an offender from your State to one or more cases in other states.

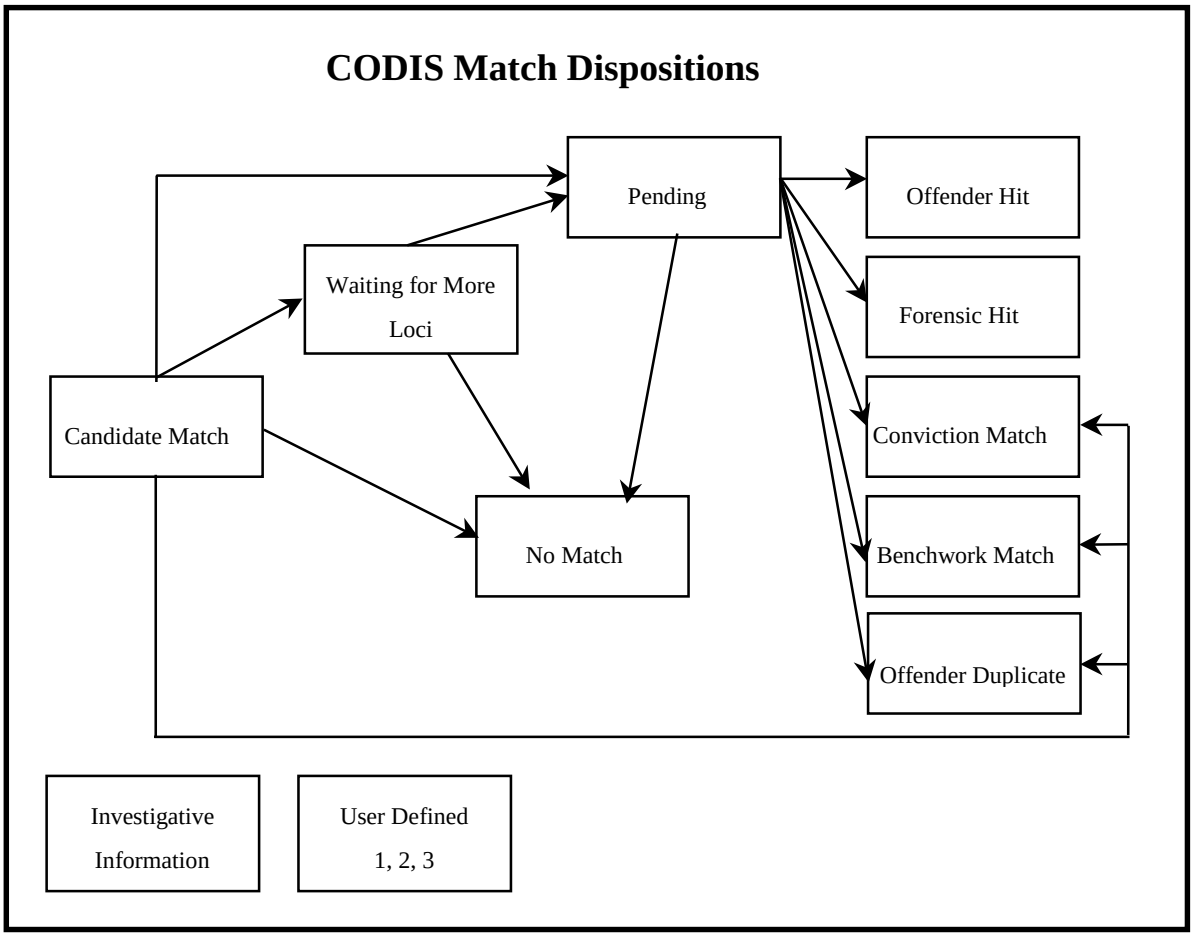
FH_n Forensic Hit made at NDIS linking a casework sample from your State to one or more cases in other states.

IA_n Cases belonging to other laboratories in the country (outside of your State) that were linked to one or more cases from your State through an NDIS hit.

Appendix B: CODIS Match Dispositions

CODIS Match Dispositions

Following is a list of CODIS Match Dispositions, and how they are interrelated.



Disposition	Description
Candidate Match	A possible match between two or more DNA profiles discovered by CODIS software (AutoSearcher, Searcher, or Batch Search). Candidate Matches must be confirmed or refuted by qualified DNA analysts. If profiles from multiple laboratories are included in a Candidate Match, a qualified DNA analyst from each laboratory must participate in the confirmation process.

	The Searcher family of programs is capable of generating many candidate matches, depending on the configuration of stringency, match window, equivalent alleles, number of missing loci, etc.
Waiting For More Loci	Waiting for More Loci is an intermediate step, indicating that the match is undergoing confirmation by at least one qualified DNA analyst (see *NDIS Operational Procedures, Confirm an Interstate Candidate Match*). The qualified DNA analyst confirming the Candidate Match has determined that one (or more) additional loci must be analyzed before the match can be confirmed or refuted. The Candidate Match enters the Waiting for More Loci step until the loci are completed. This situation is likely to occur with RFLP data because of changes to NDIS core loci requirements for Convicted Offenders. Before January 1, 1997, the NDIS core loci for convicted offender RFLP data were D2S44, D4S139, and D10S28. On January 1, 1997, this requirement was expanded to include D5S110. However, D5S110 was not required for profiles generated before January 1, 1997. Because many convicted offender profiles produced before this date have only three loci, the NDIS procedure *Confirm an Interstate Candidate Match,* requires the laboratory to run D5S110 as one of the first steps in the confirmation process.
Pending	Pending is also an intermediate step, indicating that the Candidate Match is being confirmed by at least one qualified DNA analyst (see *NDIS Operational Procedures, Confirm an Interstate Candidate Match*). Based on an initial review of the match report, one (or more) qualified DNA analyst(s) has determined that the match requires confirmation. The Candidate Match enters the Pending step until the qualified DNA analyst(s) completes the confirmation process and either declares or refutes the Pending match. The confirmation process may include many activities – from pulling an offender sample from the freezer to verifying sizing results. All such activities are considered Pending.
Offender Hit	An Offender Hit (**OH**) occurs when one or more forensic samples are linked to a convicted offender sample at SDIS or NDIS. Offender Hits are sometimes called case-to-offender hits. Cold and warm hits are counted as Offender Hits. Note: states permitted to have “suspect” indexes should classify hits

	against this index as Offender Hits.
Forensic Hit	A Forensic Hit (**FH**) occurs when two or more forensic samples are linked at LDIS, SDIS, or NDIS. Forensic Hits are sometimes called case-to-case hits. Cold and warm hits are counted as Forensic Hits.
The difference between cold and warm hits	In a cold hit, there is no prior indication that the DNA profiles are related. Cold hits add value by linking cases that are previously unlinked, or by providing investigators with the identity of a known convicted offender. In a warm hit, investigators have a hunch that there may be a match in CODIS. A typical example of a warm hit is when several cases or offenders are searched with the suspicion that two or more match. Warm hits add value by reducing the investigative resources that would otherwise be required to link the cases.
Conviction Match	A Conviction Match occurs when CODIS matches a DNA profile developed from crime scene evidence to a DNA profile from a convicted offender, but the crime from which the evidence was collected has already been solved and linked with the offender. For *intra*state matches, a Conviction Match is usually between the convicted offender's DNA profile and the evidence used to convict him/her. For *inter*state matches, a Conviction Match usually indicates that the perpetrator has been convicted of a different crime in another State. This is not an Offender Hit, because the information is most likely already captured in the States' criminal history record system. In some instances, a Conviction Match can be determined directly from reviewing the Candidate Match; the Pending and Wait for More Loci steps can be skipped. In a sense, Conviction Matches are a form of blind external testing –the offender ought to match the evidence for which s/he was convicted.
Benchwork Match	A Benchwork Match is like a Conviction Match, except it applies only to the Forensic index. Benchwork Matches occur when profiles from several cases linked external to CODIS (i.e., the examiner links the cases by matching DNA profiles on the workbench) are also matched subsequently by CODIS.
Offender Duplicate	An Offender Duplicate indicates that two convicted offender profiles match. Offender Duplicates occur when the Offender

	index is searched against itself. While an Offender Duplicate match does not provide probative information, it is a form of blind testing. Offender Duplicates also provide insight into the efficacy of the sample collection and analysis infrastructure.
No Match	During the confirmation process, a qualified DNA analyst determines that a Candidate, Pending, or Waiting for More Loci Match is not a true DNA match.
User Defined #1 User Defined #2 User Defined #3	The User Defined dispositions exist for the convenience of state and local laboratories. For example, they can be used to further refine the Pending disposition.
Investigative Information	The Investigative Information disposition is a cross between a No Match and a Warm Match. Consider the following scenario: a police officer develops a suspect in a violent crime and has the suspect's profile searched in CODIS. The suspect's profile does not match any other profiles in CODIS. Although the search is a No Match, it does provide probative information. Based on the suspect being excluded by the CODIS search, the investigating agency can redeploy resources to other suspects/leads. The Investigative Information disposition will usually be set from the Searcher program.