



NATIONAL INSTITUTE OF JUSTICE

Jail-Specific Data Analysis: Considerations for Jail Analysts

Reena Chakraborty

October 2020

U.S. Department of Justice
Office of Justice Programs
810 Seventh St. N.W.
Washington, DC 20531

David B. Muhlhausen, Ph.D.
Director, National Institute of Justice

This and other publications and products of the National Institute of Justice can be found at:

National Institute of Justice

Strengthen Science • Advance Justice
NIJ.ojp.gov

Office of Justice Programs

Building Solutions • Supporting Communities • Advancing Justice
OJP.gov

The National Institute of Justice is the research, development, and evaluation agency of the U.S. Department of Justice. NIJ's mission is to advance scientific research, development, and evaluation to enhance the administration of justice and public safety.

The National Institute of Justice is a component of the Office of Justice Programs, which also includes the Bureau of Justice Assistance; the Bureau of Justice Statistics; the Office for Victims of Crime; the Office of Juvenile Justice and Delinquency Prevention; and the Office of Sex Offender Sentencing, Monitoring, Apprehending, Registering, and Tracking.

This paper was prepared with support from the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice, under contract number GS-00F-219CA. The opinions, findings, and conclusions or recommendations expressed in this publication are those of the author and do not necessarily represent those of the Department of Justice.

Contents

- Introduction iii**
- Part 1: An Overview of Jail Analysis 1**
 - The Jail Analyst’s Role 2**
- Part 2: Suggestions for Building and Refining Data Resources 3**
 - Section 1: Information Requirements for Supporting Basic Analysis..... 3**
 - Capture Information Correctly at the Point of Entry 3
 - Collect Data That Are Structured To Facilitate Analysis 4
 - Collect Location Data Such as Addresses 7
 - Section 2: Data Collection From Nonoffender Management Systems 8**
 - Collect Data From Correctional Information Systems Other Than Offender Management Systems 8
 - Collect Data Derived From Management Control Infrastructure — Workflow Management and Compliance Tracking..... 9
 - Establish Snapshot Tables 10
 - Identify and Address Data Quality Concerns — Immediately and Long-Term 12
 - How To Start an Inquiry 12

Section 3: Context and Specific Data Required To Support Jail-Based Analyses	13
Context for Jail-Based Analysis	13
Specific Data Required for Jail-Based Analysis.....	14
Part 3: Suggestions Regarding Types of Jail Analyses	17
Section 1: Questions That Guide Basic Analysis	17
Who Is in Jail Today?	17
Review of the Past 12 Months	18
Housing Utilization and Associated Facilities Maintenance Information.....	20
Classification and Social Information	20
Section 2: Analysis Using Other Jail-Based Information.....	22
Other Impactful Analyses	22
Analysis of Inmate Health Diagnoses	23
Security and Infractions Information	24
Incident Analysis	24
Relationship Chronology and Social Network Analysis	26
Analysis of Workload Demands and Facility Activities	26
Analysis of Workforce Information	27
Notes	29
About the Author	31

Introduction

This paper highlights the basics of jail-specific analysis. It emphasizes the importance of linking data and information to the processes from which they are derived, and collecting data in forms amenable to analysis using readily available applications like worksheets and network mapping applications. Posing clear and meaningful questions is important. Fundamental yet powerful analysis of jail data is achieved by categorizing information and applying counts or sums to derive insight about the business processes that generate the data. A basic understanding of jail processes and information collection, recording, and storage procedures facilitates meaningful and informative jail analysis using principles, basic analysis skills, and freely or commonly available tools such as spreadsheets and network analysis applications (which help visualize relationships between people). These ideas can be applied to many information sources and processes. The value of the analysis is determined by the nature of the questions that guide inquiry and is restricted by the inherent limitations of the data-gathering mechanisms and processes. Within these limits, jails, regardless of size or resource constraints, can harness readily available tools to extract significant benefit from jail analysis.

The purpose of this paper is to discuss how descriptive statistics and basic analysis of the daily activities of jails can support safety and help measure and improve performance. The paper is organized in three parts. Part 1 provides a short overview of the role of jail analysis. Part 2 discusses the fundamentals of collecting information from offender management systems and other information systems and proposes a set of key data elements essential for conducting jail analysis.¹ Part 3 describes representative questions and contexts that jail analysts may encounter in practice and discusses ways analysts can generate insights about practice and performance. Tasks required to support implementation of routine executive or operational review processes are also discussed. A discussion of the many trade-offs required by resource-strapped jails to establish and maintain a modern analytical capacity is beyond the scope of this paper.

This paper assumes that interested analysts have access to a spreadsheet application, some experience with collecting data in a format conducive for analysis, and a working knowledge of specific data elements required to answer questions that frequently arise in daily operations and external inquiries. It also assumes that analysts are comfortable with basic descriptive statistics, such as determining the best way to categorize data and

generating frequency counts by category. The ability to filter data and derive counts is necessary. Proficiency in the use of pivot tables or their equivalents is helpful but not absolutely necessary, as many of the same questions can be answered simply by sorting, filtering, and counting data.

Some subsections are written in a “how to” manner because correct performance of the described tasks, which form the foundation for analysis, is critical in order to prevent the production of problematic data that are impossible to analyze. Other subsections are written in a form that introduces the types of data elements that

could be collected or the questions analysts may need to answer. This is intended to provide suggestions or guidance for analysts to adapt to meet their needs and purposes. The underlying assumption is that analysts have collected the relevant information, such as that described in detail in the third section of Part 2.

Collecting and analyzing data can immediately benefit jails. Furthermore, consistent data collection and analysis over time allows jails to derive deeper insights into their operations and provides greater opportunities for improving practices, performance, and outcomes.

Part 1: An Overview of Jail Analysis

Jails, large or small, are highly resource-constrained, safety-focused organizations that must securely house individuals, sometimes for extended periods of time. They operate like and provide all the services of a small city, and thus can be thought of as “cities within cities.” The term jail, however, applies to different types of facilities performing different functions. Lockups holding arrestees for a short time prior to arraignment at a court may be called jails. Detention facilities that hold inmates after arraignment or sentencing are also called jails. Colloquially, the terms prison and jail are often used interchangeably, though that is incorrect. Prisons hold persons who have already been sentenced and have more than a year remaining to serve, and they are funded and operated by state or federal governments. Jails are usually funded and operated locally. For the most part, they hold persons awaiting sentencing whose legal matters are still being adjudicated and who have indeterminate lengths of stay, as well as sentenced persons with typically less than a year remaining to serve.

Jail staff must rapidly and accurately assess the risks these individuals pose to themselves and others and connect them to the treatment, programs, and services they need both in the facility and in the community upon release. To accomplish this, jail staff at every organizational level require accurate, timely, and appropriately accessible information to make sound decisions. This information is derived from sources internal and external to the jail. Most of these data are transcribed and recorded manually into a variety of information systems. From there, existing data can be retrieved and used by analysts who support decision-making.

I have served as an analyst supporting decision-making for a large jail system for 16 years; the jail system operated a lockup for six of those years and continues to do so. When I began this work, I had experience in analysis but knew nothing of jail operations and associated data collection and had little sense of the questions relevant to a jail’s decision-makers. Then, as is still true today, little had been written about jail-specific analysis. To help address that gap, this paper offers a set of suggestions based on lessons learned. Its intended audience is fellow jail analysts. My experience is limited to a single jail system, so I hope readers will apply the filters of their own needs, resources, operating reality, and experience to determine what is helpful to them.

The Jail Analyst's Role

I have learned that every jail is faced with the need to respond to inquiries, whether of internal or external origin — and this task often falls to analysts. Analysts may be employed by counties or localities assigned to support the analysis of jails or they may be embedded within jails, as is frequently true for larger jails. In working with fellow jail analysts for the Metropolitan Washington Council of Governments, I learned that there is a diversity of expertise, knowledge, and experience among jail analysts. Our skills span a spectrum — ranging from extensive experience in jail operations but limited experience with data analysis to extensive experience in data analysis but limited knowledge of jail operations and the business processes that generate data. All analysts strive to provide meaningful analysis to support organizational and jurisdictional decision-makers and gradually strengthen and enhance their analytic capacity.

A strong jail analytic capacity is essential for collecting and recording information in a manner that improves understanding of jail operations, practices, performance, and outcomes. The jail analyst's most pressing challenge is to demonstrate the value of analysis — how the resources and efforts expended in producing an analysis contribute to improvements. Presenting

analysis so that the requestor or end user can clearly and rapidly understand it is as essential as its technical aspects. Many excellent references on technical writing, data visualization, and presentation of analytical results apply equally well to jail-specific analysis. Little has been written, however, about how data are generated by, or recorded as a result of, jail business processes, and even less has been written about how to analyze and utilize these data to benefit jails.

Jail analysts are uniquely tasked with understanding how data are generated and recorded by jail business processes so they accurately represent the perspectives of those who generate or record the data. This will influence how well their effort is received. Value demonstrated repeatedly over time leads to tangible support for investment in information systems and services, and ultimately, research capacity. Developing this capacity is necessary to solve everyday problems and improve safety and performance. These objectives are mission-critical for jails. Presently, however, there is little guidance specifically focused on jail-based analysis for jail analysts that could help them support these objectives. This paper is intended to fill that gap, providing ideas, suggestions, and encouragement for jail analysts who must answer the questions that come their way by optimizing their sparse resources.

Part 2: Suggestions for Building and Refining Data Resources

Section 1: Information Requirements for Supporting Basic Analysis

This section describes the fundamentals of data collection that can support basic analysis for jails and how to avoid common errors. It speaks to the importance of avoiding transcription errors or other mistakes in the initial recording of data, structuring data to facilitate analysis, collecting location data (such as addresses) for later use, and collecting information from systems and sources other than the offender management system. Part 2 ends with a brief discussion of how to start an inquiry.

This section will be useful for analysts who:

- Have limited experience working with databases.
- Must demonstrate how to collect data to others with varying experience.
- Want to know about the different types and sources of jail data that can be collected.
- Would like ideas on how to create resources to improve analytical response time.

Capture Information Correctly at the Point of Entry

When it comes to analysis, the first rule is to collect information accurately and consistently at the point of entry. Underlying data quality profoundly influences the choice of analytical methods and the ultimate value of the analysis. Analysts, especially in larger jails, typically do not collect information at the source; they retrieve it from information systems. They may need to work with others to routinely review data to ensure quality. In smaller jails, they may have the luxury of collecting information at the source.

For many jails, commonly used productivity software such as Microsoft Excel, Apple Numbers, and Google Sheets can provide adequate analytical tools. The key is to create and maintain workbooks in a manner that supports using the many built-in tools of these applications. Capturing information in a consistent and sufficiently disaggregated form is critical to leveraging these applications successfully. Though this software has some inherent limitations — the inability to recognize and adjust for variations in spelling, difficulty in analyzing free text, and storage needs for different data types (e.g., dates, times, integers, and text) — using it is an essential first step in the analytic process.

Additionally, it is important to maintain information so it is associated with the correct individual and the specific booking during which it was collected. For instance, some individuals may have multiple records for a single booking, so it is vital to associate these records not only with the individual and booking identifiers, but also with a record-level identifier so they are not missed during the analysis.

Collect Data That Are Structured To Facilitate Analysis

Analysis is often motivated by questions of operational significance. Data elements are collected to help answer the questions that arise. It is important to identify data attributes and collect them in separate fields or workbook columns in a consistent manner so that descriptive analysis tools can be used to extract information from the data rapidly, whenever the need arises. An illustrative example follows.

A property officer wants to track the frequency with which individuals present wearing blue high tops, which are associated with membership in a local gang; another local gang prefers the use of brand-name shoes, here referred to as Brand A. The officer has maintained a workbook of the types of footwear individuals presented with over the past 30 days. Exhibit 1 provides an example of what a portion of this workbook looks like.

Assume the officer has a month of data for which the Type of Shoe column has similar

Exhibit 1. Property officer log entries of inmate shoes received

Inmate Number	Booking Number	Date	Type of Shoe
123234	2019-0550	04/15/2019	Bl. Hi top
123344	2019-0561	04/15/2019	Blk running shoes
121987	2019-0564	04/15/2019	Blue high top
122567	2019-0567	04/15/2019	Red Brand A
113241	2019-0570	04/15/2019	Brown loafers
120395	2019-0571	04/15/2019	Blu H-top
123458	2019-0573	04/15/2019	Blk sandals

Exhibit 2. Property officer log entry of inmate shoes received, restructured to facilitate subsequent data analysis

Inmate Number	Booking Number	Date	Shoe Color	Shoe Style	Shoe Make	Type of Shoe
123234	2019-0550	04/15/2019	Blue	High Top	Generic	Blue High Top Generic
123344	2019-0561	04/15/2019	Black	Running Shoes	Generic	Black Running Shoes Generic
121987	2019-0564	04/15/2019	Blue	High Top	Generic	Blue High Top Generic
122567	2019-0567	04/15/2019	Red	Cross Trainer	Brand A	Red Cross Trainer Brand A
113241	2019-0570	04/15/2019	Brown	Loafers	Generic	Brown Loafers Generic
120395	2019-0571	04/15/2019	Blue	High Top	Brand A	Blue High Top Brand A
123458	2019-0573	04/15/2019	Black	Sandals	Generic	Black Sandals Generic

entries. Due to inconsistent coding, the officer's only option is to count the entries manually in order to find out how many blue high tops were processed. This is time-consuming and prone to errors.

If one considers the information content in the Type of Shoe column, it has three distinct parts or data attributes: Shoe Color, Shoe Style, and Shoe Make. In exhibit 2, these three data attributes are collected separately, each in its own column. The information in exhibit 1 is now restructured in exhibit 2 in a way that would enable the officer to quickly count how many blue high tops were processed and to better facilitate an analysis.

The information in the Shoe Color, Shoe Style, and Shoe Make columns is typed consistently each time (as most applications will remember the last entry and auto-populate its previous spelling). Alternatively, drop-down menus of known colors, styles, and makes can be used to select the appropriate attribute values for each record. The final column is populated using a concatenation formula that generates the formatted text using consistent spacing (spaces are inserted between the specified cells within the

concatenation formula). In this example, consistent data entry ensures that the application recognizes each instance of Blue High Top Generic as identical when filtering by column for text containing "Blue High Top Generic" or when using a built-in formula for counting — thereby enabling an immediate search. While it requires some initial effort to organize information and enter it consistently, rapid analysis on demand is the resulting benefit.

Well-designed offender management systems often provide some, or even most, of this data structuring automatically. However, information demands change with time and are likely to surpass a system's initial capacity. A clear understanding of how to structure and collect data to facilitate analysis is necessary to support data collection when this occurs. It is also helpful when developing technical requirements for new tables and fields. Indeed, new information systems may use different platforms, have different user interfaces, and be more powerful, but the basics of ensuring that data input is accurate and consistent — not only by an individual at various times but by all individuals who enter similar information — still apply. An example

of how a jurisdiction’s attempt to apply for State Criminal Alien Assistance Program (SCAAP) funds can be affected by inconsistent data input is illustrated in exhibit 3.

In a large urban jail where inmates have many different countries of origin, one of the fields captured at intake is place of birth. This information is needed for jurisdictions to apply for and receive funding through SCAAP — as well as for law enforcement purposes, to respond to embassy requests, and to facilitate reentry linkages or culturally sensitive service provision. Unfortunately, the place-of-birth data can be difficult to interpret if staff members have not correctly used the two-letter country codes of the National Crime Information Center (NCIC).

Sometimes, making an educated guess about an inmate’s place of birth based on his or her name is a necessary method of last resort to ensure that data are reasonably quality-assured, specifically when applying for SCAAP funding. In exhibit 3, it is likely that the last two records represent individuals who were not actually born in Estonia (NCIC code “ES”). It is likely that the person who entered the data used ES as an abbreviation, perhaps for El Salvador. The inmate Jaan Kaasesalu is likely someone whose place of birth was Estonia, based upon the cultural origin

of the last name. Given the apparent inconsistencies in these data, it may also be difficult to determine if the first four records represent individuals from Tunisia (TU) or Turkey (TY). If these individuals are no longer in the facility and there are no official records documenting their place of birth, the data may never be resolved. If data are entered consistently and correctly, jail analysts need not rely on such methods to attempt to correctly identify country of origin when applying for SCAAP funds. Stated another way, achieving public safety and criminal justice outcomes depends upon capturing data correctly and consistently when they are first recorded in the jail information system.

This example illustrates how using coding systems inconsistently, regardless of who records the data, can corrupt information in a way that renders it unreliable and inaccurate on a permanent basis. In this particular case, such issues can be mitigated by providing a drop-down menu with the country names as field labels and storing the two-letter codes (or three-letter codes, which are less prone to misinterpretation) in the information system or stand-alone system of record. It is also worth mentioning that NCIC codes are designed to avoid conflicts with abbreviations for U.S. states, whereas two-letter International Standards Organization (ISO) codes are often in conflict. For example, the two-letter ISO

Exhibit 3. Example of data entry inconsistencies in inmate place of birth

Inmate Number	Booking Number	Date	Birthplace	First Name	Middle Name	Last Name
128640	2019-563	04/20/2019	TU	Ali	Muhammed	Trabelsi
128504	2019-572	04/21/2019	TU	Omar	Abdul	Mehmet
129603	2019-591	04/24/2019	TY	Faisel	Omar	Mehmet
129742	2019-605	04/24/2019	TU	Muhammed	Bin	Kamal
129759	2019-637	04/26/2019	ES	Jaan		Kaasesalu
129891	2019-668	04/28/2019	ES	Jorge	Santos	Meija
129933	2019-701	04/30/2019	ES	Karlos	Hernandez	Campos

code for Tunisia is TN, which is the same as the abbreviation for Tennessee. Using a coding system that prevents conflicts of interpretation can lead to more informative analysis and accurate insights long after individuals have left the facility.

Collect Location Data Such as Addresses

Location data are important pieces of information required for a variety of jail-related needs. It is critical for jails to be able to quickly identify and, if necessary, separate individuals from specific neighborhoods or locations — for example, to prevent incidents in the jail following spates of community-based violence (which is often neighborhood-related and not gang-related). Accurately captured location data can save time and effort and positively impact safety when minutes count the most. Another use for location data is to support jail-based voter registration efforts or protect voting rights for pretrial detainees during local elections, which may be limited to specific neighborhoods within the community.² Location data are also used to support the strategic planning efforts of local communities that want to align their reentry services with the number of persons being released to various neighborhoods.

A geographic information system (GIS) is a powerful analysis tool that enables mapping of address information with geocoded data. To use GIS, address information for each free-form text record must be disaggregated into its component parts. These component parts often include ZIP code, state, city, thoroughfare name, thoroughfare type, building name, building number (or street number), and unit type or unit number. If these data elements are correctly and consistently tabulated in a spreadsheet with each row corresponding to a single record, the batch of records can be uploaded into a geocoding application (often several thousand records at a time). The geocoded

information produced by this application then allows the GIS application to create a map with the address data provided. Thus, the hard work is in disaggregating the address information into its component fields and ensuring it is accurately and consistently collected. This is sometimes challenging when there are many inmates to process and the address fields are free-form text.

One way to collect the data accurately at the point of entry is to type the address information into a mapping application. Increasingly, local and state governments provide geocoding and address look-up services to government analysts and users as a part of standard service agreements between agencies. These should be options of first choice. If they are not available, there are several free commercial address look-up applications. The Environmental Systems Research Institute (also known as Esri) provides geocoding services based on purchased licenses for ArcGIS, a GIS application. Universities may partner with local governments to provide geocoding services. To use a look-up service, the user types in the address information provided and then receives a set of options from which to select a match. Once a match is found, the user must copy and paste the address information into the jail information system or an alternative (e.g., spreadsheet or workbook). Address information thus captured will be consistent and can be disaggregated using text-to-column functions and then geocoded. Alternatively, the address information can be provided directly from the mapping applications to geocoding applications because each mapping application already has geocoded addresses in the format they display; when this information is provided back in the same format, the geocoder recognizes it and can provide the geocoded coordinates for mapping. The additional advantage of copying and pasting addresses is that invalid addresses are identified

immediately. This provides an opportunity to determine if an individual with an invalid address is homeless or transient and needs links to shelter services and housing upon release, or if the individual is concealing his or her actual place of residence for criminal reasons.

If the information is not captured accurately, then it must be downloaded and disaggregated one record at a time, and each address has to be checked later for validity. It may take an analyst several days to verify large datasets of several thousand records. Invalid address data cannot be acted upon in this enormously laborious process because most individuals will no longer be in the facility. Capturing the data accurately at the point of entry prevents significant information loss.

Relatively small efforts to improve accuracy at the point of data capture and entry can produce significant analytical benefits. For example, if it suddenly becomes necessary to identify all intakes from a particular neighborhood during a specific time period to support a law enforcement investigation, accurate address data enable a response within a matter of minutes. For jails that need to support voter registration for local elections and by-elections, having accurate address information can make the difference between ensuring that pretrial misdemeanants are registered and receiving legal complaints about violation of rights. Jails of all sizes, serving communities with a wide range of expectations, benefit from accurate address information.

While it may seem like a lot of effort, collecting accurate location information provides valuable support for strategic planning by local law enforcement and community-based reentry services. Address information derived from sources such as visitor logs and mail can also support ongoing police investigations or legally authorized surveillance activities to protect

lives and prevent crime. Addresses can also be used to help connect offenders to supportive treatment, programs, and services in their community during reentry. Given that many returning offenders will have limited access to transportation, offering them services near their place of residence reduces their need to travel and can help them better coordinate their time. This information is also helpful in local capacity-planning efforts. If users of certain services are clustered in a few communities, it makes sense to plan for and provide the services in those communities for the residents' convenience. If there are known gaps in needed services, they can be addressed in a thoughtful manner. Jails can leverage their unique information sources and share them with partner agencies to amplify the value of their analysis to help the community achieve its desired outcomes in public safety, public health, human services, and quality of life.

Section 2: Data Collection From Nonoffender Management Systems

Collect Data From Correctional Information Systems Other Than Offender Management Systems

Offender data form the core of jail information systems but are only a part of the information needed to successfully operate a jail. Sometimes simple questions posed to analysts are difficult to answer because the necessary data are recorded and stored in multiple information systems and challenges arise when attempting to associate records in a logical way. Each information system has its own platform, machine or user language, data formats, and identifiers. Some may have reporting capabilities, but the outputs may be in paper reports or highly stylized formats not conducive to extracting the information

Nonoffender Management Information Systems and Sources for Jails

- **Electronic medical records (EMR)** contain inmate medical information. For Health Insurance Portability and Accountability Act (HIPAA) compliance, EMR information should be maintained in a separate set of tables, and access should be controlled so that these records can only be reported in the aggregate or examined on a need to know basis.
- **Pharmacy information systems**, subject to the same stringent HIPAA constraints as EMR, check for known drug interactions and preserve life and safety. These can be stand alone systems or other types of software, such as Software as a Service (also known as SaaS).
- **Medication dispensing systems** are a separate information source within pharmacies and may have associated reporting. **Medication administration systems** are a third component of pharmacy operations. When an information system is used, the resulting record is called an electronic medical administration record, which notes the administration of medication to the intended individuals.
- **Roster management systems** may be used to record schedules, leave utilization, overtime assignments, and emergency points of contact, and to track this information over time.
- **Biometric clock in systems** may track time and attendance electronically.
- **Learning management systems** may record details of training, such as in service training status certifications (e.g., firearms, accreditation) and specialized training.
- **Work order management systems** may be used to record facilities maintenance information, trouble tickets, locations, times assigned and completed, shop assigned to, and the names of the staff members to whom each trouble ticket is assigned.
- **Supply chain management systems** are specialized information systems that help track invoices and inventory, forecast demand to prevent essential supplies from running out of stock, and provide strict controls to ensure fiscal compliance.
- **Tools from the internet of things**, which is a widespread system of devices connected to the internet, make it possible to glean meaningful data from numerous correctional technologies and devices that send and receive information over the internet.

attributes required for analysis. The sidebar “Nonoffender Management Information Systems and Sources for Jails” provides examples of information systems and sources for jails other than offender management systems.

Collect Data Derived From Management Control Infrastructure — Workflow Management and Compliance Tracking

Workflow management systems and compliance tracking systems are both components of management control infrastructure. Workflow management systems improve the effectiveness of jail business processes; compliance tracking systems support risk management and mitigation. Both types of information

systems store data that can be analyzed to improve the practices and performance of individuals, teams, and the agency.

Workflow management is facilitated by workflow assignment and tracking systems, which are used to gather information on sequences of tasks required to complete critical business processes, such as the time required to complete each task. To derive optimal benefits from a workflow management system, it is necessary to glean insights from data analysis and translate them to actions and results. Analysis can determine average task completion times and how available staff should be assigned to achieve an optimal level of performance. Data analysis can also identify staff who may benefit from additional training or support, as well as those who produce consistent, high-quality work in an efficient manner.

Such insights can be used to gradually improve the performance of an entire team and thus, agency performance.

Agencies engage in risk management and mitigation to improve practices and performance by identifying and addressing sources of error in critical business processes. Compliance tracking, a data-intensive process, is required to accomplish this. All jails need to document the various steps required to complete critical business processes, for example, intake and release processing. This is laborious. Paper logs are traditionally used for documentation, but they are typically fraught with problems such as illegibility, inconsistency in notations, or incomplete data entry. Data analysis of paper logs is a labor-intensive and frequently frustrating undertaking hampered by data quality concerns. Deriving the desired benefits of compliance tracking becomes more difficult if the jail relies on paper logs.

Many modern offender management systems have capabilities that allow for the electronic integration of workflow assignments, tracking, and compliance monitoring using business rules within the system or in stand-alone systems that may be integrated. Analysis of compliance tracking information can support the identification and reduction of errors.

Consider the case of a particular jurisdiction in which a release cannot be initiated until a checklist is completed that specifies 20 different activities performed by four different departments in proper sequence. The information system automatically alerts each department when it is time for them to act upon their checklist items and documents when those tasks have been successfully completed. This documentation serves as a trigger for notification of the next step in the sequence. Only when all required steps are complete is the releasing officer alerted to implement the release. This ensures

that erroneous releases are prevented or minimized. However, if an erroneous release does occur, it is possible to review the electronic information quickly to determine if any of the required steps were suspect. Such a review might show that all the steps were, in fact, completed as required, but errors occurred further upstream where new documents were not recorded in the system in time to prevent the release from taking place. This could then lead to further process improvements and specification of new business rules. The availability of electronic information in relational databases greatly facilitates data analysis. Without the electronic information, correctly identifying the source of the error may be difficult, if not impossible. Analysis of data from compliance tracking systems supports error reduction and risk mitigation, and consequently, improved agency performance.

Establish Snapshot Tables

Jails function as cities within cities and are thus served by multiple information systems, most of which are production systems (i.e., live information systems where data are frequently overwritten as values change). Once a field is overwritten, the original information in it may be permanently lost. In order to conduct a meaningful analysis given these constraints, it is helpful to establish some fundamental information-based tools.

One of the most helpful tools is generated by creating a list of variables for analysis from the jurisdiction's information systems and pulling them routinely (e.g., every day at an established time) into a table or set of tables, also known as snapshot tables, so they are readily accessible. Snapshot tables, refreshed periodically, guard against permanent data loss and provide data in a format that allows for rapid analysis. In many jails, capturing a daily snapshot is sufficient for analysis purposes. Putting

care, thought, and resources into creating a set of tables that enables analysts to answer the most frequently asked questions will considerably enhance decision-making support for jail administrators.

The advantage of snapshot tables is that it is possible to query many variables originating from many separate tables all at once, considerably simplifying query efficiency and saving time. This process also reduces potential errors introduced from incorrect or inconsistent table joins. Although it is possible to create many snapshot tables, it is better to have as few as possible. Variables that relate one-to-one with a booking can be maintained in one table, and those that relate one-to-one with charges in a second table. These two tables can form the foundation for jail information analysis, with expansion as resources and time permit.

If resources permit, it is also helpful to establish logic for transforming variables commonly required for analysis. The transformed variables can be appended to the snapshot tables to improve the speed and efficiency by which routine analysis can be accomplished. As an example, charges could be categorized (e.g., by the high-level NCIC charge categories or simpler categories like property crimes, person crimes, and other offenses, depending on the jurisdiction), charge severities could be assigned, and charge dispositions could be categorized so that it is possible to rapidly identify active and inactive charges as well as those that have resulted in convictions, sentences, or dismissals. Once these are in place, it may be helpful to create transformed variables that identify an individual's legal status, as shown in the sidebar "Inmate Legal Statuses."

Inmate Legal Statuses

Typical legal statuses that are encountered in jails often must be manually computed by analysts because each jail system has its own logic for determining how they are assigned. Even within a single system, a status such as "sentenced felon" may have more than one meaning depending upon the context in which it is used. For example, for classification and housing purposes, individuals with multiple charges — some of which are unresolved — who have been sentenced on at least one felony offense may still be classified and housed as a sentenced felon. Though this is not an exhaustive list, typical inmate statuses include:

- Pretrial with felony charges
- Pretrial with only misdemeanor charges
- Sentenced with felony charges and more than 12 months to serve (or the cutoff for removal to prison)
- Sentenced with felony charges and will serve time at the jail
- Sentenced with misdemeanor charges and charged with no felony offenses
- Parole or supervised release violation awaiting hearing
- Parole or supervised release violation awaiting removal to prison
- Writ or hold
- Fugitives awaiting removal by other jurisdictions
- Jail inmates housed for other jurisdictions
- Inmates housed for state authorities
- Inmates housed for federal authorities

These statuses can be refined as needed. Accessible and high quality information is likely to produce more meaningful outcomes for analysis.

Identify and Address Data Quality Concerns — Immediately and Long-Term

The purpose of good analysis is to generate good questions that lead to a deeper understanding and effective solutions. This is a process, not a one-time event. Even with significantly limited data, it is possible to initiate that process and embark on a path to improving data quality, the strength of analysis, and the value of the resulting information. Those who analyze jail data need to proceed with a thorough understanding of the potential sources, underlying quality, and observed frequency of errors associated with commonly used information. It is almost always possible to produce meaningful analyses with imperfect data; however, it is important to choose one's methods wisely and to inform end users of the data limitations in clear terms to prevent overreach and poor decisions.

Data quality concerns are problems that snapshot tables cannot address. Errors introduced from incorrect transcriptions, inconsistent application of codes, or data-recording protocols will transfer into the snapshot tables as is. Assigning staff to validate data quality and remediate errors is highly resource intensive and of limited effectiveness. For example, two different reviewers can introduce two sets of errors. Such an approach is not sustainable. To address data quality effectively, jails need to adopt technologies that facilitate end-to-end electronic data capture with data recorded at a single point of origin (which might be outside the agency).

Such solutions are certainly possible but require massive investments in information infrastructure. Electronic transaction management technology is prevalent in business; grocery and convenience stores use it for even the least risky transactions. The sale of a \$1 candy bar or \$3 tube of toothpaste is end-to-end electronic, data-quality assured, and auditable. In 2018,

organizations across all industries were projected to spend about 3.28% of their revenue on information infrastructure, with information-based services spending more than average.³ Information technology spending for most jails, however, is about 1.5% of their operating budgets, with no capital funding programs for ongoing, routine, life-cycle systems. For safety-focused, high-reliability organizations, the accuracy, accessibility, and controlled flow of information are of paramount importance to sustaining safety and facilitating resilience. Jails are similar in this respect. Jail analysts can help jail administrators, staff, and the localities that fund them recognize the value of information gathering, collection, and reporting; specifically, they need to demonstrate how meaningful analysis helps jails sustain high levels of safety over a broad range of operating conditions.

How To Start an Inquiry

As with all analyses, inquiry begins with a set of questions. Some questions may be specific to the jurisdiction or the point in time at which the inquiry is made. These questions, in turn, will determine the data that must be collected to inform the analysis.

The analyst's next task is to work with a database administrator (DBA) and line staff to determine the information system or systems (there may be a number of stand-alone workbooks or databases) that contain the data elements, tables, fields, or even text (such as notes) required to answer the questions posed. Data discovery does not end at the conclusion of a conversation with the DBA, because data do not exist in a vacuum. There are underlying real-world processes and people who generate those data. It is incumbent upon an analyst to gain a thorough understanding of these processes and people during the data discovery process.

In the course of discovering the data and understanding the process by which it is received, transcribed or generated, and

entered, the analyst will gain an invaluable insight into the inherent quality and limitations of the data.

The more visible, critical, or sensitive the analysis, the more important it becomes to simplify choices of data elements and analytical methods and use the highest quality information available. When conducting analyses that must be explained at multiple levels to multiple audiences, including the public, it is preferable to rely on principles that can be readily explained and understood rather than sophisticated or elegant techniques that offer only marginal benefits but require specialized training to comprehend. When information that has underlying data quality issues must be utilized and there is no other option, it is important to be clear and forthright about the limitations of the analysis so that end users can derive meaningful value from it without exceeding the bounds of how it may be used to support decisions.

Section 3: Context and Specific Data Required To Support Jail-Based Analyses

This section provides an introduction to the context in which jail-based analyses often arise and details the minimum set of variables that should be collected to answer frequently asked questions about daily operations or to respond to queries from sources outside the jail.

This section will be useful for analysts who:

- Want suggestions about basic data elements to collect for lockups.
- Want suggestions about basic data elements to collect for jails.
- Want to know what a relatively robust set of data elements for jail-based analysis might contain.

Context for Jail-Based Analysis

This section discusses basic questions that arise in jail-based analysis. These questions concern:

- Who is in custody.
- By what processes they arrive.
- Why they are in custody.
- How long they stay.
- By what means they are released.
- Where they are released to.
- Their treatment and programming needs.
- Their risks (institutional and post-release).
- Services they require.
- Their receptivity to pro-social changes.
- How the jurisdiction garners resources and adapts detention practices to provide them.

This information is critical for planning and providing treatment, programs, and services for the jail and the community it serves. To do this, it is necessary to consider several key points in the criminal justice system. Analysts must identify and characterize the pathways by which individuals arrive at jail, resource and process constraints affecting partner agencies that in turn impact lengths of stay, and broader neighborhood and community dynamics that result in the events that lead individuals to jail. (Some of the basic questions that drive analysis of jail data and the value that can be derived from such analyses are discussed in Part 3 of this paper.)

Specific Data Required for Jail-Based Analysis

When establishing an analytics function, it is helpful to start with the basics. Daily or weekly analyses of the characteristics of the jail population can be used to gain an understanding of its key characteristics and major cohort groups, turnover rates of each cohort group, and the jail’s overall population. Even jails that do not have information systems can still collect this

information readily using electronic workbooks.⁴

Five broad categories of information are worth capturing for detention facilities.⁵ The first two pertain to all jails; the remaining three categories of information may not be collected at lockups.⁶

1. **Receiving and discharge information** includes inmate identifiers, demographic information, commitment

Essential Data Elements for Jail Analysis

Each element in this list is intended to be recorded in its own column. The elements, many of which are simple yes/no questions, can provide ample information for analysis. Suggested essential data elements in each category, based upon the author’s experience, are in **bold**.

Each jail has its own unique needs and this list is offered as a starting point for consideration. Some jails may need more or different data elements for their purposes; many will need far fewer data elements. Information can be gathered from different departments and much of this information is likely collected in various formats at various times. If the jail uses an offender management system, data can often be downloaded in the form of .txt or .csv files from preprogrammed reports and then matched in a workbook using record-matching functions.

This information is enough to answer questions regarding the jail population on a given day. Answering most questions involves simple counts or sums; however, the answers offer insight that is fundamental to understanding the nature of the jail and the population served.

Receiving and Discharge Information

1. **Jail-based unique identifier (this stays with the individual no matter how many times they come back to jail)**
2. **Arresting agency ID (e.g., police department identifier)**
3. **Other important identifiers (create a separate column for each one)**
4. **Last name**
5. **First name**
6. Middle name
7. Affix (Jr., Sr., III, etc.)
8. **Birthdate**
9. Age (compute using the formula: current date minus birthdate, divided by 365.25)
10. **Sex**
11. Gender (if your jurisdiction requires it)
12. **Race**
13. Ethnicity

14. **Date and time committed**

15. **Committing authority/document**
16. **Date and time of release**
17. **Type of release**
18. **Releasing authority**
19. **Custody of release**
20. **Location of release**
21. **Release compliant with local laws?**
22. **Facility**
23. **Housing unit (section and block)**
24. **Cell**
25. **Bed**

Alerts

26. **Any alerts (specify)?**
27. **Health or mental health alert level (normal, acute, serious, etc.)**

Security-Related Information

28. Homeless (Y/N)
29. Transient (Y/N)

30. Lives in a shelter (specify shelter from a drop-down of available shelters)

31. **Street number**
32. **Street direction (for some streets this may be required)**
33. **Street name**
34. **Quadrant (for some cities this is required)**

35. Type of residence (single-family home, multifamily unit, apartment building, condominium)

36. **ZIP code (five-digit only)**

37. Neighborhood or community (for GIS analysis and citywide planning purposes)
38. Ward (may be of relevance to some cities)
39. Birthplace
40. First time in jail (Y/N)
41. First time in this jail (Y/N)
42. Any relatives ever in jail (Y/N)
43. Any relatives currently in jail (Y/N)

and release information, and housing location.

2. **Alerts** include those assigned by jail staff — to denote interpreter needs, religious accommodations, “keep separate” orders (based upon known enemies or court-ordered separations), and risk of victimization or predatory behavior — and those assigned by a medical or mental health provider, such as medical diets or accommodations

(for example, limitations on shackles), disability accommodations, and risk of self-harm.

3. **Security-related information** includes information that is often collected during intake, including inmate address, several fields that relate to length and extent of criminal justice system involvement, custody classification, last assigned housing, and movement information.

Essential Data Elements for Jail Analysis (continued)

- | | | |
|--|--|---|
| 44. Any associates ever in jail (Y/N) | 67. Last certification, diploma, or degree | 85. Number of other offenses currently active |
| 45. Any associates currently in jail (Y/N) | 68. Registered for special education (Y/N) | 86. Number of other offenses resolved |
| 46. Any enemies (Y/N) | 69. If yes, in which school system? | 87. Other offenses (link to separate worksheet with complete offense information for each individual, each offense on a separate row) |
| 47. Member of gang or crew (Y/N) | 70. Religion or faith (helpful not only for facility services but also for post release linkages and community and faith based organizations working in the reentry space) | 88. If parole, probation, or supervised release violation, is there an associated new offense? |
| 48. Gang/crew name | 71. Medicaid recipient (Y/N) | 89. If so, type of offense (violent, dangerous, person, weapons, drug, property, writ, held for other jurisdiction, other offenses) |
| 49. Any court ordered separations (Y/N) | 72. Private health insurance (Y/N) | 90. Awaiting bail or bond release (Y/N) |
| 50. Number of court ordered separations | 73. Require income assistance upon release (Y/N) | 91. Held without bond (HWOB) (Y/N) |
| 51. Names of those people from whom the individual has court ordered separations (list in a separate worksheet, provide link to worksheet) | 74. Require Temporary Assistance for Needy Families benefits (Y/N) | 92. Held on unsentenced charges (Y/N) |
| 52. Last assigned housing (section, block, cell, and bed) | 75. Require Supplemental Nutrition Assistance Program benefits upon release (Y/N) | 93. Sentenced (Y/N) |
| 53. Date of last housing unit move | 76. Need ID upon release (Y/N) | 94. Projected release date available (Y/N) |
| 54. Date of last move within housing unit | 77. Need links to substance use treatment services upon release (Y/N) | 95. Date of projected release |
| 55. Current classification level | 78. Need links to mental health services upon release (Y/N) | 96. Projected release date in the past (flag and investigate for potential over detention) |
| 56. Date of initial classification | 79. Need links to shelter or housing upon release (Y/N) | 97. Revoked parole/probation/supervised release (Y/N) |
| 57. Date of most recent classification | 80. Need links to employment assistance services upon release (Y/N) | 98. Awaiting transfer to another facility/jurisdiction (Y/N) |
| Classification or Case Management Information | Inmate Legal Status Determination Information | 99. Which facility/jurisdiction? |
| 58. Recidivism risk level (high, medium, low) | 81. Most serious current offense | 100. Any detainers (Y/N) |
| 59. Preferred language (required to be compliant with Language Access Act) | 82. Type of offense (violent, dangerous, person, weapons, drug, property, parole or release violation, writ, held for other jurisdiction, other offenses) | 101. Detainers from which jurisdiction? |
| 60. Marital status | 83. Current offense disposition | 102. Detainers active (Y/N) |
| 61. Number of minor dependents | 84. Number of other offenses | 103. Detainers resolved (Y/N) |
| 62. Employment status prior to arrest | | 104. If resolved, date of resolution |
| 63. Category of last job held | | 105. Warrants (Y/N) |
| 64. If unemployed or partially employed, for how long? | | 106. Bill to jurisdiction (Y/N) |
| 65. Last grade attended | | 107. Billing rate |
| 66. Years of school | | |

4. **Classification or case management information** includes social and reentry needs.
5. **Inmate legal status determination information** includes criminal offense, detainer, and warrant information.

A detailed example of information fields is provided in the sidebar “Essential Data Elements for Jail Analysis.” Facilities maintenance information is also crucial for jail analysis, but it is often collected in stand-alone information systems. For a list of relevant information fields, see the sidebar “Facilities Maintenance Information.”

Facilities Maintenance Information

This information is necessary to support analysis of the operating budget and to support capital budget planning and requests. Essential data elements include the nature and frequency of problems and repair related time points, including date and time of request, date and time of issue or assignment, and date and time completed.

It is necessary to work with the facilities maintenance team to determine categories that make sense based on the tool sets maintenance staff need to repair the problems. The purpose of identifying meaningful categories is to allow staff to take the right set of tools for a repair job, without taking too many tools (a security risk) or too few (an ineffective and inefficient use of time). In addition, maintaining information about housing unit temperatures is essential for ensuring the health and safety of all within them — officers, inmates, staff, and volunteers.

Suggested data elements include:

1. Problem number
2. Location identifiers (where possible, these should be lists or drop downs)
3. Facility
4. Housing unit or area
5. Specific location
6. Specific asset
7. Problem category (masonry, electrical, plumbing, HVAC, other)
8. Priority level (1 — Life/safety immediate, 2 — Urgent but not life/safety, 3 — Needs repair)
9. Problem description category
10. Request date and time
11. Requestor (should be a standard list)
12. Issued date and time
13. Assigned to
14. Completed date and time

Part 3: Suggestions Regarding Types of Jail Analyses

Section 1: Questions That Guide Basic Analysis

This section introduces questions that jail-based analysts could encounter during their work. Analysts can respond to these questions using the data elements suggested in Part 2, Section 3. The questions revolve around understanding the population snapshot, or who is in jail on a particular day, and population characteristics of intakes and releases over a 12-month period. Frequently asked questions related to housing utilization and facilities maintenance are discussed briefly. Section 1 ends with a list of questions that may arise when analyzing jail classification and social information. The questions form the basis for deeper and more advanced analyses. It should be possible to answer most of the questions presented in Section 1 using simple descriptive statistics based upon the variables described in Part 2, Section 3. Pivot tables or their equivalent can be used to conduct this analysis.

This section will be useful for analysts who are:

- Experienced and want to know about the questions that guide jail analysis.
- Not jail-based but need to know about the questions that guide jail analysis.
- Already performing analysis but want some confirmation or ideas about the questions other jail analysts answer.

Who Is in Jail Today?

At the most fundamental level, jail analysts need to know the characteristics of the population housed in jail on a given day. The purpose of this knowledge is to gain insight into the nature of the jail population and the nature of the processes that lead to (and out of) jail. This insight can support jail administrators in their public conversations around jail capacity utilization, resource needs, local public safety, and justice processes. A subset of this information may also serve to inform and educate key stakeholders about the jail and its population. Single-day population snapshots are some of the least labor-intensive

information to gather (since they are only being collected for one day). If, however, the day is representative of the month or quarter, answering some basic questions can provide a great deal of insight into the nature of the jail's population, including how inmates arrive and what their behavioral characteristics and programming needs might be. If there are capacity utilization issues, answering these and other questions can provide a place to begin asking about individuals who might be diverted or whose processes might be reviewed and expedited.

Analysts need to be able to answer a series of questions about capacity utilization in terms of major population cohorts of interest. These cohorts are typically divided according to sex (or gender), age group, race and ethnicity, language spoken, paths by which they arrived at jail, type of intake, committing authority, current legal status, current stage of their legal process (e.g., pretrial/unsentenced, sentenced, awaiting hearing, awaiting release to the community, or removal to prison), length of stay, most serious active offenses, and how violent or dangerous these offenses are. Seriousness of offenses can often be mapped for local offenses using NCIC's Uniform Offense Codes.

The sidebar "Questions About Daily Population Snapshots" lists some questions that analysts need to be able to answer. They can be answered using the data elements described in Part 2, Section 3. They can also be answered for significant subpopulations or cohorts, if data and analytical resources allow. The questions provide insight into the nature of the jail population; possible behavioral challenges; criminal justice system policies, processes, and timelines; and basic programming needs.

Review of the Past 12 Months

As information becomes available for a full 12 months, it is useful to pose additional

questions about the population to derive insight into longer-term trends about jail populations and jail utilization. The answers could inform local public safety and justice practices, help evaluate and refine policies, and support the locality's planning for community-based prevention efforts and reentry services. These additional questions include:

1. How many individuals have been in custody more than once in the past 12 months?
2. During the past 12 months, what percentage of individuals have been in custody twice for new charges? Three or more times?
3. How many were sentenced to serve weekends?
4. How many were committed on new offenses?
5. Of those who were committed to the jail on new offenses, how many are homeless or transient? How many self-report mental illness or substance use? How many have been diagnosed with mental illness or substance use disorders?

Answers to these questions are helpful in identifying those individuals who cycle through the facility most frequently. The identities of such individuals can then be shared with other local government and community partners such as shelters, police, and emergency services. This may help to identify the most frequent users of locality services and divert them to alternative treatment and permanent supportive housing. In this manner, it may be possible to reduce their frequency of contact with the criminal justice system and produce better outcomes.

The next step is to consider who has been committed in the past 12 months. This

Questions About Daily Population Snapshots

1. What is today's jail population?
2. What are their characteristics?
3. How many men? How many women? Any juveniles?
4. What is the ratio of adult men to adult women? Adult men to juvenile males? Adult women to juvenile females? Adults to juveniles?
5. How many of each race? What proportion of each race?
6. How many individuals are of each age? What do the main age groups look like? How many are in each age group?
7. Where (i.e., which locality) do the individuals come from? How does that compare to the demographics of the locality (sourced from Census.gov, for example)?
8. How many by each city, town, township, community, or ward? What about the demographics of the places where the individuals live?
9. How many individuals stated they are homeless?
10. How many are unemployed? How many have been unemployed for at least 30 days prior to incarceration?
11. What is the distribution of charge categories for the most serious offense holding the individuals?
12. How many individuals have been arraigned and assigned to preventive detention while strictly awaiting commencement of their legal process? What is the distribution of their lengths of stay? What are their median and average lengths of stay?
13. How many have commenced their legal process but have matters not yet adjudicated? What is the distribution of lengths of stay?
14. What is the distribution of offense/charge categories?
15. How many are committed only on misdemeanor offenses? What is their average and median length of stay?
16. If the jurisdiction defines dangerous or violent offenses, how many are committed on dangerous or violent offenses? What is their average and median length of stay?
17. How many are committed directly after arraignment? What is their average and median length of stay?
18. How many violated conditions of bail or bond? What is their average and median length of stay?
19. How many violated probation? How many violated supervised release? How many violated parole? What is the average and median length of stay for each group?
20. How many are committed after sentencing? What is their average and median length of stay?
21. How many are writs? What is their average and median length of stay?
22. How many are held for other jurisdictions? What is their average and median length of stay?
23. What percentage of jail capacity is utilized by persons who are serving sentences of a year (or whatever the statutory length of time before requiring transfer to a prison)?
24. What percentage of jail capacity is utilized by persons awaiting transfer to another facility or jurisdiction?
25. What percentage of jail capacity is utilized by persons who have legal matters that are not yet adjudicated?
26. For those in violation of probation, supervised release, or parole, how many have been committed on new offenses?
27. For those held for other jurisdictions, how serious are their offenses (using NCIC Uniform Offense Codes as guidance, for example)?
28. What are the major cohorts by legal status and how many are in each cohort group? What is their average length of stay?
29. For the group in custody the longest, how serious are their charges and how many charges on average do they have?
30. How many are awaiting transfer to other authorities or release to third parties?
31. How many are being held on writs but have been housed at the jail for over 90 days?
32. How many are awaiting hearings related to pretrial release violation, probation violation, supervised release violation, or parole violation (revocation decisions)? What is the distribution of lengths of stay for these individuals? For the group staying the longest, what is the average length of stay?

information provides insight into underlying neighborhood and community dynamics that can be shared with partner agencies and organizations in the locality that can band together and shore up support when and where needed. These services and interventions can help stabilize families, neighborhoods, and communities by providing human services that meet their deeper and more pressing needs. The following questions guide this effort:

1. How long do these individuals stay on average?
2. What is their median length of stay before release?

3. What is their legal status at the time they were committed?
4. What is the committing agency?
5. What is the distribution of methods of commitment?
6. What localities do these individuals reside in?

It is similarly helpful to analyze information about releases in the past 12 months. This information forms the basis for community reentry support planning. By juxtaposing releases against maps of reentry support services, which can indicate their location

and capacity utilization relative to need, communities can better assess the inventory of services and gaps in service provision and work to strengthen them. Some key questions may include:

1. What was the average and median length of stay before release?
2. What is the distribution of types of release and custody of release?
3. What is the distribution of releases by type of releasing authority?
4. What localities do these individuals return to?

Housing Utilization and Associated Facilities Maintenance Information

Institutional housing utilization can provide insight into population characteristics. The following questions can help analysts understand capacity utilization and associated facilities maintenance workloads and completion times. Even when starting fresh, it is possible to collect daily information and then review it in totality periodically — for example, monthly, quarterly, or annually as it becomes available.

The questions could be considered both for a one-day population snapshot and for a more extended period, such as a quarter or year, as the data become available:

1. How many total housing units are available?
2. How many housing units are not utilized for housing (some may be used to provide programs or training even if not housing individuals in cells)?
3. How many housing units are not utilized at all?
4. How many available housing units are occupied by (1) adult men, (2) adult women, (3) juvenile males,

and (4) juvenile females? What is the average capacity utilization by housing unit?

5. How many available housing units are (1) restrictive housing units, (2) program units (including units for mental health treatment communities, acute mental health care, step-down programs, residential substance abuse treatment, and inmate work details), and (3) general population units?
6. What types of maintenance and repair requests occur (frequency distribution) by housing unit?
7. How many and what proportion of cells are not available for occupancy, by housing unit?

The examination of maintenance and repair request records can provide insight into poor housing unit supervision, the prevalence of disruptive or destructive behavior, and weaponization of facility materials. Such indicators are often observed days or weeks before institutional incidents occur. Thus, closely tracking these indicators may alert administrators of trouble ahead and provide them time to mediate and act to prevent undesired outcomes. These indicators often lack a strong correlation with incidents, and not all indicators are observed for every incident (i.e., the indicators are “weak”). However, they remain useful because they occur before the actual incidents (i.e., they are “leading”). Significant operational value may be derived from identifying and tracking such “weak leading” indicators.

Classification and Social Information

Combined with an understanding of who is in jail and how long they stay, classification and social information form the basis of planning for programming and services, whether they are offered by jail staff, contractors, or volunteers. Knowing the

proportion of individuals with charges yet to be adjudicated and their median lengths of stay is important because it informs the modes in which programs and services can be delivered effectively. For those with short stays, modular programs that are offered in both the jail and the community can prove beneficial.

Analysts should be prepared to answer the following questions to support safety and to provide programs and services in appropriate formats for all jail populations. While not comprehensive, this list of questions should be sufficient to inform jail-based analysis that can help safely expand reentry programs and services:

1. How many inmates are assessed as high, medium, and low risk?
2. How many inmates are assessed as maximum, medium, and minimum security?
3. What is the proportion of each of these groups based on a one-day snapshot population?
4. What is the average proportion of each of these groups based upon analysis of a longer time period, such as a quarter or a year?
5. Of inmates who were reclassified in the last 12 months, how many and what proportion saw their classification level increase?
6. How many and what proportion of inmates experienced a reduction in classification level?
7. How many minor children do inmates report on average?
8. What does the distribution of parents reporting minor children look like by age group (focusing on those age groups that are likely to have minor children)?
9. What marital status do inmates report? What is the marital status distribution for parents of minor children? How are these distributions similar or different?
10. How many inmates have parents/siblings/relatives who have been or are incarcerated?
11. Do these individuals have a history of institutional incidents or violence?
12. What proportion of inmates have relatives with a history of incarceration (or who are currently incarcerated)?
13. Of these inmates, what proportion have family histories of engaging in institutional incidents or violence?
14. What is the educational status of inmates?
15. What was the last grade of school attended? What does the distribution of individuals based upon last grade attended look like today? How has the distribution of individuals based on last grade attended and level of education changed, if at all, in the last quarter or last year?
16. What was the last job inmates worked?
17. What is the distribution of individuals in custody based upon a one-day snapshot within the category of last employment? What is the distribution of individuals incarcerated over the last quarter or year based on category of last employment?
18. What proportion of inmates are chronically unemployed?
19. What is the distribution of inmates by religion or faith?
20. What is the distribution of inmates based upon a one-day snapshot according to primary language spoken?

21. What is the distribution of inmates in the last quarter or year based on primary language spoken?
22. How many and what proportion of inmates need an interpreter?
23. How many and what proportion of inmates need assistance from an embassy (if housing foreign nationals)?

Section 2: Analysis Using Other Jail-Based Information

This section builds on the basic set of data elements described in Part 2, Section 3, by augmenting them with data elements derived from other sources as needed. It builds on understanding developed by applying descriptive statistics to answer the questions in Part 3, Section 1. This material highlights how descriptive statistics can inform analyses using other jail information sources with greater operational impact. Valuable operational insight can also be derived from basic analysis of incidents and security. Relationship chronology and social network analysis with freeware is suggested as a way to further improve safety. Analysis of workload demands and facility activities, inmate health diagnoses, and workforce data can support planning and improved performance.

This section will be useful for analysts who:

- Have already established the capacity and capability to meet routine analytical demands.
- Are working to expand the applications of analysis in a meaningful way.
- Are curious about how analysis can be used to meaningfully examine and improve operations, performance, practices, and outcomes.

Other Impactful Analyses

Jail analyses can be both quantitative and qualitative. Basic methods of qualitative inquiry and basic quantitative analysis methods (typically descriptive statistics) can be applied to derive insights for improving the safety, efficiency, and effectiveness of operations.

Analysis of inmates' health diagnosis information, security and infractions information, incidents, relationship chronology, and social networking — as well as analysis of the jail staff's workload demands and workforce information — have both tactical and strategic value in informing jail operations. Two examples of tactical and strategic aspects related to the analysis of inmate health diagnoses and to basic workforce analysis are briefly discussed in the following paragraphs, followed by a more detailed description of the data sources and methods that could be used to conduct such analyses.

Analysis of inmate health diagnoses can inform health services provision and planning. Consider the case of a jail experiencing a high level of off-site clinic transports. This places a strain on its ability to provide facility-based staffing. The jail is considering whether off-site clinic transports could be reduced if some of the more frequently used clinical specialties could be offered within the facility. To understand the issue, the jail analyzes the frequency of health clinic transports by type of clinic and nature of diagnoses. The results support planning and negotiations that may lead to on-site clinics or alternatives such as telemedicine. Ultimately, this benefits both the facility and the inmates, who will not need to be transported while they are ill.

Basic workforce analysis of jail staff can inform recruiting and training strategies. Information on workforce age, educational backgrounds, training and certification

history, and skill needs identified through strategic planning can inform agency development. For example, if large numbers of officers are approaching the mandatory retirement age and the jurisdiction must recruit within a very competitive labor market, the jail may need to develop and implement a multiyear recruitment strategy to ensure it maintains a workforce that is both adequately staffed and has the necessary skills. It may be possible to find correlations between the nature of facility incidents and a need for better training in specific policies or procedures. Periodic workforce aging analysis can alert agencies to appropriate periods for offering early retirement options or ramping up recruiting efforts. If bottlenecks are observed in midlevel supervisor positions, analysis can be used to identify persons eligible for leadership training and development in a way that minimizes allegations of favoritism or unfairness in the selection process.

Due to the nature of the data and their potential impact, these analyses are sensitive and complex. While some of these analyses may have established and detailed multistep methodologies, most do not — and those that do require jail analysts to provide at least some information to support the overall effort. These types of analyses are briefly described in the following sections.

Analysis of Inmate Health Diagnoses

Data sources for analysis of inmate health diagnoses include medical records (such as an electronic medical records system), facility population snapshots, and intake and release information for a specified period of time (e.g., a quarter, a year). The final dataset for analysis is usually stripped of identifiers or tagged with research identifiers (also known as anonymous unique identifiers) so that individuals with multiple diagnoses, intakes, or releases can be associated with the appropriate records but cannot be

identified. Analysis of de-identified inmate health diagnosis information (which can be obtained from health information systems) can inform planning to provide services within the facility. Reviewing this information periodically can help ensure that the most frequently needed services are specified within a contract or provided on site to minimize the need for external transports. Combining this with telemedicine can further improve the efficiency and effectiveness of health services.

Some facilities alert officers to inmate behavioral health needs in a HIPAA-compliant way by categorizing supervision needs generically, for example, by using a numeric coding system where the number indicates the required management responses. This may involve a Likert scale, where every inmate is assigned a health score, substance use score, or mental health score on a scale of 1-3 or 1-5. Another way is to assign a binary (0 or 1) indicator of whether or not the issue is a concern. Officers may then be advised that individuals with a particular behavioral health score may need to be managed using specific strategies, or officers may be told to watch for potential types of trauma-triggered responses, without divulging individual diagnoses or patient concerns to them. Officers placed in units that house inmates at specified levels may require specialized training based upon the types of behaviors they may encounter. In order to supervise effectively, officers must be aware of potential barriers to cognition among residents in their housing units and the possible impacts on the residents' ability to follow directions.

Inmate health indicators also have planning value. They can be combined with GIS information based on addresses at the neighborhood level to create maps that allow communities to plan for and deliver necessary reentry services.

Security and Infractions Information

Managing inmate behavior is core to effective jail operations and performance. Information required to conduct this analysis is sourced from disciplinary reports (typically paper reports), daily staff rosters (often paper reports), and daily snapshot data (data elements described in Part 3). Some of this information may need to be manually transcribed and matched. The following questions may arise during analysis of security and infractions information; they are a good starting point for determining opportunities to further strengthen operations and improve safety:

1. How many individuals in custody today are members of a gang or security threat group (STG)? What proportion of the incarcerated population in custody today is involved in STGs? In the past quarter or past year, what proportion of the jail population was involved in STGs?
2. How many inmates have enemies? Are these enemies currently in the facility? What proportion of the incarcerated population in custody today has enemies? In the past quarter or past year, what proportion of the jail population had enemies?
3. How many inmates have court-ordered separations from any individuals in the facility? What proportion of the incarcerated population in custody today requires court-ordered separations? In the past quarter or past year, what proportion of the jail population had court-ordered separations?
4. What proportion of the population in custody today is housed in disciplinary restrictive housing, protective custody, or administrative restricted housing?

In the past quarter or year, what proportion of the population on average was housed in disciplinary restrictive housing, protective custody, or administrative restricted housing?

5. What is the average and median length of stay in custody? What is the average and median length of stay in each type of restrictive housing?
6. What is the distribution of inmates' institutional offenses? Which offenses are the most frequent?
7. Which housing units report the most infractions?
8. What is the distribution of infractions by staff assigned to housing units at the time of infraction?
9. When do infractions occur by housing unit? When do infractions occur by type of infraction?
10. What is the average charge severity of individuals who commit infractions?
11. What proportion of the inmate population housed in the past 12 months engaged in some sort of infraction? Of these, what proportion committed serious infractions?

Incident Analysis

Incident analysis requires integrating and examining information from multiple sources (including witness statements, injury reports, surveillance footage, and institutional records) and reviewing an entire chronology of events. The information may include collaborative responses and investigations with other agencies. Basic questions to be answered include persons involved, what happened, when the incident occurred, where it occurred, how it transpired, and the

means used to carry it out. Paperwork should be examined for completeness and consistency. Analysis of surveillance footage includes tracking the movements of involved individuals immediately prior to the incident. Criminal investigations include studying available surveillance footage for movements of individuals involved and their known associates going back as far as footage is available. The purpose of the analysis is to determine what preventive measures worked, where gaps in those measures made it possible for the incident to be planned and executed, and whether any patterns exist that could provide insight into managing and preventing future incidents. The analyst's challenge is to identify and codify data attributes in formats conducive to analysis. This laborious manual work is of significant operational value. If a jail wishes to establish a routine program to examine and learn from significant incidents and near misses, often called sentinel event reviews, regularly providing these data can greatly facilitate the process.

Data must be viewed for each serious incident, as well as in totality on a monthly, quarterly, and annual basis for emergent insight. Larger facilities with significant infractions during a period may find it helpful to assign each incident a score on two scales. The first scale is for the overall seriousness of the incident (its institutional impact), and the second is for the frequency with which similar incidents occur. The goal is to use these two scores to determine an overall measure of disruptiveness. For example, an analyst may ask four senior staff members with significant operational experience to assign a score of 1 to 5 on each of those two scales to each incident as a part of the institutional sign-off process. Collected and averaged, these scores produce an assigned score for each incident and can be displayed on a scatter plot.

Incidents that cluster in the most serious but least frequent class (disruptive because the seriousness of the offense requires a labor-intensive response) and the least serious but most frequent class (disruptive in aggregate because of the frequency with which these incidents occur and because they often serve as initiators of more serious incidents later) could be selected for further review. Analysis of the most serious incidents can identify what to avoid in the future, and analysis of the most frequent incidents can determine which actions might prevent them and so keep incidents from escalating over time. Thus, only those incidents that meet predetermined thresholds of seriousness and frequency need to be considered for periodic review. They will likely include incidents that were successfully de-escalated, those that were not de-escalated, and near misses. Reviewing these incidents to gain insight strengthens the jail's ability to anticipate, detect, and respond to future incidents and even prevent them — thus reducing the overall levels of disruption to operations. Less serious incidents are often chronologically related to more serious ones.

When analyzing serious incidents of violence, it is necessary to identify chronologically related incidents that occurred sequentially on the same day or within a few hours. The chronology is vital. Related incidents may be staged in order to allow for the actual violence to occur while attention is diverted or to allow for the destruction of evidence associated with the serious or violent incident. The staged incidents are usually serious enough to trigger an “all available” alert and divert staff. Information on chronological incidents between an involved individual's associates or relatives, whether triggered in the community or in the facility, can contribute to analysis. Insight derived from clustered analysis (i.e., identifying related

incidents and analyzing them together using descriptive statistics and social network mapping), and from a consideration of the information in a qualitative way, can be used to develop strategies to anticipate possible incidents in development and prevent them from occurring through situational interventions.

Relationship Chronology and Social Network Analysis

Analyzing incident chronologies, associates, and networks to search for correlations between incidents and participants can be valuable. It can provide insight into inmate behavior and staff training needs. Sometimes interactions between a handful of staff and inmates, or among a few inmates, can lead to a spate of institutional disruptiveness. Widespread disruptive behavior may point to different root causes — maintenance issues, food service issues, program and activity needs, staffing shortages (leading to insufficient out-of-cell time), or staff training needs (e.g., training to identify and manage problematic inmate behavior). Identifying the root causes of disruptions and addressing the underlying issues (e.g., idleness, mental illness, grief, unresolved anger, anxiety) allow for systematic reduction of tensions and disruptive behaviors.

Methods for analyzing incidents and disruptions include descriptive statistics and network analysis, for which freeware is available. Analysis could generate insights about relational issues, identify weak signals about plans for criminal activity, or highlight ineffective housing assignments. Tracing prior familial or institutional relationships among individuals involved in an incident can provide insights that anticipate and prevent future incidents. It may point to a need to collect additional information during intake or the classification process, for example. This can be used to strengthen such processes in the future.

The analysis may suggest value in developing community-based intelligence. It may highlight secondary factors contributing to an unnecessarily stressful climate, previously unknown criminal associations in either the formative or dissolution stage of an incident, or the need to strengthen surveillance or address blind spots. Each new incident adds to the institutional body of knowledge and range of known situations for which staff can be trained to be vigilant and respond effectively, helping to prevent future incidents.

The analysis can also be shared periodically with senior command staff within the facility; engaging stakeholders in reviewing inputs and results will allow analysts to periodically refine their process so its value can be continually enhanced. This work is labor-intensive, and establishing post-incident reviews and training processes may be difficult when a jail is habitually understaffed and under-resourced. Even so, this practice is necessary in order to reduce and prevent incidents. As key staff realize value from such analyses, they are more likely to support the investment in time and labor needed to institutionalize this practice.

Analysis of Workload Demands and Facility Activities

Data sources for workload demands analysis include shift rosters, facility schedules for activities by shift, and payroll data. The purpose of analyzing workload demands and facility activities is to provide insight into ways of improving staff scheduling and deployment. Analysis may also lead jail administrators to reconsider what work is done and how and when it is scheduled. The desired outcome of such analysis is to operate more effectively with existing staff and also to identify gaps in staffing.

Jails routinely perform an annual determination of net available working hours and shift relief factors. To derive full value

from staffing analyses, jails need to be able to analyze the time distribution of workload demands and activities required by these methods. Jails contemplating such projects can begin preparing 12 to 24 months in advance by collecting foundational information. Some key questions that often motivate workload demand and facility activity analysis are:

1. What are the intake and release distributions by time of day and day of the week?
2. When are the busiest and least busy times of day by housing unit or service unit and day of the week? The response should consider scheduled programs, services, recreation, linen exchanges, laundry services, commissary delivery, religious services, and any other activities that are routinely scheduled.
3. What do staffing complements look like by housing unit or service unit and day of the week? This may be as simple as one staff member per housing unit, but there may be additional staff assigned to tasks in nonhousing service units; these tasks may include supervision of work detail inmates, operation of the command center, intake and release operations, transportation or facility escorts, staff and visitor entrance operations, and facilitating legal and social visits.
4. Who was assigned overtime, for how long, and why? What are the main drivers of overtime costs for a given period? How many total hours of overtime were there in a given period? What do those hours represent in terms of employees or positions on an annual basis?
5. How are overtime assignments distributed? Do 20% of people earn 80% of overtime? Do some individuals

earn so much overtime that they are not likely to be productive? What are the rules for assigning overtime? Can better rules be negotiated to both provide service when needed and improve the effectiveness of dollars spent on overtime (i.e., improve the hours-to-cost ratio)?

6. What does leave utilization look like by day of the week and type of leave used for a 12-month period? Are there any notable patterns? (For example, do an inordinate number of staff suddenly call in sick every Saturday?)

Analysis of Workforce Information

Basic analysis of separations (i.e., staff who leave the agency), their causes, and their frequency, as well as forecasting mandatory or anticipated retirements, can help jurisdictions stay ahead of the recruiting curve and train officers for quick backfill as vacancies arise. Such workforce information analysis may also point to staffing and training needs and support the implementation of better employee retention strategies that provide clearly defined career ladders for professional development. For example, if a jail experiences 100 separations a year and 70 of them are due to resignations, it is worth considering why the resignations occurred. Digging a little deeper, analysts may find that 60 of the 70 annual resignations occur during the training or probationary period. Exit interviews may further indicate that 55 of the 60 resignations happen because cadets find better jobs elsewhere.

Based upon these findings, analysts may recommend improving the screening process to select applicants who demonstrate a commitment to the work, reviewing starting salaries and benefits to ensure they are competitive, and including clauses that require cadets to reimburse the jurisdiction for costs of testing, uniforms, equipment,

and training if they depart before a set term. Analysts might assess the basic correctional training program to ensure instructors are up to date in their training and certifications and the curriculum is current and relevant, and they might recommend a follow-on period of field training to help cadets transition to their assigned posts. In its subsequent review of recommendations and findings, jail leadership might determine that establishing a career ladder and clear standards for advancement, reimbursing certification fees for those who achieve successful American Jail Association or American Correctional Association certification, and facilitating study groups for those who work to improve their knowledge and practice are other effective ways to improve retention of new officers.

Analysis of a particular facility's workforce may find that one-third of the officers are eligible for retirement within the next five years. The jail's current recruiting strategy

may not result in sufficient annual hires to address the upcoming need. Analysts may recommend that the recruiting program, along with training staff and resources, should be enhanced and expanded. Analysts could help the jail develop a strong business case to local funding authorities to support the requested budget enhancements. (This often requires multiple funding cycles to achieve.) Analysts may also recommend that the agency engage in succession planning to prevent institutional knowledge loss as senior officers retire.

These two examples — responding to early-career resignations and planning for upcoming retirements — highlight the jail analyst's role, which is to examine the data and present findings that emphasize potential impact on the jail. Analysts also research and recommend options for addressing issues they have identified, and calculate the cost of these options to support the jail's strategic planning process.

Notes

1. Many data elements suggested for collection will not be available or useful for all facilities. Data collection and analysis needs for a lockup, or a lockup population that is co-located within a detention facility, are far less extensive than those for detention facilities. The author has erred on the side of being extensive, with the understanding that individual analysts will use the list of elements as a suggestion, adding to it or subtracting from it as best suits the needs of their facilities and the nature of the analysis they need to perform.
2. The term “pretrial” is used in different ways by different partners in the criminal justice system. Those who are in pretrial service agencies and prosecuting agencies use it to mean individuals who are waiting for their trials to begin. Those in jails use it to mean individuals who have charges yet to be adjudicated. Within a jail, “pretrial” can be used in different ways. It could refer to those with only unadjudicated charges, or it could refer to those with at least one charge that is yet to be adjudicated even though other charges may have been adjudicated. Prisons use the latter definition when asking jails about the status of individuals.
3. Khalid Kark, “IT Spending: From Value Preservation to Value Creation,” *The Wall Street Journal*, Deloitte, March 12, 2018.
4. In current versions of a popular spreadsheet program, for example, a single worksheet can have over 676 columns and 750,000 rows. Even a jail that has 2,000 daily records can capture a year’s worth of data on a single worksheet. This should be adequate to allow for analyses of most jail data.
5. Not every jail analyst may have or need every data element; at the same time, there may be data elements not mentioned that some jails and some analysts require.
6. Some lockups may provide a limited number of linkage referrals, such as to community health or mental health providers.

About the Author

Reena Chakraborty, Ph.D., has served as chief of strategic planning and analysis for the DC Department of Corrections since 2012. She is dedicated to applying systems and process analysis to understand, improve, and transform real-world systems that serve the public. Chakraborty also serves as a practitioner in residence at the National Institute of Justice. She hopes this work will result in renewed interest in jails-based research that will meaningfully impact practice.

