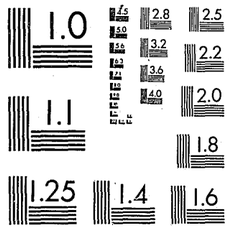

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Describing and Analyzing Case Processing Time in Criminal Cases

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Harry M. Bratt
Acting Director

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Suggestions for Administrators

Mary Lee Luskin

September 1981

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Preface

This practical guide for court administrators and others interested in measuring and analyzing case processing time in their courts is part of a larger evaluation of delay-reduction programs funded by LEAA. The larger study, Managing the Pace of Justice: An Evaluation of LEAA's Court Delay-Reduction Programs, is available through the National Institute of Justice, in Final Report or Executive Summary form. The study, including this guide for administrators, was funded by Grant Number 78-NI-AX-0076 awarded by the National Institute of Law Enforcement and Criminal Justice, Law Enforcement Assistance Administration, United States Department of Justice, to the American Judicature Society. The analyses, conclusions, and opinions expressed are those of the author(s) and not necessarily those of the American Judicature Society or the United States Department of Justice.

John Paul Ryan
Project Director

DESCRIBING AND ANALYZING CASE PROCESSING TIME IN CRIMINAL CASES

Given the current attention to problems of long case processing times (usually termed "court delay"), court personnel with administrative responsibilities are frequently required to assess how well their court is doing with respect to this issue; if how well their court is doing is defined as not well enough, to choose solutions; and, if they have implemented a solution, to decide how well it worked. To do these things intelligently, administrators need information.

An administrator's own knowledge of the court, derived from shared experience and observation, is an important source of such information. It is, however, a limited source. Everyone in the court may "know" what the problem is, what the solution should be, or that the solution had an effect, but it is unlikely that they know exactly how large an effect a particular factor has on case processing time. This is especially true when, as is the circumstance with case processing time, the phenomenon to be explained is a function of many variables, all of whose effects must be taken into account when estimating the effect of any one of them. Moreover, the common knowledge of the court may emphasize one or two variables (e.g., Judge X's illness or a small defense bar) to the exclusion of other variables whose effects may be smaller but, nevertheless, more subject to control by the court. In addition to informal knowledge, important though it is, an administrator needs data systematically collected and analyzed in an appropriate fashion, that is, in a fashion that takes account of multiple causes and yields information in meaningful units.

A recently completed study attempts to provide this information on four criminal courts that implemented court delay reduction projects under LEAA sponsorship (see Neubauer et al., 1980). Nevertheless, we recognize that most courts must act on their own. Thus, in this guide we should like to offer a few observations and suggestions based on our experience that may be of use to people working in the courts. In addition, since research which has the potential to inform future policy choices in this area has been limited by the high cost of collecting data, our intent is to suggest how courts acting individually can begin to assemble information about cases and case processing time that can be compared with other courts so that courts can better learn from one another's experiences.

More specifically, in what follows, we discuss record-keeping, deciding what data to collect, sampling cases for statistical analysis, analyzing the data, and using the

results in making policy choices. In organizing this material, the rule we have followed is to begin with simpler and more general suggestions and to progress towards those having to do with more specific questions. We hope, by doing so, to address an audience from courts having different problems, case monitoring practices, and financial and technical resources.

Record-Keeping

Court records must be kept for and serve a variety of purposes. Providing information that is easily useable in quantitative studies of case processing time is only one and certainly not the most important of such uses, but having readily accessible information will not only make such studies easier, it will also increase the ease and efficiency of other court tasks that depend on information from case records. There are, to be sure, many guides to record-keeping. (See, for example, the National Center for State Courts' publications on record management and data processing.) We do not presume to offer a comprehensive guide, but only to give emphasis to certain considerations that affect the accessibility of information for the analysis of case processing time.

Case numbering. Fairly frequently, court personnel are not able to tell where they stand because they have no simple way of calculating their caseload or the levels of case processing time in their courts. In part, this problem involves the definition and numbering of cases in the court. While most courts use separate numbering systems for civil and criminal matters, they sometimes combine felonies, appeals from lower courts in misdemeanors, extraditions, and other miscellaneous matters in the same numbering system. A court may be interested in knowing how many felonies have been filed in a specific time period, but have no way of telling which case numbers refer to felonies without examining each case individually. In addition, the court may not be able to tell from the numbering system how many cases were filed within a particular time period or when a particular case was filed because the numbering system does not distinguish cases by year filed.

We suggest that courts distinguish among various sorts of matters on their dockets and that they assign case numbers sequentially within type by year. A trial court might, for example, use a "CR" prefix for numbers for felonies and any misdemeanors in which it has trial jurisdiction, an "A" prefix for criminal appeals from

a lower court, and a "CI" prefix for civil cases. Then, if the court numbers cases in each of these categories consecutively within each year by filing date, there is always, at a minimum, a simple means of ascertaining how many cases of a particular type have been filed to date by looking at the last case number assigned. For example, if criminal case number CR-80-1946 is the number of the last case filed on June 30, 1980, one knows at a glance that in this court 1946 criminal cases were filed by July 1, 1980. Furthermore, if the person assigning case numbers keeps a list of the final case number assigned on the last day of each month, it is simple to calculate the number of new filings for each month. The court then has available a complete list of all criminal case filings over any desired time period.

File summaries. With regard to the content of the cases, because we were interested not only in the current states of cases but also their processing histories, we found that even in the courts with the most fully developed computerized records, it was necessary to go to the casefiles themselves to obtain the information we needed. The ease with which data could be collected from these files varied enormously from city to city. A crucial factor in how easy it was to record data from the file was whether the casefile included a summary of the major characteristics and events of the case. The summary sheet might be a separate page attached to the file or it could be printed on the file jacket. In one court we studied (Detroit's Recorder's Court), the left side of the interior of the file jacket was printed to serve as a summary sheet with spaces for defendants' names; short descriptions of charges (e.g., armed robbery or unlawful driving away of an automobile); statute numbers; personal characteristics of the defendant; bail type, amount, and release status at each stage; dates of events (e.g., arrest, arraignment, preliminary hearing, etc.); outcomes of events; judges and attorneys at each event; and continuances. The right side of the jacket interior provided space for noting motions and their dates and outcomes, failures to appear, and other miscellaneous events in the life of the case. Each jacket had space for this information for up to four defendants. If there were more than four defendants in the case, a photocopy of the jacket was stapled to the jacket and the information for the additional defendants was recorded there.

Two other courts we studied included pages at the front of the file on which minutes of events were recorded. Although these were better guides to the file than no summary, they did not provide as consistent a record as did the printed summary sheet because what information was recorded and the words used varied considerably

from case to case. The printed form, for which the clerks at the event needed only to respond in a number of categories, assured that the same kinds of information were recorded for every case.

With the printed summary sheet, we found that data collection was made easier because much of the information could be obtained directly from the case summary. In addition, a summary sheet prepared as the case progresses can produce order in what can become, by the conclusion of the case, a welter of incomplete and inconsistent documents. If the case were a complex one, the summary provided a guide to finding and interpreting the documents inside.

Since criminal cases already have a processing history when they arrive in the trial court -- arrest, arraignment and bail setting in the lower court, preliminary hearing, and grand jury indictment — trial courts would do well to record information about this history in summary fashion when the cases are filed. We believe that such summary sheets would aid court personnel in performing their everyday tasks as much as they aided us in data collection.

Variables

Case processing time. If a court administrator wants to find out how long it takes to process cases or to assess the effects of delay reduction innovations, he or she must first define and measure case processing time. The definition of this variable requires the choice of a beginning and ending date that can be applied to each case. To the extent possible one should be interested in choosing dates that define the entire life of the case in a particular court and, in addition, the beginning and ending of important stages within the life of a case. The National Center for State Court's guide to data collection, Measuring the Pace of Litigation, considers a number of important events and suggests how a court can go about collecting dates on their occurrence. Exactly which events are chosen to define the life span of a case will depend on the jurisdiction of the court but, with respect to termination dates, two possibilities would seem of particular use. These are (1) the date of verdict, dismissal, plea of guilty, or entry into pretrial diversion and (2) the sentence date. Both of these dates exclude post-conviction appeals, new trials as a result of appeals, revocation of pretrial diversion, revocation of probation, and changes in sentence. For many courts, the sentence marks the final disposition of a case, but we suggest the use of the verdict,

dismissal, plea of guilty, or entry into pretrial diversion to define case processing time, because all cases will have such a disposition date, while only some will receive court action after that date.

Once appropriate events are selected, case processing times for the life of the case and for intermediate stages can be calculated. In the section on analysis of data, below, we discuss some worthwhile ways of examining the distributions of cases on the case processing time variables.

Factors influencing case processing time. In addition to simply describing how long cases and specific stages in cases take to process, an administrator may well want to assess the impact of a particular variable (for example, failures to appear or trials or a delay reduction innovation). To do this one needs to know what other variables to "control for," that is, what other variables have to be taken into account before one can attribute an effect of a specific size to a given variable. In other words, one needs to decide what variables affect case processing time in one's court. For guidance in selecting this set, an administrator can turn first to the findings of researchers in other courts. In addition, the administrator can and should think about case processing times in his own court, where there are likely to be factors that the administrator or others with knowledge of the court believe to be important (for example, the amount of time given over to bail violation hearings) either across courtrooms or across time in the particular court.

Tables 1 and 2, below, offer a list of factors that may affect case processing time in a court. Not all, of course, will be applicable in every court, but all should be considered by an administrator in light of his knowledge of his own court. The tables divide the list into two sets: characteristics of the case and its processing, and characteristics of the court or system. Let us consider case characteristics first.

Table 1 presents a list of case characteristics. In light of the empirical findings contained in our Final Report, it seems evident that defendants' prior record, pretrial release status, presence of motions, and disposition of the case by trial appear particularly influential and deserve special attention. In some of the courts we examined, the seriousness of the charge, and, indirectly, the type of charge were also important influences. We also found that once other variables were taken into account, defendants' personal attributes, the type of defense counsel, and proceeding

by indictment versus information had small or negligible effects. The list includes some variables whose effects we were not able to examine (e.g., the strength of evidence). In general, it will be more difficult to collect data on variables like the strength of evidence, but an administrator planning an analysis of case processing time should think about their importance in his court and the feasibility of collecting data on them.

It should be obvious that information on these variables would have to be collected from a number of sources. Some can be collected directly from the summary sheet of the casefile. Others — defendants' prior record, for example —must be obtained from documents in the files or from other records (prosecutor's files or police records). Since it is likely that at least some data will need to come from sources other than the court file, it will be necessary to find a means of identifying the same case in other files. The National Center for State Court's guide to data collection suggests several means of cross-referencing files.

In addition, some thought has to be given to how the variables will be operationalized. Even with variables that seem relatively straightforward, choices concerning measurement and categorization must be made. For example, to operationalize the type of crime, one must choose which count to use, when there is more than one count charged, and which crime types to distinguish. The National Center directs the users of its guide to select the most serious count (an alternative would be to choose the first count) and to fit it into one of the ten crime categories (alternatively, one might define more or fewer categories). Another example of such decisions from our research in Detroit involved whether or not the case was coded as having been disposed by trial. We included both bench and jury trials in the trial category under the argument that it is the preparation for trial that consumes processing time (witnesses must be subpoenaed and so forth). This seems a fairly reasonable coding procedure for many courts, but if we had been working in a court like that of Los Angeles, we might have made a different decision. In that court non-jury trials are heard on the basis of transcripts of the preliminary examinations (Mather, 1979). In this instance, the preparation requirements of court and jury trials are no doubt quite different; this difference should be reflected in the coding of the cases.

Table 1. Case Characteristics Affecting Case Processing Time

Defendant's Age	Prior Record
Defendant's Sex	Pretrial Release Status
Defendant's Race	Plea Offer
Number of Co-defendants	Disposition Type
Type of Crime	Type of Defense Attorney
Statutory Maximum of Most Serious Count	Judge
Habitual Offender Prosecution	Number of Motions
Pre-sentence Report	Indictment/Information
	Days Defendant Fails to Appear
	Days Psychiatric Commitment/Evaluation
	Number of Continuances
	Number of Counts Charged
	Strength of Evidence
	Physical Evidence

Table 2 presents a list of characteristics of court systems. We found that several of these court characteristics also have large effects on case processing times. In the courts we studied, the introduction of some kind of case tracking or case monitoring system was important in affecting how long it took to process cases. In one of our courts, the change from a master to an individual calendaring system produced large effects in case processing time especially for cases going to trial. In general, an administrator will want to obtain information on those variables that are likely to have large effects on case processing time, but s/he will also want to give attention to variables that are manipulable even though they may have lesser effects.

The variables in Table 2 are court-wide variables, which characterize the state of the court at any one time. These variables have the same values for all cases processed at the same time in the court, but vary over time. At any given time, the court has a configuration of values on all of these variables, but they vary from day to day and even within days. For example, on any specific day, the number of active cases varies as new cases are filed and existing cases are closed. One could, in theory, take daily or even hourly measurements of the number of active cases before the court. While daily measurements might be desirable in some instances, they are likely to be too costly to take. In addition, if the variable is a statistic calculated across cases (for example, average case processing time in a preceding period), there are likely to be too few cases on a given day to yield a stable estimate. Thus, for court-level variables we would recommend bi-weekly or monthly measurement to balance the needs for stable estimates, precise measurement, and data collection costs.

If one is looking at a court over a short period of time, these variables can be presumed static. One should, however, be very careful in making any generalizations from a short time period, especially if court-level variables are changing. Furthermore, if one's purpose is to estimate the size of the effect of a change in a court organization or practice, a longer time frame must be selected and changes in court-level variables must be taken into account.

Table 2. Court Characteristics Affecting Case Processing Time

Number of New Filings
Number of Cases on Each Judge's Docket
Average Case Processing Time in Preceding Time Period
Number of Cases Pending
Number of Judges on the Bench
Delay-Reduction Innovations Affecting All Cases (e.g., change of calendaring system)
Other Changes in Court Structure/Operation

Defining the Study Period and Selecting Cases

Having information available is a first step that prepares one to address questions relating to case processing time (and other aspects of case processing as well). The next task is to choose a set of cases on which to examine the effects of the variables of interest. In selecting the period for study, one must be guided by the intent of the study. If an administrator is interested in assessing the impact of some change, a study period surrounding the change should be chosen. Exactly how much time prior to and after the change is included should be determined by expectations about how long it took for the change to have an impact, by the numbers of cases handled by the court, and by the resources available.

Population of cases to be studied. Once a study period is selected, a population of cases must be defined. A case might be a defendant with one or more charges against him or a case folder with one or more defendants and the charges against them. Since the personal characteristics, processing, and disposition for co-defendants in a single case folder will probably differ, we suggest that the case be defined as a defendant with one or more charges. It one is sampling from a list of case numbers, a two stage selection process could be used for cases with co-defendants. First, case numbers should be sampled. If the casefile has only one defendant, that defendant should be included in the sample; if the case file has more than one defendant, one defendant from among those in the file should be randomly selected for inclusion.

Another question in the selection of cases is whether the population to be sampled should be that of cases initiated in the court or cases disposed within the time period. These are two different populations of cases and, for different purposes, have different strengths and weaknesses. The National Center for State Courts directs users of its manual to sample from cases disposed because, they argue, in courts with very long case processing times, one would have to select cases from filings several years previous in order to be sure that all the cases were disposed by the time the data were collected, yielding a sample which did not provide the most recent information on current case processing time. The National Center's data collection guide suggests several means of obtaining samples of cases disposed.

If, on the other hand, one is interested in assessing the impact of one or more changes in court structure or practices, a sample of cases initiated within a specific

time period would seem most desirable. The disadvantage of drawing a sample from cases disposed is that it under-represents those cases initiated after an innovation went into effect, and those cases from the post innovation period that do appear in the sample will be those which were — for one reason or another — "easier" to dispose. Those cases initiated after the innovation which were more difficult to process are less likely to appear in the sample because they would be less likely to be terminated. Therefore, if one wants to avoid over-estimating the size of the effect of a delay reduction innovation, it seems better to choose cases initiated. The disadvantages of this choice are that an innovation may have foreshortened case processing time in cases initiated just prior to the innovation and that some time needs to be allowed for most cases initiated near the end of the study period to close. Taking all these considerations into account, it seems to us that one should choose to sample from cases initiated rather than those disposed. Sampling of cases initiated within a specific time period can be done from a listing of case numbers of the type we describe above.

Sampling cases. If one is to have confidence in the inferences one makes about case processing times, the cases selected for examination, that is, sampled, must represent the population of cases from which they are drawn. A random sample, which gives each case the same probability of being selected, does so with a specific degree of confidence depending on the size of the sample drawn. Generally, increasing the sample size increases the precision of the estimates of the values of population characteristics and thus the confidence one can have that the estimates represent the true values. Larger samples, however, bring larger costs in data collection and analysis. The size of the sample necessary to estimate a population characteristic — say mean case processing time — with a given level of confidence depends on an estimate of the size of the mean and an estimate of the variance of cases around this mean. In courts with little or no prior information about case processing time, such estimates are difficult to make. Thus, the National Center's strategy of selecting a moderately large sample (500 cases per year) for any court is a conservative and simple one for a court to follow.

An administrator might also want to consider sampling within categories on one or more variables. For example, one might want to sample within months in order to obtain a representative sample of case processing times in each month. The case numbering system we have suggested would facilitate doing so. An administrator

might also want to consider drawing a supplemental sample of trials so as to permit additional analysis of these relatively infrequent but important events. Before deciding to do so, however, the administrator should consider that, if an event is indeed rare, it cannot contribute much to overall case processing times, the explanation of which is usually of primary interest.

Description and Analysis

In deciding how the data on case processing time one has collected should be summarized and analyzed, it is important to keep in mind what questions one wants to answer. One such question, especially in courts with no previous systematic measurement of case processing times, is what the typical lengths of case processing time are. In particular, a court administrator might be interested in describing the distributions of case processing times for the entire lifespan of cases and for various processing stages.

Describing case processing time. Data on case processing times can be organized and described in a number of different ways. First, an administrator will want to describe the central tendency and variability of the case processing time variables. To do this, he or she can calculate the average (mean or median) and the standard deviation of the processing times. Other statistics to characterize the distribution of processing times such as those indicating "kurtosis" or peakedness and skewness are also available. (Any introductory statistics book will describe how to calculate and interpret these statistics, but one addressed to social science applications — e.g., Mueller, et al (1977) — will probably be most helpful.) With respect to criminal court cases, one will often find that the distribution on case processing time is fairly peaked and skewed to the right, that is, that most of the cases are disposed with relatively low case processing times while a minority have substantially longer case processing times.

The asymmetry of the distribution will also be evident in the difference between the distribution's mean and its median (that is, the point at or below which half its cases fall). Since the mean and median case processing times will usually be different from one another in samples of criminal cases, both are useful in conveying information about the distribution. In communicating "typical" levels of case processing time, the median is particularly useful since its value is not influenced by

extreme values on a few cases. Alternatives to the usual measures of variance and skewness, taking not the mean but the median as the measure of central tendency, can be found in Tukey (1971). Tukey's "box-and-whisker plots" are especially useful in that they show the spread of cases between the lower and upper quartiles and allow the identification of extreme values. It may also be revealing to construct bar graphs of the percentages of cases disposed within categories of days of case processing times (e.g., 0 to 30 days, 30 to 60 days, 60 to 90 days, and so forth).

All of these statistics, needless to say, can be calculated not only for the duration of the case as a whole but also for each of its constituent phases; not only for all cases but for each of various types of cases (e.g., drug cases, cases disposed by trial, etc.); and not only for the entire sampling period but for shorter periods within it. In particular, it may be useful to calculate and plot mean and median case processing times for each month in the sample period. Tukey suggests "smoothing" these graphs by calculating "running medians" in order to better reveal the overall pattern of the data over time. Box-and-whisker plots for cases from time periods within the sample period can also show changes in the variability of case duration with the passage of time, even when the median case processing time does not change appreciably. Examples of all of these statistical applications describing case processing times can be found in the Final Report of our study.

Explaining differences in case processing times. A decision-maker, however, will probably be interested in more than mere description of the distribution of case processing time, no matter how suggestive this description may be. The administrator will want to know the size of the contribution of each of a number of factors to variation in case processing times. If the court has implemented an innovation to reduce case processing times, he will want to know the size of the effect the innovation had. Since explanations of case processing times necessarily involve multiple causes (see the list of variables in Tables 1 and 2), the investigator needs a model that provides for the estimation of the influences on case processing time — the influences of the innovations among them — each controlled for the rest.

Most relatively simple models — those consisting of a single, linear and additive (regression) equation or a set of two or more such equations, recursively structured — can be optimally estimated, under the appropriate assumptions, by ordinary least squares. Again, there are many textbooks that discuss the analysis of regression

models, including, for example, Rao and Miller (1971) and Kmenta (1971). In addition, almost every widely available package of computer programs for statistical analysis (SPSS, OSIRIS, BMD, SAS, e.g.) contains an easy to use regression — i.e., ordinary least squares — program. For more complicated models, more complicated methods of estimation are, of course, available. On these, the reader should consult an econometric text (for instance, Kmenta, 1971 or Intrilligator, 1978). It would be a mistake, however, to dwell too narrowly on mere questions of technique. The key thing is that the model one analyzes be plausible, a reflection of the modellor's substantive hypotheses both in the variables it contains and the mathematical relations among them. An example of the sort of model and analysis we are describing appears in the Final Report of our study.

What an administrator gains for the trouble in formulating and estimating a model of case processing time is information about the size, as opposed to the mere existence, of the effect of each of the influences on case processing time —including, most notably, each of the innovations. In other words the administrator obtains an estimate of the number of days by which each innovation curtails (or conceivably, if the innovation turns out to be counter-productive, prolongs) the average case processing time. And, with this information in hand, he should be able to reach an informed decision as to the value of an innovation in relation to its cost and in relation to alternative innovations.

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