

# IMPLEMENTATION OF RISK ASSESSMENT TOOLS IN THE CRIMINAL JUSTICE SYSTEM: WHAT IS A FAIR APPROACH?

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## EXECUTIVE SUMMARY

Algorithmic-based risk assessment tools that help judges determine risk of recidivism and set bail have increasingly become a solution to the bloated, inefficient, and unfair pretrial system. Despite their potential advantages, they perpetuate the existing biases that have historically denied many marginalized people a fair opportunity to receive justice. In order to minimize the bias that will inevitably result and increase the fairness of risk assessment tool use, justice systems considering implementing these tools should follow three general guidelines. First, the structure of risk assessment tools should be publicized. Second, risk assessment tools should only be used as an aid for judge decision making. And third, they should be used only to assess high-level offenses.

## INTRODUCTION

The rise of big data and artificial intelligence (AI) in the 21st century has inspired increased use of technological approaches in the justice system, including predictive policing algorithms and facial recognition surveillance systems. Within the pretrial detention system, algorithmic-based risk assessment tools are one type of technological program that has been quickly adopted nationwide (Doyle, Bains, and Hopkins 2019). These tools use individualized data to predict, in a split second, the likelihood that defendants will commit another offense (recidivate) if released before trial, expediting the time judges typically spend examining defendants' cases before setting their bail. These technologies pose some superficial gains to efficiency, but raise fundamental challenges regarding individual privacy and perpetuate the biases upon which they were built (Brennan-Marquez and Henderson 2017).



Data is generated about individuals from the time of their arrest to the time of their release. This data allows court officials and contracting companies to connect criminal histories and booking questionnaires<sup>1</sup> to the likelihood of recidivism. At every stage in this process, however—from policing to booking to sentencing—human bias causes disparities in justice system outcomes, which are reflected in the data and are often detrimental to people who are Black and Latinx. Risk assessment tools use the data generated from these processes to form predictions. As a result, no matter how many precautionary steps are taken, their outputs too will be reflective of these problems, and they will remain biased.

In 2016, the Correctional Offender Management Profiling for Alternative Sanctions (COMPAS) tool, a risk assessment tool employed by justice systems across the United States, was criticized for producing higher risk scores for Black defendants than for white defendants accused of identical crimes and with similar criminal histories (Brennan-Marquez and Henderson 2018). COMPAS's prediction model relied heavily on factors that were highly correlated with race (Harcourt 2015). Instead of making the system fairer, the tool exacerbated existing inequalities in pretrial sentencing. This narrative was reproduced again and again as researchers began examining the biases embedded within similar risk assessment tools (Mayson 2019). In spite of growing warnings to proceed with caution, justice systems around the US have continued to naively implement these tools without fully understanding or mitigating their negative consequences (Kaye 2019).

The following sections include analysis of (1) the problems that perpetuate bias within the pretrial system, (2) the creation of risk assessment tools to help justice systems manage the growth of incarceration, (3) the inevitable bias with which risk assessment tools will be built, (4) the potential threat risk assessment tools pose to due process, and (5) solutions that should be used to guide the implementation of these tools.

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<sup>1</sup> When defendants are first brought to jail by police, an intake officer will typically administer a series of booking questions. These questions generally reference standard individual characteristics (e.g. height, weight, marks, scars, or tattoos) as well as prior convictions.



## THE PRETRIAL PROCESS: A FLAWED AND BIASED SYSTEM

The pretrial detention system is a flawed and biased system that has remained relatively unchanged since the War on Drugs in the 1970s. One of its critical aspects has been its reliance on the use of money bail to keep potentially “risky” defendants in jail (Digard and Swavola 2019). Recently, however, there has been a growing trend of constitutional challenges to this practice, with varying success. Some of these, including an attempt by New York State, have established bail systems that require individual assessment of ability to pay (Lartey 2020; Banks 2019; Knight v. Sheriff of Leon County 2019; Walker v. City of Calhoun 2017). Despite such instances of limited progress, the bail system remains largely intact throughout much of the country (Doyle et al. 2019). This is problematic for many reasons. Not only does money bail violate the justice system’s bedrock principle of “innocent until proven guilty,” it is also inherently biased.

The number of people held in local jails before trial has exploded, growing over 400 percent between 1970 and 2015—from 82,922 to 441,790 (Digard and Swavola 2019). This growth in pretrial detention accounts for nearly the entire expansion in net jailing over the past two decades (Wagner and Sawyer 2018). The government spends billions of dollars per day jailing pretrial suspects, which doesn’t even include the cost of lost wages and jobs of the defendants (Baradaran 2011). Most scholars point to money bail as the primary culprit for the increase in pretrial detention (Stevenson and Mayson 2017). This relationship is apparent, as nine out of ten felony defendants in 2009 were detained in jail before trial because they were unable to afford the set bail (Reaves 2009). Although intended to compel individuals to return for trial and to reduce recidivism, in reality bail has little effect on actual court appearance rates (Bechtel, Clark, Jones, and Levin 2012). Often, only those who cannot pay remain in jail, while those with similar criminal backgrounds but who can afford to pay are released (Starger and Bullock 2017).

Forty-eight hours after an arrest made without a warrant, a judge must determine whether there was probable cause for the defendant’s arrest (County of Riverside v. McLaughlin 1991). If the judge deems that there was probable cause, the defendant will face a determination for release on bail or personal recognizance (Bail Reform Act of 1984). The Bail Reform Act of 1984, legislation passed by Congress to govern federal pretrial detention, outlines standards that are generally used by states and localities around the nation to continue detention of defendants before trial. In



order to justify pretrial detention, a judge must view the defendant as either (1) a threat to public safety or (2) a high risk to not reappear for trial (Linker and Sloan 1978). When making this determination, a judge must weigh the need to protect the community with the need to ensure that detention is appropriate and does not violate defendants' rights to be held innocent until proven guilty (Linker and Sloan 1978). The ability of judges to make this determination accurately, however, is highly constrained.

Pretrial hearings include information about defendants, including their ties to the community, job history, assets, and criminal record—which explain more about the environments in which the defendants live than about the defendants themselves (Leipold 2005). These conditions are not determinative of how risky defendants actually are, but mainly provide indicators for a judge to make an assumption. Most pretrial hearings are also very brief, without substantial opportunity for defendants to introduce evidence to support their release (Baughman 2017). Consequently, release and bail determinations are often subjectively made on a judge's gut feeling instead of based on sound reasoning (Baughman 2017).

Despite the lack of a full trial, defendants are in effect sentenced by a judge after pretrial hearings since they face possible jail time. This practice often incentivizes defendants to accept a plea bargain or make an admission of guilt, even when they are innocent (Dobbie, Goldin, and Yang 2017). Combined with the fact that defendants in the pretrial system are supposed to be presumed innocent until proven guilty, this shows the extent to which the existing pretrial system is flawed. In response, legal groups have demanded greater objectivity and fairness in determinations for bail and release (American Bar Association 2007).

The traditional explicit purpose of bail is to act as a retainer, providing a disincentive for defendants to skip trial (American Bar Association 2019). Despite this aim, the use of bail has little to no effect on guaranteeing the reappearance of defendants at trial (Jones 2013). On the contrary, the bail system undermines the very notion of equality before the law because it confers advantages on the basis of defendants' abilities to pay (Franklin 2018). Negative consequences from the use of bail are experienced most profoundly by individuals below the poverty line (Franklin 2018).

When defendants are unable to afford bail, they typically have two options: remain in jail or hire a bonding agency (Doyle et al. 2019). If the former option is taken, defendants face pretrial detention as a consequence of their lack of wealth. Such



pretrial detention has lasting consequences on both future case success and on defendants' lives in general: defendants face greater difficulty finding witnesses, gathering and reviewing evidence, and consulting counsel about strategy (Doyle et al. 2019). Their continued detainment further damages their family and community relationships and leads to lost earnings and jobs (Heaton, Mayson, and Stevenson 2017). The latter option, although it secures defendants' release, can lead to rapidly escalating debt as a result of the predatory nature of bonding agencies (American Civil Liberties Union 2017). This burden of debt is exacerbated when defendants are unable to pay off their loan, since their credit rating will also fall and this will permanently diminish their access to credit (American Civil Liberties Union 2017). Neither of these options are reasonable for defendants who are supposed to be presumed innocent.

The phenomenon of community bail funds has recently emerged as a third option for some defendants. These funds are established by donations from public citizens and are granted to defendants unable to post bail (Simonson 2017). This practice has exposed the public's disdain for the bail process, but has had only limited success since many defendants cannot access these funds and still face bail rates which they are unable to afford (Simonson 2018).

In addition to the problems with bail, pretrial sentencing is plagued by judges' explicit and implicit biases, skewing outcomes for different populations. In the justice system, these biases cause especially severe and irreparable harm (Holroyd, Scaife, and Stafford 2017). Even if unintentional, judges inevitably impose their own implicit biases in sentencing (Kang, Bennett, Carbado, Casey, Dasgupta, Faigman, Godsil, Greenwald, Levinson, and Mnookin 2012). These biases, compounded by countless societal barriers, accentuate lasting disparities between white and minority groups. Specifically, studies have found that race has a significant impact on judges' decisions about bail setting. For instance, Black defendants are more likely to receive higher bond amounts, have lower odds of receiving personal recognizance bonds, and have an overall higher likelihood of remaining in prison than other defendants, controlling for relevant factors (Freiburger and Hilinski 2010). Black defendants between the ages of 18 and 29 are the most likely to receive disparately negative sentences and release decisions in the pretrial process (Wooldredge 2011). These outcomes indicate that courts often view Black defendants as more dangerous and blameworthy, even when in reality they are not (Freiburger and Hilinski 2010). This is profoundly alarming, and will continue to perpetuate systemic inequalities until it is addressed.



Some efforts have been made to combat these injustices within the pretrial process (Doyle et al. 2019). One emerging strategy has been to use personal recognizance bonds. These bonds are agreements between a defendant and a court that the defendant will be released without bail as long as they agree to return to trial and not recidivate during the interim. Defendants will commonly face a future penalty that vastly exceeds the cost of the standard bail amount if they fail to uphold the agreement. Justice systems that use personal recognizance bonds will often implement a texting or calling system to remind defendants of their trial. Studies on this practice have reported that defendants reappear at similar rates to those released on bail (Jones 2013).

In order to implement personal recognizance systems effectively, judges have sought greater assurance that the defendants who are given these bonds will in fact return to trial and not pose a threat to the public. However, the justice system is already too overburdened to incorporate more detailed pretrial hearings that enable judges to better assess defendants' worthiness for personal recognizance bonds. As a solution, many have turned to algorithmic-based risk assessment tools (Doyle et al. 2019). Unfortunately, this tactic often perpetuates bias instead of fixing it.

## WHAT FACTORS DETERMINE RISK RATINGS?

Risk assessment tools have become a *de facto* remedy for overcoming many ongoing justice system challenges in the pretrial process. However, the structure of these tools requires an explanation. In the past, police and judges were subject to a "plausibility test" that required intelligible and balanced explanations for their decisions at each stage of the justice process (Brennan-Marquez 2017). As machines have begun to play a larger role, however, explanations have been, to a degree, replaced by statistical associations produced by algorithms (Brennan-Marquez 2017). Without a sufficient explanation for the algorithms' outputs, the inherent value judgements upon which they were built will produce outcomes that are neither intelligible nor balanced (Brennan-Marquez 2017).

Generally, risk assessment tools incorporate a range of variables such as criminal history, personal information, neighborhood characteristics, and community involvement to establish a personalized risk score. One of the most commonly implemented risk assessment tools is designed by the private contracting company COMPAS. Not all COMPAS tools are identical, but they contain many



similar elements. For example, a COMPAS tool used in Wisconsin employs a booking questionnaire and prior criminal history to gauge the risk that defendants will recidivate or fail to appear for trial (Angwin 2011).

After receiving responses, the COMPAS algorithm outputs a single score that a judge interprets to determine release or non-release, as well as to set bail. Judges are cognizant of the vast amount of information considered by the risk assessment tool, so they are unlikely to question or alter the ratings very often, particularly since bail hearings are relatively brief in the first place. Therefore, the risk rating will be a key determinant of defendants' release conditions, and problems or exceptions will not often be discovered.

The variables contained in the booking questionnaire used by many COMPAS tools evaluate information including gang membership, parental support, friends who have been arrested, residential stability, neighborhood crime, school suspensions, finances, activity levels, sadness, anger, and criminal thinking. The booking questionnaire asks a total of 137 questions, some of which are directly answered by the defendant while others are gauged by the booking agent's impressions. The questionnaire includes questions such as:

- Based on the screener's observations, is this person a suspected or admitted gang member?
- If you lived with your parents and they later separated, how old were you at this time?
- How many of your friends/acquaintances have been arrested?
- How often have you moved in the last 12 months?
- In your neighborhood, have some of your friends or family been convicted of crimes?
- Were you ever suspended or expelled from school?
- How often do you have barely enough money to get by?
- How often do you feel bored?
- How much do you agree or disagree with the statement: I have never felt sad about things in my life?
- How much do you agree or disagree with the statement: If people make me angry or lose my temper, I can be dangerous?
- How much do you agree or disagree with the statement: A hungry person has a right to steal?





Most booking questionnaires used for risk assessment tools contain questions similar to the ones listed above, in addition to various others. In an attempt to employ actuarial measures, COMPAS designers compare responses to historical data to find a correlation between responses and recidivism or non-appearance. To some extent, this model can effectively predict these outcomes. Nevertheless, the questions used to form risk assessment tools' predictions are fraught with prejudice and susceptible to subjectivity on behalf of the booking agent.<sup>2</sup> Furthermore, arrests are imperfect estimators of crime commission, and are inherently biased due to discriminatory policing practices (Barocas and Selbst 2016). The combination of these factors inevitably produces biased predictions. In effect, these tools replace fairness and justice with efficiency and expediency, even in spite of concerted efforts to remove bias from risk assessment tools' algorithms.

## INEVITABILITY OF BIAS

Two primary strategies are employed in attempting to develop less biased risk assessment tools: controlling inputs and adjusting outputs (Mayson 2019). The first strategy, controlling inputs, assumes that bias can be reduced through the careful selection of unbiased independent variables to predict riskiness. The second strategy, adjusting outputs, also termed “algorithmic affirmative action,” proposes that the effects of racism can be measured and parsed out of risk ratings by scaling the predictions based on a race variable. Unfortunately, regardless of algorithmic manipulation, the construction of risk assessment tools is still inevitably susceptible to bias—especially related to race, but also to gender and age (Mayson 2019).

### Controlling Inputs

Nearly every facet of the justice system is affected by racial bias. When past data is blindly used to predict future arrest, it embeds historical racial disparities into its future predictions. In many communities, Black individuals are arrested at rates so much higher than white individuals that multiple convictions of a Black individual does not imply that that individual poses a greater threat; it instead more accurately demonstrates the greater rates of police patrol that exist in the

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<sup>2</sup> It is difficult to have an accurate comparison for likelihood of committing crime because crimes are inconsistently reported and prosecuted based upon community factors.





individual's community. Some risk assessment tool developers believe that such racial bias can be reduced or eliminated by carefully selecting variables, but it is impossible to fully do so.

A developer might, for instance, choose to remove the variable *zip code*, since it is so heavily affected by race and perpetuates the structural discrimination that led to regional variance in crime commission rates in the first place. Another approach might be to employ an instrumental variable to assess the amount that race influences a measure, so that the tool could then be adjusted to reflect a score that is not confounded by race. However, in spite of such careful variable selection and statistical manipulation, it is still impossible to remove all effects of race from the prediction, as race influences nearly every input that might be included.

To more fully remove the effects of racial bias on prediction, some argue that it is necessary to include race as its own input variable. By including race as a variable, it would hypothetically be possible to discern the magnitude of influence that race has on variance in the output. Although perhaps one step closer to achieving racial parity, this method fails to account for the fact that the output variable itself (arrest rate) correlates with race, adding still more unmeasurable statistical bias. By addressing one aspect of racial bias, another still renders the first incomplete in fully producing "fair" outputs. Implementing such a tool without fully acknowledging or understanding the existence of bias that cannot be removed by controlling input variables will further institutionalize racial bias.

## Adjusting Outputs

It is well established that Black men are arrested and sentenced at higher rates than white men and women. When arrest or conviction rates are subsequently used to predict future recidivism, the racial bias inherent in such data manifests itself in the outputs, skewing them based on the race of each defendant. These arrest and conviction rates serve as proxies to identify crime commission; however, they are not perfect indicators. The strategy of adjusting outputs purports that the amount of racial bias manifested in the outputted risk ratings can be measured and is known.<sup>3</sup>

Nevertheless, substantial research demonstrates that actual rates of crime commission and rates of racial bias are largely unknown (Maryfield 2018).

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<sup>3</sup> For instance, an instrumental variable would be able to completely assess the effect that race has on a particular output variable.



Furthermore, certain crimes occur so rarely that statistical predictions of those events are tenuous at best (Pennsylvania Commission on Sentencing 2018). Predictions attempt to use past events to predict future events, but in some cases the random explainability of data is a poor road map for future prediction. And when the data is, at its roots, a poor predictor of crime because it is biased by too many extraneous factors, it reinforces systemic racism that marginalizes people of color in the US. Without proper checks in place to constantly evaluate these tools, they can do much more harm than the good that would come from gains to efficiency.

## VIOLATING DUE PROCESS

The inevitability of bias has large implications for continued reliance on risk assessment tools and their use in the pretrial process. The right to due process is protected by the Fifth and Fourteenth Constitutional Amendments. Procedural due process, a subcategory of this right, requires that the government protect individuals from the arbitrary exercise of its power by giving individuals opportunity to be heard and to have a decision made by a neutral decision maker. Thus, when a judge makes a sentencing decision using a risk assessment tool, they must be able to provide intelligible and balanced reasoning to support that decision (*Marchant v. Pennsylvania R.R.* 1894). In many instances, judges using risk assessment tools will struggle to adhere to this standard without necessary safeguards, especially when its results are inherently biased.

In 2013, Eric Loomis, a defendant who had been sentenced to jail by a judge referencing the COMPAS risk assessment tool's rating to support the ruling, appealed his case to the Wisconsin Supreme Court as a violation of his right to due process (*Loomis v. Wisconsin* 2016). The Wisconsin Supreme Court, however, ruled against Loomis, arguing that his claim was invalid since the risk assessment tool was not the sole criteria used in the judge's final decision (*Loomis v. Wisconsin* 2016). However, this ruling left open the possibility that if a risk assessment tool is in fact determinative in a judge's sentence, then that ruling will violate due process. This has important consequences for risk assessment tools used in the pretrial process.

The brevity of typical bail hearings has already been mentioned, but when risk assessment tools are incorporated into this process, the pretrial reviews of most defendants' cases will likely become even more cursory, if they are



not eliminated altogether. As a consequence, risk assessment tools will have a largely determinative role in the pretrial process. To protect defendants' due process rights, the administration and structure of these tools must thus be critically evaluated and supported. The "black box" nature of algorithmic-based risk assessment tools inherently lacks a high level of explainability. This issue is compounded by the fact that private contractors such as COMPAS who build risk assessment tools are not required to publicize or explain their tools' structure to the public. Therefore, in order to protect defendants' constitutional right to procedural due process, justice systems must either refrain from over relying on risk assessment tools, or implement solutions that will minimize and expose the bias that will be perpetuated by them.

## PROPOSED SOLUTIONS

The pretrial system has been a primary driver for the modern phenomenon of mass incarceration. It has widely discriminatory and detrimental impacts on those unable to afford bail or who are viewed as threatening by the system. Justice systems across the nation have increasingly adopted risk assessment tools to introduce some efficiency and standardization to this biased pretrial process. They reduce administrative costs and expedite the pretrial process, which is notoriously strained. Unfortunately, no matter how they are implemented, they will reinforce and institutionalize racial biases, marginalizing minority communities. In order to ensure that these biases will be non-determinative and transparent to the public, adequate safeguards must be implemented. Justice systems considering the implementation of risk assessment tools should follow three best practices.

### Publication of Structure

To ensure that risk assessment tools in use can be evaluated by the people and communities they affect, the formulas and calculations that form their structure should be publicly available. The current structure of many risk assessment tools is not publicized, leaving little opportunity to expose, question, and reduce bias in their predictions. This lack of transparency amplifies and institutionalizes the disparities that are perpetuated in the current system. Due process in the pretrial system requires explanations for why specific procedures exist. Without a critical and public evaluation of risk assessment tools, their problems will continue to remain unexplained and harmful.



Justice system administrators and judges are also, understandably, rarely trained in statistics or machine learning. Their evaluation of the “fairness” of risk assessment tools is thus likely insufficient in protecting the public from the bias that will exist within these tools and that could widen disparities even further if they are improperly designed. By publicizing the structure of the tools, both before implementation and after, organizations with ample statistical and machine learning expertise can assess and report their analyses of the risk assessment tool in use. With this additional critical analysis, bias can be minimized and exposed. Consequently, the public can engage in a productive dialogue on the tools’ roles in the pretrial process.

## **Aid to Judge Decision Making**

Risk assessment tools have the potential to completely replace the human judge pretrial hearing process, in which case these tools would operate and set bail independently. As many justice systems are currently moving towards using these tools, this dystopian situation appears increasingly likely. This is not a viable option, however, as it would violate existing notions of due process and institutionalize bias. Instead, risk assessment tools, if implemented, must only be a source of information for a judge in a pretrial hearing, not the chief and sole pretrial sentence determiner.

The ability to reduce bias and accurately assess the likelihood that a defendant will not recidivate and will return to court could in fact be strengthened by pairing risk assessment tools and judges together. In this case, a judge can consider a risk assessment tool recommendation in light of extraneous circumstances facing an individual defendant, and can thus make a more fully informed release determination. This would be a step up from the existing cursory review and gut determinations that occur in most pretrial hearings. Having judges use risk assessment tools as an aid will take necessary steps toward protecting defendants’ rights to due process by not allowing risk assessment tools to be completely determinative of their release or non-release.

Risk assessment tools used only as an aid to judges can also generally provide a minimum standard estimate of riskiness in pretrial sentences. This standard, though biased, may be less biased than an existing judge, and can consequently motivate fairer pretrial sentences. When a judge repeatedly issues pretrial sentencing decisions that deviate significantly from risk assessment tool recommendations in a way that is prejudiced against individuals known to be



disadvantaged by the tool, the fairness of the judge's rulings can be questioned. That judge can then be challenged to examine their own bias and become less biased in the future.

## **Assessment of High-Level Offenses, Not Low-Level Offenses**

Many individuals who are rated by risk assessment tools as “high risk” to commit another crime are often only rated as such because the crime they may commit is a low-level offense such as a traffic violation, trespassing, petty theft, or drug usage. The likelihood of an individual actually committing such crimes is also very low—between 8 and 16 percent (Mayson 2017). If a risk assessment tool is built to classify all defendants who pose a potential threat of committing any type of crime as “high risk,” it is recommending that even those defendants who are only slightly likely to commit an offense that has only a minimal harm to society should remain detained. The continued detainment of these individuals, however, will impose significant costs on both the already bloated prison system and on defendants' livelihoods, damaging their work, family, and community relationships, with compounded effects even after the defendant is released.

Instead of building a risk assessment tool that classifies defendants as “high risk” when they are only likely to commit a low-level offense, risk assessment tools should only classify defendants as “high risk” when the tool rates them as likely to commit a high-level offense, such as a felony. Those rated as likely to commit a high-level offense pose a threat to society that is much more harmful than those likely to commit a low-level offense. In the case of those rated as likely to commit a high-level offense, the potential harm that could result has at least some grounding to justify a risk assessment tool's classification of a defendant as “high risk” and contribute to the continued pretrial detainment of that defendant.



## CONCLUSION

In 2016, *ProPublica* published a report that brazenly exposed the existence of bias in risk assessment tools and its potential for detrimental impacts on the lives of real people (Angwin, Larson, Mattu, and Kirchner 2016). Four years later, justice systems around the US have barreled ahead with the implementation of these risk assessment tools, often without safeguards. No action can make risk assessment tools unbiased, but steps must be taken to minimize as well as expose their bias and protect defendants' legal rights. First, justice systems must publicly publish the structure of their algorithmic-based tools (both before and after implementation). Second, justice systems must implement these tools only as an aid to judge decision making, not as the sole determinant for defendants' release. Third, justice systems must develop risk assessment tools to assess only the likelihood of a defendant committing a high-level offense rather than a low-level offense. These measures will serve as guard rails to egregious harm, but do not eliminate bias from the risk assessment tools altogether. Instead, justice systems have a duty to engage in discussions with community members to ensure that every person's expectations and needs are met.



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