

Service Provision Risk Assessment

Guiding violence reduction through predictive analytics

In 2016, as gun violence surged in Chicago, the University of Chicago Crime Lab began developing a risk assessment tool designed to help violence-prevention organizations find the people at highest risk of future gun violence involvement and pair them with intensive social services and supports. In this brief, we provide an overview of the purpose of that risk assessment tool, how it was developed, and how it has been used by READI Chicago partner organizations.

What is the Service Provision Risk Assessment?

The Service Provision Risk Assessment uses data to predict a person's risk of future gun violence involvement, defined as being either arrested for, or a victim of, a serious violent crime involving a gun. Using data from the Chicago Police Department (CPD), the risk assessment predicts the likelihood that a person with law enforcement contact in the last 5 years, either as an arrestee or a victim, will be involved in gun violence over the next 18 months.¹ Although the risk assessment uses data from CPD, its predictions are never shared with CPD or any other law enforcement agency. The sole purpose of the risk assessment is to provide community groups working to prevent gun violence, such as READI Chicago partner organizations, with information to help them better serve people in their community at very high risk of gun violence involvement.

Why and how was the Service Provision Risk Assessment developed?

The risk assessment was developed with the goal of reducing gun violence in Chicago. By identifying those at highest risk of future gun violence involvement, the risk assessment can help violence-prevention organizations—street outreach groups, transitional jobs providers, and others—better target their supports. These organizations have been successfully finding, engaging, and serving this vulnerable population for years. But it remains difficult for even the most skilled practitioners to identify everyone who could benefit from their services, or to quantify the exact risk people face. Pairing practitioner knowledge with a proven risk assessment helps organizations provide more intensive services to the people with the greatest need.

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How has the Service Provision Risk Assessment been used?

To date, the risk assessment has been used to identify men who could be eligible for READI Chicago. READI Chicago is a large-scale violence reduction initiative that connects adult men at the highest risk of gun violence involvement with two years of intensive, innovative programming to aid them in their pursuit of a better future. It offers up to 18 months of cognitive behavioral therapy and paid employment, in addition to relentless outreach and engagement, and wraparound services with up to six months of follow-up support. To locate men at the very highest risk of gun violence, READI identifies eligible participants through three pathways: community partners, reentry from the criminal justice system, and the risk assessment. READI currently operates in four community areas: North Lawndale, Austin, West Garfield Park, and Greater Englewood. As of December 2020, READI has identified and offered programming to over 1,200 men across the four neighborhoods, 54% of whom have taken up the job and attended their orientation.

Cities collect a great deal of information about their residents, but it is not always used to support them. Our research team began working with government agencies and social service organizations to determine the best way to use this information to reduce gun violence while respecting people's privacy. This process included a series of design workshops led by Heartland Alliance, presentations and focus groups with community members, and conversations with street outreach organizations to incorporate their experiences.

How does the Service Provision Risk Assessment work?

The risk assessment works by relying on the fact that gun violence is, to some extent, predictable. Data from past gun violence incidents reveal patterns that can help identify people at higher risk of future harm. Approaches to predicting gun violence that rely on only a handful of factors, like someone's age or where they live, miss important details that can distinguish people at higher risk from people at lower risk. In contrast, this risk assessment tool relies on detailed information about how people interact with each other and the police department over time in order to make more tailored, and more accurate, predictions.² Specifically, the risk assessment uses machine learning to analyze years of detailed CPD data. It also identifies patterns in people's previous arrests and reported victimizations, as well as in the arrests and reported victimizations of people with whom they may interact, to predict future gun violence involvement.³ These detailed data include the number of arrests or reported victimizations a person had, the type, and their timing, along with similar information about a person's peers.

Once these patterns are identified, the risk assessment can predict the likelihood that a given person with recent CPD contact may be involved in gun violence in the future by looking for those same patterns in that person's data.⁴ And because these data are regularly updated, a person's predicted risk changes over time, helping to keep the risk assessment's predictions current and accurate. As the risk assessment was developed, research staff consulted with all four READI outreach partners to understand how the referrals generated from the risk assessment aligned with social networks, perceived risk levels, and whether and how outreach workers could systematically use such referrals.

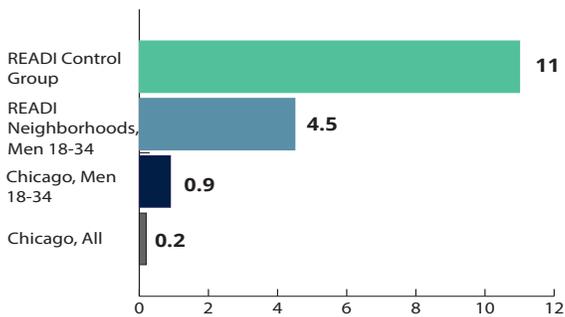
Importantly, only **publicly available** information is shared with program implementers about people identified by the risk assessment. **The research team never shares sensitive, non-public information**, including the CPD data used to predict a person's risk, with CPD or any other party, out of respect for people's privacy and to remain in compliance with our data sharing agreements. Once the requesting organizations receive this publicly available information, they attempt to find and engage those at risk and connect them to appropriate services and supports.

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What have we learned from the Service Provision Risk Assessment?

To understand how well the risk assessment predicts gun violence involvement, consider the adult men identified by the risk assessment as potential participants in READI Chicago. These men are thought to be at the highest risk of gun violence involvement. Because there are not enough resources to provide READI's services to all of the men who might benefit, some men can only receive what is already available in communities, but not READI Chicago; this is the READI control group. We can track the outcomes of the READI control group to determine what level of gun violence they actually experience in the absence of READI (but in the presence of all other status quo services, such as outreach and employment alternatives), and whether it is as high as the level of gun violence they were predicted to experience.

Shootings and homicides over 20 months per 100 people



We find that the men in the READI Chicago control group experience extraordinarily high levels of gun violence.⁵ **Over a 20-month period, the men in the READI control group were 54 times more likely to be shot or killed than the average Chicagoan.** Even compared to men ages 18-34 living in READI neighborhoods, who already experience very high rates of gun violence, the men in the READI control group are roughly 2.5 times more likely to be shot or killed. This extraordinarily high level of violence serves as evidence that the men being referred through the risk assessment are men at the very highest risk of being involved in gun violence.

Limitations of the Service Provision Risk Assessment

As mentioned earlier, organizations in Chicago have been successfully finding, engaging, and supporting people at high risk for gun violence involvement for years and have developed in-depth knowledge of their communities in doing so. Because the risk assessment is only able to predict risk for people who come into recent contact with CPD, and only by using data about them collected by CPD, there are some people for whom it cannot predict risk at all, and others for whom it cannot predict risk as reliably or with the same accuracy as local practitioners. This makes the risk assessment a complement to, and not a substitute for, the expertise and experience of the organizations already doing this work. For example, with READI Chicago, the risk assessment serves as one of three referral arms into the program; community referrals and reentry from the criminal justice system serve as the other two pathways into READI Chicago.

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In addition, the research team is keenly aware of how data limitations shape the risk assessment's predictions. The CPD data on which the risk assessment is built are imperfect in many ways: not all arrests reflect culpability, not all offending leads to arrest, and not all victimizations are reported to the police. Furthermore, these patterns likely vary with a person's race and where they live. The researchers are working on a technical report that will provide greater detail about how prediction models built using such imperfect data perform across different racial and demographic groups. Importantly, there have been two key findings from this research so far.

First, despite the biases present in the underlying CPD data, these kinds of prediction models are still able to successfully identify people at high risk of future gun violence involvement who might benefit from additional support. Second, data limitations and the complexity of gun violence involvement make it a very difficult outcome to accurately predict; many of the people predicted to be at high risk may not end up being involved in gun violence, and many of the people who actually end up being involved in gun violence may not have been predicted by the model to be at high risk. These patterns underscore both the dangers of using such prediction models for law enforcement and their promise for helping social service organizations work to keep safe people who might otherwise be missed.

Questions?

To find out more about the risk assessment or the READI evaluation, please contact Monica Bhatt, Senior Research Director, at mbhatt@uchicago.edu. To learn more about READI Chicago, please visit www.heartlandalliance.org/READI or contact Barbara Hoffman, Chief External Affairs Officer at bhoffman@heartlandalliance.org.

Endnotes

- 1 The risk assessment only predicts risk for people who have been arrested at least once, or reported being victims at least twice, in the previous 5 years in Chicago Police Department data.
- 2 This document references findings from "The Lessons and Limits of Predicting Shooting Victimization," an in-progress paper by Sara Heller, Benjamin Jakubowski, Zubin Jelveh & Max Kapustin.
- 3 A person is thought to interact with someone else if both of them are involved in the same criminal incident, either as an arrestee or a reported victim. For example, if two people are both arrested in the same incident, or one person is arrested and the other is reported to be a victim, then for the purposes of the risk assessment they are considered to have interacted with one another. Although this provides an incomplete picture of a person's social network, research by Andy Papachristos and others suggests that information about a person's contacts gleaned from this approach is useful for predicting a person's risk of future involvement in gun violence.
- 4 Because the risk assessment currently relies on CPD data to predict a person's likelihood of future gun violence involvement, it cannot predict risk for someone who has never been arrested by, or been a reported victim, to CPD. Similarly, people who have not been arrested or repeatedly been reported victimized within the last 5 years have data that is too outdated or unreliable to predict their risk.
- 5 This document references findings from "Predicting and Preventing Gun Violence: Experimental Results from READI Chicago", an in-progress paper by Marianne Bertrand, Monica Bhatt, Christopher Blattman, Sara Heller, and Max Kapustin.