

## Probable Causation, Episode 39: Anna Bindler

**Jennifer** [00:00:08] Hello and welcome to Probable Causation, a show about law, economics and crime. I'm your host, Jennifer Doleac of Texas A&M University, where I'm an Economics Professor and the Director of the Justice Tech Lab. My guest this week is Anna Bindler. Anna is an Associate Professor of Economics at the University of Cologne. Anna welcome to the show.

**Anna** [00:00:26] Thank you very much, Jennifer.

**Jennifer** [00:00:28] Today, we're going to talk about your research on the labor market effects and other costs of crime victimization. But before we get into that, could you tell us about your research expertise and how you became interested in this topic?

**Anna** [00:00:40] Sure. My research revolves around the economics of crime and the criminal justice system. Through my PhD, I studied aspects of the relationship between labor market conditions and crime. And more recently, I've looked into decision making in the criminal justice system and the role of police in crime. So just to give some examples of what I've looked at. In one of my first papers, which I wrote together with Brian Bell and Steve Machin, which tries the effects of recessions and crime and show that graduating into recession results in higher likelihood of being involved in criminal activity later in life. My recent work with Randi Hjalmarsson, we study the impact of large sanctioned reforms and jury decisions in 18th and 19th century London, and currently we work on a research project that studies the impact of the first professional police force, the London Metropolitan Police, on crime.

**Anna** [00:01:28] One overarching theme in my research prior to the study that we will talk about today has been a focus on offenders. So looking into their motives and the treatment at courts or by the police, and I think that's true for large parts of the economics of crime literature that focuses predominantly on the offending side of crime. I've been interested in learning more about the other side, the victims of crime for quite some time now. And this particular topic of labor market effects of criminal victimization was motivated by the observation that the economics of crime literature documents limited labor market opportunities for offenders when they reenter the labor market, which we termed that crime scarring effect, but that we know comparatively little about what happens to the victims of crime. So when I met my absolutely fabulous coauthor, Nadine Ketel, after I joined the University of Gothenburg in Sweden, it turned out that she was also interested in this topic and knew a great source of data, which I will talk about later on. But this is really how we got started on this research project and has developed into quite important research agenda of both Nadine and myself.

**Jennifer** [00:02:32] So your paper's titled "Scaring or scarring? Labour market effects of criminal victimisation." As you said, it's coauthored with Nadine Ketel. Are you in the paper that we don't know much about the causal effects of crime victimization? So what specific effects do you have in mind there?

**Anna** [00:02:47] Right. So we started this project with the idea in mind that we know relatively little about the cost of crime for victims. The literature, the cost of crime typically consider three categories: the direct costs, the indirect costs, and the intangible cost for victim. Right, so the general wellbeing or pain of suffering. The direct costs include, for example, the administrative costs for policing, courts, and sanctions, but also immediate health related costs for a victim's injury. These direct costs are relatively easy to measure,

but when it comes to the indirect costs of crime, this is much harder. So these indirect costs can include components such as lost productivity, costs associated with precautionary behavioral responses, for example, moving to a new place, also long term health related consequences. And this is where our study comes in. We are interested in learning more about these indirect costs. In particular, we look at people's earnings and social benefit receipt as two important labor market outcomes.

**Anna** [00:03:40] Now, you might ask, why would victimization lead to a worsening of labor market outcomes? What are the mechanisms at play here? Changes in labor market outcomes would simply be the consequence of a deterioration in physical or mental health, or they could be due to change in daily behaviors towards preemptive and precautionary strategies. One can think of a story in which such changes plausibly affect choices regarding the type, time, and location of work which could be reflected in changes in income or employment status. It is even possible that victims of some crimes face social stigma, such as sexual assault victims or victims reporting offenses that occurred at work, but maybe colleague was the offender, and that this could affect future employment opportunities. The certainly - this last thing is certainly something that has been discussed more in the context of the MeToo movement. These are the type of mechanisms that we have in mind in the study and that we cannot write them out completely. We can look at secondary outcomes such as health related costs, moving decisions, and changes in family composition.

**Anna** [00:04:34] So if I want to tie this all together, to give you a better sense of what we do in this research project, we ask three fundamental questions. First, what are the effects of crime victimization on individuals earnings and social benefit receipt? Second, are these effects temporary? Did they last of a time? And third, why might they exist?

**Jennifer** [00:04:52] So economists often include a social cost of crime number and the kind of a cost benefit analysis of the end of the paper. So at least in some sense, people have thought about the cost of crime. So before this paper, what did we know about the cost of crime broadly, and then the effects on victims in particular?

**Anna** [00:05:10] Right. So as I mentioned earlier, the victims of crime literature has been largely dedicated to studying the potential costs and consequences of criminals interacting with the justice system. Right. So Aaron Chalfin and Justin McCrary and Mirko Draca and Stephen Machin provide just two of the comprehensive reviews of that literature. The same cannot be said about victim related costs. There's a longer standing correlation in the literature, but there's much less evidence of the causal effects of crime victimization. And there's a large knowledge gap that emerges. The existing literature focus on the behavioral responses to crime victimization, misperceptions, and changes to mental health and subjective well-being. I can provide some examples here. A study by Francesca Cornaglia and coauthors documents a negative impact on mental health, both on victims and through crime exposure, also for nonvictims using Australian data.

**Anna** [00:05:57] Another study by Christian Dustmann and Francesco Fasani finds that in the UK, higher local property crime rates cause mental distress, in particular for women. The further studies --- of researchers suggesting negative effects of victimization on subjective wellbeing and life satisfaction. I should mention here that together with Nadine, the coauthor of this study, and another coauthor, Randi Hjalmarsson, we have recently published a more comprehensive review of the literature on the costs of victimization. And if any of the listeners of this episode is interested in the topic they might find this to be useful resource. When it comes to the effects that crime victimization can have on labor market

outcomes, there are quite a few studies really. Closely related to our research is working paper by Petra Ornstein from 2017 in which she uses administrative data from Sweden that identifies assaults leading to hospitalization. In her paper, she documents adverse effects of such severe assaults on mortality, health, and labor market outcomes. But, if I summarize it, all and all, I think it is fair to say that a knowledge of costs and causal effects of victimization is quite limited at this point.

**Jennifer** [00:07:01] That's great to hear about the review article you have with those coauthors. We'll put a link to that in the show notes for folks. So why is this such a difficult question to answer? What are the obstacles that researchers like yourselves needed to overcome in order to measure the causal effect of being a crime victim?

**Anna** [00:07:16] This is an excellent question, and I think it is the key to why the literature on this topic has been quite scarce to date. An important obstacle that one needs to overcome here in this line of research is how to isolate the causal effect of being crime victim from a simple correlation. The fundamental challenge is to overcome the econometric problems of simultaneity and limited variable bias. Let me give you an example of simultaneity. Think about what comes first unemployment, which could increase the risk of victimization or victimization, which could increase the risk of unemployment. The problem of limited variable bias refers to the fact that we can simply not observe everything. Do individuals who become a crime victim differ in an observable characteristics, for example, of risk taking behavior from those who do not? And do these characteristics in fact drive the observed patterns?

**Anna** [00:08:02] The further difficulty is a lack of high quality individual level data on victimization that can also be linked to individual level labor market data. But the existence of such data is, of course, a crucial ingredient for any empirical research on the topic. In particular, the lack of high quality data limits the toolset and estimation strategies available to a researcher aiming to retrieve causal effects despite the problems that I just described. The earlier literature has many- uses three types of data: survey data, aggregate crime data, and hospitalization data. Surveys a great measure of variables that can otherwise not be observed such as subjective wellbeing or crimes that the victim did not report to the police. The main disadvantage of survey data for studies of victimization really comes down to small sample sizes, which limit a researcher's ability to provide robust empirical evidence. Using aggregate crime data, for example, at the neighborhood level can be great to study the effect of crime exposure. However, this type of data is not suited to deeply understand the individual labor market responses to crime victimization. Lastly, using hospitalization data to identify assault cases can be very useful when general victimization data are not available. However, it comes with the disadvantage that individuals observed in the data suffered from very severe cases of assault. Right. Namely those that led to a hospitalization. This limits the external validity of the results that the sample might just not be representative of all cases of assault or any other type of offense.

**Jennifer** [00:09:26] I think a lot of people who don't work in this area probably haven't thought about how difficult it might be to get data on crime victims. Right. And I think like one advantage of working and studying crime is that it's relatively easy to get information on criminal offenders, people who are arrested or incarcerated, but for, you know, good reasons, privacy reasons, getting data on those victims is really hard in practice. And so we will talk more about how you guys were able to get this data in a couple of questions. But first, walk us through your approach in this paper. So what's the natural experiment that you and Nadine use to isolate the effect of crime victimization from other factors?

**Anna** [00:10:04] So, ultimately, we're interested in the causal effect of crime victimization or labor market outcomes, and as explained before we have to overcome some empirical challenges here. First, there's a problem of unobservable characteristics such as risk attitudes and risky behaviors. These might be correlates of both victimization and labor market outcomes, which makes it difficult to separate out the effect of victimization itself. To deal with a problem, we move in two steps. We condition our sample on individuals who at some point become victims of crime. Intuitively, it means that we do not compare someone who has been a victim of crime to someone who has not. But rather we compare someone who has been a victim of crime to someone who has been a victim of crime of the same offense at a later point in time. Further, we adopt a quasi experimental approach and use an event study with individual fixed effects. The basic idea is to isolate changes in labor market outcomes before and after victimization from any constant individual characteristics, that is those characteristics that do not change over time. Causal interpretation then relies on the assumption that the timing of victimization is random once we control for observables and these individual fixed effects.

**Anna** [00:11:13] This brings us to the second challenge, simultaneity of the question of what comes first, the victimization or the change in labor outcomes. To address this, we make use of the rich panel data, which I will talk about and trace out the effect of a time in an event study design. Intuitively, we estimate the changes to labor market outcomes each month before and after victimization compared to a reference month, which is the month just before victimization. This allows us to pay close attention to anything that happens before victimization with respect to labor market outcomes and to identify sharp changes at the time of victimization.

**Jennifer** [00:11:48] So in many ways, this is a very visual - a research design, right. So you can picture - you know, listeners obviously don't have the graph in front of them, but basically can picture a graph where you have - you kind of look at labor market outcomes and each month and each point on the x-axis is a different month. And then suddenly in the middle, you have the shock that you are the victim of a violent assault or something. And so basically what you're trying to test is if that matters, you should see a sudden increase or drop in the outcome measure - you're interested in labor market outcomes in this case at that point. And so what we want to see in these kinds of papers is basically, do you see that sharp increase or decrease? Is that a good way to explain it?

**Anna** [00:12:32] Yes, that's absolutely right. Thank you. Exactly. So in the paper, we work a lot with graphs. We visualize our results and use the type of graph that you just described. So we have a time axis, and we show the changes in labor market outcomes relative to just before victimization of a long time span. So we can really see when there's a sharp change at the time of victimization and what happens after victimization. We can trace it out over time.

**Jennifer** [00:12:59] Right. Okay, so now let's get to the data. What are the data that you are using for all of these analysis?

**Anna** [00:13:05] So for this study, we use administrative data from the Netherlands. These data have some great advantages and allow us to overcome the shortcomings of other data sources that I described earlier. The victimization data here come from yearly files of all police registered victims of crime in the Netherlands. That is, they contain all victims of an offense that was reported to the police. So if you imagine - you become a victim of crime, you go to the police, you report that that will be registered in the type of data. These files exist from 2005 onwards and contain an anonymized individual identifier for the

victims as well as the offender whenever the offenders known, the reporting date, and the offense type. What's really great about registered data is that we can link these victimization data to number of Dutch administrative records, which provide us with information about income spells for wages and earnings for self employment, as well as social benefits. Social benefits in our context include unemployment insurance, sickness and disability benefits, and welfare benefits. This data available from 1999 onwards, which allows us to observe the labor market trajectories of individuals of a quite long time span before and after the victimization. The three laws for the type of events that are designed that was just described, tracing out the effects of a time. The Dutch data, incredibly rich, which allows us to complement our main data sources here with even further records that contain annual expenditure for physical and mental health costs. And we can link the data to demographic information such as gender, year of birth, marital status, household composition, offending behavior at the municipality, and neighborhood of residence.

**Jennifer** [00:14:44] So you have basically the ideal data - all the data you could possibly wish for, which is the big advantage of working with data from these countries. So what outcome measures are you most interested in here?

**Anna** [00:14:56] Right. So in this study, our main focus is on labor market outcomes. We are most interested in earnings and social benefit receipt. For our outcomes, we construct monthly measures of earnings which include both wage earnings and income from self employment from the income data that I just described. For social benefits, we measure the number of days per month during which individuals receive any kind of benefits. This allows us to abstract from the actual amount of benefits which may be determined by previous income or other rules and make things less comparable. In addition, we use the information from the health insurance data to create annual measures of total mental health expenditures as secondary outcomes. Unfortunately, this type of data is only available at the annual and not as a monthly level, but given the richness of the data, this much really be a luxury problem.

**Jennifer** [00:15:44] And so what is the sample that you're dealing with here? You mentioned this a little bit earlier, but who are the people that you're focusing on in your analysis?

**Anna** [00:15:52] Right. In our analysis, we focus on the most important violent and property crimes to start with. The violent crimes include assault, threat of violence, and sex offenses. And the property crimes include robbery, burglary, and pickpocketing. Let me highlight here that in contrast to some other countries, including the U.S., robbery is classified as a property offense in the Dutch state, and this is done by the by the police, essentially, this is not our classification. We just follow the official classification. From here, we trade subsamples with one sample each per offense and gender. The aim is to obtain as homogeneous samples as possible such that we compare victims of the same offense to each other. Remember that we condition our sample of crime victims, and we do not include nonvictims in our analysis.

**Anna** [00:16:37] Next, we are mostly interested in the fact of first victimization. Unfortunately, we do not know anything about victimizations before the start of the data in 2005. For that reason, we exclude individuals who were reported victims of crime in 2005 and 2006 and construct a sample of individuals for whom we know that they have not been victimized for at least two years. As we're interested in labor market effects, we zoom in on individuals aged 18 to 55, which are typical labor market ages in our context. For property crime, we restrict the sample a little bit further and exclude those below the age of 26 as

the likelihood of owning valuable property increases after labor market entry. Finally, we exclude individuals who have a criminal record prior to the victimization as this could have an effect on labor market outcomes, per se.

**Anna** [00:17:24] Overall, this leaves us with more than 800,000 victims divided over the offense and gender subsamples. Here, we really see the advantage of using administrative data. The survey data will never be possible to obtain such a large sample. What's further interesting and important to realize when we think about who we look at here is that there are notable differences when we compare the people in our sample of victims to the general nonvictimized population. Victims, especially of violent crime, tend to have below average earnings and employment probabilities, but above average social benefit dependencies to start with.

**Jennifer** [00:17:59] Yeah, and that really highlights the reason that you really focus on the people who are victims at some point in your data set and just identify the effect off of the exact timing of when they were victimized because people who are never victims of crime are probably just different in a whole bunch of ways that's really hard to control for. Great. Okay, so you break the analysis up into five parts. You consider violent and property crime separately and also consider male and female crime victims separately. But then for women, you also consider the effects of domestic violence separately from other types of violent crime against women, which I think is really interesting and leads to a lot of rich discussion in the paper. So let's walk through each of these analyses in turn, starting with the effects of violent crime against men. So what do you find are the effects of violent crime against male victims during the year after they were victimized?

**Anna** [00:18:49] Let me talk you through the results for assaults as one example of violent crime. For my victims of assault, we find that earnings sharply decreased by 4.5% in the month after victimization and by 7.5% one year after victimization. These changes are always compared to the month before the victimization. If you keep in mind this sort of visual version of our results, I think that makes it more intuitive. The decreases in earnings are pretty much mirrored when we look at social benefits. The number of days with social benefit receipt increased by 3.5% one month after an assault and 2.9% one year later. Together with these labor market changes, we see a surge in health expenditure in the year of the assault by 28% relative to the mean. And this could be rationalized if you think about what an assault actually means. Right. So you can think about injuries and the treatment of injuries. One thing that is really striking about the results for assault is the timing of the immediate decrease in earnings and increase in social benefits. Such a prompt direction may be due to job losses. Right. So the share of workers on fixed term contracts or temporary work arrangements for which employment --- laws are weaker is high in our sample compared to the overall workforce in the Netherlands. This makes it a plausible explanation. In addition, we see that the immediate increase in social benefits is driven by a sharp increase in disability insurance and sickness payments. This is really in line with the surge in health expenditure and suggests that some of the drop in earnings might be due to the transition to sickness or disability benefits.

**Jennifer** [00:20:18] Okay, so next, let's talk about violent crime against female victims, which, as I said, you break up into domestic violence and other violence. So first, actually, how do you do this in practice? How can you tell in the data which crimes are what we think of as domestic violence and which aren't?

**Anna** [00:20:35] This differentiation between domestic violence and other violence against women turns out to be really important. In the data, domestic violence is not flagged or

otherwise identified by the police. So we have to construct our own measure. We use information about the offender and the fact that we can observe whether individuals live in the same household at a given point in time. We use this to classify those crimes as domestic violence that are committed either by current household member or previous household member, for example an ex-partner. What we unfortunately cannot identify with this approach is intimate partner violence and couples where the partners do not live in the same household. This is one limitation that I will come back to that point.

**Jennifer** [00:21:12] Okay, so what do you find are the effects of violent crime against female victims excluding domestic violence?

**Anna** [00:21:19] Starting with earnings, we find an immediate decrease of 3.8% one month and of 8.8% one year after an assault. It's a similar pattern for violent threat, but with different magnitudes. To be - the patterns for social benefits are really even more striking. There's a sharp increase in the number of days with social benefit receipt for victims of threat and sex offenses with 1-2% in the month after and about 5% one year after victimization.

**Anna** [00:21:49] For assault victims, there's a similar sharp change at the time of victimization with an increase in social benefit receipt by 3.7%. But here there's more to the story. While we observe this sharp change at the time of victimization, we also see a pre-trend. That is our results suggests that the number of days with social benefit receipt increased gradually already before the reported victimization for female victims of assault. Now we have two possible explanations for this pattern, which I will also come back to later again. It is possible that there were earlier victimizations that were not reported to the police but had an effect on labor market outcomes. This might particularly be the case of our classification of domestic violence really misses some cases, which instead remain in the sample of other violence against women. So these could be cases in which couples don't live at the same address. It's also possible that other life events that might happen before victimization contribute to the changes in labor market outcomes and confound our estimates. But no matter what, there's a trend break at the time of victimization. The changes in social benefit receipt following the victimization really not a simple continuation of what happened before. This is why we interpret the victimization as an escalation point and that we'll pick up on this term again throughout our discussion.

**Jennifer** [00:23:06] Okay, great. And then - so what are the effects of domestic violence against female victims for the cases where you can identify it as domestic violence?

**Anna** [00:23:14] The majority of domestic violence cases in our data are assaults. So let me focus on these for now. We split our analysis into cases in which the offender is a partner at the time of victimization and cases in which the offender is an ex-partner. When the offender is the current partner, earnings decrease by 8.9% in the month immediately after the assault. The patterns for social benefits, again, reiterate striking. There's absolutely nothing happening prior to the assault, which then is followed by an incredibly sharp increase of 23% in the month after the victimization and 42% one year later. Note that these effect sizes are way larger than for the violent offenses not classified as domestic violence. Let me also make one remark on flat pretense here because this is quite interesting. It is possible that they are partly due to the fact that welfare benefits - the driver of the social benefit results for women are means tested at the household level. It is plausible that the household breaks up when the assault is reported to the police and the woman becomes eligible for welfare benefits at this point. However, it is also possible that what we observe here are first time victimizations. When we move to cases in which the

offender is an ex-partner, the results look still similar for earnings, but quite different for social benefit receipt. Here, we see a clear pre-trend. The number of days with social benefit receipt increase prior to the reported victimization, though, there's still a distinct change in the month of this ---. When you think about these cases, which the offender's an ex-partner, it's plausible that there were early victimizations that led to the breakup of the household in the first place. The gradual increase of social benefit receipt can be a symptom of this. And tell us something about the extent of underreporting of domestic violence cases.

**Jennifer** [00:24:54] Right. And just to kind of clarify what we're thinking about with the kind of earlier victimizations that might not have been reported. I think the general sense among people who study this type of violence is that often women are victimized and we know that domestic violence is - often goes unreported to police. And so what is happening here is basically like in a lot of these cases, there's probably a lot of ongoing violence. And then at some point it's so severe that either she or maybe a neighbor or somebody actually calls the cops. That leads to some sort of real consequences. Actually, so what is - remind me what exactly the event is here - does someone have to be charged or is an arrest? How does it get classified as a crime event?

**Anna** [00:25:32] So that the crime event that we observe here is essentially the crime event that is reported to the police. When we observe an offender, and this is the suspected offender, which is a strong indication in this context for this actually being the offender. The correlation between being a registered suspect and a charge is very high.

**Jennifer** [00:25:55] Okay, so we can think of these as being maybe like equivalent 911 calls or charges for these types of crime. So tell us a little bit more about what the advantages are of breaking these types of violence against women up in this way. So what do you learn from these separate analyses of domestic violence and other violent crime?

**Anna** [00:26:12] Our main goal of breaking up these types of violence against women in the way that we do is to offer a possible explanation of the pre-trend that we see in social benefit receipt for female assault victims when we exclude domestic violence. So the idea here is that we possibly missed some domestic violence cases in our classification, for example, as partners do not live in the same household or are not reported to the police. Given the patterns that we observe, in particular when we study ex-partners as offenders, this is indeed plausible. But of course, the secondary interest lies is catching the labor market responses to domestic violence, which adds to the existing literature and also to the ongoing policy debate. The letter really has received renewed attention recently, given the surge in domestic violence, followed the COVID-19 epidemic and stay at home policies. And we think we can contribute to that by looking at the concert - or the possible consequences of domestic violence.

**Jennifer** [00:27:08] Okay, so staying on violent crime for a little bit longer, you consider a few additional factors that are relevant to understanding the cost of these crime events. First, you consider longer term effects, so the effects of victimization beyond that first year that you consider in the main analysis. So what do you find there?

**Anna** [00:27:26] So when we switch our attention to the longer term effects, we see that for both men and women, the changes in labor market outcomes are lasting. More precisely, they are still visible up to four years after victimization. For social benefits, the effects remain quite stable over the period, and for earnings the effects grow slightly. That means, on average, victims do not return to the pre-victimization earning of benefit

dependency levels. Of course, one may wonder why the effects are lasting. It's possible that it's driven by individuals who leave the labor market or lose employment, do not return for years or remain long-term dependent on social benefits once they enter specific scheme. To benchmark our results, we compare this to the literature on the effects of job displacement, which also finds a negative effect on earnings that lasts up to 12 years in Sweden and up to seven years in Norway. We also compare our findings to the literature on graduating into a recession which finds that initial earnings losses only disappear 10 years after graduation. One particular insight here is that workers at the lower end of the earnings distribution suffer from larger and more permanent losses. As individuals in our sample tend to be at the lower part of the earnings distribution that if they earn less than the average independent of victimization, they might also be at higher risk of experiencing more permanent decreases in earnings. An alternative or rather an additional explanation to what I just described is that victimization is an escalation point, a life changing event that triggers other life events.

**Jennifer** [00:28:52] And so next, you considered the possibility that victims are victimized multiple times and those subsequent crime events could be contributing to the big costs you discussed before. So how do you look into this and what do you find there?

**Anna** [00:29:06] In our main analysis, we focus on the first victimization that we observe for an individual. But of course, there could be multiple criminal events. If that was the case, and each event had a similar impact on earnings and benefit receipt, then especially the longer term effects might be a combination of effects of multiple crime events. To study this we turn this logic around. If it is true that if one removes the effect of, say, the second or third victimization, the isolated effect of the first victimization should become smaller. We approach this in different ways. We restrict our sample to those individuals who report only one victimization during the entire period. Depending on the offense and gender, this leaves us with between 74% and 88% of the victims in the respective subsamples. When we repeat our analysis with this additional sample restriction, we indeed see the same pattern of decreases in earnings and increases in benefit receipt, but with somewhat smaller effects sizes. As an alternative, we use our main samples but at a control variable for later victimization, which leads us to the same conclusions.

**Jennifer** [00:30:05] And there's evidence from other work that individuals who are victims of crime are often also criminal offenders themselves. This is one reason you want to focus on people who are victimized at some point, not people who are never victimized. And so you and Nadine consider the possibility that becoming a crime victim could coincide with being more criminally active in the future. And perhaps that contributes to the cost of crime. Of course, that could be part of the mechanism here if the victimization caused the future criminal behavior. Perhaps you'd lost income, but regardless, it's useful to separate these things if we can. So talk a little bit about what you do there. What do you look for and what do you find?

**Anna** [00:30:42] So as you already said, this part of the analysis is motivated by the notion of a victim-offender overlap or the idea that individuals involved in criminal activity might find themselves on either side of crime as an offender or a victim. Our main analysis exclude individuals who have criminal records prior to the victimization. But it is, of course, possible that people get involved in criminal activity after this crime event, and that this contributes to the negative labor market effects that we find, especially in the long run. We again approach this by restricting the sample in a different way, and we exclude all victims who obtain a criminal record at any time after the victimization. The likelihood of this happening differs a lot between our subsamples. Among victims of assault, threat, and

robbery about 10% obtain a criminal record in due course. Among victims of sex offenses, burglary, and pickpocketing this share is lower at around 5%. When we re-estimate our regressions on this newly restricted samples, we find that the effect sizes are again smaller. This is in particular the case for earnings and also for males and females. But as males constitute a larger share of offenders also in Dutch crime statistics, this might not be too surprising. The fact that the effect sizes are smaller once we abstract from a possible add on effect of criminal activity suggests that some crime victims indeed become criminally active, and this contributes to the effects seen in the longer term.

**Jennifer** [00:32:00] And then finally, you consider the possibility of various correlated shocks. So maybe someone's relationship ends or they move or they have a child. And those events coincide for some reason with becoming a crime victim. If that's the case, then when you look at just the effect of the timing of victimization that might not fully separate the effect of crime victimization from these other factors and the crime victimization itself might not be the full cause of the labor market effects you found before. So how do you consider this possibility and what do you find?

**Anna** [00:32:32] So this part of the analysis has two goals, which you already described. On the one hand, we wanted to know whether any of these correlation shocks contributes or maybe confounds the effects of crime victimization if they happen at the same time. On the other hand, we wanted to learn whether there were prior changes to the victim's life circumstances that could have changed the risk of victimization and could have affected labor market outcomes at the same time. To investigate this, we use a similar empirical approach as in our main analysis, but look at three different outcomes: whether a person moves, whether a person divorces, and whether a person has a child. So keep in mind this type of event study design and you can visualize this again by the same type of graphs where we have a time axis and then we look at changes in the respective outcome. We find for males there are no large changes in these outcomes and it is unlikely that they confound or contribute to our estimated effect of victimization on labor market outcomes.

**Anna** [00:33:26] For females, the differentiation between domestic violence and other violence is again important. For domestic violence victims, the likelihood of moving and having a divorce increases before victimization. It peaks in the month after victimization at 4.7 percentage points and 1.4 percentage points respectively. Compared to monthly divorce rate of 0.14% percent, this increase is really sizable, to say the least. For female victims of other violence, we also observe increases in the likelihood of moving and having a divorce, which is in line with the idea that some domestic violence cases are not classified as such. But again, the magnitudes are very moderate in comparison. What we take away from this type of analysis is that for domestic violence, there are adverse events preceding and also following the victimization. But for other violence against women and violence against men, these events are unlikely to confound estimated effects.

**Jennifer** [00:34:20] It also tells us something about what is likely to lead to you becoming a crime victim. Right? It's just like the reasons that men are victimized are just so different from from the reasons that women are often victimized, especially in these violent cases. And it would feel like we could go down a whole rabbit hole of how women wind up leaving a relationship and then their partner might become violent as a result.

**Jennifer** [00:34:40] Okay, so now let's turn to your property crime results, again for male and female crime victims separately. So, as you noted before, the Netherlands defines property crimes a bit differently than some other countries, so crimes like robbery that include violence are labeled as property crimes here. So folks should keep that in mind. So

what do you find are the effects of property crime on earnings, benefits, and health expenditures?

**Anna** [00:35:03] Right. So we find that male victims of burglary experience a decrease in earnings by 4.3% one year after the event, but no statistically significant change in benefit receipt. We do see a small increase in the likelihood of moving in the month of and after victimization, which suggests that moving to a new place would potentially lead to different commuting patterns or even a new job contributes to the decline in earnings. As there are not as many robbery victims as victims of other offenses, our estimates in that case are somewhat less precise and less significant in statistical terms. Nonetheless, we can observe a sharp decrease in earnings of 8.4% in the month just after victimization and similarly an increase in social benefit receipt by 2.7%. Interestingly, the increase in social benefit receipt is driven by sickness and disability benefits and coincides with an increase in health expenditure by 18% in the year of the robbery. In turn, this is largely driven by mental health expenditure. The patterns for females are qualitatively quite similar, except that we do find an increase in mental health expenditure by 50% following a burglary. Finally, we do not find any changes in labor market outcomes for pickpocketing victims. This is in line with what we expect. The offense unlikely to be severe enough to trigger any of the mechanisms that lead to worsening of business labor market situation, of which I described earlier.

**Jennifer** [00:36:20] So what are the main takeaways for you from all of these analyses? What do we learn about the effects of being a crime victim and how it varies with the type of crime?

**Anna** [00:36:29] So our results show the crime victimization leads to significant losses and earnings decreases within the first year after victimization of up to 10.4% for violent crime and up to 7.4% for domestic violence. It also leads to increases in benefit dependency of up to 6% for violent crime and 41.7% for domestic violence within the first year after victimization. With the exception of robbery, the effect sizes are somewhat smaller for property crime. But we do find evidence that also property crimes can affect labor market outcomes. These effects persist over at least four years, and our results suggest that additional victimizations, criminal involvement, and to some extent, also other life events may contribute to these effects. The extent to which this is the case also depends on the gender of the victim. And this relates to what you mentioned earlier, Jen, that also the determinants of victimization or the changes in risk of victimization might be very different for men and women. For us, the important takeaway of our study is that a crime victimization can be a life changing event that leads to an escalation point in a victim's life and potentially triggers a number of adverse outcomes and behaviors.

**Jennifer** [00:37:36] So that is your paper. Is there any other recent research about the cost of crime victimization that's come out since you first started working on this project?

**Anna** [00:37:47] So this is a young, but I think very quickly evolving field of research, and I expect a number of studies to come out over the next couple of years. I know of groups working on some of the topics, and I'm very much looking forward to seeing their studies and the results. One important study in this line of research that came out recently is a paper by Janet Currie, Michael Smith, and Maya Rossin-Slater, which is forthcoming in the Review of Economics and Statistics, and also features on this podcast in an earlier episode. In this paper, the authors estimate the adverse impact of violent assaults during pregnancy on newborn children. This is in some ways complementary evidence to our

study of victimization focused on the adverse effects of birth outcomes of which we know that they have long term consequences.

**Jennifer** [00:38:27] Yeah, and we will post a link to that interview with Maya Rossin-Slater about that paper in the share notes as well. So what should policymakers take away from the literature on this topic, including your study, of course? What are the most important policy implications here?

**Anna** [00:38:45] And so I think that there are a number of important policy implications. First, the literature on this topic speaks towards the ongoing debate concerning the cost of crime. Providing causal estimates of the effects of crime victimization is crucial for any evidence based approach to policymaking and in particular for evaluation of successful crime deterrent strategies. Second, I think that the results speak to the question of how crime victims should be compensated. Should earning losses be taken into account? Of course, this depends on the policy aim, but one may also think about types of support other than monetary compensation, maybe programs that support victims in the labor market or in their personal lives to deal with the trauma caused by the crime event. But it's important to keep in mind here, though, is that our results are based in one country, the Netherlands. And so the Netherlands has quite generous welfare system in international comparisons, both in terms of health insurance and social benefits. And for me, it's not clear how the effects would look like in another country with less generous support systems, maybe more inequality or different access to health care. I think that there's definitely a need for more empirical evidence here from different contexts to come to robust policy conclusions and to understand these interdependencies.

**Jennifer** [00:39:54] Yeah, it is really interesting to think about the role of those social benefits, and especially as you mentioned earlier, as we all think about the implications and consequences of the rise of domestic violence during covid, it sounds like mental health care in particular was a big factor in a lot of the health expenditures that you were finding. And I would love to see numbers using similar sorts of events in the US context because I suspect people just have much less access to that kind of care here and that surely harms those victims. Right. I mean, it's beyond the scope of your study to see, you know, what are the effects of having access to these different benefits or not. So add that to the list of future research. But yeah, I mean, just the fact that people were even accessing those benefits when they were, you know, the victim of burglary, for instance, I think is a really important indicator that they found it valuable, right?

**Anna** [00:40:48] Yes, I agree. And I also agree. I would love to see a study like that in the US context or to other European contexts. I think that would be very valuable. So, again, our study is situated in the Netherlands, and we could learn a lot from our results about this context. And it would be super interesting to see how that compares to other contexts.

**Jennifer** [00:41:09] Yeah. So speaking of this, what's the research frontier here? What are the next big questions in this area that you and others are going to be thinking about in the years ahead?

**Anna** [00:41:18] Right. So I think there are a number of big questions here that will be very relevant going forward. I already described this in the last point. It will be very interesting to understand how contextual the effects of crime victimization are. And thinking about this at the micro level due to differences across countries, but also at the micro level with differences in personal situations and support networks, maybe due to family networks or friendships. There's also a lot to be learned about the victim-offender overlap that is the

connection between criminal behavior and victimization. Finally, once we understand the causal effects of crime victimization on economic and social outcomes, I really expect the research frontier to shift towards a more in-depth analysis of the mechanisms through which these effects materialize. Of course, this will require even richer and better data, even better than we have access to right now. But hopefully in the future this will be made available to researchers.

**Jennifer** [00:42:10] We always want better data.

**Jennifer** [00:42:13] My guest today has been Anna Bindler from the University of Cologne. Anna, thanks so much for talking with me.

**Anna** [00:42:18] Thank you so much for having me.

**Jennifer** [00:42:26] You can find links to all the research we discussed today on our website, [probablecausation.com](http://probablecausation.com). You can also subscribe to the show there or wherever you get your podcasts to make sure you don't miss a single episode. Big thanks to Emergent Ventures for supporting the show. And thanks also to our Patreon subscribers. This show is listener supported. So if you enjoy the podcast, then please consider contributing via Patreon. You can find a link on our website. Our sound engineer is Jon Keur with production assistance from Haley Grieshaber. Our music is by Werner and our logo was designed by Carrie Throckmorton. Thanks for listening and I'll talk to you in two weeks.