The Effects of Social Movements: Evidence from #MeToo

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Abstract

Social movements are associated with large changes in norms and behavior, but evidence on their causal effects is limited. We study the effect of the MeToo movement on a high stakes personal decision—reporting a sexual crime to the police. We construct a new dataset of sexual and non-sexual crimes in 30 OECD countries, covering 88 percent of the OECD population. We analyze the effect of the MeToo movement by employing a triple difference strategy over time, across countries, and between crime types. We find that the movement increased reporting of sexual crimes by 13 percent during its first six months. While the effect slightly declines over time, the movement had a strong effect even 15 months after it started. We use more detailed US data to show that despite the increase in crimes reported, the movement did not increase the number of arrests in the short-run. In contrast to a common criticism of the movement, we do not find evidence for large differences in the effect across racial and socioeconomic groups. Our results suggest that social movements can rapidly change high stakes personal decisions.

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1 Introduction

Societal changes are often associated with social movements advocating for changes in norms and behaviors. For example, the increase in women's labor force participation, the shift in attitudes towards LGBTQ individuals, and the increased concern for the environment all happened in conjunction with social movements advocating for these changes. Despite the importance of these changes and the common perception that social movements took part in bringing them about, it is difficult to establish if these movements are the drivers of change or if they are caused by changing norms. In this paper, we focus on the MeToo movement and estimate its effect on reporting sexual crime to the police.

We study the effects of the MeToo movement, which started on October 15, 2017, and was exceptionally effective in rapidly increasing awareness around sexual misconduct in many countries. Since the movement did not lead to major immediate changes in laws or government institutions, we can attribute the effects of the movement on behavior to changes in social norms. We focus on the effect on reporting sexual crimes to the police since underreporting of sexual crimes is a major social problem directly related to the goal of the MeToo movement—sharing one's story and breaking the stigma surrounding being a victim of sexual misconduct. In addition, reporting a sexual crime is a high stakes decision as it can come with substantial costs in terms of the victim's time, social stigma, the negative experience of reliving the trauma, and a risk of reprisals. Hence, using the number of crimes reported to the police as the outcome variable is setting a high standard for the types of behaviors that the MeToo movement might have changed.

We construct a data set on the number of crimes reported to the police by quarter in 30 OECD countries, covering 88% of the OECD population. We identify the effect of the MeToo movement using a triple difference strategy comparing countries with weak and strong MeToo movements, sexual and non-sexual crimes, and the pre and post periods. We find that the MeToo movement increased the number of reported crimes by 13% during the first six months of the movement.[1] While countries with strong MeToo movements are different from countries with weak movements, we show that the two sets of countries have similar pre-trends for the difference between sexual crime and non-sexual crime. Furthermore, we confirm the reliability of the result by performing placebo tests where we estimate the effects of fictional MeToo movements set in each of the six month periods from Q2 2010 to Q3 2017. The placebo tests show that our empirical strategy neither over rejects the null hypothesis nor frequently

[1]The exact estimate of the effect is 13 log points, which is equal to a 14% increase. For simplicity, we describe the effects in log points as percentage changes throughout the paper, although this slightly understates the magnitude of the results.

estimate effects of the magnitude that we find. To the best of our knowledge, this is the first rigorous evidence on the effects of the MeToo movement on reported sexual crimes.[2]

To measure the persistence of the effects, we focus on the countries with an initially strong MeToo movement and use a difference-in-difference strategy comparing sexual crime with all other crimes over time.[3] We find that among these countries, the effect of the movement declines from approximately 16% in the first quarter after the movement started to 10-15% in subsequent quarters. While the movement had its largest effect in the quarter immediately after it started, the results indicate that the change in norms caused by the movement is persistent, and that the movement still had a strong effect on behavior 15 months after it started.

The international data allows for the strongest identification strategy, but it lacks details on the crimes reported. To better understand the mechanisms underlying the effect of the MeToo movement, we use detailed incident-level data from the US at both the national and city level. The national data is collected from the FBI National Incident-Based Reporting System (NIBRS) and covers approximately 30% of the US population. The city data, which includes additional covariates and covers more crime categories, is collected from seven large US cities. Since the US lacks substantial geographic heterogeneity in the strength of the MeToo movement, we employ a difference-in-difference strategy comparing sexual crimes to all other crimes over time.

We find that the MeToo movement increased the number of sexual assaults reported in the US by 8% in the first six months after the movement started. A strong effect is also found in the city-level sample and is robust to employing the matrix completion method (Athey et al., 2017), which uses more flexible patterns in the data to create a counterfactual for the number of sexual crimes reported had there been no MeToo movement.

We present four main findings based on the US data. First, by focusing on crimes that were committed before the start of the MeToo movement, while still including crimes reported after the start of the movement, we show that an increase in the incidence of sexual crimes cannot explain the effect we find and therefore we attribute the effect of the movement to an increase in the propensity to report crime. Second, the movement had a larger effect on crimes that were reported at least a month after they occurred. However, the effect on crimes which were immediately reported is also strong and statistically significant, implying that even if part of the effect of the movement is due to the reporting of a stock

[2]Rotenberg and Cotter (2018) present descriptive statistics showing that sexual crimes reported increased in Canada after the MeToo movement started.

[3]We use this strategy instead of our main triple difference specification since the MeToo movement became more prominent over time in several of the countries where it was initially weak.

of old crimes, the movement also increased reporting of the flow of new crimes. Third, we do not find evidence for the claim, commonly made in media reports, that the MeToo movement mainly affected white women of high socioeconomic status. Fourth, we show that compared to the effect the movement had on the number of sexual crime cases reported, it had a disproportionately small effect on the number of arrests made in these cases, resulting in a decline in the rate at which reported crimes lead to arrests.

The results are related to three different streams of literature. First, we contribute to a long debate among social scientists on whether social movements have any political influence (Burstein and Sausner, 2005). In a review of the topic, Amenta et al. (2010) state that "The disagreement on this basic issue is wide. Some ... hold that social movements are generally effective and account for most important political change. Others ... argue that social movements are rarely influential." Papers in this field often document a correlation between a movement's activity and an outcome, such as congressional attention (e.g., Baumgartner and Mahoney, 2005), but do not necessarily identify causal effects. A smaller literature focuses on the causal effects of political protest, a specific tactic often employed by social movements. This literature has shown that protests can mobilize people and change voting behaviors, but that violent protest may also cause a political backlash leading to less political support and subsequent electoral defeat (Madestam et al., 2013; Wasow, 2017).[4] We bridge these literatures by identifying the causal effect of an important social movement. An additional contribution of our paper is that we do not focus on political outcomes, which are typically studied, but rather show how a social movement can affect costly *personal* decisions. Studying the effects of social movements on such decisions is important since many social movements focus on changing norms and individual behavior and not only official policy. Personal decisions also often have large externalities (e.g., more equal sharing of non-market labor between men and women) and carry high stakes for the individual, which may make them more difficult to change than voting decisions, for example.

A second contribution to the literature is showing how norms can rapidly change. It is well established that social norms, and especially gender norms, have strong effects on behavior (e.g., Alesina et al., 2013; Bertrand et al., 2015; Charles et al., 2018). However, there is still limited understanding of how social norms change. Several studies have shown how popular culture can affect norms and behavior (e.g., Banerjee et al., 2019; Chong and Ferrara, 2009; Jensen and Oster, 2009; La Ferrara et al., 2012). There are also well-documented examples of how deceptive practices can lower trust towards certain institutions and change behavior (Alsan and Wanamaker, 2017; Martinez-Bravo and Stegmann, 2018). A recent

[4] Acemoglu et al. (2017) also show that street protests, but not twitter protests, can reduce the valuation of politically connected firms and may serve as a check on political rent-seeking.

literature based on theory, as well as information interventions, shows how multiple equilibria of social norms can exist when individuals do not express their personal beliefs publicly, and that social norms can "unravel" quickly when individuals start expressing those beliefs (Bursztyn et al., 2017, 2018; Cheng and Hsiaw, 2019; Sunstein, 2019). We contribute to this literature by demonstrating in an important real-world setting that norms can shift quickly and change important behaviors as awareness to a social issue rises.

This paper also contributes to the literature on reporting gender-based violence by showing that awareness-raising campaigns can have a large effect on the reporting of sexual crimes. Previous studies have shown that a high profile rape and murder case increased reporting of sexual crimes in India (Bhatnagar et al., 2019; McDougal et al., 2018) potentially due to changes in police administration, that an information treatment targeting social norms increased the reporting of violence towards women (Green et al., 2019), and that the election of female politicians increased the reporting of crimes towards women (Iyer et al., 2012). Public campaigns increasing awareness is a common strategy to increase reporting.[5] However, there is limited evidence on the effects of awareness-raising campaigns. The MeToo movement can be seen as a particularly successful awareness-raising campaign, and our results show that such campaigns can be effective in increasing the reporting of sexual crimes.

The rest of the paper is organized as follows. Section 2 describes the underreporting of sexual crime and the MeToo movement in more detail. Section 3 describes the international data, our identification strategy, and provides evidence for the effect of the movement. Section 4 describes the US data and provides results on mechanisms as well as heterogeneity in the effect of the movement. Section 5 interprets the overall results, and Section 6 concludes.

2 Background: Underreporting of Sexual Misconduct and the MeToo Movement

2.1 Reporting of sexual misconduct

Underreporting of sexual misconduct is a serious problem. In the US, only 33% of sexual crime victims stated that the crime had come to the knowledge of the police, compared to 46% of victims of other violent crimes.[6] Underreporting decreases social welfare since it reduces the probability that perpetrators

[5] For example, the largest US-based anti-sexual violence organization RAINN spends 27% of its budget on educating the public.

[6] Authors' calculations using 2011-2017 National Crime Victimization Survey microdata.

are held accountable. Thus it may increase the incidence of sexual misconduct because repeat offenders are not prevented from committing additional crimes, and future offenders are not deterred. Indeed, Green et al. (2019) and Iyer et al. (2012) provide suggestive evidence showing that increases in reporting reduce the incidence of gender-based violence.

Reporting a sexual crime to the police is a high stakes decision for the victim. The process of reporting the crime and attending hearings with detectives and prosecutors have monetary costs such as lost income, childcare, and travel costs (Morabito et al., 2019). Moreover, reporting a sexual crime forces the victim to relive the experience by giving detailed accounts of what happened at several points in the investigation process. Reporting is especially hurtful for victims who experience that their account of the event is not believed by law enforcement officials(Spohn and Tellis, 2012). Furthermore, reporting a crime may lead to reprisals by the offender or the community shared by the victim and the offender. According to National Crime Victimization Survey Data, 17% of sexual crime victims who did not report the crime to the police cite fear of reprisals as a reason for not reporting the crime, while the same figure for victims of other violent crimes is 7%.

In this paper, we focus on reporting sexual crimes to the police. However, the MeToo movement also highlighted cases of sexual misconduct which do not constitute a criminal offense such as cases of workplace sexual harassment, but still have negative welfare consequences (Hersch, 2011). Furthermore, a victim has a range of possible actions to take in response to sexual misconduct. Reporting to the police is probably one of the actions with the greatest consequences. It is therefore likely that if reports to the police increased, many other behaviors changed as well. Indeed, there have been anecdotal reports of an increase in the number of calls to helpline centers following the MeToo movement.[7] Therefore, the effects we find on reporting crime to the police are probably a subset of the overall behavioral effects of the movement.

2.2 The MeToo movement

The MeToo movement went viral on October 15, 2017, after the Harvey Weinstein sexual misconduct allegations, when a tweet by Alyssa Milano encouraged people who had been sexually harassed or assaulted to write "Me too" on social media.[8] The movement uncovered a large number of sexual misconduct cases, and within a year more than 200 high profile men had been ousted from their positions

[7] Chiwaya, Nigel - New data on #MeToo's first year shows 'undeniable' impact. NBC News. Oct 11, 2018. Online: https://www.nbcnews.com/news/us-news/new-data-metoo-s-first-year-shows-undeniable-impact-n918821

[8] The phrase "Me Too" was first used by Tarana Burke in 2006, but widespread usage only started after October 15, 2017.

in the US alone.[9]

The MeToo movement provides a setting particularly well suited to the study of the effects of social movements on behavior for four reasons. First, the movement was very effective in drawing attention to sexual harassment and sexual misconduct. While the movement started in the US, its effect quickly spread to other countries. Figure 1 shows that in the OECD, mean Google search interest for MeToo and for sexual misconduct (sexual harassment and sexual assault) increased substantially immediately after the start of the MeToo movement. In the 15 months after the movement started, mean search interest in the entire OECD for sexual harassment and sexual assault was 99% higher than in the period from January 2010 to September 2017. In the US, approximately eight months after the movement started, 65% of social media users stated that some or a great deal of the content they seen in social media is about sexual harassment or assault.[10] Furthermore, people who do not use social media were also likely to encounter the movement. Appendix Figure A.1 shows that among four major US newspapers, coverage related to sexual assault and sexual harassment increased substantially after the movement started and remained much higher than average coverage before the movement started for at least nine months.

Second, there was large variation in the strength of the movement between countries, as shown in Figure 2. The OECD country in the 75th percentile in terms of MeToo search interest had a 651% larger interest in the MeToo movement in October 2017, compared to the country in the 25th percentile. This allows us to identify the causal effect of the MeToo movement by comparing changes across countries. Third, one of the main objectives of the MeToo movement, increasing reporting of sexual misconduct, is an outcome for which there is high-quality administrative data across many countries.

Fourth, while the MeToo movement had a big impact on the public discourse, it did not result in immediate widespread changes to laws or government institutions, allowing us to attribute the effect we find to changes in social norms. A report by the International Lawyers Network (2019) shows that among the 11 OECD countries covered by the report, the US was the only country that made changes to laws governing sexual misconduct between the start of the MeToo movement and the end of 2018.[11] This is not surprising given that passing legislation is a lengthy process, often taking more than a year. Even the earliest legislative changes in the US took effect in the second quarter of 2018 and therefore could not have directly influenced reporting in the short run.[12] Furthermore, we have not found substantial

[9]The New York Times - #MeToo Brought Down 201 Powerful Men. Nearly Half of Their Replacements Are Women. October 23, 2018. Available online: https://www.nytimes.com/interactive/2018/10/23/us/metoo-replacements.html

[10]Pew Research Center American Trends Panel Wave 35.

[11]To the best of our knowledge only one more country in our data, Sweden, changed laws with respect to sexual crimes between October 2017 and the end of 2018. In Sweden the change took effect in the third quarter of 2018.

[12]An analysis of US laws conducted by USA Today one year after the start of the MeToo movement found that Congress

evidence of funding increases for the work against sexual crimes right after the start of the MeToo movement.[13] We can, therefore, attribute the short-run effect we find to changes in social norms, where norms are broadly defined to include the norms of victims, firms and government employees, such as police officers, but exclude any changes to laws or government policy.

While the MeToo movement was very successful in raising awareness, it is by no means unique. In recent years, several social movements such as Black Lives Matter and March for Our Lives, have had similar success in raising awareness about their causes (Pew Research Center, 2018). Social media has enabled new social movements to raise awareness at a larger scale, within shorter time spans, and with almost no organizing structure.[14] However, little is known about the effects of these modern social movements that are often disconnected from party politics and do not use traditional organizing techniques such as strikes or publishing lists of demands.

3 Identifying the Effect of the Movement: Analysis of International Data

3.1 Data

3.1.1 Outcome: reported crimes

We build a data set with quarterly data on the number of crimes reported in 30 OECD countries representing 88% of the OECD population.[15] We include in our sample countries that have quarterly, or more frequent, data available, disaggregated by sexual crimes and non-sexual crimes. We collect data available from the start of 2010 until the end of 2018 and manually classify offense categories as sexual crimes or non-sexual crimes for each country. We define sexual crimes as all forms of sexual assault and sexual harassment and define non-sexual crimes as all other crime. When possible, we exclude crimes of sexual nature that were not the focus of the MeToo movement, such as incest, human trafficking, and pornography. For more details on crime classification and OECD data collection, see Appendixes A.1

passed no laws related to sexual harassment in the workplace since the movement started. While there was a slight uptick in state laws related to sexual misconduct, they were mostly limited in scope. Kelly, Cara, and Hegarty, Aaron - #MeToo was a culture shock. But changing laws will take more than a year. USA Today. October 4, 2018.

[13] We have collected budget data for the police units specializing in sexual crime from two (Seattle and Kansas City) out of the seven US police departments for which we conduct detailed analysis on reported crime. We have also collected data on the total amounts of grants given by The United States Office on Violence Against Women (OVW). The data ranges from 2014 to 2018. The first year that the MeToo movement could have affected the budgets and amount of grants given was in 2018, the average increase in 2018 was 3.7% (3.8% for the police departments and 3.5% for OVW). This can be compared to an 2.6% average increase in in the years before 2017 and a 2.6% average increase in the total police department budgets between 2017 and 2018.

[14] Enikolopov et al. 2019 show how social media facilitated protests in Russia. There is also a literature on how different technologies enables the diffusion of social movements (e.g., Christensen and Garfias, 2018; García-Jimeno et al., 2018).

[15] See Table A.4 for a list of the countries and data sources.

and A.2, respectively.

3.1.2 Strength of the MeToo movement

We use monthly Google Trends data on search behavior from 2010-2018 to create a proxy for the strength of the MeToo movement in each OECD country.[16] The primary measure is based on the proportion of total Google searches for the "topic" of the MeToo movement. Google defines a search for a topic as any search query including a phrase directly linked to the topic in any language. Figure 1a shows the search interest in the topic of MeToo over time for the entire OECD. Figure 1b shows the interest in the topics of sexual harassment and sexual assault, which we use as an alternative measure for the strength of the movement. The figure demonstrates that the movement had a large effect on interest in sexual misconduct. Appendix A.3 provides more details on how the Google Trends data was processed.

We define *immediate interest* as the interest in the MeToo movement during October 2017, the month the MeToo movement started. In our main specification, we categorize a country as having a *strong* MeToo movement if the immediate interest is above the OECD median and a *weak* MeToo movement if the immediate interest is below the OECD median. Figure 2 shows the immediate interest for each OECD country, highlighting the countries for which we have crime data and indicating which of these countries we classify as having strong and weak MeToo movements. Appendix Figure A.2 confirms the validity of our primary measure for the strength of the MeToo movement by comparing it with survey data on the fraction of the population who has heard of the MeToo movement (YouGov, 2019). Even though the survey took place in February-March 2019 and our measure is based on data from October 2017, there is a strong correlation of 0.69 between the two measures.

3.2 Empirical strategy

Our main empirical strategy to measure the causal effect of the MeToo movement on sexual crime reported to the police is a triple difference strategy where we use the difference over time, across countries, and between sexual crimes and non-sexual crimes:

$$y_{itc} = \beta_1 Post_t \times StrongMeToo_c \times SexCrime_i + \beta_2 Post_t \times SexCrime_i + \beta_3 Post_t \times StrongMeToo_c + \quad (1)$$
$$\beta_4 Post_t + \beta_{5,ic} Trend_t + \gamma_{i,c,q(t)} + \varepsilon_{itc}$$

[16] Caputi et al. (2019) show that the MeToo movement affected Google search interest in the US.

- y_{itc} is the natural logarithm of the number of reported crimes of type i, in quarter t, in country c
- $Post_t$ is an indicator for the fourth quarter of 2017 (when the MeToo movement started) and later quarters
- $StrongMeToo_c$ in an indicator for whether country c had a strong MeToo movement
- $\beta_{5,ic}Trend_t$ controls for differential linear time trends by the full interaction of country and crime category
- $\gamma_{i,c,q(t)}$ controls for the full interaction of country, calendar quarter and crime category fixed effects

The regression is unweighted and uses standard errors that are clustered at the country by crime category level.[17] Our identifying assumption is that without the MeToo movement, the difference between sexual crimes and non-sexual crimes would have changed in the same way from the pre to the post-period (after controlling for crime and country-specific seasonality and for differential linear time trends) in the countries with strong and weak MeToo movements. For an omitted variable to explain the results we find, it would have to have a non-linear change after October 2017, to affect the number of reported sexual crimes more than it affects reported non-sexual crimes, and to disproportionately affect countries where the MeToo movement was strong, as compared to countries where it was weak. While the strength of the MeToo movement is not random, we have no reason to believe it is correlated with an omitted variable affecting sexual crimes differentially in the post period.

3.2.1 Time frame of analysis

In this section, we focus on the effects of the MeToo movement in the short-run, defined as the first six months of the MeToo movement. In Section 5.1, we test if the effect is persistent over time. There are two main reasons for separating out the short-run effects. First, the first six months is the time period when there exists a substantial difference in interest between countries with a strong movement and countries with a weak movement. Therefore, this is the only period in which we can employ our triple difference empirical strategy. Appendix Figure A.3 shows the convergence of interest over time between the countries that we classify as having strong and weak MeToo movements. Second, during the initial six month period there were, to the best of our knowledge, no changes to laws governing sexual crimes

[17] Since the variation in the MeToo movement occurs at the country by crime type level we choose to cluster our standard errors at that level. Standard errors clustered at the country level are very similar to the standard errors clustered at the country by crime level.

in any of the countries in our sample. After the initial six month period some laws with respect to sexual crime changed in at least two countries, probably as a result of the MeToo movement. Therefore, in the first six months we are able to interpret the effect as being driven by a change in social norms.

3.3 Results

Table 1 shows that the MeToo movement caused an increase in sexual crimes reported in our sample of 30 OECD countries. Column (1) uses data only on sexual crimes to show a simple difference-in-difference estimator over time and between countries with strong and weak MeToo movements. Column (2) uses all 30 countries and shows a difference-in-difference over time and between sexual and non-sexual crime. While the two columns use different sources of variation, they both find statistically significant effects of 9-14%. Column (3) estimates the effect from Column (2) separately for countries with strong and weak MeToo movements. The effect on the entire sample is driven by the countries that had a strong MeToo movement. These countries had an effect of 16%,, while the effect was only 3% among countries with weak MeToo movements. Finally, Column (4) shows the results from our main triple difference specification described in Equation 1. Here the coefficient of interest is that on $Post_t \times StrongMeToo_c \times SexCrime_i$ and we find a statistically significant effect of 13%.

In Columns (3) and (4) of Table 1, the coefficient on $Post_t \times StrongMeToo_c$ can be interpreted as a difference-in-difference estimate of the effect of the MeToo movement on non-sexual crimes, using variation between countries and time. Since we do not expect the MeToo movement to affect the number of non-sexual crime reported, this coefficient can be used as a placebo test. We estimate the coefficient to be close to zero, which confirms that our estimate of the MeToo movement's effect is not influenced by differential trends in non-sexual crime reporting between countries with weak and strong movements.

To illustrate the difference estimator, we present the raw data visually in Figure 3. Sub-figure 3a shows the number of sexual crimes reported, indexed to be 100 in the third quarter of 2017, and averaged across the countries with strong and weak MeToo movements. To make the average numbers comparable over time, we have shortened the data series to the years 2013-2017 and excluded four countries for which we only have data for shorter time periods. The strong and weak MeToo movements have similar pre-trends. Even in this relatively short time span, a clear seasonality is observed, where the fourth quarter of each year tends to see a decrease in the number of sexual crimes reported. This is true for both strong and weak MeToo movement countries until the fourth quarter of 2017 when the strong MeToo movement countries experience an increase in the number of reported sexual crime while the

weak MeToo movement countries experience the typical decline. In the first quarter of 2018 the number of reported sexual crimes in countries with strong and weak MeToo movements continue to diverge.

Sub-figure 3b shows that this differential increase in reported crimes for the countries with strong MeToo movements did not happen for non-sexual crimes. The figure also shows that the strong and weak MeToo movement countries may have somewhat different pre trends for non-sexual crimes. In our main specification, we control for linear time trends, and hence, these differential trends do not drive the effects as measured in Table 1. Furthermore, Sub-figure 3c shows that in the difference between the sexual and non-sexual crime indexes displayed in Sub-figures 3a and 3b, there are no differential pre-trends, while there is a substantial divergence between countries with strong and weak MeToo movements after the start of the MeToo movement.

Using a continuous estimate of the strength of the MeToo movement it is possible to estimate the effect of an increase in MeToo movement strength on the number of sexual crimes reported to the police. Replacing the $StrongMeToo_c$ term in Equation 1 with the inverse hyperbolic sine transformation (IHS) of the immediate search interest in the MeToo movement provides an estimate of the effect of an IHS point increase on the log of reported sexual crimes.[18] Since Google searches for the MeToo topic is a noisy proxy for the underlying interest in the MeToo movement, this estimate probably suffers from attenuation bias. One advantage is that the estimate has an economic interpretation akin to the elasticity of crimes reported to the national interest in the MeToo movement. This regression yields an estimate of 0.05 that can be interpreted as a 10% increase in MeToo movement interest resulting in a 0.5% increase in reported sexual crimes. However, this estimate is imprecise and not statistically significant.

3.4 Placebo tests

We conduct a set of placebo tests to further assure that MeToo movement is driving our result and not some other mechanism, such as non-linear differential trends between countries with strong MeToo movements compared to those with weak movements. Figure 4 presents placebo tests setting the start of the MeToo movement in every second quarter from Q2 2010 to Q4 2017 and then measuring the effect over a six month period.[19] We estimate the effect of these placebo MeToo movements using the

[18] We use the IHS transformation instead of the natural logarithm since for one country the measured interest is negative, but very close to zero.

[19] We set the start date in every second period to avoid having two adjacent estimates using overlapping data and thereby introducing a mechanical autocorrelation. When estimating the placebo effect for every quarter we still find that no placebo test has a statistically significant effect and that the actual effect of the MeToo movement has a larger absolute coefficient than any of the 31 placebo tests.

triple difference specification from Equation 1, just as we do in our main specification in Column (4) of Table 1. Out of the 15 placebo tests, none is significantly significant at the 5% level. If our specification over-rejected the null hypothesis, we would have expected to see more placebo tests rejecting the null hypothesis. The actual effect of the MeToo movement (Q4 of 2017) has a larger absolute coefficient than any of the 15 placebo tests.

3.5 Using different MeToo start dates

The MeToo movement spread to some countries gradually. In our main estimation, we estimate the strength of the movement based only on data from October 2017 to mitigate reverse causality concerns. In this section, we exploit the variation in the start dates of the movement to estimate the effect of the movement using the following regression:

$$y_{itc} = \beta_1 MeToo_{ct} \times SexCrime_i + \beta_2 MeToo_{ct} + \beta_{3,ic} Trend_t + \gamma_{i,c,q(t)} + \varepsilon_{itc} \quad (2)$$

where $MeToo_{ct}$ takes a value of one if the MeToo movement in country c started before or in the first month of quarter t and $MeToo_{ct}$ equals one-third or two-thirds if the movement started in the second or third month of quarter t, respectively. The other terms of the equation are defined in the same way as in Equation 1.

We use two different strategies for estimating the start of the MeToo movement in each country. First, we define the start of the movement as the first month when google search interest in the MeToo topic was higher than the OECD median in October 2017. Under this classification all the countries that were classified as having had strong MeToo movements in the analysis in Section 3.3 have MeToo movements starting in October 2017 but additional countries have MeToo movements starting after October 2017. Our second criteria is based on search interest for the sexual harassment and sexual assault topics. We classify the start of a MeToo movement as a month, in or after October 2017, that had the highest search interest for the sexual harassment and sexual assault topics since 2010. Appendix Table A.5 shows the start dates of the MeToo movement for each country according to both criteria.

Note that both these specifications have potential reverse causality problems since an increase in sexual crimes reported to the police could affect searches for the topics of the MeToo movement, sexual harassment, and sexual assault. Due to this problem we see this analysis as supplemental to our main analysis.

Table 2 shows the results of our analysis using different start dates of the MeToo movement. Columns (1) and (2) use the start date based on searches for the MeToo topic and Columns (3) and (4) use the start date based on sexual harassment and sexual assault topic searches. Column (1) reports an overall effect of the MeToo movement of 12%, statistically significant at the 1% level. Column (2) splits these estimates by the number of quarters since the start of the MeToo movement and shows that the effect is stable over time with all of the point estimates for each of the quarters since the start of the MeToo movement being between 9% and 13%.[20] The results of Column (3)-(4) are slightly smaller but qualitatively similar.

3.6 Robustness checks

Table 3 shows the robustness of our main triple difference estimate. Each row shows the estimate of a regression similar to that in Equation 1. Row (1) repeats the result from Column (4) of Table 1. Row (2) shows the effect of the MeToo movement during its first quarter by restricting the sample to end in Q4 2017. The effect is 10% which is similar in magnitude to our main estimate but the standard error is larger and the estimate is no longer statistically significant. Row (3) shows the effect of the MeToo movement during the first three quarters of the movement. The effect is 12% and statistically significant.

Rows (4)-(6) shows the robustness with respect to the measure of the strength of the MeToo movement. Row (4) uses Google searches for the MeToo topic during the period from October 2017 to March 2018, the same period for which we measure the number of reported crimes for. The estimate is 13% and is statistically significant. Row (5) uses the sum of the Google search interest in the topics of sexual assault and sexual harassment. Since there was a meaningful interest in these topics even before the start of the MeToo movement we use the increase in search interest at the start of the MeToo movement, after controlling for linear trends and monthly fixed effects in each country separately. Focusing on these increases avoid including pre MeToo levels of interest, linear trends or seasonality, since these factors are not indicative of the strength of the MeToo movement. Using this measure of MeToo strength the effect is estimated to 6% and not statistically significant. Row (6) uses a survey measure of the percentage of the population who had heard of the MeToo movement in February-March 2019 (YouGov, 2019). The survey was only conducted in 12 of the countries for which we have data on reported crimes and hence this analysis is done using only these 12 countries. This analysis yields a point estimate of 10% but due to the reduced sample size it is less precisely estimated than our main estimate and not

[20] In Columns (2) and (4) the dummy variables take the value of either one or zero, regardless of when in a quarter the MeToo movement started.

statistically significant.

Row (7) shows the result of a regression weighted by the population of each country.[21] Using these weights changes the interpretation of the estimate from the average effect of the MeToo movement on the number of sexual crimes reported in countries that had a strong MeToo movement to the average effect of the MeToo movement on the population in the countries that had strong MeToo movements. This effect is estimated to be 11% and is more precisely estimated than our main estimate since we put more weight on countries with a large population that on average have a more stable quarter-to-quarter number of crimes reported. Row (8) shows the result of our preferred specification but clustering the standard errors at the country level instead of at the country by crime type level. This yields a slightly lower standard error of our main estimate.

4 Heterogeneity and Mechanisms: Analysis of US data

To study heterogeneity and mechanisms in the effects of the MeToo movement, we focus on the US since that is where the movement started and since rich incident-level data is available for the US.

4.1 Data

We use US data from two sources: the FBI National Incident-Based Reporting System (NIBRS) and more detailed crime data for seven large US cities.

4.1.1 National data: FBI NIBRS

Law enforcement agencies voluntarily report data on offenses as part of the FBI's Uniform Crime Reporting (UCR) Program. Agencies have been gradually shifting from reporting summary statistics of the most severe offenses to reporting incident-level data using the NIBRS for 52 specific crimes, defined as Group A offenses.[22] By 2017, more than 7,000 agencies covering approximately 30% of the US population reported data using the NIBRS program. In our main specification, we use 2010-2018 NIBRS data aggregated at the state by crime category level for each month. Similarly to the international analysis, we aggregate data into two main categories: Sexual crime and non-sexual crime. Since Group A offenses do not include sexual harassment, our estimates will measure the effect only on sexual assaults.

[21] We use UN population data for 2015 from the 2017 revision of World Population Prospects.

[22] For more details, see the 2019 National Incident-Based Reporting System User Manual. Available online: https://ucr.fbi.gov/nibrs/nibrs-user-manual

The main advantage of using NIBRS data is that the crime categories and the variables describing each incident are harmonized across law enforcement agencies. This allows us to test for heterogeneous effects by crime type, the characteristics of the victim and offender, and whether an arrest was made. Appendix A.4 provides more details on how the NIBRS data was processed.

4.1.2 City-level crime data

We collect incident-level data from seven large US cities with a combined population of 16 million: Denver, Kansas City, Los Angeles, Louisville, Nashville, New York City, and Seattle. Our sample consists only of cities that provide incident-level data on all crimes and provide both the date each crime occurred and the date it was reported, along with the crime's approximate location. The seven cities selected are the cities that met our inclusion criteria among the 50 largest US cities.

The city-level data is used to complement our analysis in three ways. First, information on the location of each incident allows us to analyze heterogeneity in the effect of the MeToo movement by neighborhood. Second, we use the detailed reporting and occurrence dates to analyze heterogeneous effects according to whether the crime was immediately reported. Furthermore, by focusing on crimes that occurred before the start of the movement, we can isolate the effect of the propensity to report crime from a possible effect on crime incidence. Third, the data includes virtually all crimes reported to the police, and not only the relatively severe offenses covered by NIBRS.[23] Specifically, this allows us to analyze the effect of the movement on sexual harassment, in addition to sexual assault.

We aggregate the city-level crime data into three main categories: sexual assault, sexual harassment, and non-sexual crime. We manually classify the crime categories for each city separately and exclude crimes that could be indirectly affected by the MeToo movement. In our main specification, we aggregate data at the city by crime category by month level. To estimate heterogeneity within cities, we define neighborhoods according to the police administrative areas (e.g., a police division or precinct) of each city and aggregate the data at the neighborhood by crime category by month level. We calculate the demographics of each neighborhood based on the 2016 American Community Survey 5-year estimates. Appendixes A.1, A.5, and A.6 provide more details on how crimes were classified, how the city data was processed and how the neighborhood-level data was processed.

[23] There are several exceptions, such as cities excluding crimes related to child abuse cases or unfounded complaints.

4.2 Empirical strategy

We analyze US data using a difference-in-difference specification over time and by crime type. We do not use a triple difference strategy since we do not observe meaningful variation in the strength of the MeToo movement across different regions within the US, as seen in Figure A.4.[24] This is unsurprising as the national media covered the movement and the allegations related to it, and the movement generated substantial public discussion in social media, which is not limited to a specific media market. Indeed in a PEW survey from November-December 2017, 92% of Americans reported reading or hearing about recent allegations of sexual harassment and assault.[25]

We use the following regression as our primary specification:

$$y_{itc} = \beta_1 SexCrime_i \times Post_t + \beta_2 Post_t + \beta_{3,ic} Trend_t + \gamma_{i,c,m(t)} + \varepsilon_{itc} \tag{3}$$

- y_{itc} is the inverse hyperbolic sine transformation of the number of reported crimes of type i, in month t, in location (state or city) c. The inverse hyperbolic sine is used instead of a log transformation since there are months when no crime is recorded for a specific location and crime category
- $Post_t$ is an indicator for October 2017 and later
- $\beta_{3,ic} Trend_t$ controls for differential linear trends by the full interaction of location and crime category
- $\gamma_{i,c,m(t)}$ controls for the full interaction of location, calendar month and crime category fixed effects

The specification is similar to our triple difference specification described in Equation 1 with several differences. First, we aggregate the data at the monthly level, instead of the quarterly level. Second, we use robust standard errors. Since our main specification includes only two crime categories, we cannot cluster the standard errors at the crime category level (where the treatment occurs). Appendix Table A.1 uses the same specification, with a finer aggregation of crime categories, which allows us to cluster the standard errors at the crime category level, and shows that the point estimates and standard errors remain similar. In Section 4.4, we show that the results are also robust to an estimation strategy using

[24] While the OECD country in the 75th percentile in terms of search interest had a 651% larger interest in the MeToo movement, compared to the country in the 25th percentile, the same figure for US states was only 47%. Furthermore, the variation between OECD countries was relatively stable over time with a correlation of 0.95 between interest in October 2017 and interest in November 2017, while the same correlation for US states was just 0.34. This figure indicates that a large part of the variation in interest between US states is probably due to noise and not actual differences in the strength of the MeToo movement.

[25] Pew Research Center, December 2017 Political Survey.

a finer aggregation of crime categories at the city level and bootstrapping the standard errors. A third difference is that we weight regressions by the average number of crimes that occurred in a location in the pre-period since we are interested in the effect of MeToo on the number of crimes reported and not in the effect of the movement on an average city or state.[26] An additional advantage of weighting the data is that the weights reduce the importance of the aggregation method in our estimates (e.g., whether we aggregate the data by state or county).

Our identifying assumption is that without the MeToo movement, the difference between sexual crime and non-sexual crime in the post-period would have been the same as the difference in the pre-period after controlling for crime by location-specific seasonality and crime by location time trends.

4.2.1 Heterogeneity by neighborhood demographics

We estimate heterogeneity by the neighborhood where the crime occurred using the following regression:

$$y_{itc} = \beta_1 SexCrime_i \times Post_t + \beta_2 Post_t + \beta_{3,ic} Trend_t + \beta_4 SexCrime_i \times Post_t \times Demog_c + \tag{4}$$
$$\beta_5 SexCrime_i \times Demog_c + \beta_6 Post_t \times Demog_c + \beta_7 Demog_c + \beta_{8,ic} Trend_t + \gamma_{i,c,m(t)} + \varepsilon_{itc}$$

The regression is based on our main specification with c now representing a neighborhood instead of a city/state and β_4 estimating heterogeneous effects by various neighborhood characteristics. Each demographic variable ($Demog_c$) is constant across time and is first subtracted by its weighted mean to keep the estimates for the effect of the MeToo movement consistent across specifications.

4.3 Results

Table 4 shows that the MeToo movement had a strong and statistically significant effect on crimes reported in both the NIBRS and the city dataset. This demonstrates that the effect found is robust to using different samples (OECD, US states, US cities) with different sources of variation (triple difference, difference-in-difference). Based on NIBRS data, Column (1) shows that the MeToo movement increased the number of reported sexual assaults by 8% in the six months after the movement started. Column (2) shows that in our sample of large cities the effect on sexual assault and sexual harassment is approximately 11% and 15%, respectively. Since both effects are related to the MeToo movement, in Column (3), we

[26]The international analysis regressions in Section 3.4 are not weighted, since in this analysis the treatment occurs at the country level and we are interested in the average effect of the MeToo movement on different sets of countries.

aggregate sexual assault and sexual harassment into one category, labeled sexual crime, which we will focus on throughout the rest of the analysis. We find an effect of approximately 13% on sexual crimes reported in our city sample. To ensure that the effect in one city is not driving the results, we run our main specification separately for each city. Appendix Table A.2 shows that the effect is positive for six of the seven cities in our sample and statistically significant for four of the seven cities.

4.3.1 Mechanisms: Disentangling the effect on reporting from the effect on crime incidence

One concern with our interpretation of the results is that the effect of the MeToo movement on the number of crimes reported could be driven by an increase in the incidence of crimes and not an increase in the propensity to report crimes. We find it unlikely that such a backlash effect is driving our results given that we are not aware of any anecdotal reports of increases in sexual crimes committed, while there is ample anecdotal evidence of an increase in the propensity to report crimes.[27] We can also rule out that an increase in crimes committed drives the entire increase in sexual crimes reported by restricting our analysis to crimes that were committed before the start of the MeToo movement.

Table 5 shows that the MeToo movement had a strong and statistically significant effect even on crimes that occurred *before* the movement started when incidence could not have been affected by the movement. In the regression, we isolate the effect on the propensity to report crime by including only crimes that were reported at least three months after they occurred and that were reported by December 2017 (i.e., occurred before October 2017). While this shows that an increase in incidence cannot explain the increase in reporting, the MeToo movement may have *decreased* the incidence of sexual crime, and in that case, the effects we estimate are lower bounds of the increase in the propensity to report.

4.3.2 Mechanism: heterogeneous effects by report timing and crime type

Table 6 uses city-level data to show that while the MeToo movement had a stronger effect on crimes reported at least a month after they occurred, the movement also affected crimes which were immediately reported. For this analysis, we aggregate crime into three main categories: Sexual crimes reported more than a month after they occurred, sexual crimes reported a month or less after they occurred, and non-sexual crimes, which is the reference category. Column (1) shows that the movement had an effect

[27] For example: At colleges (Binkley, Collin - MeToo inspires wave of old misconduct reports to colleges. PBS October 13, 2018); In the entertainment industry (Maddaus, Gene - Many Accused, None Prosecuted: Why #MeToo Hasn't Led to a Single Criminal Charge in L.A. Variety. September 25, 2019); Among congressional candidates (Godfrey, Elaine, Felton, Lena and Hosking, Taylor - The 25 Candidates for 2018 Sunk by #MeToo Allegations. The Atlantic. July 26, 2018)

of 10% on crimes reported within 30 days, and an effect of 22% on crime reported more than 30 days after they occurred. The total effect on all crimes (shown in Column (3) of Table 4) is similar to the effect on crimes reported within 30 days since only 20% of crimes are reported more than a month after they occur. Column (2) presents the results for the next nine months and shows a declining effect on crimes reported with a lag. This suggest that some of the short-term effect could be due to a stock of old crimes that was exhausted. However, even in the 7-15 months after the movement started there is a large effect on crimes reported at least a month after they occurred. This long-term effect on crimes reported with a lag could be explained by either a persistent effect on a flow of cases which are not immediately reported or a very large stock of unreported crimes, which is gradually affected by the MeToo movement.

We use the NIBRS data to test for heterogeneity by crime type. Column (1) of Table 7 splits the category of sexual crime according to the specific offense type and shows that the MeToo movement had a large effect on the number of rapes reported, the most severe sexual offense category, and on fondling cases. Column (2) shows that the movement had a stronger effect on offenses where the victim was physically not injured. In Column (3) we do not find substantial heterogeneity by whether the victim knew the offender.

4.3.3 Heterogeneous effects by race and socioeconomic status

The MeToo movement has been criticized for focusing on white victims of high socioeconomic status and ignoring the experiences of working-class women and women of color (Onwuachi-Willig, 2018). To test whether the effect of the MeToo movement on reporting was stronger among whites and groups with high socioeconomic status, we estimate the heterogeneous effects of the movement by demographics of the victim, offender, and the location where the crime occurred. We do not find evidence for large heterogeneity along these dimensions.

We test for heterogeneous effects among victims by separating sexual assault into sub-categories according to the victim demographics.[28] Column (1) of Table 8 shows that the movement had a larger effect among female victims than among male victims. This is consistent with the general narrative of the MeToo movement, which tended to focus specifically on female victims of sexual crimes. Column (2) finds a similar effect on black and white victims, and we cannot reject a homogeneous effect across the victim's race.[29] Columns (3)-(4) repeat the analysis according to the offender's demographics and

[28] For example, when estimating heterogeneous effects by race, the treated categories are sexual assaults of black victims and sexual assaults of white victims, and the reference category is non-sexual crimes.

[29] The NIBRS also includes data on Hispanic ethnicity. We do not find a stronger effect of the movement on individuals who

points to a similar effect among black and white offenders.

Table 9 shows that the MeToo movement did not have large heterogeneity in the effect between neighborhoods with different demographic profiles, relative to the total effect of the movement. Column (1) analyzes the effect of the movement based on our specification in Equation 3, and in Columns (2)-(6) we estimate heterogeneous effects according to each demographic variable as described in Equation 4. The regressions presented in the table are not intended to capture causal effects as they are likely to suffer from omitted variable bias. Rather, these regression are meant to estimate which types of neighborhoods were associated with a larger increase in reporting of sexual crimes during the MeToo movement. While some of the point estimates are consistent with a stronger movement among higher income and college educated neighborhoods, the estimated heterogeneity is small. For example, the difference in the expected effect on reporting between a neighborhood in 75th percentile of the share of individuals with a college education and a neighborhood in the 25th percentile is only expected to be 3 percentage points, a relatively small difference compared to the average effect of 13%. Similarly the difference between neighborhoods in the 75% and 25% percentile in the median income, share of blacks, share of Asians and other races, and share of Hispanics, is 5, 2, 1, and -5 percentage points, respectively.

To conclude, based on the analysis of victim, offender, and neighborhood demographics, we can reject the argument that the MeToo movement mostly affected the reporting of whites or those with high socioeconomic status.

4.3.4 Effect on arrests

The NIBRS data allows us to test not only whether crime reporting increased, but also whether the movement had an effect on the number arrests made by the police. The FBI defines an arrest as a case where a suspect is taken into custody based on a warrant or previously submitted report, arrested on view (without a warrant) or summoned to court.

Table 10 shows that in the first six month after the movement started, there was no increase in the number arrests in sexual assault cases as a result of the movement. In Column (1), the effect is estimated by aggregating the data into three separate categories: Sexual crimes where an arrest was made, sexual crimes where no arrest was made, and non-sexual crimes, and estimating the effect of the MeToo movement on both sexual crime categories, where non-sexual crime is the reference group. One concern with this specification is that a general decrease over time in the arrest rate for all crimes could explain

are not Hispanics or Latinos. We do not present the results by ethnicity since the ethnicity could not be identified for 28% of victims and 82% of offenders.

why we find an effect only among cases where no arrest was made. Columns (2) and (3) show that the results are robust to this concern using a slightly different specification: we run the regression separately only on crimes where an arrest was made and crimes where no arrest was made so that the control group for sexual crimes are non-sexual crimes in the same arrest category. Column (4)-(6) repeat the analysis for the long-run effect over 15 month. In this time period the MeToo movement does increase the number of arrests but the effect on arrests remains smaller than the effect on the number of crimes cleared.

The MeToo movement may not have increase the number of arrests since victims were not willing to cooperate with the police. Appendix Table A.3 tests this hypothesis by focusing on all cases cleared by the police. A case is cleared if it is associated with an arrest or if the police have sufficient probable cause to arrest a suspect but could not make an arrest for reasons outside their control including the victim refusing to cooperate, the death of the offender, the prosecutor declining prosecution for a reason other than lack of probable cause, the offender being in custody of another jurisdiction, and the offender being a juvenile. The effect on cases that were not cleared remain much larger than the effect on cleared cases.

Why did the MeToo movement not lead to a larger increase in the number of arrests? One possible explanation is that the movement affected mostly the type of cases where the probability of arrest is low. Indeed, as shown in Table 6, the MeToo movement had a stronger effect on cases reported more than a month after they occurred. Based on cities that collect arrest data (Kansas City, LA, Nashville), the share of cases resulting in an arrest in the pre-period (all months before October 2017) is only 6% for sexual assaults reported at least a month after they occurred, compared to 14% for crimes which were reported within a month.[30] However, the movement also had a strong effect on crimes reported within a month, which are far more common. Therefore, the increased reporting of old crimes only provides a partial explanation for why the number of arrests did not increase during the first six months of the movement.

4.4 Robustness: Matrix completion method

Our difference-in-difference specification relies on the assumption that other crimes are a suitable control group for sexual crimes after controlling for crime and location-specific seasonality and differential linear time trends. In this section, we relax those assumptions, and instead of estimating an effect based on the standard difference-in-difference specification, we use the matrix completion method and show that the

[30] Anecdotal evidence also suggests that it was difficult to clear MeToo-related cases since they were reported long after they occurred. For example, see Maddaus, Gene - Many Accused, None Prosecuted: Why #MeToo Hasn't Led to a Single Criminal Charge in L.A. Variety. September 25, 2019

results are robust to the method used.

The matrix completion method (Athey et al., 2017) is used for panel data and is based on a matrix where each row is a unit and each column is a time period. The method attempts to predict the counterfactual outcome for treated units in the post-period. We use the method to create a counterfactual for the expected number of sexual crimes in the post periods, which would have been reported if there was no MeToo movement. The counterfactual matrix is created for all observations, and values are chosen to minimize the sum of squared differences between the actual outcomes and the predicted counterfactual outcomes for observations that were not affected by the movement (non-sexual crimes in all periods and sexual crimes in the pre-periods), with penalization according to the nuclear norm of the predicted matrix. Penalization is required to prevent overfitting, and the regularization parameter is selected through cross-validation. Finally, the average treatment effect is the weighted difference between the actual outcomes and counterfactual outcomes for the treated units in the post-periods. The main advantage of the matrix completion approach is that it is "*able to model more complex patterns in the data, while allowing the data (rather than the analyst) to indicate whether time-series patterns within units, or cross-sectional patterns within a period, or a more complex combination, are more useful for predicting counterfactual outcome*" (Athey, 2018).

We use this method with our city-level data and define each unit as a crime category by city combination, and each time period as a month. We use the original crime categories defined for each city and do not aggregate crimes to broader categories.[31] We exclude categories for which there was at least one month with no crimes reported. All sexual assault or sexual harassment crimes that occurred on or after October 2017 are considered treated. In total, we have 39 treated groups and 399 control groups. We explicitly control for category and time fixed effects and do not add any additional controls. We weight each crime group by the number of reported crimes for that crime group in the pre-period.[32]

We find an average treatment effect over six months of 0.18 and a long-run 15-month effect of 0.16. Both effects are significant at the 1% level using standard errors generated by bootstrapping. Figure 5a shows that the counterfactual created by the method fits the actual outcome well in the pre-period, and Figure 5b highlights that the treatment effect is relatively persistent.

[31] For example, indecent exposure in Los Angeles is a row in the matrix and is considered treated for time periods (matrix columns) on or after October 2017. Simple assault in Nashville in an example for a row in the matrix which is untreated in all time periods.

[32] The method was estimated using the R package gsynth by Yiqing Xu and Licheng Liu. Available online: https://yiqingxu.org/software/gsynth/gsynth_examples.html

5 Interpretation

5.1 Is the effect of the movement persistent?

Table 11 uses data from the countries with a strong MeToo movement to measure the persistence of the effect over time. For some of the countries where the MeToo movement was initially weak, such as South Korea, it gained traction and became stronger after the start of the movement globally, as shown in Appendix Figure A.3. Therefore, we do not use our triple difference empirical strategy to estimate the longer-term effects of the movement, since including countries where the movement was initially weak but grew stronger in later periods would contaminate our counterfactual. Instead, we use the difference-in-difference specification and only focus on countries where we know that the movement started in October 2017. Column (1) shows that the average effect for the first five quarters after the movement started is estimated to be 13%. Column (2) shows that the effect is strongest in the first quarter after the start of the movement, at a 16% increase in reported sexual crimes. In the following four quarters, the effect declines to between 10% and 15%, but there is no pattern of continuous decline after the first quarter. The international data suggests that the effect of the MeToo movement is persistent and had a lasting effect on behavior.

Table 12 shows that effect of the movement was persistent in the US. Columns (1) and (3) estimates the long-run effect based on the NIBRS national data, which only includes severe crimes, and the sample of US cities, respectively. Columns (2) and (4) show the effect by quarter. For all quarters, the estimated effect is between 7% and 14%. The estimated coefficients in the short run and long run could potentially be different due to a depletion in the stock of old crimes, and not due to an increase or decrease in the strength of the effect. Column (5) mitigates this concern by focusing only on the flow of crimes which were reported within a month after they occurred. The results are similar and provide evidence that the effect of the movement was persistent throughout the period.

Combined, the US and international data show that the MeToo movement had a positive effect on the reporting of sexual crimes even 15 months after the movement started.

5.2 Changes in awareness and beliefs

How did the MeToo Movement affect reporting? Table 13 uses survey data to show that awareness of sexual misconduct increased after the movement started. We use data from the Views of the Electorate Research Survey since the survey asked a large panel of respondents the same set of questions before

and after the start of the movement : in July 2016 and April-May 2018. An additional advantage of this survey is that the timing of the survey was not affected by the movement. Column (1) shows that agreement with the statement "*sexual harassment against women in the workplace is no longer a problem in the United States*" decreased by 0.14 standard deviations in 2018, compared to 2016. Other surveys also provide evidence for increased awareness. In a Washington Post ABC poll in January 2018, 72% of respondents stated that sexual harassment of women in the workplace is a serious problem, compared to 47% in November 2011.

Awareness can affect behavior by decreasing the stereotype associated with reporting (Bursztyn et al., 2017), by allowing individuals to coordinate and provide corroborating evidence (Cheng and Hsiaw, 2019), or by aggregating information and encouraging people to report as a form of protest if they learn that sexual assault is a large social problem (Battaglini et al., 2020). Since awareness affects reporting and is affected by it, an initial increase in awareness may lead to a tipping point that futher increase reporting and awareness substantially.[33]

While we cannot cleanly disentangle these stories, we can explore them further using the survey data. Column (2) of Table 13 provides evidence for heterogeneous effects in awareness between men and women. While men's agreement with the statement that sexual problem is no longer a major problem decreased by 0.24 standard deviations, women's agreement decreased by only 0.05 standard deviation and is not statistically different from zero. Interestingly, it seems that a general increase in awareness may have an effect, even when the awareness of women, who are much more likely to be victims, is not substantially affected. The results suggest that individual behavior can be affected by a change in the beliefs of other individuals, complementing experiments demonstrating that second-order beliefs can affect behavior (Bursztyn et al., 2018). In columns (3) and (4), we show that while awareness increased, agreement with the statement "*women who complain about harassment often cause more problems than they solve*" did not change substantially between 2016 and 2018. This suggests that reporting could increase even when the average stereotype associated with reporting did not substantially change.

6 Conclusions

This study shows that the MeToo movement had a substantial, persistent effect on the propensity to report sexual crimes. This result is consistent across multiple samples and is robust across multiple es-

[33] A similar tipping may have occurred around 2002 for clergy sexual abuse scandals (Bottan and Perez-Truglia, 2015).

timation techniques (triple difference among OECD countries, difference-in-difference among US states and cities and matrix completion for US cities). Furthermore, the heterogeneity results provide additional evidence for the causal effect of the MeToo movement, in contrast to some other event that occurred around October 2017. The MeToo movement focused on female victims, and often on cases that occurred several months or years before they were discussed in the media. We find a strong significant effect among female victims and an especially strong effect among crimes that are reported at least a month after they occurred.

Focusing on the US allows us to understand better who was affected by the movement. The effect is strong and statistically significant for both sexual harassment and sexual assault. While the movement may have disproportionately focused on the experiences of white women (Onwuachi-Willig, 2018), its impacts in terms of reporting of sexual crimes to the police were felt across both white and black victims, offenders and neighborhoods.

We estimate that in the first six months of the movement, 25,984 additional sexual crimes were reported in the 15 OECD countries with strong MeToo movements for which we have data, as a result of the MeToo movement.[34] 10,760 of these are sexual assaults in the US. This number is a lower bound for the total effect since the NIBRS only includes severe criminal offenses and the city-level data reveals that the MeToo movement had a stronger effect on reported sexual harassment cases. Furthermore, it is likely that the MeToo movement also led to changes in lower stakes decisions, such as reporting sexual misconduct by a colleague to an employer, talking to a friend about an experience of sexual misconduct, or calling a helpline for victims of sexual misconduct. Based on the National Crime Victimization Survey, the effect of 8% found for the US is equivalent to closing 20.6% of the gap between the reporting of sexual crimes and other violent crimes.

One limitation of this study is that it is difficult to disentangle the effect of the MeToo movement on the incidence of crimes from its effect on the propensity to report crimes. We show that a change in incidence cannot explain the effect found and is unlikely to drive the results. However, it is possible that as a result of the movement, the incidence of sexual crimes decreased, and in that case, our primary estimates should be interpreted as lower bounds for the increase in the propensity to report sexual crimes, as they are reduced by a lower incidence of crime.

The findings imply that social movements can have large, long-lasting effects on social norms and, as

[34]The estimation uses the difference-in-difference specification for each country separately and compares this to the number of predicted crimes reported if the MeToo movement had not taken place, based on the same regression. The calculation for the countries where we have partial police data (the US, the UK, Iceland, and Australia) is based on the assumption that the MeToo movement had the same effect on areas for which we obtained data as in other areas in the country.

a result, individuals make meaningful changes in their personal decisions. The action individuals take is costly and the effect occurs almost immediately. This suggests that awareness-raising campaigns can be effective in changing personal behavior.

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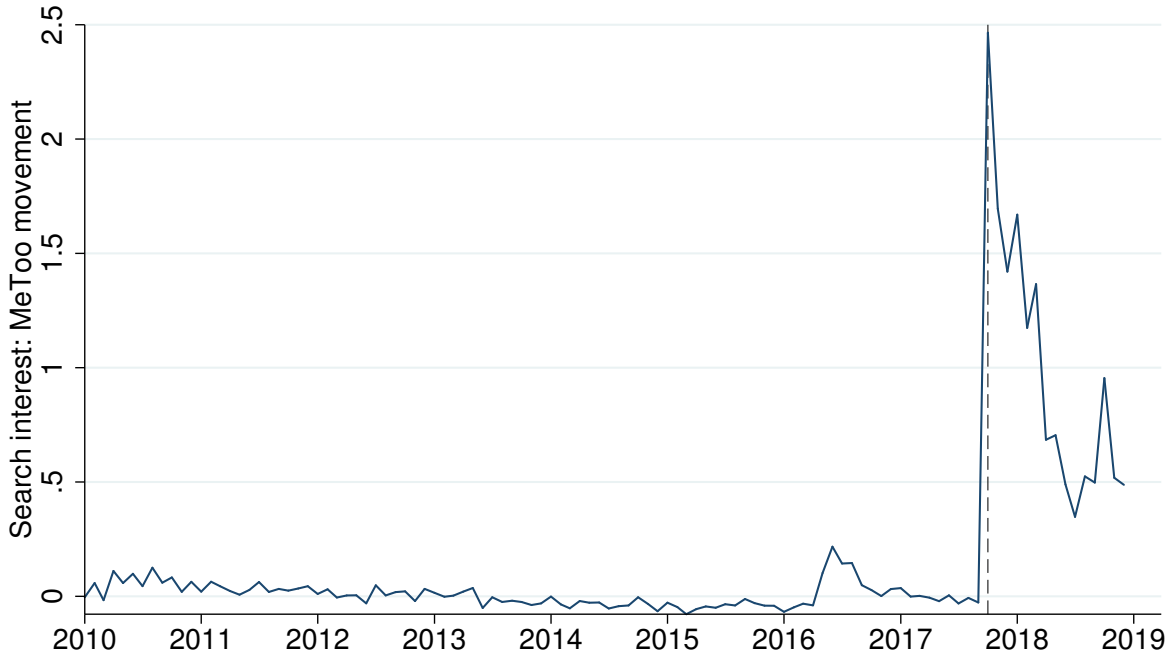
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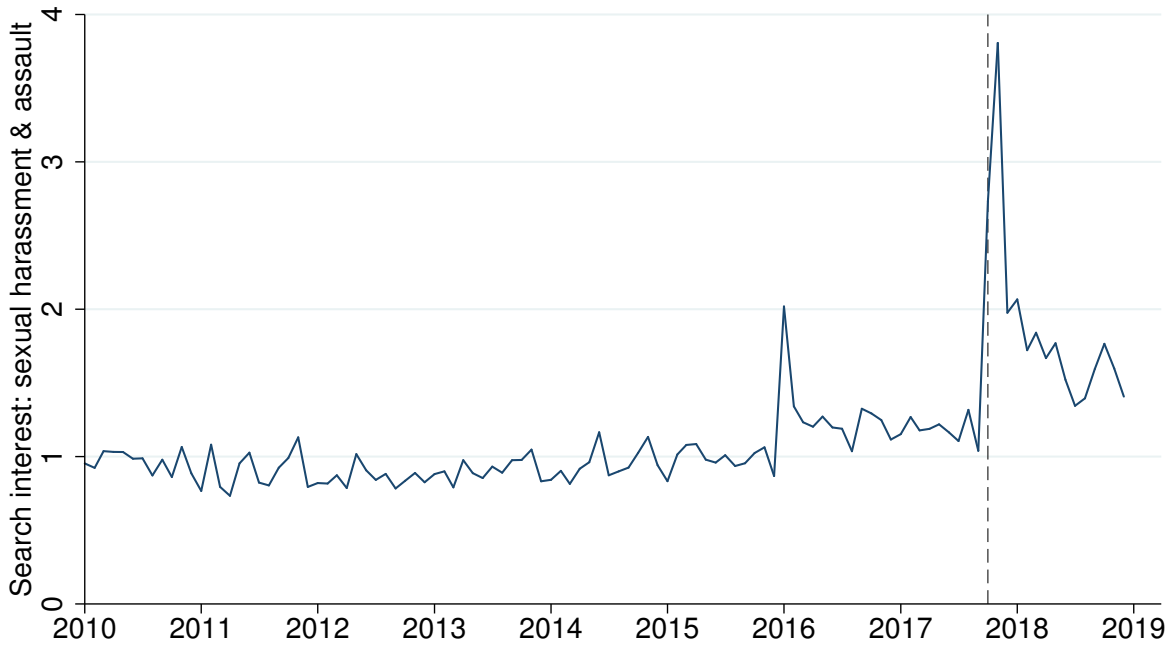
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Figure 1: Google search interest in the OECD

(a) OECD search interest in the topic of the MeToo movement

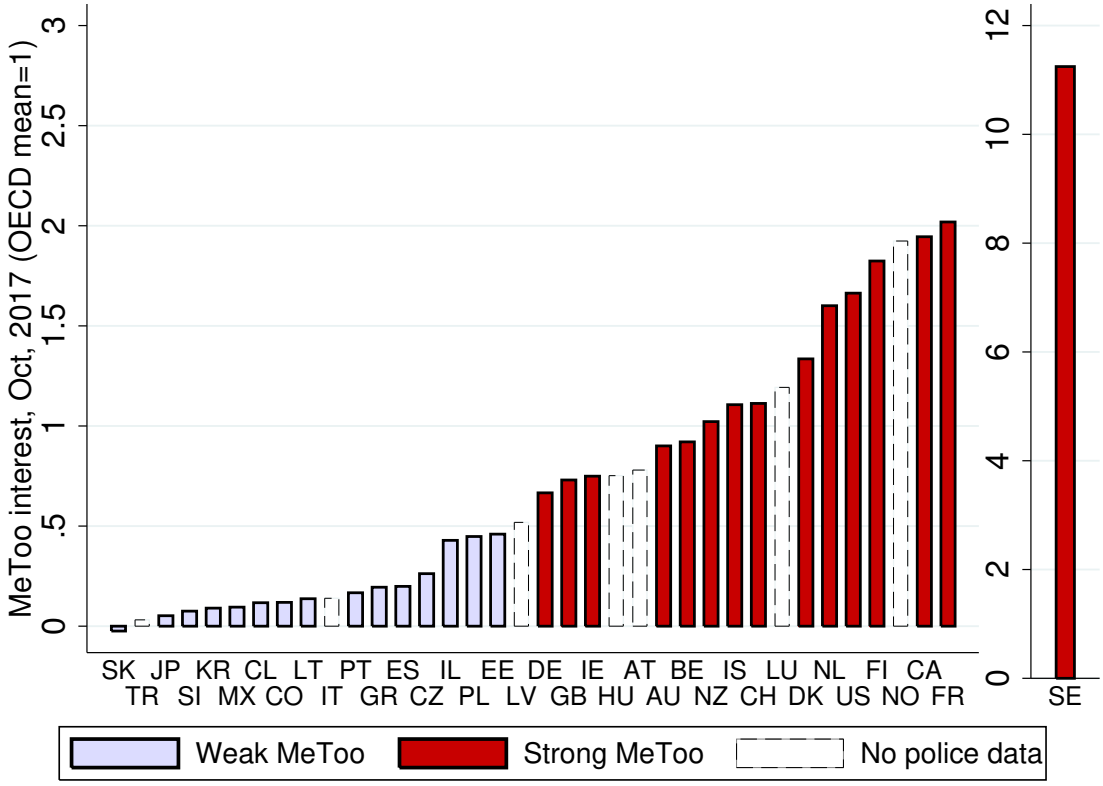


(b) OECD search interest in the topics of sexual harassment and sexual assault



The figures show the monthly time series for the OECD means of both measures of the strength of the MeToo movement from 2010 to 2018. Data is from Google Trends. The vertical dashed line represents the start of the MeToo movement (October 2017). Sub-figure (a) shows search interest in the topic of the MeToo movement. Mean pre-MeToo interest is subtracted from the time series for each country separately so that the pre-MeToo period has a mean of zero, the data is then normalized so that the post-MeToo OECD mean equals 1. Sub-figure (b) shows search interest in the topics of sexual harassment and sexual assault. The data is normalized so that the pre-MeToo mean equals 1 for each country.

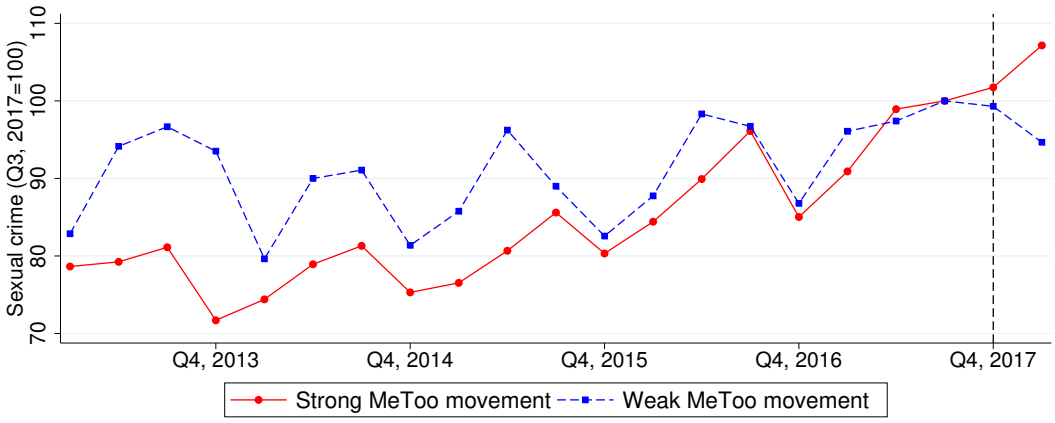
Figure 2: Immediate search interest in MeToo Movement



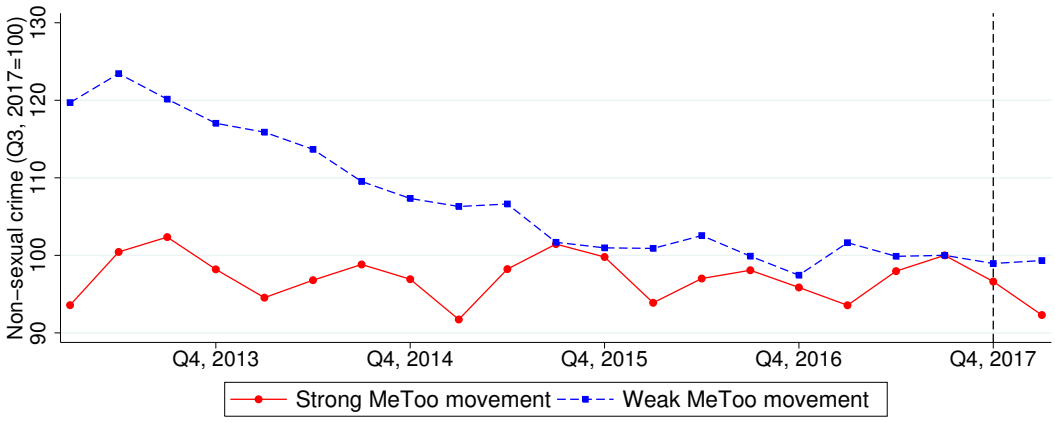
This figure shows the strength of the MeToo movement in OECD countries, based on Google Search interest in the topic of the MeToo movement during October 2017. The Weak MeToo group of countries have below-median interest, the Strong MeToo group of countries have above-median interest, and the rest of the countries are not included in our sample since we have not obtained access to their police data.

Figure 3: Crimes reported over time

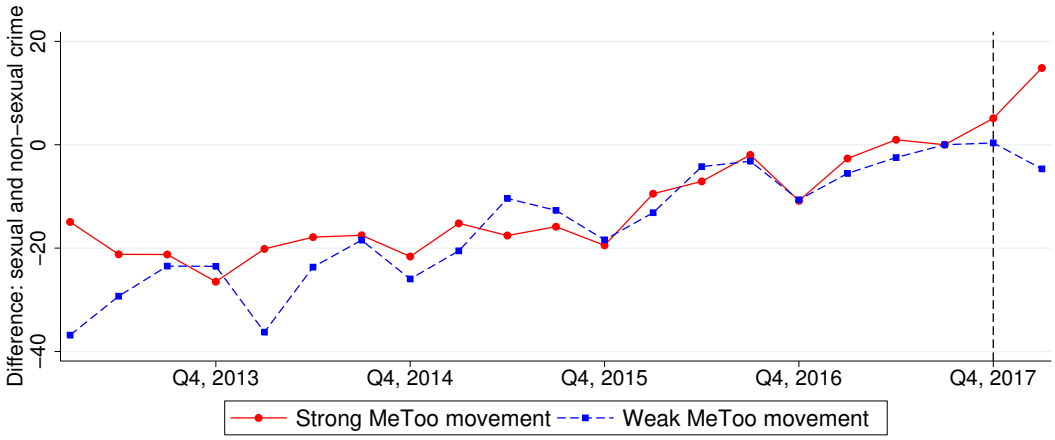
(a) Sexual crime reported in countries with strong vs. weak MeToo movements



(b) Non-sexual crime reported in countries with strong vs. weak MeToo movements

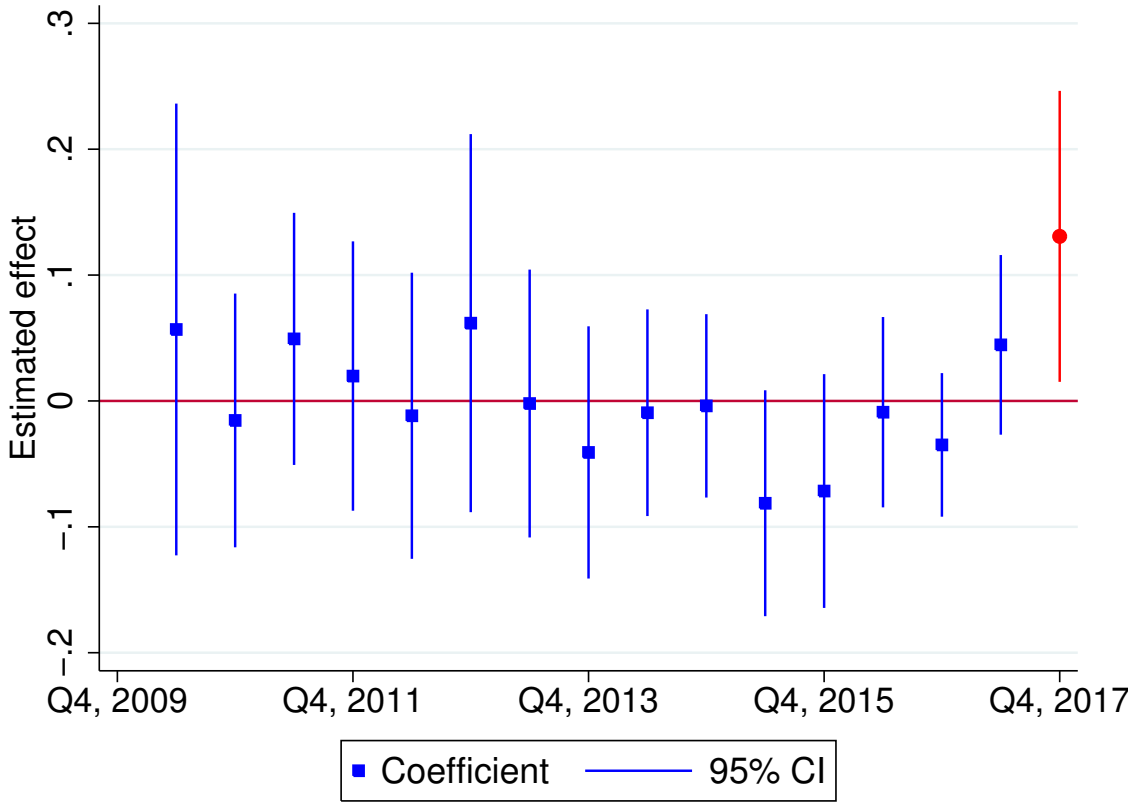


(c) Difference between sexual and non-sexual crime reported in countries with strong vs. weak MeToo movements



Figures (a) and (b) show the number of reported sexual crimes and the number of reported non-sexual crimes, both normalized to 100 in Q3 2017 for each country, and averaged separately for the countries with strong and weak MeToo movements. Figure (c) shows the difference between the normalized number of sexual crimes and the normalized number of non-sexual crimes. The vertical dashed line represents the start of the MeToo movement, Q4, 2017. To make the observations comparable over time, Japan, Lithuania, Mexico and New Zealand are excluded since data for these countries is not available for the entire Q1 2013 - Q1 2018 period.

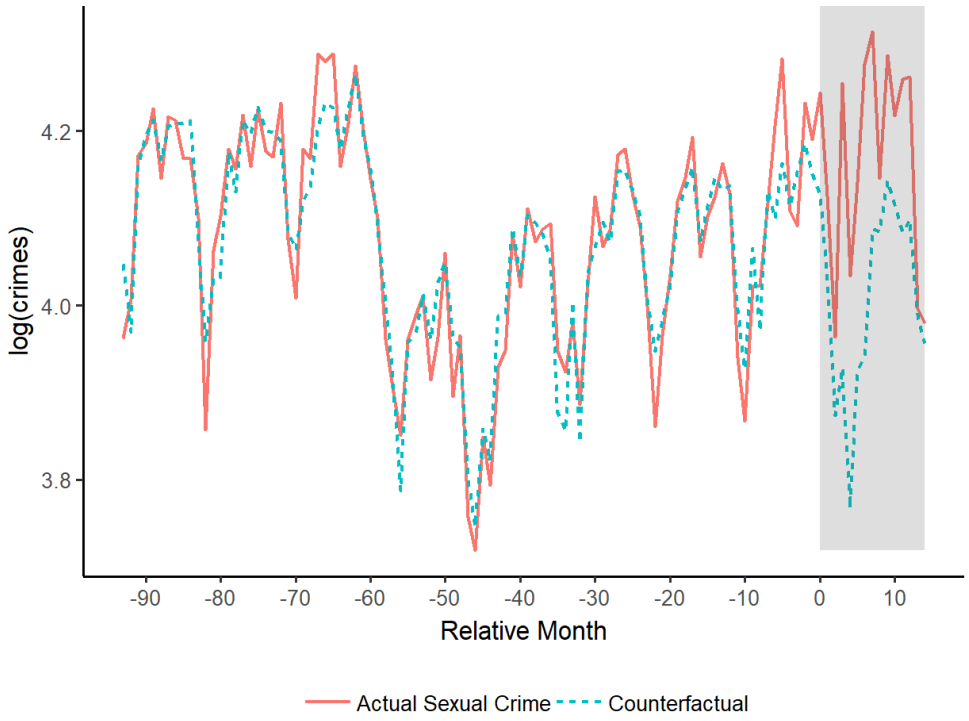
Figure 4: Placebo tests, setting the start date of the MeToo movement in every second quarters from Q2 2010 to Q4 2017



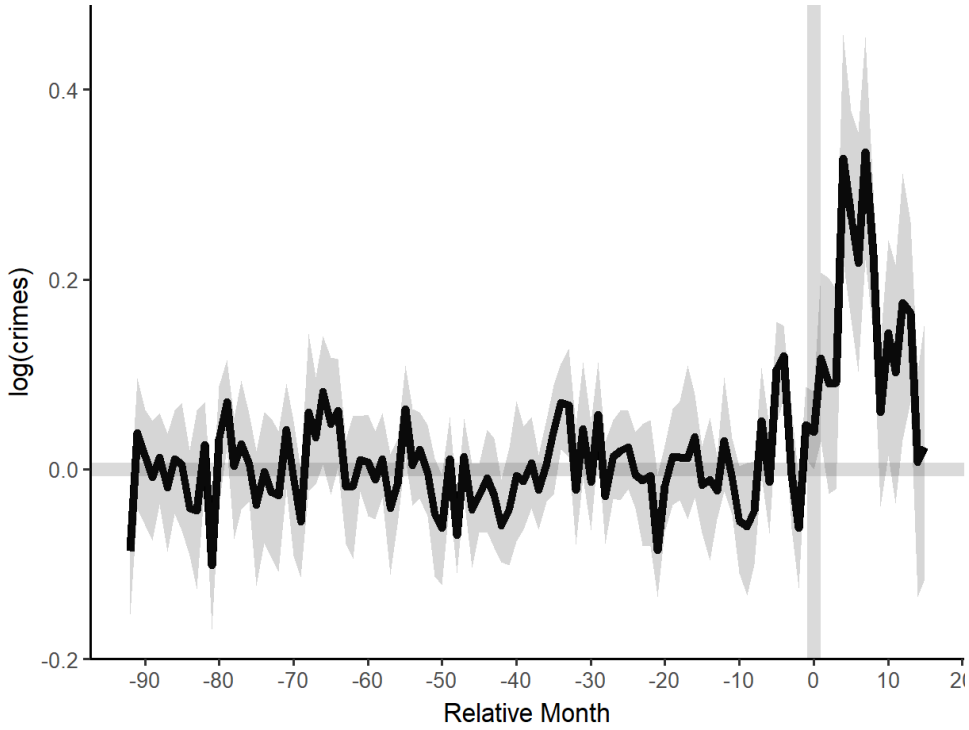
This figure shows the results from 15 placebo triple difference regressions (Q2 2010-Q2 2017) and our main triple difference result (Q4 2017, shown in red). Each coefficient comes from a regression using the full Q1 2010 - Q1 2018 data set, but with a different 6 month period for when the placebo MeToo movement happened. The corresponding confidence intervals are constructed using standard errors clustered at the country by crime type level.

Figure 5: Matrix completion results

(a) Counterfactual versus actual outcomes



(b) Average treatment effect



Sub-Figure (a) shows the actual and counterfactual reported sexual crimes (in logs) based on the matrix completion method for our sample of US cities. The method is described in Section 4.4. Sub-Figure (b) presents the average treatment effect - the difference between the actual crimes and the counterfactual. Standard errors are bootstrapped.

Table 1: Effect of the MeToo movement during the first six months in 30 OECD countries

	ln(crime)			
	(1)	(2)	(3)	(4)
Post * Strong MeToo	0.135**		0.004	0.004
	(0.053)		(0.026)	(0.026)
Post * Sexual crime		0.092***		0.026
		(0.032)		(0.043)
Post * Strong MeToo * Sexual crime			0.157***	0.131**
			(0.040)	(0.059)
Post * Weak MeToo * Sexual crime			0.026	
			(0.043)	
Country * Crime type * Lin. trend	X	X	X	X
Country * Crime type * Quarter	X	X	X	X
Post	X	X	X	X
Crime data used	Sexual crimes	All crimes	All crimes	All crimes
Observations	892	1,784	1,784	1,784
Clusters	30	60	60	60

This table shows the effect of the MeToo movement on sexual crimes reported using data from 30 OECD countries for the period from Q1 2010 to Q1 2018. Column (1) uses data on sexual crime only while Columns (2)-(4) uses data on both sexual and non-sexual crimes. A country is categorized as having a strong MeToo movement if search interest for the topic of the MeToo movement was above the OECD median in October 2017. Standard errors clustered at the country by crime level in parenthesis. ***p<0.01, **p<0.05, *p<0.1.

Table 2: Effect of the MeToo movement, using different MeToo start dates

	ln(crime)			
	(1)	(2)	(3)	(4)
Post MeToo start * Sexual Crime	0.116***		0.096***	
	(0.034)		(0.032)	
Quarter of MeToo start * Sexual Crime		0.114**		0.065**
		(0.051)		(0.029)
1Q after MeToo start * Sexual Crime		0.130**		0.065
		(0.051)		(0.045)
2Q after MeToo start * Sexual Crime		0.116***		0.078
		(0.039)		(0.052)
3Q after MeToo start * Sexual Crime		0.092**		0.113***
		(0.036)		(0.030)
4Q after MeToo start * Sexual Crime		0.122***		0.139***
		(0.043)		(0.039)
Country * Crime type * Lin. trend	X	X	X	X
Country * Crime type * Quarter	X	X	X	X
Post MeToo start	X		X	
Quarters since MeToo start FE		X		X
Observations	1,964	1,964	1,964	1,964
Clusters	60	60	60	60
MeToo start indicator	MeToo search interest		SH/SA search interest	

This table shows the effect of the MeToo movement using different start dates of the MeToo movement in each country. In Columns (1) and (2) a start of the MeToo movement is a month when searches for the MeToo movement topic was higher than the OECD median for October 2017. In Columns (3) and (4) a start of the MeToo movement is a month, after October 2017, when searches for the sexual harassment and sexual assault topics were the highest since 2010 in that country. Data is from 30 OECD countries for the period from 2010 to 2018. Standard errors clustered at the country by crime level in parenthesis. ***p<0.01, **p<0.05, *p<0.1.

Table 3: Robustness checks

(1)	Preferred specification	0.131**
		(0.059)
Length of short-term period:		
(2)	3 month effect	0.101
		(0.068)
(3)	9 month effect	0.115**
		(0.054)
Different measures of MeToo strength:		
(4)	6m MeToo search interest	0.126**
		(0.062)
(5)	SA/SH immediate search interest	0.063
		(0.062)
(6)	% heard of MeToo movement	0.095
		(0.080)
(7)	Weighted by country population	0.109**
		(0.048)
(8)	Standard errors clustered at country level	0.131**
		(0.058)

This table shows robustness checks for the triple difference effect estimated in Column (4) of Table 1. All rows except Row (7) from 30 OECD countries. Row (7) use data from the 12 OECD country surveyed in the 2019 YouGov survey. Rows (2)-(3) use different periods over which the effect is measured. Rows (4)-(6) use different measures of the strength of the MeToo movement. Row (7) shows the result of our main specification weighted for the countries population. For all rows except Row (8) standard errors clustered at the country by crime level are in parenthesis. Row (8) shows standard errors clustered at the country level. ***p<0.01, **p<0.05, *p<0.1.

Table 4: Effect of the MeToo movement on sexual crime in the US

	ihs(crime)		
	(1)	(2)	(3)
Post * Sexual Assault	0.081***		
	(0.015)		
Post * Sexual Assault		0.112***	
		(0.036)	
Post * Sexual Harassment		0.148***	
		(0.055)	
Post * Sexual Crimes			0.129***
			(0.036)
State * Crime Type * Time	X		
State * Crime Type * Month	X		
City * Crime Type * Time		X	X
City * Crime Type * Month		X	X
Post	X	X	X
Data	NIBRS	City	City
Final Month	Mar 2018	Mar 2018	Mar 2018
Observations	6,654	1,863	1,242

This table shows the effect of the MeToo movement on sexual crimes reported based on NIBRS and city crime data. Regressions are weighted by the number of crimes that occurred in each state/city before the MeToo movement started. Robust standard errors in parenthesis. ***p<0.01; **p<0.05; *p<0.1

Table 5: Incidence - effect on crimes that occurred before the MeToo Movement started

	ihs(crime)
Post * Sexual Crimes	0.194**
	(0.077)
City * Crime Type * Time	X
City * Crime Type * Month	X
Post	X
Final Month	Dec 2017
Crimes Included	3 Month <= Lag
Observations	1,179

This table shows the effect of the MeToo movement on sexual crimes, which were reported at least three months after they occurred. The table only includes crimes reported by December 2017. Therefore, all crimes included in this table occurred before the MeToo movement started. 2010-2017 city crime data. Regressions are weighted by the number of crimes in each city before the MeToo movement started. Robust standard errors in parenthesis. ***p<0.01; **p<0.05; *p<0.1

Table 6: Effect by the lag between occurrence and reporting dates

	(1)	(2)
Post * Sexual Crimes, Lag<=30 Days	0.095**	0.111***
	(0.038)	(0.023)
Post * Sexual Crimes, Lag>30 Days	0.215***	0.135***
	(0.049)	(0.048)
City * Crime Type * Time	X	X
City * Crime Type * Month	X	X
Post	X	X
Treatment Dates	Oct 17-Mar 18	Apr 18-Dec 18
Observations	1,842	1,905

This table shows the effect of the MeToo movement on sexual crimes according to when the crime was reported. In all columns, the data is aggregated into three categories: Sexual crimes reported within 30 days, sexual crimes reported after more than 30 days, and non-sexual crimes. Non-sexual crimes is the reference category. Column (1) focuses on the primary main short-term effect and includes data until March 2018 and Column (2) excludes October 2017-March 2018. Regressions are weighted by the number of crimes that occurred in each city before the MeToo movement started. City crime data 2010-2018. Robust standard errors in parenthesis. ***p<0.01; **p<0.05; *p<0.1

Table 7: Effect of the MeToo movement, by relationship and crime type

	ihs(crime)		
	(1)	(2)	(3)
Post * Fondling	0.111***		
	(0.019)		
Post * Rape	0.093***		
	(0.017)		
Post * Sodomy	−0.024		
	(0.031)		
Post * Statutory Rape	0.027		
	(0.042)		
Post * Sexual Assault, No Injury		0.093***	
		(0.016)	
Post * Sexual Assault, Injury		0.028	
		(0.022)	
Post * Sexual Assault, Knew Offender			0.089***
			(0.016)
Post * Sexual Assault, Stranger			0.104***
			(0.035)
Difference		0.065***	-0.015
State * Crime Type * Time	X	X	X
State * Crime Type * Month	X	X	X
Post	X	X	X
Final Month	Mar 18	Mar 18	Mar 18
Observations	16,635	9,981	9,981

This table shows the effect of the MeToo movement on different crime types. In each column, crimes are aggregated into different categories. The reference group for all columns is non-sexual crimes. In Column (1), the category "Sexual Assault With An Object" is excluded since approximately a third of state*months had zero crimes reported. Incidents related to multiple sexual offense crime categories are also excluded. In Column (2), cases where it is unknown if a victim was injured are excluded. In Column (3), cases where the relationship between the victim and offender was not reported or where the relationship is unknown are excluded. 2010-2018 NIBRS Data. Regressions are weighted by the number of crimes that occurred in each state before the MeToo movement started. Robust standard errors in parenthesis. ***p<0.01; **p<0.05; *p<0.1

Table 8: Effect by victim and offender demographics

	ihs(crime)			
	(1)	(2)	(3)	(4)
Post * Sexual Assault, Victim Female	0.091***			
	(0.016)			
Post * Sexual Assault, Victim Male	0.033			
	(0.024)			
Post * Sexual Assault, Victim Black		0.077***		
		(0.024)		
Post * Sexual Assault, Victim White		0.082***		
		(0.016)		
Post * Sexual Assault, Offender Female			0.015	
			(0.042)	
Post * Sexual Assault, Offender Male			0.098***	
			(0.016)	
Post * Sexual Assault, Offender Black				0.095***
				(0.022)
Post * Sexual Assault, Offender White				0.092***
				(0.017)
Difference	0.058**	-0.005	-0.083*	0.003
State * Crime Type * Time	X	X	X	X
State * Crime Type * Month	X	X	X	X
Post	X	X	X	X
Final Month	Mar 18	Mar 18	Mar 18	Mar 18
Observations	9,981	9,981	9,981	9,981

This table shows the effect of the MeToo movement by victim and offender demographics. In each column, crimes are aggregated into different categories. The reference group for all columns is all non-sexual crimes. In Columns (1) and (3) crimes where the sex the victim or offender is unknown are excluded along with crimes with multiple victims or offenders. In Columns (2) and (4) Crime where the race of the victim or offender is unknown are excluded along with crimes with multiple victims or offenders. Crimes with a victim or offender of another race (e.g., Asian) are also excluded since they are relatively rare. 2010-2017 NIBRS Data. All regressions are weighted by the number of crimes that occurred in each state before the MeToo movement started. Robust standard errors in parenthesis. ***p<0.01; **p<0.05; *p<0.1

Table 9: Effect by neighborhood

	ihs(crime)					
	(1)	(2)	(3)	(4)	(5)	(6)
Post * Sexual Crimes	0.128***	0.135***	0.128***	0.129***	0.128***	0.128***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Post * Sexual Crimes * Median Income (std. dev.)		0.045**				
		(0.020)				
Post * Sexual Crimes * Share College Educ.			0.148			
			(0.096)			
Post * Sexual Crimes * Share Blacks				0.054		
				(0.089)		
Post * Sexual Crimes * Share Other Non-Whites					0.019	
					(0.127)	
Post * Sexual Crimes * Share Hispanics						−0.148*
						(0.087)
Weighted Mean of Demographic		58,626	0.341	0.23	0.285	0.298
Neighborhood * Crime Type * Time	X	X	X	X	X	X
Neighborhood * Crime Type * Month	X	X	X	X	X	X
Post	X	X	X	X	X	X
Final Month	Mar 18	Mar 18	Mar 18	Mar 18	Mar 18	Mar 18
Observations	25,056	25,056	25,056	25,056	25,056	25,056

This table shows the effect of the MeToo movement based on neighborhood-level data and tests for heterogeneous effects by neighborhood demographics. 2010-2018 city crime data. All regressions are weighted by the number of crimes that occurred in each neighborhood before the MeToo movement started. All demographic variables are first subtracted by their weighted mean. Robust standard errors in parenthesis. ***p<0.01; **p<0.05; *p<0.1

Table 10: Effect of the MeToo movement on arrests

	ihs(crime)					
	(1)	(2)	(3)	(4)	(5)	(6)
Post * Sexual Assault, No Arrest	0.095***			0.105***		
	(0.016)			(0.011)		
Post * Sexual Assault, Arrest	−0.008			0.052***		
	(0.026)			(0.018)		
Post * Sexual Assault		0.014	0.091***		0.071***	0.107***
		(0.027)	(0.016)		(0.019)	(0.011)
Difference	0.103***			0.053***		
State * Crime Type * Time	X	X	X	X	X	X
State * Crime Type * Month	X	X	X	X	X	X
Post	X	X	X	X	X	X
Final Month	Mar 18	Mar 18	Mar 18	Dec 18	Dec 18	Dec 18
Crimes *	All	Arrest	No Arrest	All	Arrest	No Arrest
Observations	9,981	6,654	6,654	10,899	7,266	7,266

This table shows the effect of the MeToo movement on sexual crimes by whether an arrest was made. A case is defined to have an arrest if a suspect is taken into custody based on a warrant or previously submitted report, arrested on view without a warrant or summoned to court. In Column (1) and (4), the crimes are aggregated to three separate crime categories: Sexual crimes where an arrest, sexual crimes where no arrest was made and non-sexual crimes, which are the control group. In Column (2) and (5), only crimes where an arrest was made are included and columns (3) and (6) include only crimes where no arrest was made. Columns (1)-(3) focus on the short run effect and columns (4)-(6) focus on the long run. 2010-2018 NIBRS data. Regressions are weighted by the number of crimes that occurred in each state before the MeToo movement started. Robust standard errors in parenthesis. ***p<0.01; **p<0.05; *p<0.1

Table 11: Persistence of the effect in countries with a strong MeToo movement

	ln(crime)	
	(1)	(2)
Post * Sexual crime	0.130***	
	(0.034)	
2017 Q4 * Sexual crime		0.163***
		(0.042)
2018 Q1 * Sexual crime		0.150***
		(0.053)
2018 Q2 * Sexual crime		0.098***
		(0.035)
2018 Q3 * Sexual crime		0.100**
		(0.037)
2018 Q4 * Sexual crime		0.142***
		(0.043)
Country * Crime type * Lin. trend	X	X
Country * Crime type * Quarter	X	X
Post	X	
Q4 2017-Q4 2018 FE		X
Observations	988	988
Clusters	30	30

This table shows the effect of the MeToo movement over time using data from the 15 OECD countries with a strong MeToo movement in October 2017. Standard errors clustered at the country by crime level in parenthesis. ***p<0.01, **p<0.05, *p<0.1.

Table 12: Persistence of the effect in the US

	ihs(crime)				
	(1)	(2)	(3)	(4)	(5)
Post * Sexual Crimes	0.100***		0.125***		
	(0.011)		(0.021)		
2017 Q4 * Sexual Crimes		0.070***		0.125***	0.113***
		(0.017)		(0.033)	(0.039)
2018 Q1 * Sexual Crimes		0.093***		0.136**	0.081
		(0.020)		(0.065)	(0.067)
2018 Q2 * Sexual Crimes		0.101***		0.106***	0.090**
		(0.018)		(0.038)	(0.037)
2018 Q3 * Sexual Crimes		0.106***		0.138***	0.136***
		(0.020)		(0.035)	(0.035)
2018 Q4 * Sexual Crimes		0.137***		0.115***	0.103**
		(0.026)		(0.038)	(0.041)
City/State * Crime Type * Time	X	X	X	X	X
City/State * Crime Type * Month	X	X	X	X	X
Post	X	X	X	X	X
Data	NIBRS	NIBRS	Cities	Cities	Cities
Crimes	All	All	All	All	Reported Within 1 M
Observations	7,266	7,266	1,368	1,368	1,361

This table shows the effect of the MeToo movement on sexual crimes by quarter. Data is aggregated at the monthly state/city by crime category level. Columns (1) and (2) are based on 2010-2018 NIBRS data. Columns (3)-(5) is based on the sample of US cities. Columns (1) and (3) report the long run effects until December, 2018. Columns (2), (4), (5) report the effect by quarter and each coefficient represents the effect on sexual crimes in a three month period. Column (5) includes only crimes which were reported within 30 days of their occurrence. Regressions are weighted by the number of crimes that occurred in each city before the MeToo movement started. Robust standard error in parenthesis. ***p<0.01; **p<0.05; *p<0.1

Table 13: Change in beliefs regarding sexual harassment

	Workplace sexual harassment no longer a problem		Accusers cause more problem than they solve	
	(1)	(2)	(3)	(4)
2018	-0.139^{***}		-0.010	
	(0.032)		(0.025)	
Women, 2018		-0.047		0.004
		(0.043)		(0.035)
Men, 2018		-0.238^{***}		-0.026
		(0.048)		(0.035)
Respondent FE	X	X	X	X
Observations	9,252	9,236	9,212	9,196

This table shows the change in beliefs regarding sexual harassment between 2016-2018. The data is the pooled 2016 and 2018 responses for the Views of the Electorate Research Survey. Columns (1) and (2) refer to respondents' agreement with: "Sexual harassment against women in the workplace is no longer a problem in the United States." Columns (3) and (4) refer to respondents' agreement with "Women who complain about harassment often cause more problems than they solve." The answers are coded between 0 (strongly disagree) and 3 (strongly agree) and then standardized. The results are similar when a binary coding of the response is used instead. All regressions control for respondent fixed effects. Robust standard error in parenthesis. ***p<0.01; **p<0.05; *p<0.1

Appendix For Online Publication

A Processing Crime Data

A.1 Crime classification

For both the US and international data we classify each crime as belonging to one of the following categories: sexual assault, defined as a sexual crime that includes physical contact; sexual harassment, defined as a sexual crime that does not include physical contact (e.g. stalking or indecent exposure); non-sexual crimes and crimes which are not directly affected by the MeToo movement but could be indirectly related to it. Crimes indirectly related to the MeToo movement include crimes related to bestiality, bigamy, domestic assault, harassment where it is not clear if the harassment is of sexual nature, incest, pedophilia, pornography, prostitution, and registration of sexual offenders. We exclude these crimes from the analysis since spillovers from the MeToo movement can affect this group of crimes, and therefore, they are not a suitable control group. We also exclude from the analysis cases appearing in police records, which are not related to any specific crime (e.g., missing person investigation) and traffic tickets.

Throughout most of the analysis, we aggregate the sexual assault and sexual harassment crimes into one category, defined as sexual crime.

A.2 OECD crime data collection and processing

To collect high-frequency crime data from as many OECD countries as possible, we first downloaded the data available on the websites of the statistics agencies and the police. If no data was available online, we contacted both the main statistics agency as well as the national police requesting data on the number of crimes reported at a monthly or quarterly level. Finally, if these contacts did not yield the required data, we filed the equivalent of a Freedom of Information Act request or purchased data specifically aggregated for our project from the statistics agency. The effort has currently succeeded in collecting data from 30 OECD countries, but the data collection efforts are ongoing, and more data will be added to this dataset as more countries respond to our requests.

To quality control our international data, we crosschecked our data for the 19 EU countries in our sample with the 2017 Eurostat data on sexual violence. To avoid correlation between the two data sets driven by population size of the countries, we compared the sexual crimes per population of 100,000. Reassuringly, the correlation in the number of sexual crimes per population of 100,000 is 0.96. The average percentage difference between the numbers in the two data sets is -1% showing that there is no systematic difference in the level of the numbers. Finally, the average absolute percentage difference between the numbers in the two data sets is 24% showing that for most estimates the two numbers are similar in magnitude. The difference could be explained by the fact that we excluded specific sexual crimes that did not seem directly related to the MeToo movement (such as crimes against children) and since we included crimes that may appear outside the sexual assault category, such as stalking.

In Australia, Iceland, the United Kingdom, and the United States, high-frequency data on the number of crimes reported are not available for the whole country. For Australia we have data for New South Wales, Queensland, Victoria, and Western Australia, covering 88% of the population, but not for the Australian Capital Territory, Northern Territory, South Australia, and Tasmania. For Iceland, we have data for the Capital region, covering 63% of the population. For the United Kingdom, we have data for England, Northern Ireland and Wales, covering 92% of the population, but not Scotland. For the United States, we use the NIBRS data described in more detail in Appendix Section A.4.

The 30 countries in our data set are listed in Appendix Table A.4 together with the organizations providing the data, the time period covered as well as the percentage of the population covered by the police agencies providing the data.

A.3 Google search data processing

As our primary measure of the MeToo movement's strength, we use the search interest in the topic of the MeToo movement in October 2017. Our search interest data is scraped from Google trends and contains monthly search interest figures for all of the OECD from 2010-2018.[35] To ensure that our primary measure of MeToo movement strength is not higher for countries that more frequently use search terms related to the MeToo movement, before these terms had been given the meaning they were given by the MeToo movement, we difference out the average search intensity for these terms from the period before the MeToo movement for each country, so that each country has an average interest of zero in the pre-period. Finally, to simplify the interpretation of this measure, we normalize the magnitude of the

[35] For scraping, we used the R package gtrendsR written by Philippe Massicotte and Dirk Eddelbuettel.

interest so that the average interest in the OECD is one in the post-period.

Google does not provide information on the phrases defined as being part of the MeToo movement topic. Therefore, we also create our own definition of the MeToo movement topic in all of the languages used in the OECD, for which we could find a phrase related to the MeToo movement. We restricted our measure to phrases with search interest in their country of origin of at least 1% of the search interest for "me too" in the US, these terms are: "me too", "balance ton porc", "moi aussi", "quella volta che" and "yo tambien" as well as these terms written without spaces.[36] In the relevant time period from October 2017 to December 2017 searches for these phrases has a 0.99 correlation with the MeToo movement topic defined by Google. We prefer to use the search for the MeToo movement topic instead of our list of exact phrases since it is more likely that the topic search will include searches for additional phrases related to the MeToo movement in other languages.

In Tables 2 and 3, we use an alternative measure of search interest based on searches related to the topics of sexual harassment and sexual assault. Again, the topics are defined by Google as all searches that include the concept of sexual harassment or sexual assault in any language. In contrast to searches for the MeToo topic, searches for the topics of sexual harassment and sexual assault have the same interpretation before and after the start of the MeToo movement. Therefore, we normalize the search interest so that the pre-MeToo period mean is one for each country.

A.4 NIBRS crime data processing

We classify NIBRS offenses as either sexual assault or non-sexual crimes. The sexual assault offenses are fondling, rape, sexual assault with an object, sodomy, and statutory rape. We exclude incest, human trafficking, and the pornography/obscene material crime categories. All other 43 offense types form the non-sexual crimes category. Domestic assault is not a separate offense type in the NIBRS dataset. To exclude domestic violence crimes which may have been affected by the MeToo movement, we exclude all aggravated assaults where the circumstances of the assault are defined in the NIBRS as a “lovers quarrel” and all assaults or aggravated assaults for which the relationship between the offender and victim is defined in the NIBRS as one of the following: victim was ex-spouse, victim was spouse, homosexual relationship, victim was boyfriend/girlfriend, victim was common-law spouse.

In the NIBRS data, an incident can include multiple crimes if they occurred in concert, at the same

[36] We exclude searches that contained the term “me too” along with the words "meghan", "trainor" or "song" since the song "Me too" by Meghan Trainor caused an increase in search interest around its release in May 2016.

time and place. Since our classification of incidents depends on the type of offense committed, we define an incident as a sexual assault if one of the offenses which occurred as part of the incident is a sexual assault. Similarly, if the incident is not a sexual assault, we exclude it if one of the offenses which occurred as part of the incident should be excluded (e.g., if an incident includes both a pornography/obscene material offense and a weapon law violations offense, it will be excluded).

We aggregate the NIBRS data at a geographical area by crime category by month. When analyzing state-level data, we exclude state-years where there are months with fewer than 100 crimes reported in total.

A.5 City crime data processing

Data for each city was obtained separately from the city's open data website. For each city, we first categorize a crime as a sexual assault, sexual harassment, non-sexual crime, or a crime which should be excluded since it is indirectly related to the MeToo movement (as explained in Appendix Section A.1). If an observation is defined at the crime level and the data includes multiple crimes per incident, we then aggregate crimes at the incident level. The incident crime category is defined as the most severe crime of the crimes composing the incident, where we use the following hierarchy: Sexual assault, sexual harassment, excluded crimes, other crimes.[37]

In the city data, we define each month as spanning from the 15th day of the calendar month to the 14th day of the next calendar month. By defining months in this way, we can cleanly categorize each observation in the aggregated data as occurring before or after the start of the MeToo movement, since the movement started on October 15, 2017.[38]

A.6 Neighborhood level demographics

To determine the neighborhood where each crime occurs, we use the most coarse definition of police administrative areas available in the dataset. We use the most coarse definition (e.g., a police division instead of a police beat) to ensure that the number of crimes is positive for most observations. The

[37] Typically, multiple crimes which form an incident occur at the same date. However, in Kansas City, an incident (or a "case") can be continuously updated and appear multiple times in the dataset, for example, when the victim reports a crime and when the police has a suspect. In cases where an incident appears more than once in the dataset and includes at least one report from a victim, we include only the report of the victim. If an incident still has multiple observations, we include only one observation and define the date the incident was reported as the minimal date among all observations related to the incident. If crimes related to the incident occurred over multiple days, we define the date the incident occurred as NA.

[38] We do not use a similar definition when analyzing the international data or NIBRS data since most international data we collect is already aggregated at the month or quarter level, and since we want to keep the NIBRS results consistent with the international analysis.

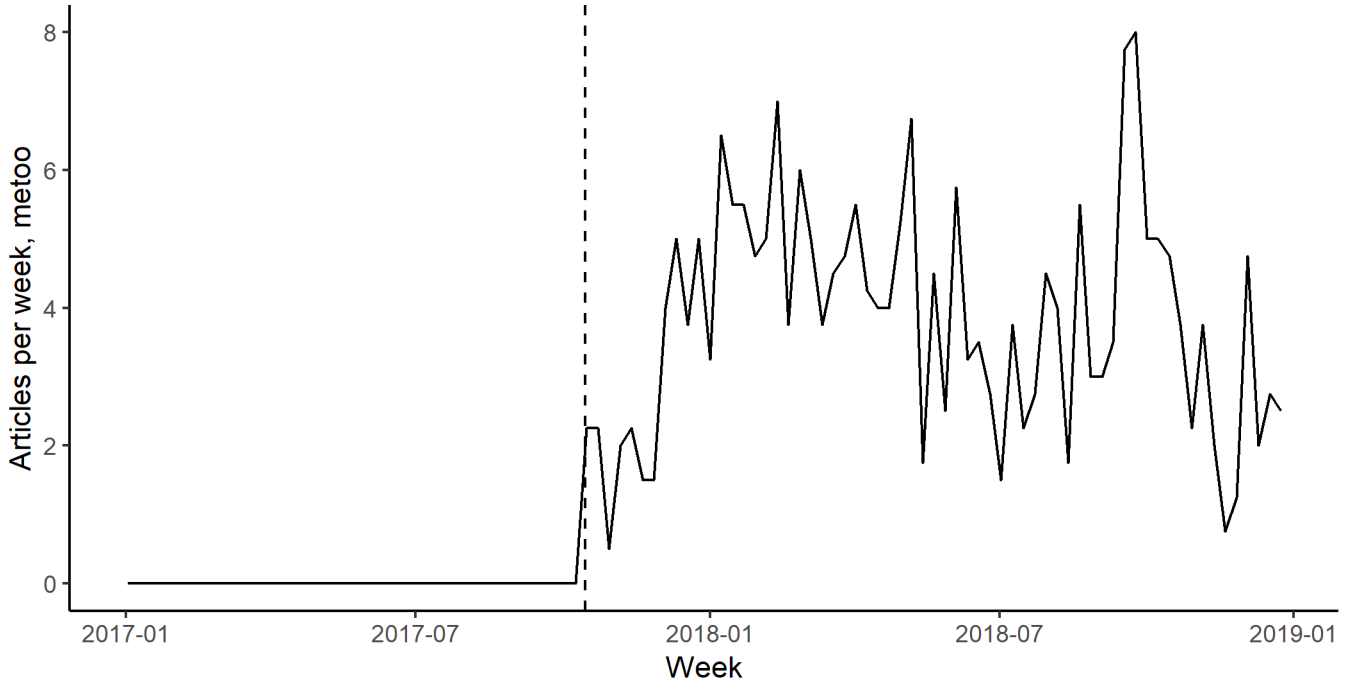
jurisdictions are detailed in Appendix Table A.6. In the case of Nashville, the police precinct where the crime occurred is not reported in the city's crime dataset, and we identify the precinct based on the rounded coordinates of the crime's location.

We use the shapefiles for the police boundaries of each city to identify the geographical boundaries of each neighborhood. For most cities, we use the most recent shapefile available. For Seattle, where changes in the shapefiles are clearly defined, we use different shapefiles for different years and determine the boundaries of each police precinct according to the year when the crime occurred.

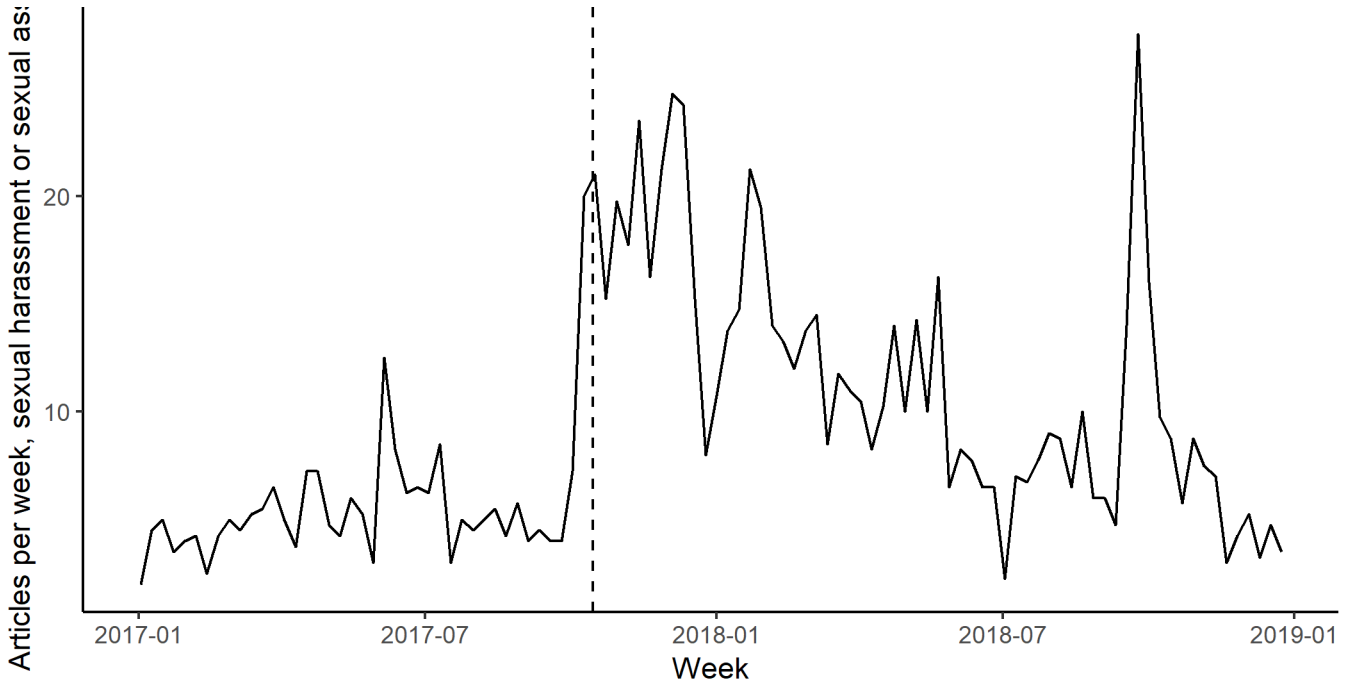
The demographics of each neighborhood are determined by spatially matching the neighborhood with census block groups. We calculate each neighborhood's demographics as the weighted average of the covariates among overlapping block groups, where the weight of each block group is the population of the block group multiplied by the share of the block group's area overlapping with the neighborhood. The demographics for each block group are based on the American Community Survey 5-year 2016 estimates.

B Additional Figures and Tables

Figure A.1: Newspaper coverage



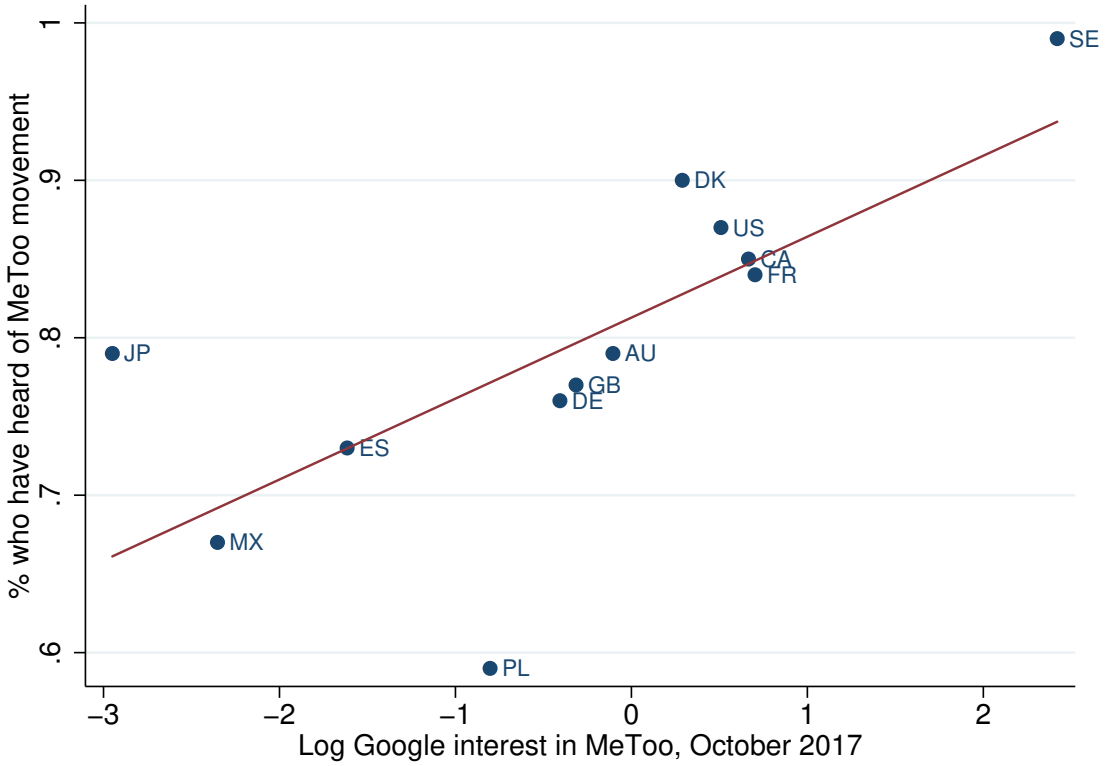
(a) Newspaper articles mentioning the term metoo



(b) Newspaper articles mentioning the terms sexual harassment or sexual assault

The first sub-figure show the average number of weekly articles mentioning the term "metoo" in the newspapers USA Today, New York Post, Denver Post, and Chicago Sun Times. The second sub-figure present the average number of weekly articles mentioning the terms "sexual assault" or "sexual harassment" (articles mentioning both terms are counted twice). The newspapers were chosen based on circulation and data availability. The number of articles is determined using the website newslibrary.com.

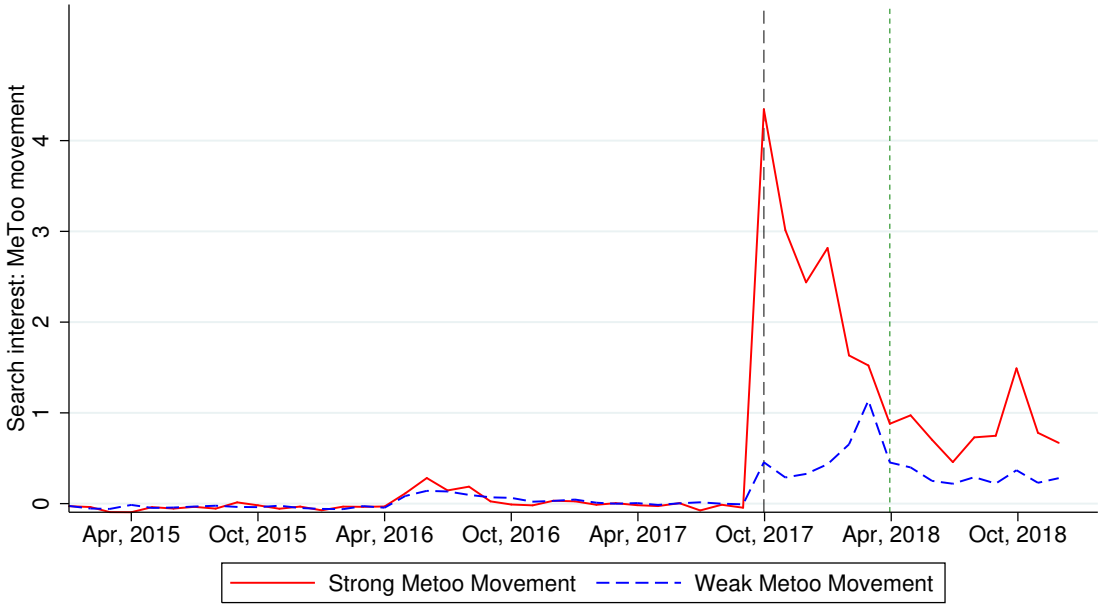
Figure A.2: Relationship between Google search interest and knowledge about MeToo movement



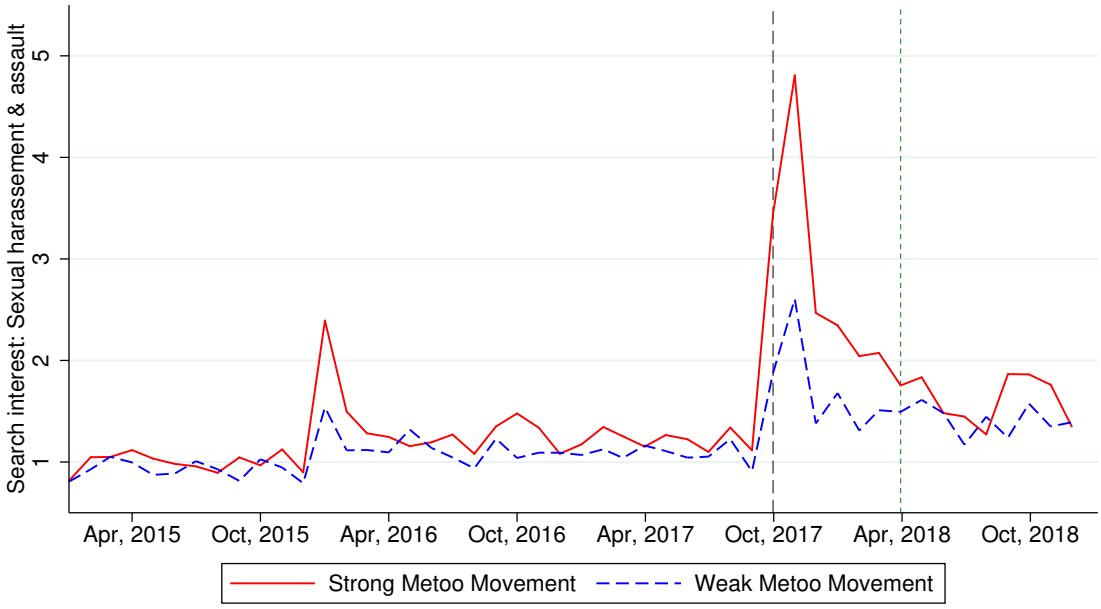
This figure shows the relationships between the log of google search interest for terms related to the MeToo movement in October 2017 and the fraction of respondents who had heard about the MeToo movement in a YouGov survey conducted from February to March in 2019 (YouGov, 2019). The data comes from the 12 OECD countries in our data that were included in the survey.

Figure A.3: Google search interest by MeToo movement strength

(a) Search interest in the topic of the MeToo movement

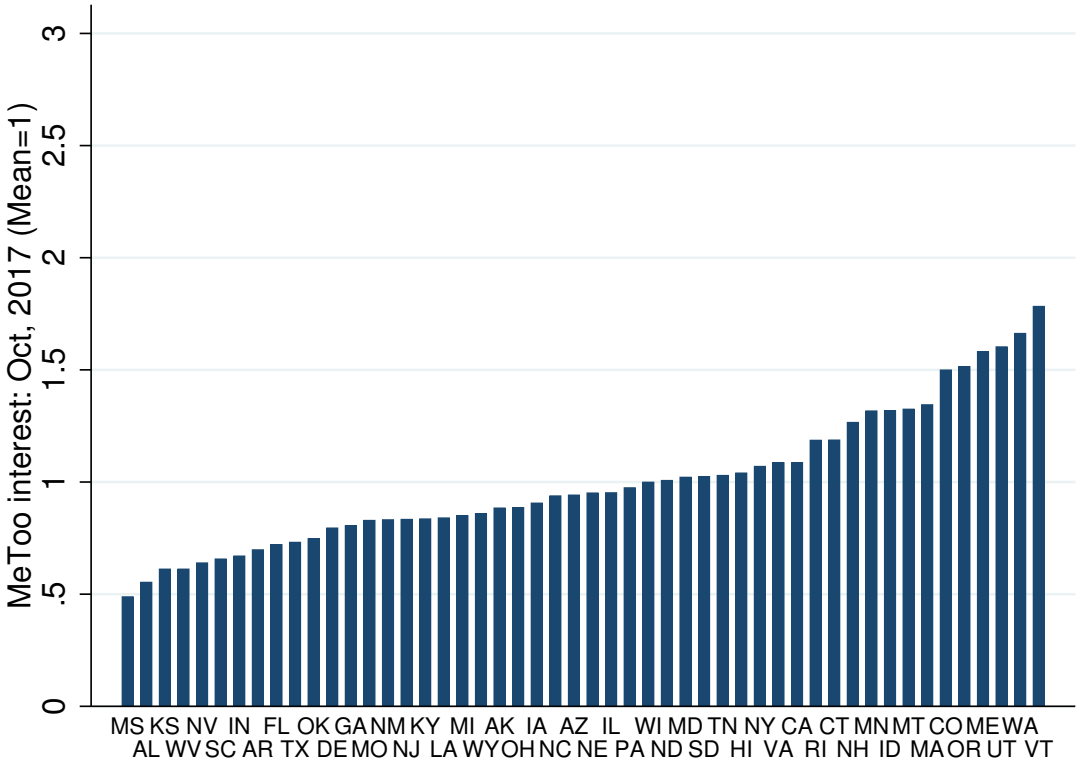


(b) Search interest in the topics of sexual harassment and sexual assault



The figures show monthly search interest for OECD countries with strong and weak MeToo movements. Countries are classified as weak or strong by search interest in the MeToo topic in October, 2017. Data is from Google Trends. The first vertical line represents the start of the MeToo movement, the second vertical line represents the end of the six month period we use to measure short-term effects. Sub-figure (a) shows search interest in the topic of the MeToo movement. Mean pre-MeToo interest is subtracted from the time series for each country separately so that the pre-MeToo period has a mean of zero, the data is then normalized so that the post-MeToo OECD mean equals 1. Sub-figure (b) shows search interest in the topics of sexual harassment and sexual assault. The data is normalized so that the pre-MeToo mean equals 1 for each country.

Figure A.4: Variation in MeToo interest across US states



This figure shows the strength of the MeToo movement in US states, based on Google Search interest in the topic of the MeToo movement during October 2017.

Table A.1: MeToo effect, with crime aggregated by offense types

	ihs(crime)		
	(1)	(2)	(3)
Post * Sexual Assault	0.081***		
	(0.015)		
Post * Sexual Assault		0.096***	0.096***
		(0.018)	(0.027)
State * Crime Type * Time	X	X	X
State * Crime Type * Month	X	X	X
Post	X	X	X
Agg Crimes	Sexual/Other Crimes	NIBRS Categories	NIBRS Categories
S.E	Robust	Cluster by Crime Type	Cluster by Crime*State
Num of Clusters		21	735
Final Month	Mar 18	Mar 18	Mar 18
Observations	6,654	69,867	69,867

This table shows the effect of the MeToo movement using different crime aggregation and inference methods. Column (1) is our main estimate where crimes are categorized as either sexual crimes or non-sexual crimes, and robust standard errors are used. In columns (2)-(3), crimes are aggregated according to the NIBRS offense types. Incidents that include multiple offense types are excluded. Column (2) clusters standard errors by crime category and column (3) clusters by the interaction of state and crime category. All regressions are weighted by the number of crimes that occurred in each state before the MeToo movement started. 2010-2018 NIBRS data. ***p<0.01; **p<0.05; *p<0.1.

Table A.2: MeToo effect by city

	ihs(crime)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Post * Sexual Crimes	0.144***	0.085***	0.189**	0.083	0.401	−0.074	0.093
	(0.041)	(0.032)	(0.074)	(0.075)	(0.307)	(0.082)	(0.065)
Crime Type * Time	X	X	X	X	X	X	X
Crime Type * Month	X	X	X	X	X	X	X
Post	X	X	X	X	X	X	X
Final Month	Mar 18	Mar 18	Mar 18	Mar 18	Mar 18	Mar 18	Mar 18
City	NYC	LA	Seattle	Denver	Nashville	Louisville	Kansas City
Observations	198	198	198	126	126	198	198

This table shows the effect of the MeToo movement on sexual crimes where the effect is calculated for each city separately. Robust standard error in parenthesis. ***p<0.01; **p<0.05; *p<0.1

Table A.3: Effect of the MeToo movement by clearance

	ihs(crime)					
	(1)	(2)	(3)	(4)	(5)	(6)
Post * Sexual Assault, Not Cleared	0.106***			0.112***		
	(0.016)			(0.011)		
Post * Sexual Assault, Cleared	0.011			0.065***		
	(0.024)			(0.016)		
Post * Sexual Assault		0.025	0.103***		0.068***	0.115***
		(0.025)	(0.017)		(0.017)	(0.011)
Difference	0.096***			0.047***		
State * Crime Type * Time	X	X	X	X	X	X
State * Crime Type * Month	X	X	X	X	X	X
Post	X	X	X	X	X	X
Final Month	Mar 18	Mar 18	Mar 18	Dec 18	Dec 18	Dec 18
Crimes *	All	Cleared	Not Cleared	All	Cleared	Not Cleared
Observations	9,981	6,654	6,654	10,899	7,266	7,266

This table shows the effect of the MeToo movement on sexual crimes by whether a case was cleared. A case is cleared if it has an arrest (a victim a suspect is taken into custody based on a warrant or previously submitted report, arrested on view without a warrant or summoned to court), or if the police or if the police have sufficient probable cause to arrest a suspect but could not make an arrest for reasons outside their control including the victim refusing to cooperate, the death of the offender, the prosecutor declining prosecution for a reason other than lack of probable cause, the offender being in custody of another jurisdiction, and the offender being a juvenile. The effect on cases that were not cleared remain much larger than the effect on cleared cases. In Column (1) and (4), the crimes are aggregated to three separate crime categories: Sexual crimes which were cleared, sexual crimes which were not cleared and non-sexual crimes, which are the control group. In Columns (2) and (5), only crimes where the case was cleared are included and columns (3) and (6) includes only crimes which were not cleared. Columns (1)-(3) focus on the short run effect and columns (4)-(6) focus on the long run. 2010-2018 NIBRS data. Regressions are weighted by the number of crimes that occurred in each state before the MeToo movement started. Robust standard errors in parenthesis. ***p<0.01; **p<0.05; *p<0.1

Table A.4: Data sources for international data

Country	Data Providing Organization	Time period	Share of the population covered
Australia	New South Wales Bureau of Crime Statistics and Research, Queensland Police, Crime Statistics Agency of Victoria, and Western Australia Police	2010-2018	88%
Belgium	Federale politie	2010-2018	100%
Canada	Canadian Centre for Justice Statistics	2010-2018	100%
Chile	Policía de Investigaciones	2010-2018	100%
Colombia	Policía Nacional	2010-2018	100%
Czech republic	Policie České republiky	2010-2018	100%
Denmark	Danmarks Statistik	2010-2018	100%
Estonia	Politsei- ja Piirivalveamet	2010-2018	100%
Finland	Tilastokeskuksen	2010-2018	100%
France	Ministère de l'Intérieur	2010-2018	100%
Germany	Bundeskriminalamt	2012-2018	100%
Greece	Hellenic Statistical Authority (ELSTAT)	2010-2018	100%
Iceland	Lögreglan a höfudborgarsvaedinu	2013-2018	63%
Ireland	Central Statistics Office	2010-2018	100%
Israel	Central Bureau of Statistics	2010-2018	100%
Japan	National Statistics Center	2015-2018	100%
Korea	Supreme prosecutors' office	2010-2018	100%
Lithuania	Informatikos ir Rysiu Departamentas	2012-2015 and 2017-2018	100%
Mexico	Instituto Nacional de Estadística y Geografía	2015-2018	100%
Netherlands	Korps Nationale Politie	2012-2018	100%
New Zealand	New Zealand Police	Q3 2014-2018	100%
Poland	Wydział ds. Parlamentarnych i Informacji Publicznej	2010-2018	100%
Portugal	Instituto Nacional de Estatística	2010-2018	100%
Slovakia	Statisticky Urad	2010-2018	100%
Slovenia	Statistični Urad	2010-2018	100%
Switzerland	Bundesamt für Statistik	2010-2018	100%
Spain	Ministerio del Interior	2010-2018	100%
Sweden	Brottsförebyggande rådet	2010-2018	100%
United Kingdom	Home Office: Crime and Policing Analysis Unit and Open Data Northern Ireland	2010-2018	92%
United States	Federal Bureau of Investigation	2010-2018	30%

Table A.5: MeToo movement start date by country

Country	**Start date using search interest in MeToo topic**	**Start date using search interest in Sexual harassment and sexual assault topics**
Australia	October, 2017	November, 2017
Belgium	October, 2017	No strong MeToo movement
Canada	October, 2017	October, 2017
Chile	No strong MeToo movement	November, 2017
Colombia	No strong MeToo movement	April, 2018
Czech republic	November, 2017	No strong MeToo movement
Denmark	October, 2017	October, 2017
Estonia	No strong MeToo movement	No strong MeToo movement
Finland	October, 2017	October, 2017
France	October, 2017	October, 2017
Greece	No strong MeToo movement	November, 2017
Germany	October, 2017	No strong MeToo movement
Iceland	October, 2017	No strong MeToo movement
Ireland	October, 2017	October, 2017
Israel	No strong MeToo movement	November, 2017
Japan	No strong MeToo movement	April, 2018
Korea	February, 2018	No strong MeToo movement
Lithuania	March, 2018	November, 2017
Mexico	No strong MeToo movement	November, 2017
Netherlands	October, 2017	No strong MeToo movement
New Zealand	October, 2017	October, 2017
Poland	No strong MeToo movement	No strong MeToo movement
Portugal	No strong MeToo movement	October, 2017
Slovakia	No strong MeToo movement	No strong MeToo movement
Slovenia	No strong MeToo movement	December, 2018
Switzerland	October, 2017	October, 2017
Spain	No strong MeToo movement	November, 2017
Sweden	October, 2017	October, 2017
United Kingdom	October, 2017	October, 2017
United States	October, 2017	October, 2017

Table A.6: Definition of the neighborhood level by city

City	Neighborhood Level
Denver	Police District
Kansas City	Police Division
LA	Patrol Division
Louisville	Police Division
Nashville	MNPD Zone (Patrol Area)
New York City	Police Precinct
Seattle	Police Precinct