

# Inequality in victimization trends in Scotland 2008/09-2017/18

Ben Matthews, Susan McVie and Paul Norris, *University of Edinburgh*

Crime Surveys User Conference

2020-12-08



WARNING!

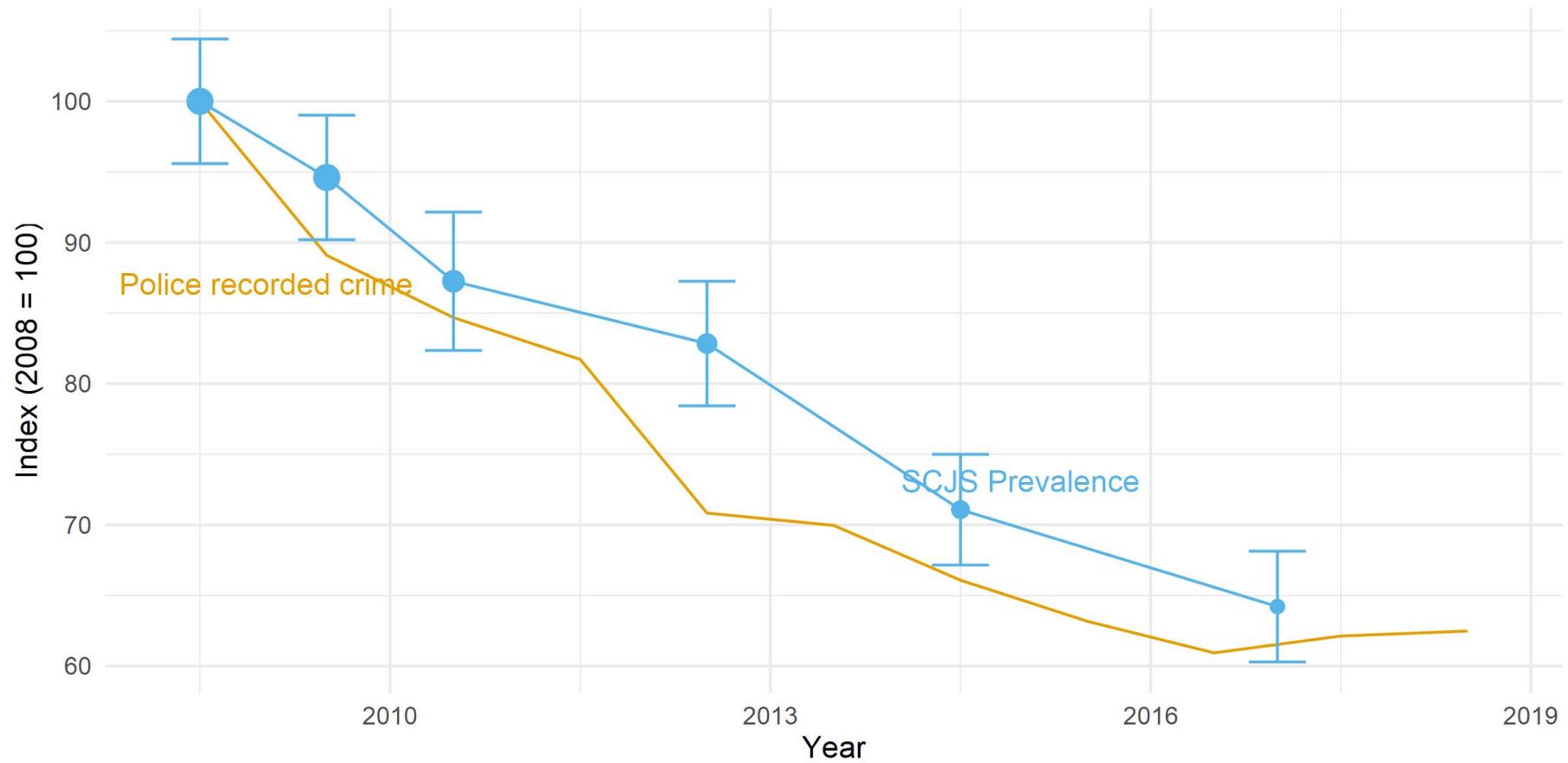
Work in progress

Background

# Motivating question

- Crime drop in Scotland and elsewhere (van Dijk and Tseloni, 2012, McVie et al., 2020)

# Motivating question



# Motivating question

- One of the big questions: has crime fallen for all groups in society equally? (Hunter and Tseloni, 2016; McVie et al., 2020)
- Measuring changing victimization inequality can help target crime prevention measures and (maybe?) also help figure out why crime has fallen
- We focus on Scotland as a case study of the crime drop

# Dimensions of inequality

- Not just finances – we need to look across multiple dimensions (Hunter and Tseloni, 2016)
- Literature is pretty fragmented, but important variables include age, gender, ethnicity, disability, area characteristics (deprivation and region), financial hardship and tenure (see variously Nilsson and Estrada, 2004; Hunter and Tseloni, 2016; Herranz de Rafael and Fernández-Prados, 2019; Ganpat et al., 2020; Grove et al., 2012; Rossetti et al., 2016)

# Measuring victimization inequality

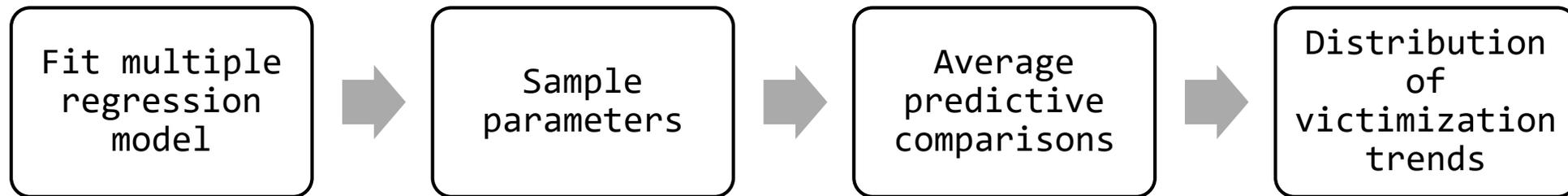
- No consensus about how best to do this!
- We use the ratio of estimated victimization rate in reference socio-demographic group to victimization rate in comparison group/s
- Benefits: this measure is (reasonably...) easy to understand and it lets us show both this 'inequality' measure and the estimated victimization rates themselves, which gives necessary context to the inequality estimates (Spiegelhalter, 2017)
- Costs: it's quite convoluted to calculate (we'll come to this in a second...)

# Measuring victimization inequality

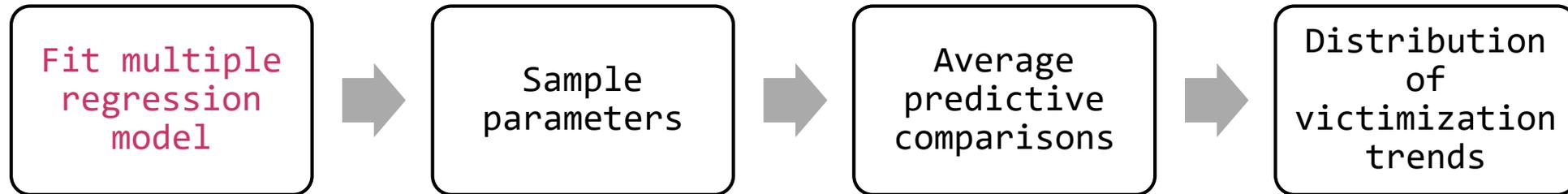
- Today we focus on adjusted victimization rates after controlling for all the other variables we examine to focus on possible drivers of victimization inequality and secondary prevention
- (In the work-in-progress paper we argue that unadjusted rates are more relevant for victim support/tertiary victimization prevention, and also that it's useful to compare the two different measures)

Data and methods

# Estimating victimization rates



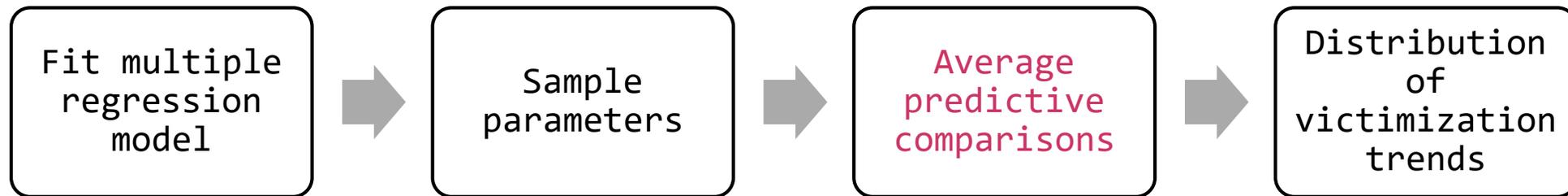
# Estimating victimization rates



# Data and regression model specification

- Data: combined SCJS sweeps from 2008/09-2017/18
- Outcome: number of victimizations (all crime types)
- Predictors: age, gender, ethnicity, disability, SIMD, urban/rural, financial hardship, tenure
- Linear time trend for survey year and interactions between survey year and each predictor
- Fit in R with the {survey} package using weighted-least squares and a quasipoisson link function to account for overdispersion

# Estimating victimization rates



# Average predictive comparisons

- Taking one predictor at a time, make a 'counterfactual' copy of each person in the pooled dataset where they have every possible level of that (categorical) predictor
- Use the fitted regression model to make a predicted victimization rate for each counterfactual person (and the original data), keeping all other predictors at their observed values
- For each level of the predictor of interest, take the average predicted victimization rate
- For rationale, see Gelman and Pardoe (2007)

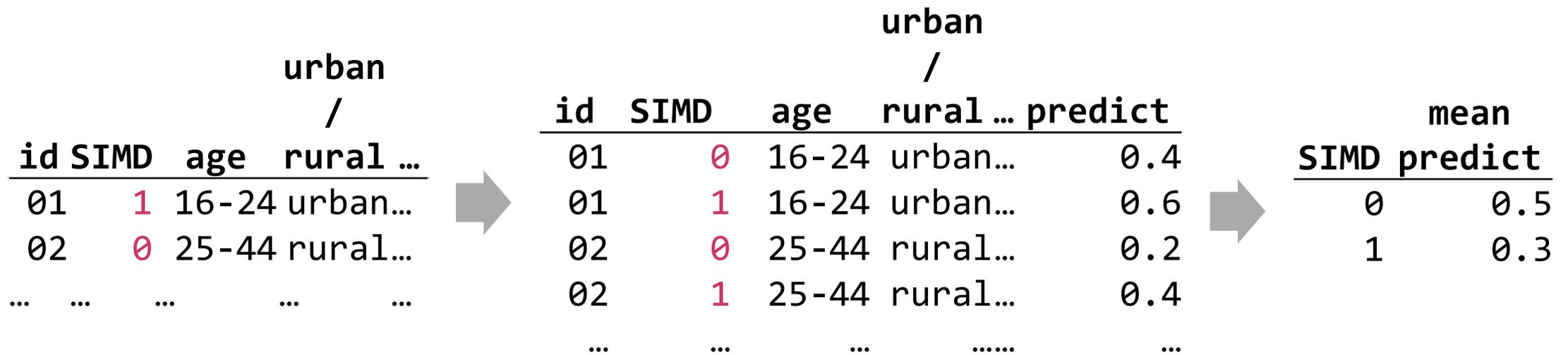
# Average predictive comparisons

					urban /							
<u>id</u>	<u>SIMD</u>	<u>age</u>	<u>rural</u>	<u>...</u>	<u>id</u>	<u>SIMD</u>	<u>age</u>	<u>rural</u>	<u>...</u>	<u>predict</u>		
01	1	16-24	urban...		01	0	16-24	urban...		0.4		
02	0	25-44	rural...		01	1	16-24	urban...		0.6		
...	...	...	...	...	02	0	25-44	rural...		0.2		
					02	1	25-44	rural...		0.4		
					...	...	...	.....		...		

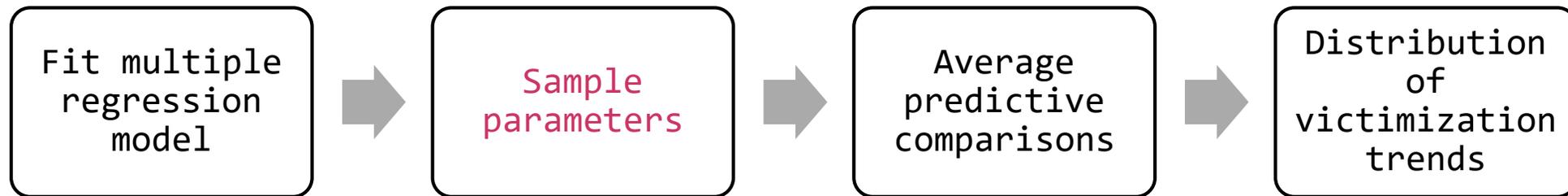
		mean	
<u>SIMD</u>	<u>predict</u>		
0	0.5		
1	0.3		

# Average predictive comparisons





# Estimating victimization rates



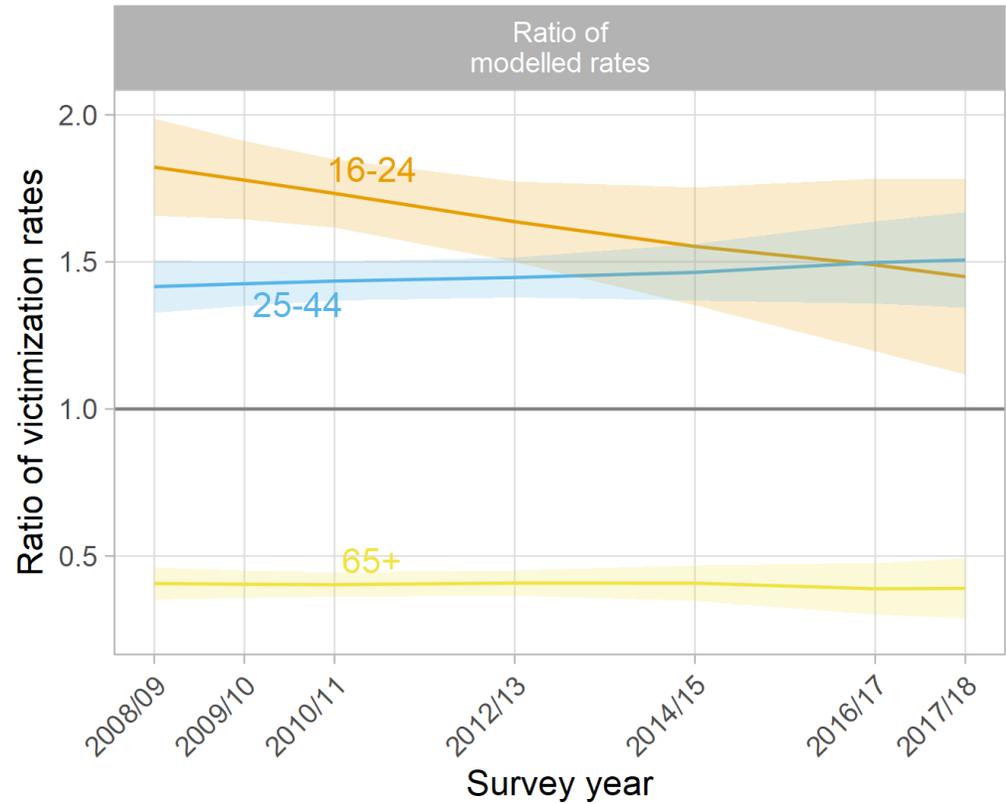
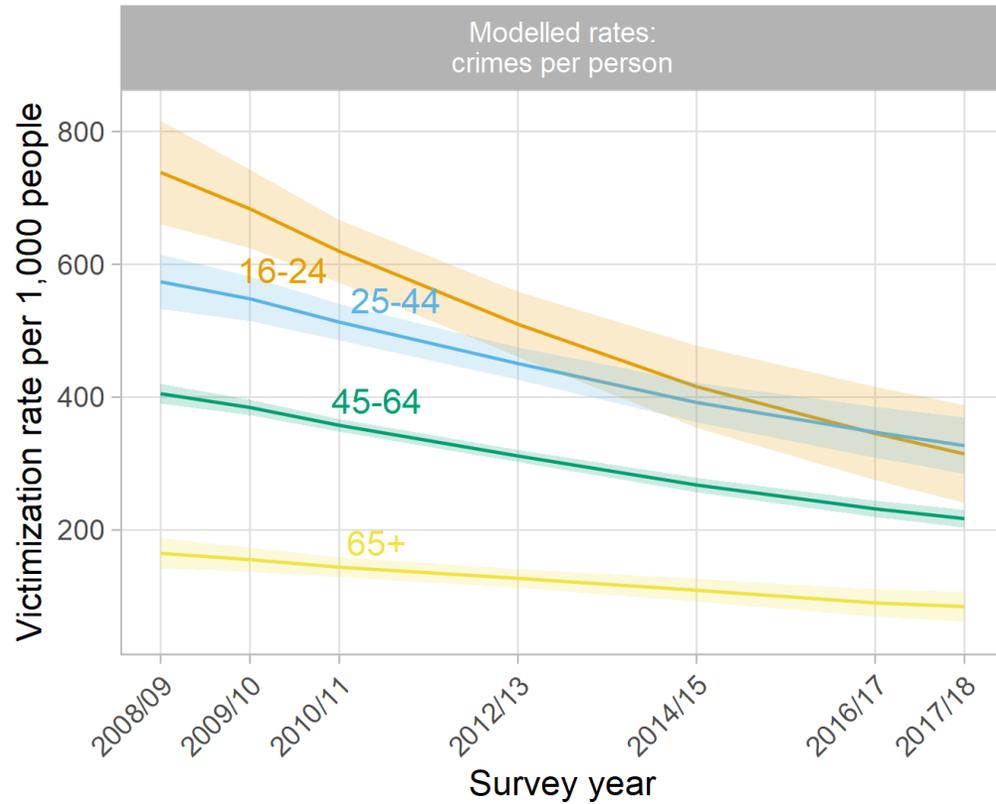
# Sample parameters

- Average predictive comparisons take only the model's point estimates – but we need to account for the uncertainty in our estimated parameters
- Simulate 1,000 sets of parameters from the model's variance-covariance matrix (see King et al. 2000)
- For each of these 1,000 parameters, calculate the average predictive comparison
- This gives us 1,000 estimated victimization rates for each socio-demographic group in each year
- Calculate the ratio of victimization rate for each comparison group relative to the reference group, then calculate mean and standard error across simulations

# Results

Decreasing inequality

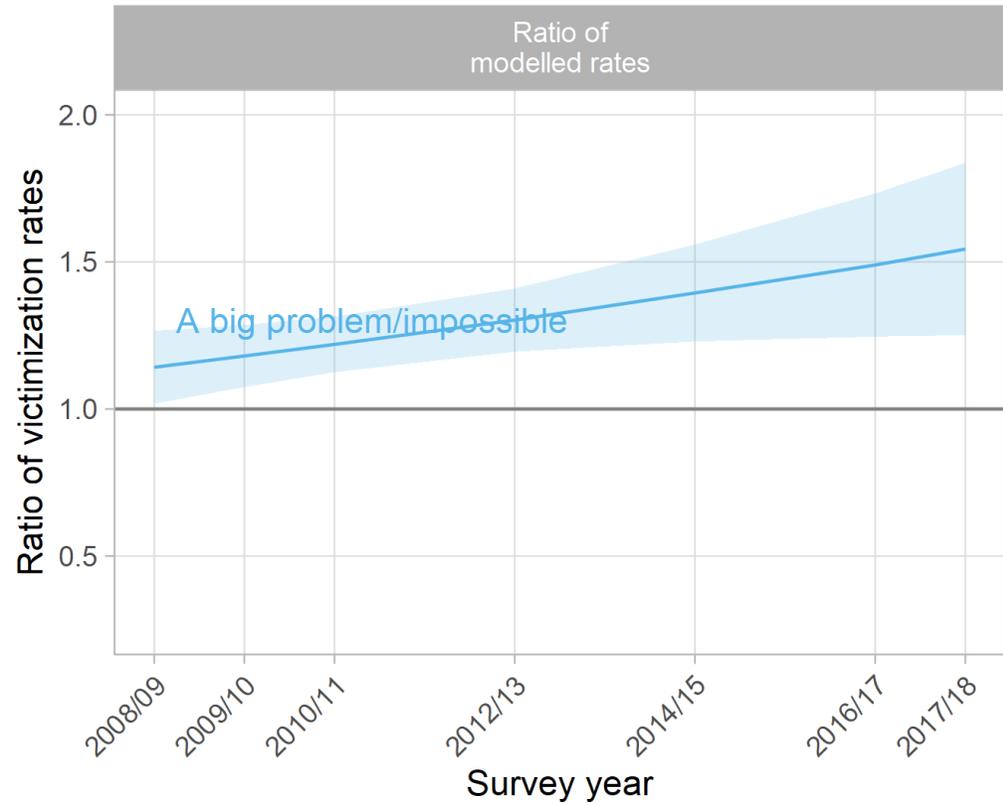
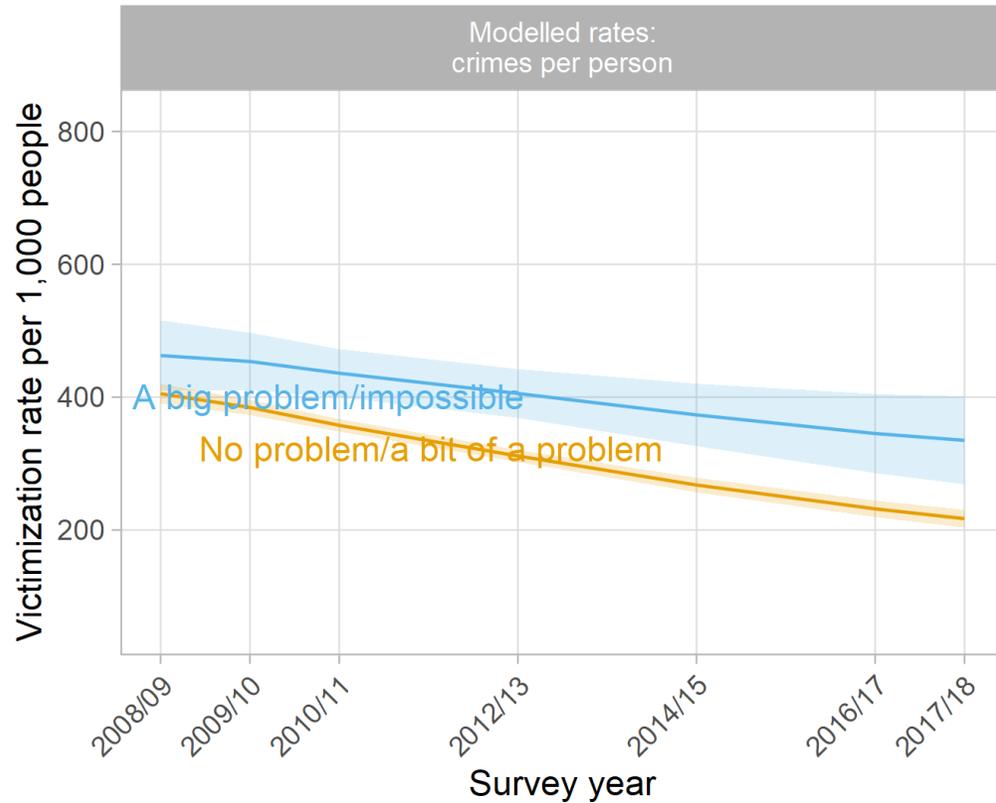
# Age



Bands around trend lines show 95% Confidence Intervals for the modelled estimates, as do the errorbars around points.  
Reference line at 1 (ratio plot) show the value of the model's reference category.

Increasing inequality

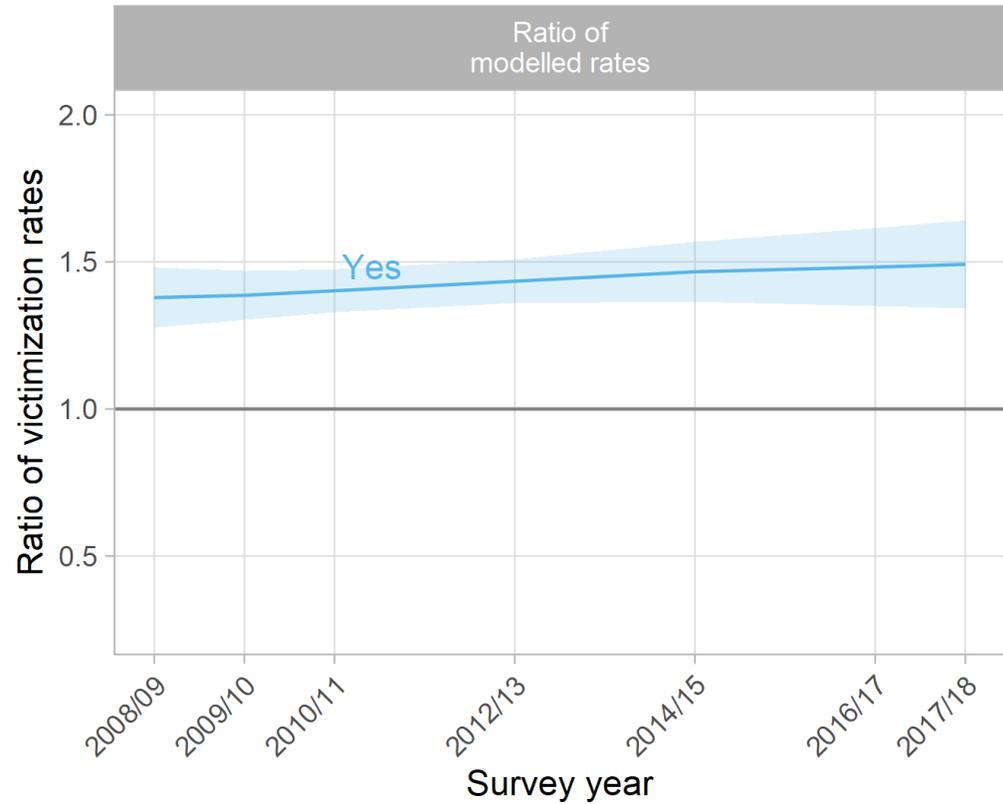
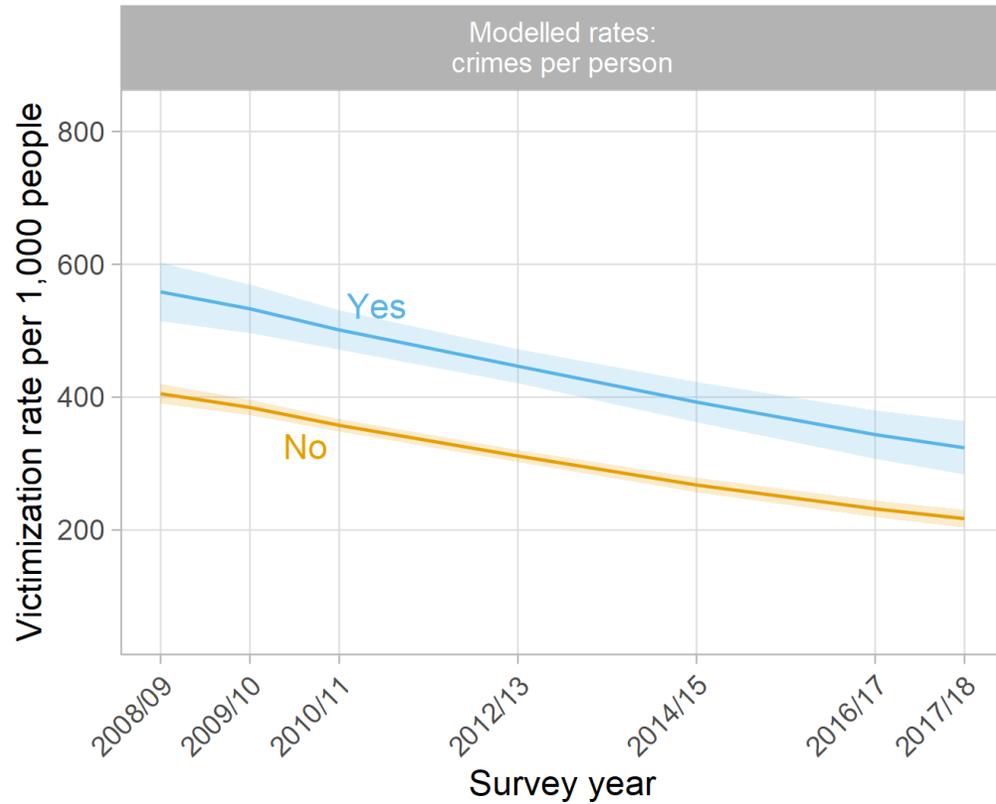
# Financial hardship



Bands around trend lines show 95% Confidence Intervals for the modelled estimates, as do the errorbars around points.  
Reference line at 1 (ratio plot) show the value of the model's reference category.

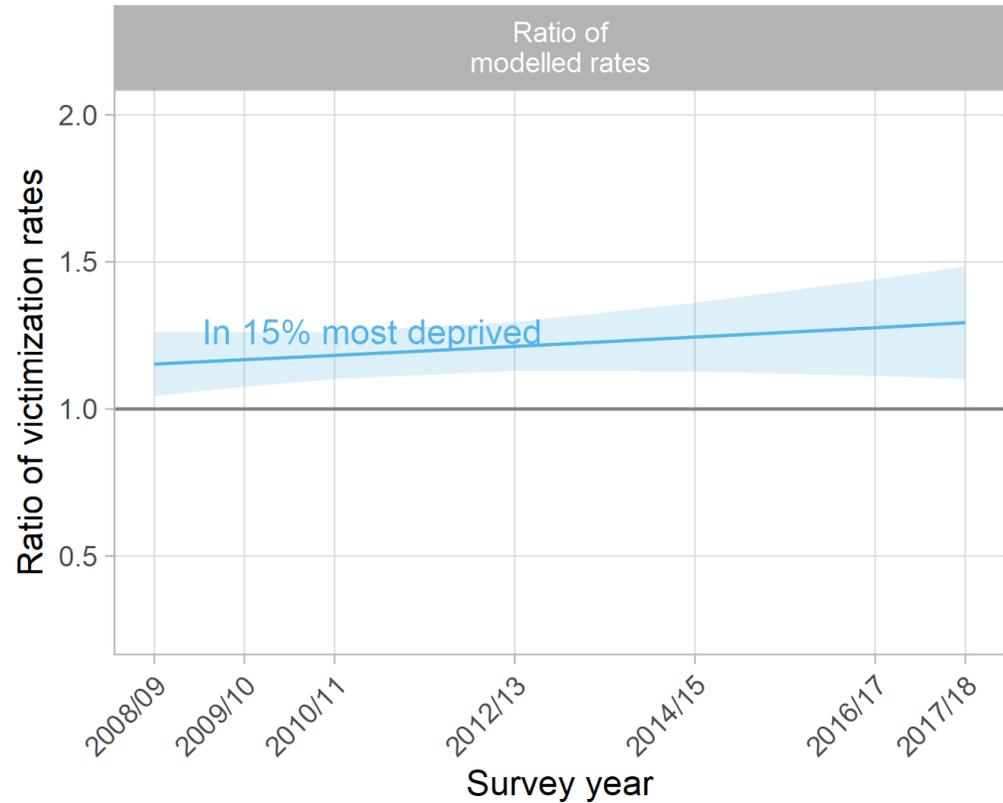
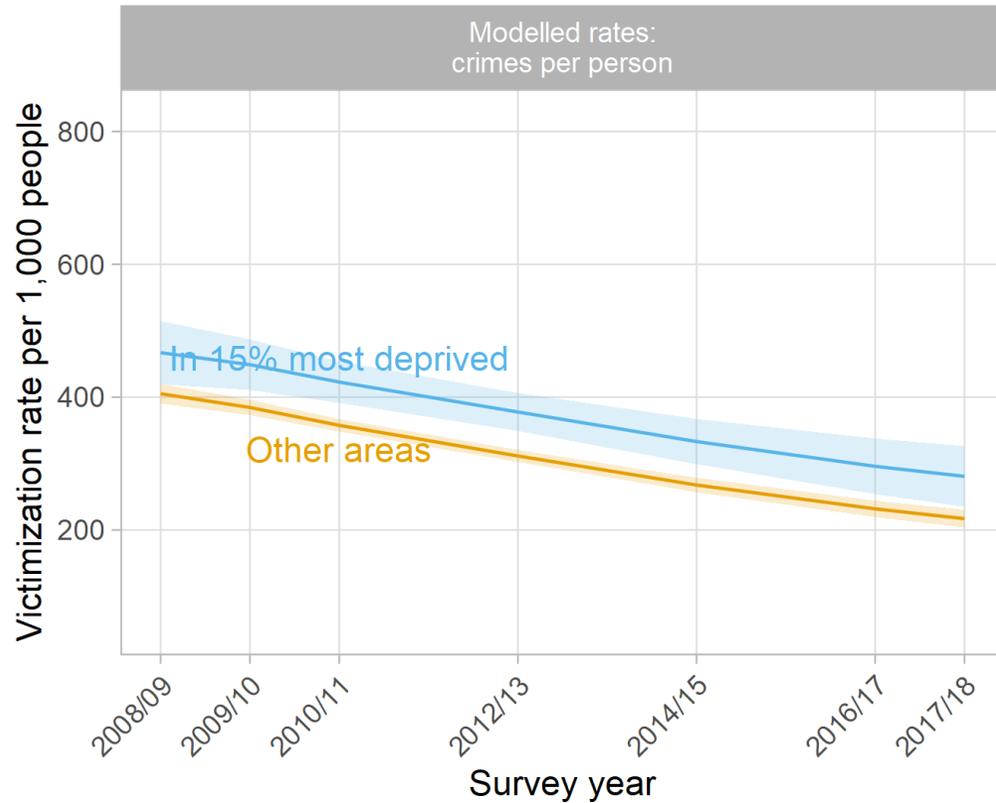
Not much change in inequality

# Disability



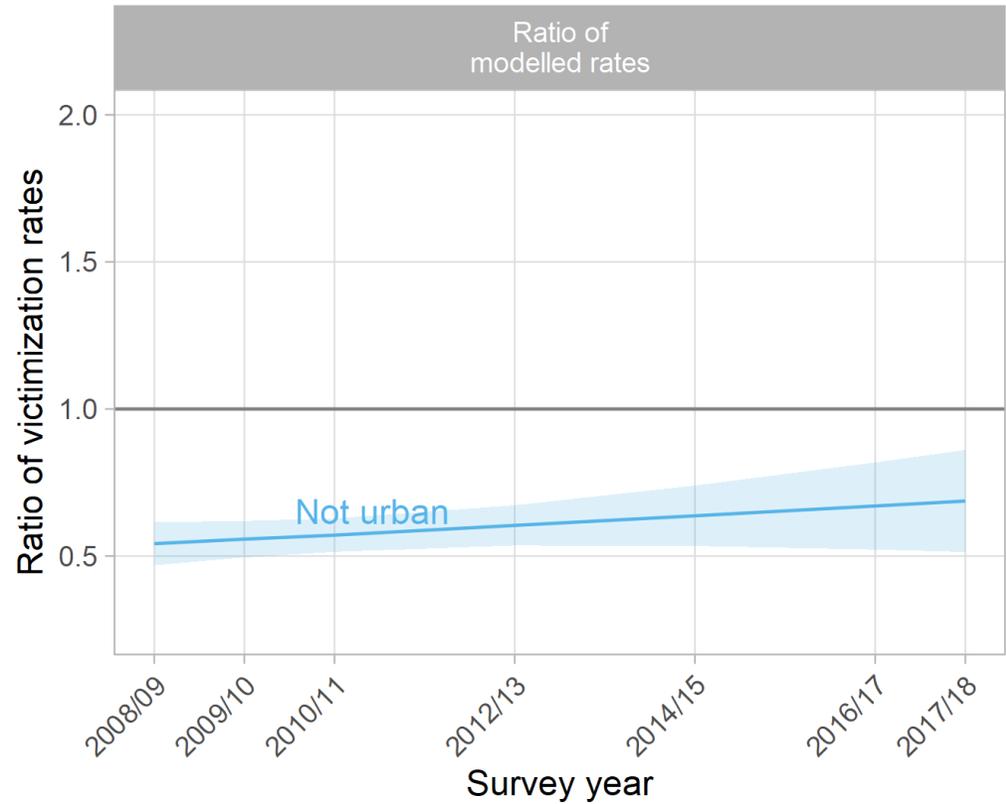
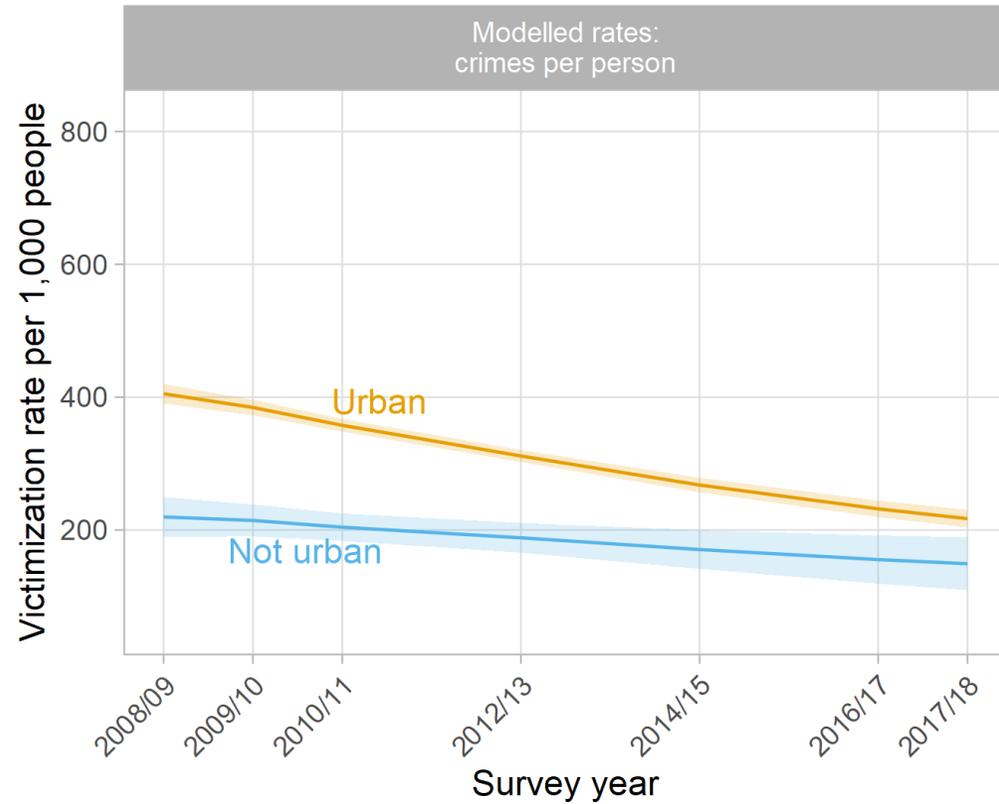
Bands around trend lines show 95% Confidence Intervals for the modelled estimates, as do the errorbars around points.  
Reference line at 1 (ratio plot) show the value of the model's reference category.

# Area deprivation



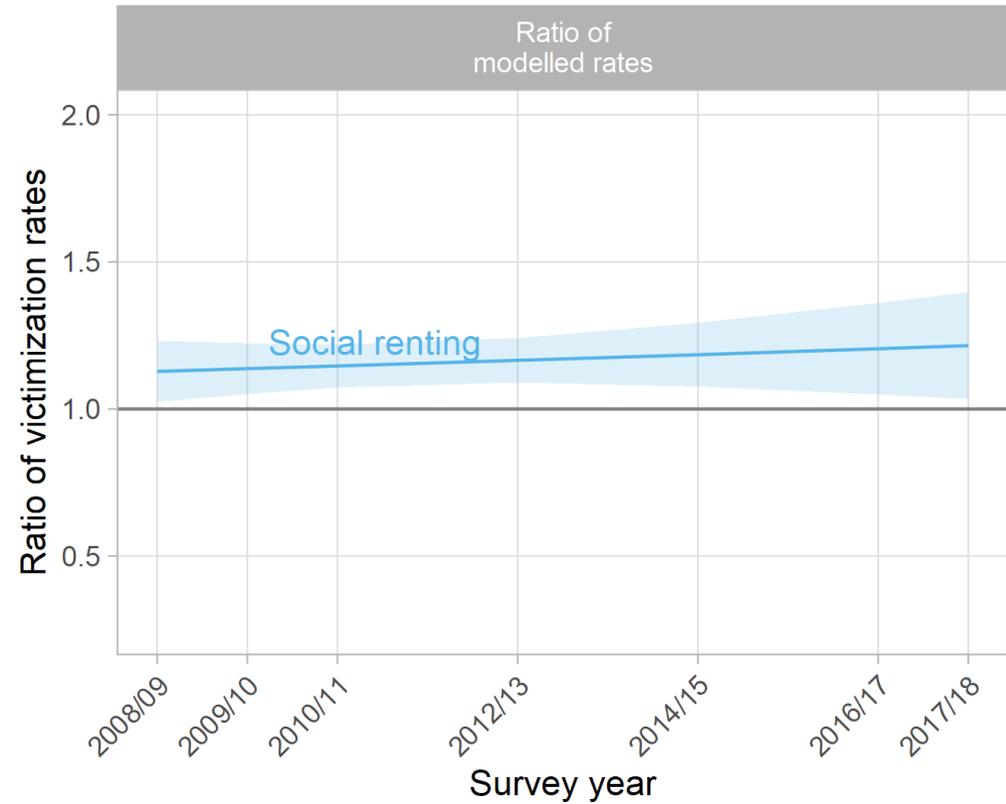
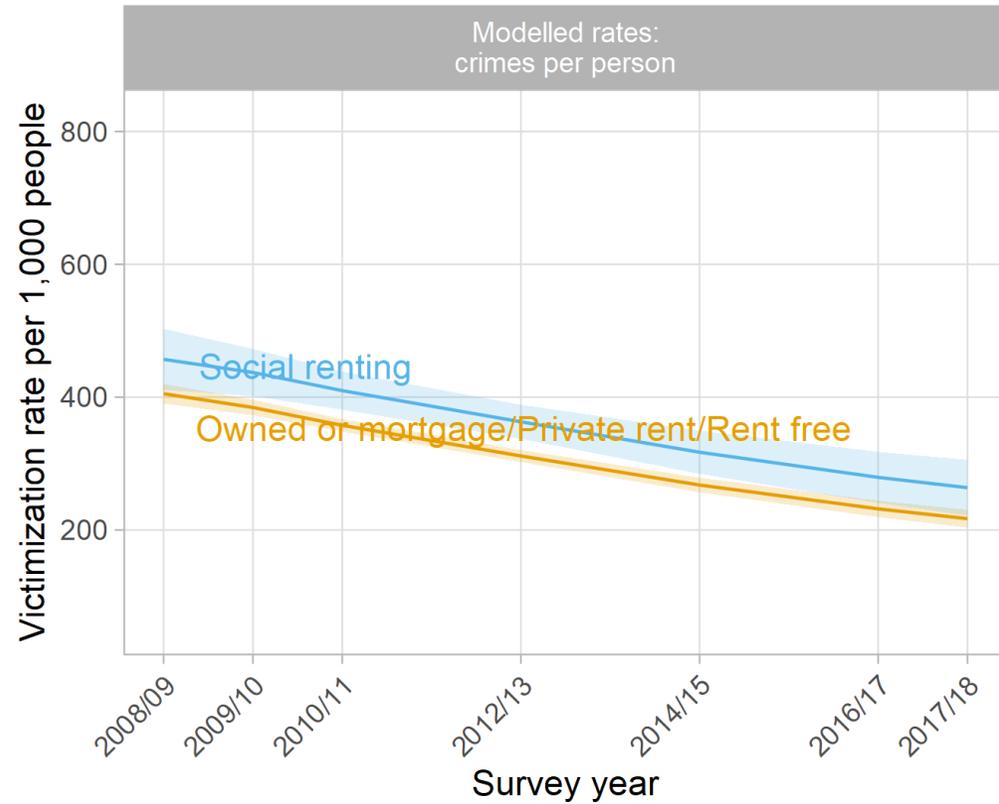
Bands around trend lines show 95% Confidence Intervals for the modelled estimates, as do the errorbars around points.  
Reference line at 1 (ratio plot) show the value of the model's reference category.

# Urban/rural



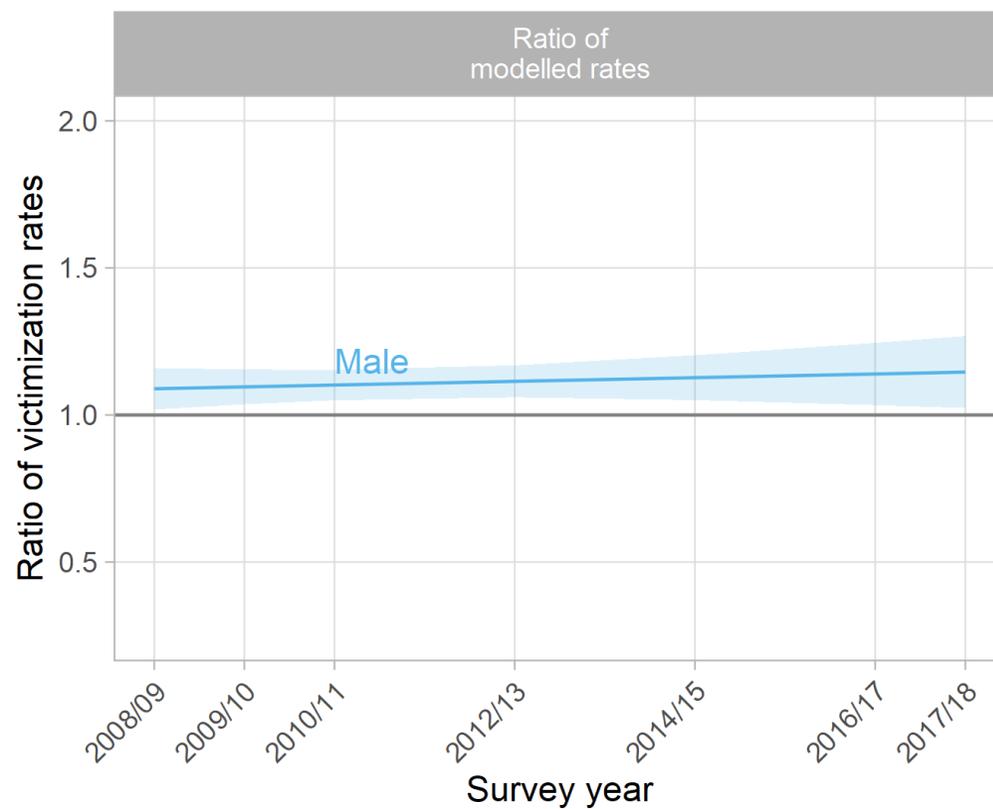
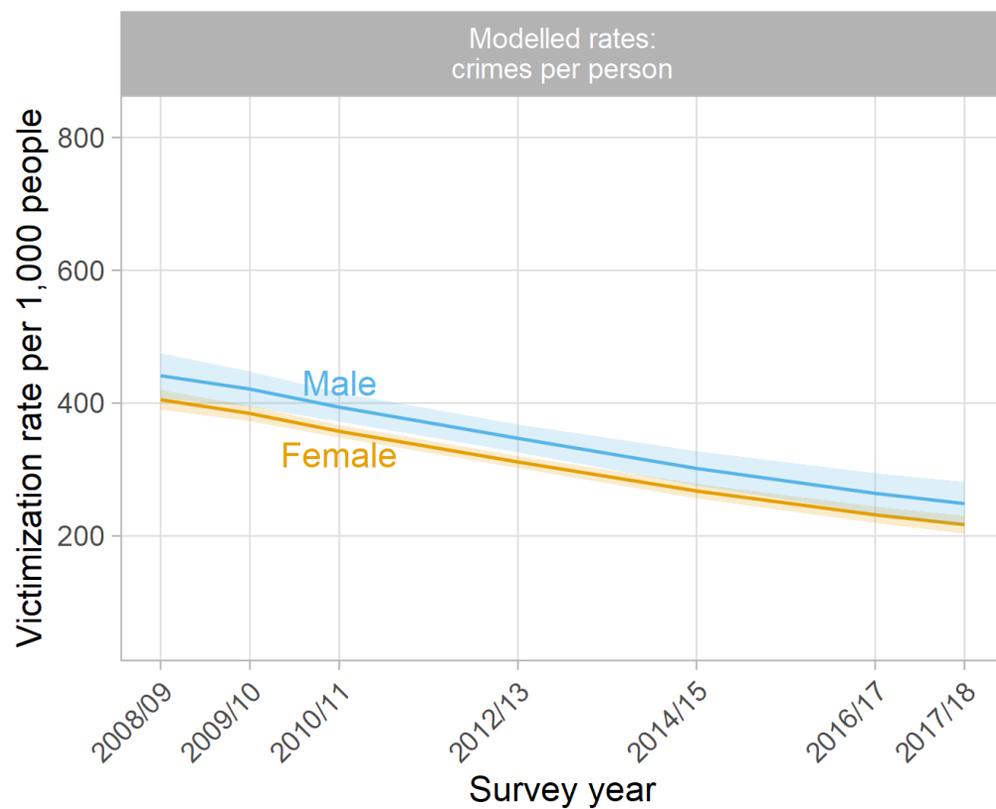
Bands around trend lines show 95% Confidence Intervals for the modelled estimates, as do the errorbars around points. Reference line at 1 (ratio plot) show the value of the model's reference category.

# Tenure



Bands around trend lines show 95% Confidence Intervals for the modelled estimates, as do the errorbars around points. Reference line at 1 (ratio plot) show the value of the model's reference category.

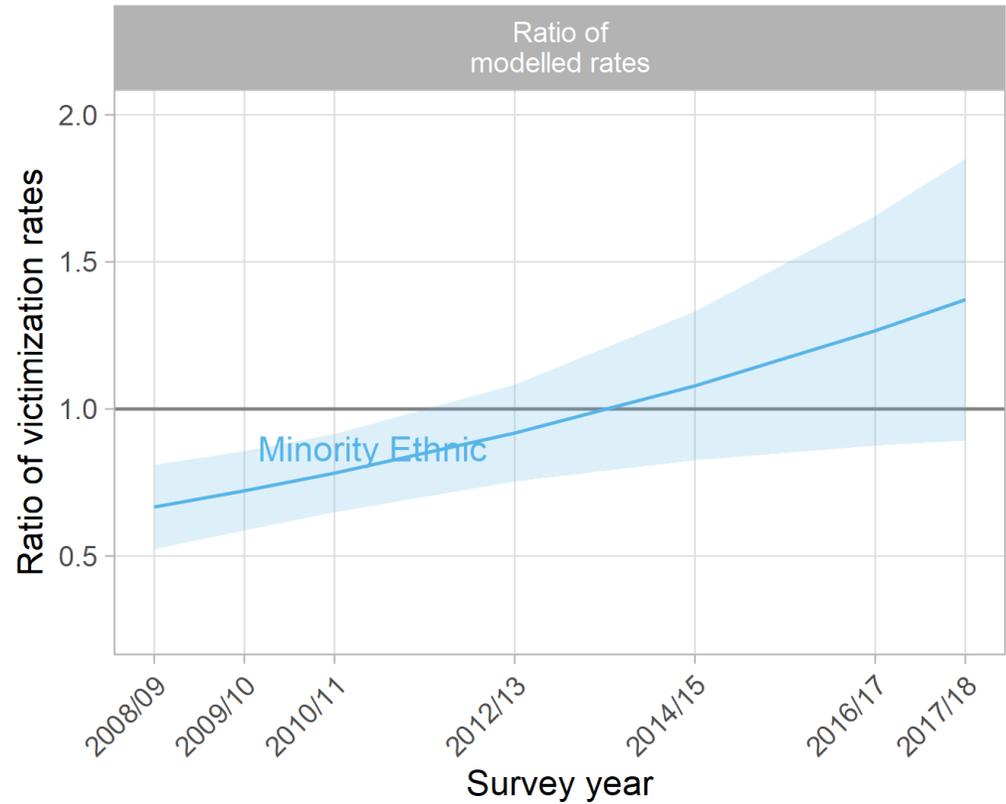
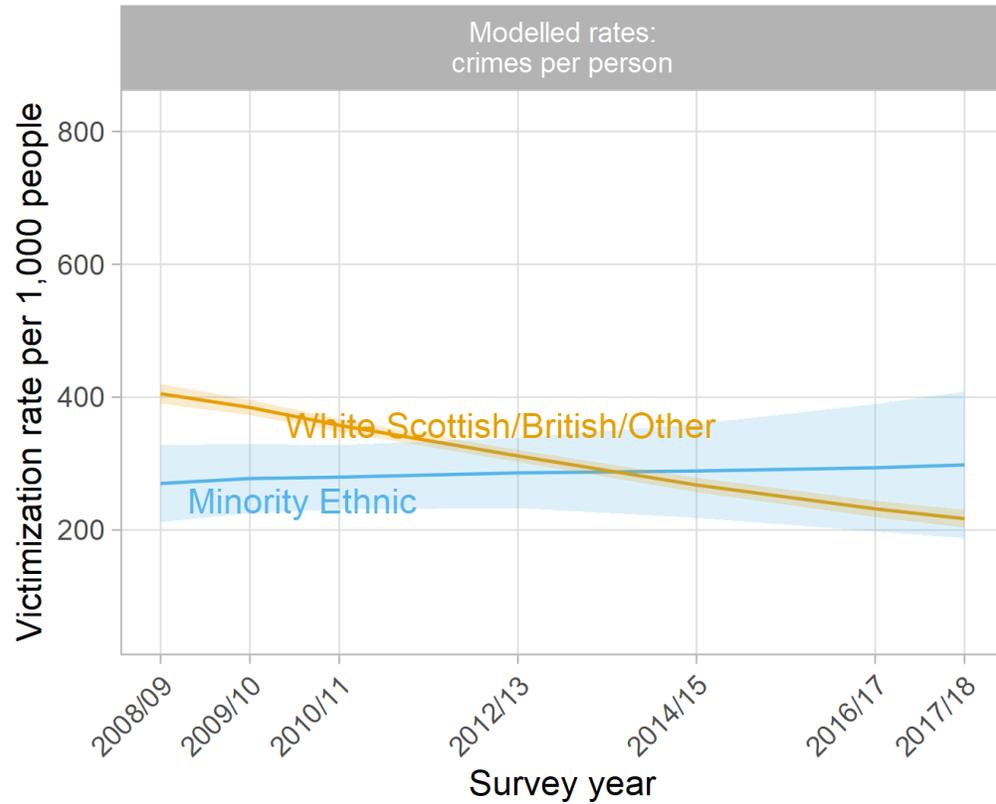
# Gender



Bands around trend lines show 95% Confidence Intervals for the modelled estimates, as do the errorbars around points. Reference line at 1 (ratio plot) show the value of the model's reference category.

Can't draw a firm conclusion?

# Ethnicity



Bands around trend lines show 95% Confidence Intervals for the modelled estimates, as do the errorbars around points. Reference line at 1 (ratio plot) show the value of the model's reference category.

# Discussion

# What have we learned?

- There's a big age component to the crime drop. We see this in convictions data too (Matthews and Minton, 2018). This has to be a fundamental part of how we understand the crime drop
- Victimization has not fallen as quickly for those experiencing financial hardship compared to others. Poverty 'penalty' getting stronger?
- Conditional on our model and assumptions, there's a lot of uncertainty about victimization trends for minority ethnic people in Scotland. This is a serious failing of our current understanding of victimization in Scotland

# Reflections and future directions

- All else being equal, fewer victims of crime mean that it's harder to understand victimization through the SCJS, particularly for minority groups
- Would different methods help? Any kind of hierarchical/regularizing model may improve estimates, but weighting makes things complicated
- Maybe pooling data between SCJS and CSEW would help?
- We've focused on the average victimization rate, but could extend to a location/scale model to explore changes in victimization concentration over time

# Thank you!

 @U\_Inequalities | @benmatthewsed



# References

Ganpat, Soenita M., Laura Garius, Andromachi Tseloni, and Nick Tilley. 2020. "Violence and the Crime Drop." *European Journal of Criminology*, May, 1477370820913456. <https://doi.org/10.1177/1477370820913456>.

Gelman, Andrew, and Iain Pardoe. 2007. "Average Predictive Comparisons for Models with Nonlinearity, Interactions, and Variance Components." *Sociological Methodology* 37 (1): 23–51. <https://doi.org/10.1111/j.1467-9531.2007.00181.x>.

Grove, Louise, Andromachi Tseloni, and Nick Tilley. 2012. "Crime, Inequality, and Change in England and Wales." In *The International Crime Drop: New Directions in Research*, edited by Jan van Dijk, Andromachi Tseloni, and Graham Farrell, 182–99. Crime Prevention and Security Management. London: Palgrave Macmillan UK. [https://doi.org/10.1057/9781137291462\\_8](https://doi.org/10.1057/9781137291462_8).

Herranz de Rafael, Gonzalo, and Juan Sebastián Fernández-Prados. 2019. "Victimization, Social Structure and Psychosocial Variables: The Case of Spain in 1999 and 2016." *Social Sciences* 8 (3): 102. <https://doi.org/10.3390/socsci8030102>.

Hunter, James, and Andromachi Tseloni. 2016. "Equity, Justice and the Crime Drop: The Case of Burglary in England and Wales." *Crime Science* 5 (1): 3. <https://doi.org/10.1186/s40163-016-0051-z>.

King, Gary, Michael Tomz, and Jason Wittenberg. 2000. "Making the Most of Statistical Analyses: Improving Interpretation and Presentation." *American Journal of Political Science* 44: 341–55.

Matthews, Ben, and Jon Minton. 2018. "Rethinking One of Criminology's 'Brute Facts': The Age-Crime Curve and the Crime Drop in Scotland." *European Journal of Criminology* 15 (3): 296–320. <https://doi.org/10.1177/1477370817731706>.

McVie, Susan, Paul Norris, and Rebecca Pillinger. 2020. "Increasing Inequality in Experience of Victimization During the Crime Drop: Analysing Patterns of Victimization in Scotland from 1993 to 2014/15." *The British Journal of Criminology* 60 (3): 782–802. <https://doi.org/10.1093/bjc/azy044>.

Nilsson, Anders, and Felipe Estrada. 2006. "The Inequality of Victimization: Trends in Exposure to Crime Among Rich and Poor." *European Journal of Criminology* 3 (4): 387–412. <https://doi.org/10.1177/1477370806067910>.

Spiegelhalter, David. 2017. "Risk and Uncertainty Communication." *Annual Review of Statistics and Its Application* 4 (1): 31–60. <https://doi.org/10.1146/annurev-statistics-010814-020148>.

Rossetti, Polly, Tamar Dinisman and Ania Moroz. 2016. An Easy Target? Risk factors affecting victimisation rates for violent crime and theft. Victim Support. <https://www.victimsupport.org.uk/sites/default/files/VS%20Insight%20Report%20-%20An%20easy%20target.pdf>

Van Dijk, Jan, and Andromachi Tseloni. 2012. Global Overview: International Trends in Victimization and Recorded Crime. In J. van Dijk, A. Tseloni, & G. Farrell (Eds.), *The International Crime Drop* (pp. 11–36). Basingstoke: Palgrave Macmillan. <http://doi.org/10.1057/978113729142>