

# Using Latent Variable Models to Estimate the Prevalence of Sexual Violence in Armed Conflict: An Introduction

Jule Krüger,  
Center for Political Studies, University of Michigan

*Workshop on Empirical and Computational Social  
Sciences in India*

Ashoka University, December 15, 2018

This workshop builds on ongoing research with

and



Ragnhild Nordås



Christopher Fariss

# Wartime Sexual Violence

- ▶ Includes the use of rape and other forms of sexual violence
- ▶ Constitutes a severe human rights problem
- ▶ Is difficult to observe and document as a practice

A lack of systematic data impedes empirical analysis with regard to extent, spatiotemporal trends, and patterns.

# Why Conflict-Related Sexual Violence Is Hard to Measure

- ▶ Shame, fear of retaliation, stigma and rejection due to socio-cultural taboos
- ▶ Inconsistency in testimony and lack of clear narrative due to trauma-induced memory loss
- ▶ Differing conceptualizations and language used to refer to sexual violence events
- ▶ Perpetrators' incentives to conceal activity and evade accountability for war crimes
- ▶ Blending of state actors and institutions with regard to the perpetration and reporting of these crimes

All of these issues vary over space and time.

# Why the Observation of Wartime Sexual Violence May Improve over Time

- ▶ Increasing international focus
- ▶ Changing norms and perceptions of survivors
- ▶ Recent challenges to societal taboos
- ▶ Growing initiatives to empower survivors to speak out
- ▶ Changes in the wording of sexual violence experiences leading to more explicit descriptions
- ▶ Growth in documentation efforts paired with improved documentation practices

While these trends vary across space, we will likely see higher reporting rates in some places over time.

# How We Currently Measure Wartime Sexual Violence

## Sexual Violence in Armed Conflict

🏠 DATASET FAQ PEOPLE BIBLIOGRAPHY FUNDERS

The Sexual Violence in Armed Conflict (SVAC) Dataset measures reports of the conflict-related sexual violence committed by armed actors (state forces, pro-government militias and rebel groups) during the years 1989-2009. The dataset includes information about the prevalence, perpetrators, victims, forms, timing, and locations of the reported sexual violence by each armed actor in each conflict-year. The information used to compile these data comes from three separate sources: the U.S. State Department, Amnesty International and Human Rights Watch.

An updated version of the dataset is available [here](http://www.sexualviolencedata.org/) (Nov 2016 – Version 1.1).

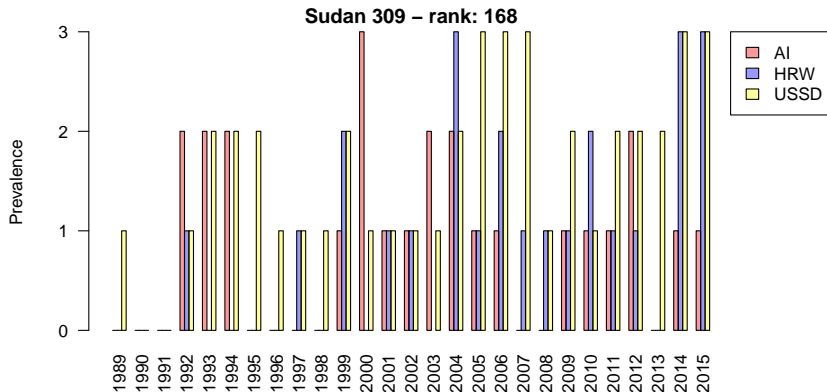
Three ordinal SVAC variables based on human-coded annual human rights reports <http://www.sexualviolencedata.org/>

Let's import the data into R and take a look at it:

```
$: cd ~/git/SVAC-LVM-tutorial/import  
$: open -a Rstudio src/import-check-data-main.R
```

In this tutorial, we will only look at reported SVAC with respect to state forces ('GOV').

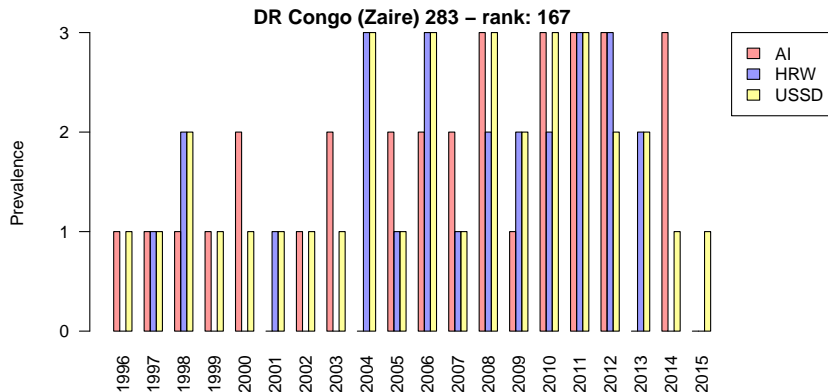
# SVAC Provides Three Indicators that Report Prevalence of Wartime Sexual Violence



Reported level of engagement in wartime sexual violence by state forces in Sudan according to three sources est



## Another Case...



Reported level of engagement in wartime sexual violence by state forces in DRC according to three sources est

Let's make some more barplots of reported state behavior for other armed conflict cases:

```
$: cd ../visualize
```

```
$: open -a Rstudio  
    src/barplot-sources-by-conflict.R
```

# For Every Conflict-Year, We Have Three Sources Reporting on SVAC Prevalence

- ▶ For many years, the three prevalence measures diverge (e.g., Sudan 2006, DRC 1998)
- ▶ In other years, the three sources seem to agree (e.g., Sudan 2001-2, DRC 2011)
- ▶ In a considerable number of years (when looking at the entire dataset), the three sources do not report any SV (e.g., Sudan 1990-1)

How do we deal with converging/diverging information across the three sources? Shall we average across them, or should we choose the most common/lowest/highest level?

# What If, for a Given Conflict-Year, We Understand

- ▶ True SVAC prevalence as a *latent trait* that can't be observed directly but estimated using observed outcomes
- ▶ Available human rights reports as imperfect measures of the latent level due to observational challenges
- ▶ Human-coded SVAC variables as imperfect measures of human rights reports due to perceptual coding error
- ▶ Information convergence/divergence across sources as a measure of certainty regarding SVAC prevalence

The logic of latent variable models (LVM) follows precisely this conceptual approach to measurement.

# The Added Value of Latent Variable Models

- ▶ Leverage information from multiple sources
- ▶ Provide probabilistic estimates of a latent trait, i.e., SVAC in our case
- ▶ Express our uncertainty regarding the estimates of the latent trait through credible intervals
- ▶ Compute the estimated latent trait at the interval-level (instead of ordinal), which simplifies subsequent analysis
- ▶ Enable direct probabilistic comparisons across conflict-years and cases

# How

# Let's Run Some LVMs

```
$: cd ../estimate
```

```
$: open -a Rstudio src/estimate-static-SVAC.R
```