

# Mental disorders and crime: assessment and treatment to prevent reoffending

Seena Fazel,  
Department of Psychiatry,  
University of Oxford



# Outline

- Are psychiatric disorders a risk factor for recidivism?
- What are the implications for assessment?
- What is the evidence on treatment?

# The wider context in prison

- 1 in 7 have a major treatable mental illness
- Around 1 in 4 have an alcohol use disorder on reception/arrival to prison
- 1 in 3 drug use disorder
- Less than 1 in 5 young people in prison have ADHD

	Men	Women
Psychotic illness <sup>1</sup>	4% (3-4)	4% (3-5)
Major depression <sup>1</sup>	10% (9-12)	14% (10-18)
Alcohol misuse <sup>2</sup>	18-30%	10-24%
Drug misuse <sup>2</sup>	10-48%	30-60%

Data are % (95% CI) or %.

**Table 1: Prevalence of different psychiatric diagnoses in adult prisoners based on systematic reviews**

# Is there a link with recidivism?

- For a long time, no link has been the orthodoxy
- But new evidence?

# Psychiatric disorders and violent reoffending: a national cohort study of convicted prisoners in Sweden

Zheng Chang, Henrik Larsson, Paul Lichtenstein, Seena Fazel



## Summary

**Background** Reoffending and presence of psychiatric disorders are common in prisoners worldwide. However, whether psychiatric disorders are risk factors for reoffending is still unknown. We aimed to examine the association between psychiatric disorders, including substance use disorder, and violent reoffending.

**Methods** We did a longitudinal cohort study of 47 326 prisoners who were imprisoned since Jan 1, 2000, and released before Dec 31, 2009, in Sweden. We obtained data for diagnosed psychiatric disorders from both inpatient and outpatient registers, and sociodemographic and criminological factors from other population-based registers. We calculated hazard ratios (HRs) for violent reoffending with Cox regression. To control for potential familial confounding, we compared sibling prisoners with and without psychiatric disorders. We calculated population attributable fraction to assess the population effect.

**Findings** Diagnosed psychiatric disorders were associated with an increased hazard of violent reoffending in male (adjusted HR 1.63 [95% CI 1.57–1.70]) and female (2.02 [1.54–2.63]) prisoners, and these associations were independent of measured sociodemographic and criminological factors, and, in men, remained substantial after adjustment for unmeasured familial factors (2.01 [1.66–2.43]). However, findings differed between individual diagnoses and sex. We found some evidence of stronger effects on violent reoffending of alcohol and drug use disorders and bipolar disorder than of other psychiatric disorders. Alcohol use disorder seemed to have a greater effect in women than in men (women 2.08 [1.66–2.60]; men 1.63 [1.56–1.71]). The overall effects of psychiatric disorders did not differ with severity of crime. The hazard of violent reoffending increased in a stepwise way with the number of diagnosed psychiatric disorders. Assuming causality, up to 20% (95% CI 19–22) of violent reoffending in men and 40% (27–52) in women was attributable to the diagnosed psychiatric disorders that we investigated.

**Interpretation** Certain psychiatric disorders are associated with a substantially increased hazard of violent reoffending.

*Lancet Psychiatry* 2015

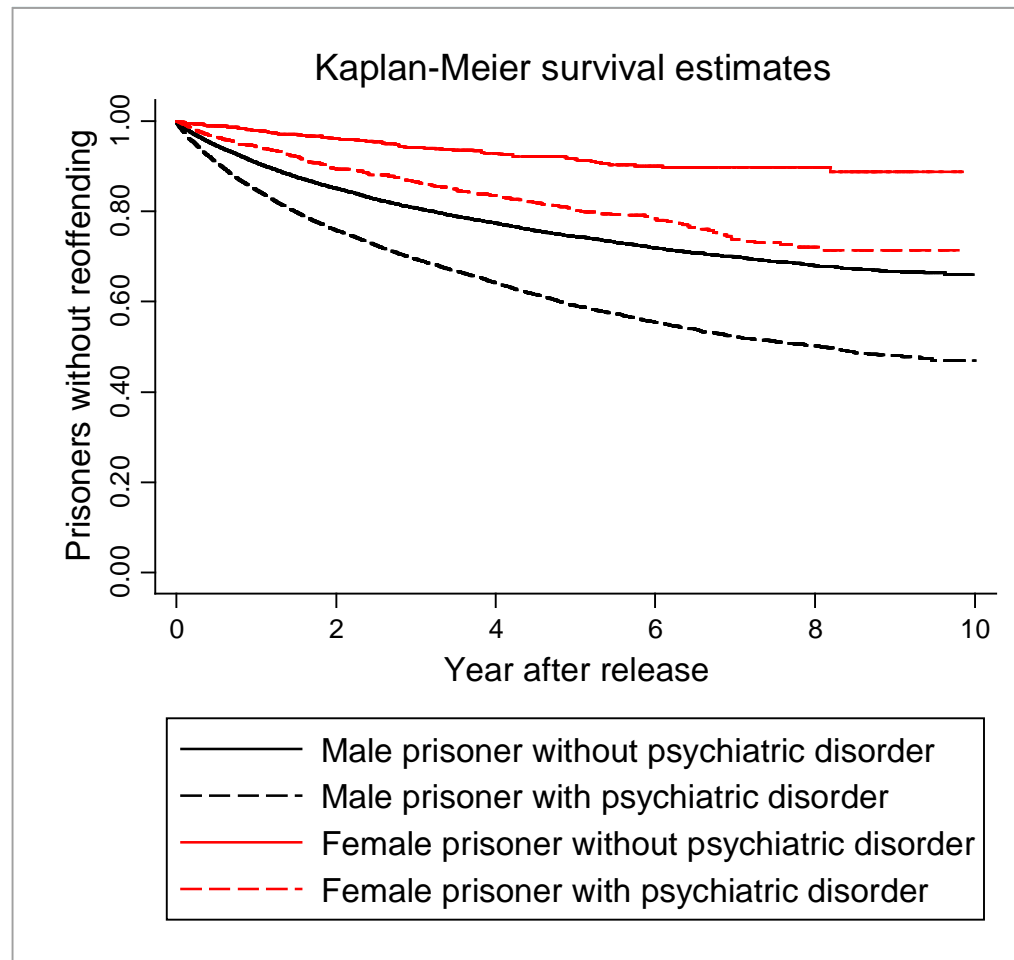
Published Online  
September 3, 2015  
[http://dx.doi.org/10.1016/S2215-0366\(15\)00234-5](http://dx.doi.org/10.1016/S2215-0366(15)00234-5)

See Online/Comment  
[http://dx.doi.org/10.1016/S2215-0366\(15\)00312-0](http://dx.doi.org/10.1016/S2215-0366(15)00312-0)

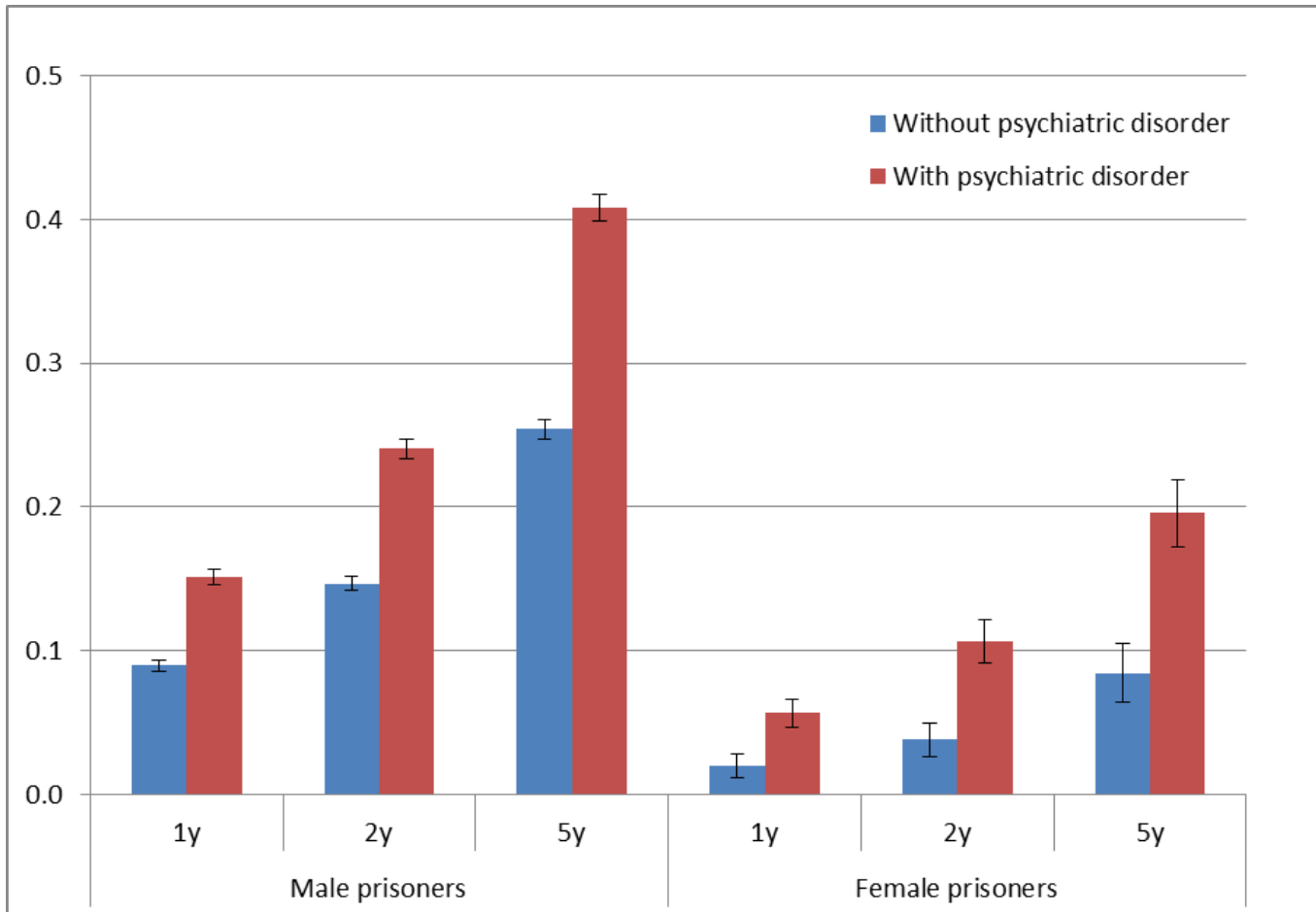
Department of Psychiatry, Warneford Hospital, University of Oxford, Oxford, UK (Z Chang PhD, Prof S Fazel MD); and Department of Medical Epidemiology and Biostatistics, Karolinska Institutet, Stockholm, Sweden (Z Chang, H Larsson PhD, Prof P Lichtenstein PhD)

Correspondence to:  
Prof Seena Fazel, Department of Psychiatry, University of Oxford, Warneford Hospital, Oxford OX3 7JX, UK  
[seena.fazel@psych.ox.ac.uk](mailto:seena.fazel@psych.ox.ac.uk)

# Psychiatric disorders increases hazards of violently reoffending

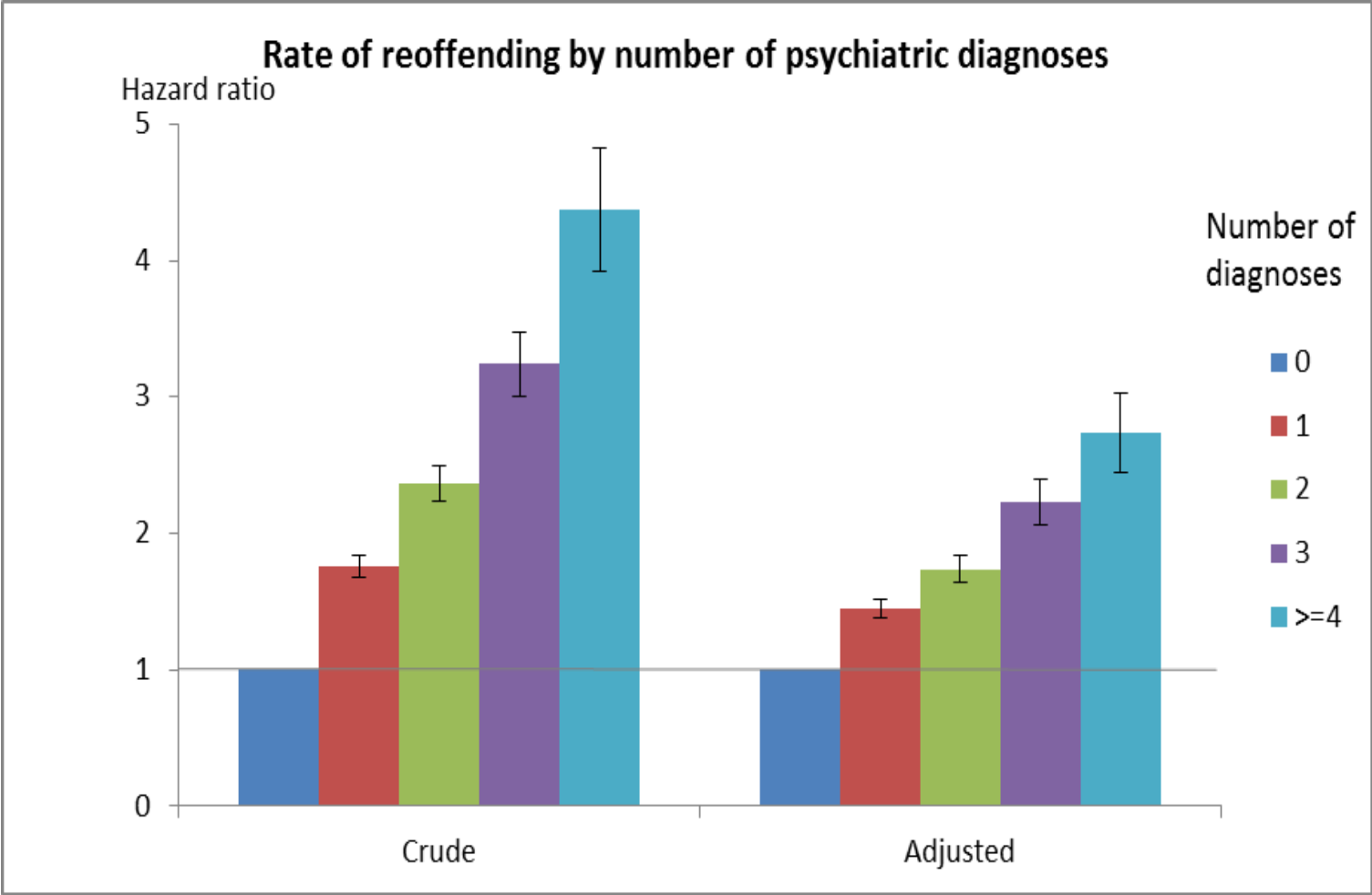


# Probability of violent reoffending increases with psychiatric disorder





# Risk increases in step-wise fashion – comorbidities important



# All disorders increase recidivism risk – not just personality disorders and substance misuse

	Model 1*	Model 2†	Model 3‡
<b>Men</b>			
Alcohol use disorder	2.14 (2.05–2.24)	1.63 (1.56–1.71)	1.45 (1.38–1.53)
Drug use disorder	2.13 (2.05–2.22)	1.65 (1.58–1.72)	1.52 (1.45–1.59)
Personality disorder	2.29 (2.14–2.45)	1.64 (1.53–1.76)	1.30 (1.21–1.40)
Attention-deficit hyperactivity disorder	2.22 (1.89–2.61)	1.56 (1.31–1.85)	1.31 (1.10–1.55)
Other developmental or childhood disorder	1.82 (1.65–2.01)	1.46 (1.32–1.61)	1.33 (1.20–1.47)
Schizophrenia spectrum disorders	2.06 (1.87–2.26)	1.51 (1.37–1.67)	1.20 (1.09–1.33)
Bipolar disorder	1.96 (1.50–2.58)	1.75 (1.32–2.32)	1.50 (1.13–1.99)
Depression	1.41 (1.30–1.54)	1.28 (1.18–1.40)	1.09 (1.00–1.18)
Anxiety disorder	1.41 (1.32–1.51)	1.23 (1.14–1.32)	1.09 (1.01–1.17)

# Replicated in community sentences

## Psychiatric disorders and reoffending risk in individuals with community sentences in Sweden: a national cohort study



Denis Yukhnenko, Nigel Blackwood, Paul Lichtenstein, Seena Fazel



### Summary

**Background** Community sentences are widely used in many countries, often comprising the majority of criminal justice sanctions. Psychiatric disorders are highly prevalent in community-sentenced populations and are thus potential targets for treatment interventions designed to reduce reoffending. We examined the association between psychiatric disorders and reoffending in a national cohort of individuals given community sentences in Sweden, with use of a sibling control design to account for unmeasured familial confounding.

**Methods** We did a longitudinal cohort study of 82 415 individuals given community sentences between Nov 1, 1991, and Dec 31, 2013, in Sweden using data from population-based registers. We calculated hazard ratios (HRs) for any reoffending and violent reoffending with Cox regression models. We compared community-sentenced siblings with and without psychiatric disorders to control for potential familial confounding. Additionally, we calculated population attributable fractions to assess the contribution of psychiatric disorders to reoffending behaviours. The primary outcomes of the study were any (general) reoffending and violent reoffending.

**Findings** Between Nov 1, 1991, and Dec 31, 2013, those given community sentences who were diagnosed with any psychiatric disorder had an increased reoffending risk in men (adjusted HR 1.59, 95% CI 1.56–1.63 for any reoffending; 1.60, 1.54–1.66 for violent reoffending) and women (1.71, 1.61–1.82 for any reoffending; 2.19, 1.88–2.54 for violent reoffending). Risk estimates remained elevated after adjustment for familial confounding. Schizophrenia spectrum disorders, personality disorders, and substance use disorders had stronger associations with violent reoffending than did other psychiatric disorders. Assuming causality, the adjusted population attributable risk of psychiatric disorders on violent reoffending was 8.3% (95% CI 6.6–10.0) in the first 2 years of community follow-up in men and 30.9% (22.7–39.0) in women.

**Interpretation** Psychiatric disorders were associated with an increased risk of any reoffending and violent reoffending in the community-sentenced population. The magnitude of the association between psychiatric disorders and

*Lancet Public Health* 2023;  
8: e119–29

Published Online  
January 17, 2023  
[https://doi.org/10.1016/S2468-2667\(22\)00312-7](https://doi.org/10.1016/S2468-2667(22)00312-7)

Department of Psychiatry,  
University of Oxford, Oxford,  
UK (D Yukhnenko DPhil,  
S Fazel MD); Institute of  
Psychiatry, Psychology, and  
Neuroscience, King's College  
London, London, UK  
(N Blackwood MD); Department  
of Medical Epidemiology and  
Biostatistics, Karolinska  
Institutet, Solna, Sweden  
(P Lichtenstein PhD)

Correspondence to:  
Prof Seena Fazel, Department of  
Psychiatry, University of Oxford,  
Oxford OX3 7JX, UK  
[seena.fazel@psych.ox.ac.uk](mailto:seena.fazel@psych.ox.ac.uk)

# Summary

- Good methods matter (systematic reviewing)
- Epidemiological evidence robust that psychiatric disorders are independently associated with general and violent recidivism
- Triangulated with other populations (community-sentenced) and first-time offending

# What about assessment?

- Various generations of risk assessment tools
- The new science of prediction means that older tools now dated and not evidence-based

# Older problems with current tools

- **Resource-intensive and costly**
- Guru system of training
- Based on **old methodology**
- **Many false positives**
- Lack transparency in development
- Evidence of authorship bias
- **WHAT ABOUT ACCURACY?**

# Predictive performance of current tools

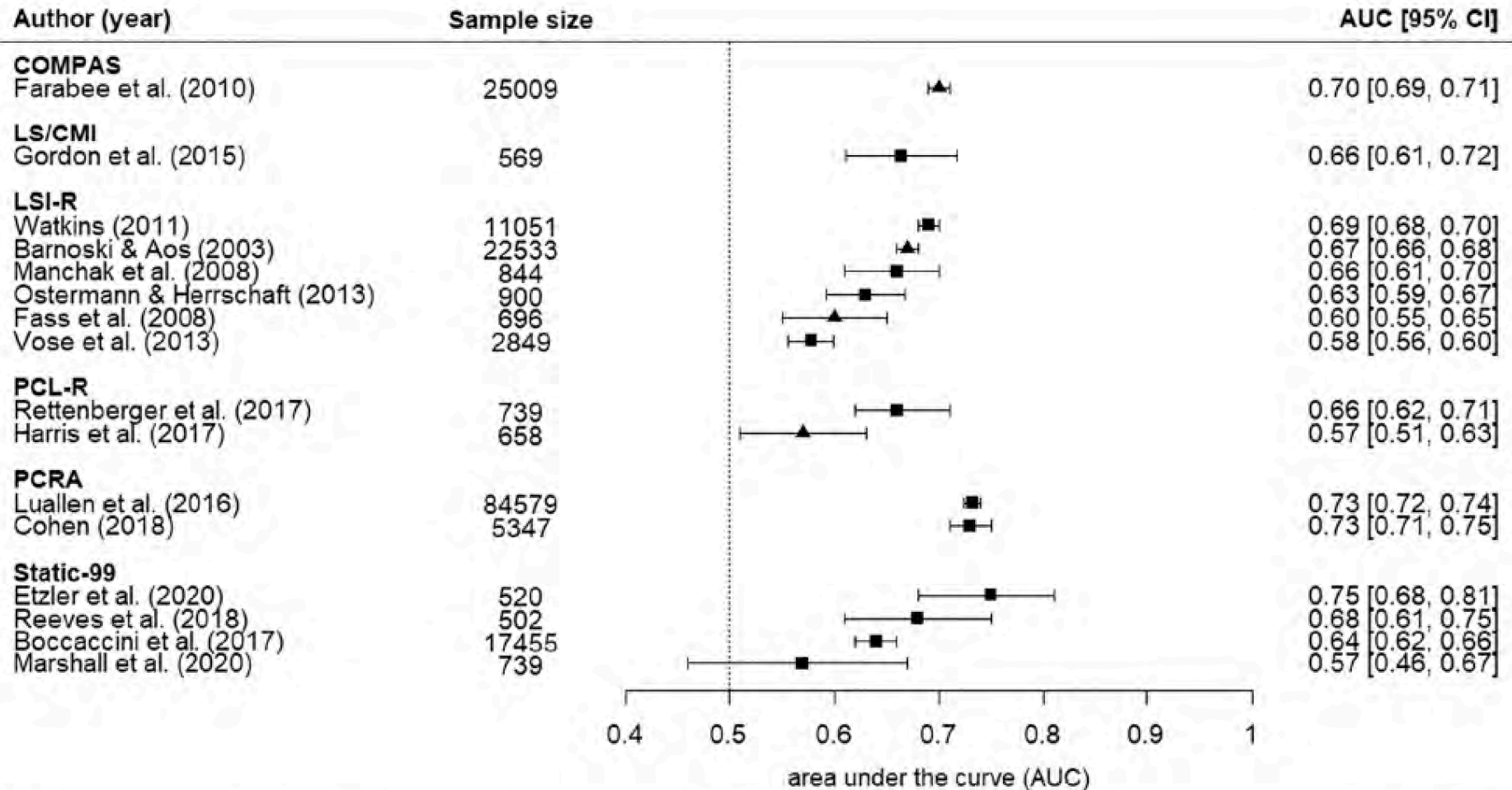


Fig. 1. Area under the curve statistics for independent validation studies for risk assessment tools used at sentencing with sample sizes with more than 500. Note: ■ = 95% CI reported; ▲ = 95% CI estimated.

# Review findings

- Very few validations of decent size and quality
- AUC – insufficient evidence for public safety or treatment allocation
- No information on other key measures of performance



# Other problems with older tools

- Key risk factors are missing (e.g. calendar age, alcohol and drug misuse separately)
- No weighting risk factors
- No information on calibration, rates of false negatives (key for public safety) and false positives (individual rights)



11°  
3°

Gusty winds and rain

**⚠ Weather warnings issued**

1400	1500	1600	1700	1800	1900
11°	11°	11°	10°	10°	9°
5%	23%	29%	36%	47%	61%



National Heart, Lung,  
and Blood Institute

Public

Health Professionals

Researchers

Clinical Trials

## Risk Assessment Tool for Estimating Your 10-year Risk of Having a Heart Attack

Age:  years

Gender:  Female  Male

Total Cholesterol:  mg/dL

HDL Cholesterol:  mg/dL

Smoker:  No  Yes

Systolic Blood Pressure:  mm/Hg

Are you currently on any medication to treat high blood pressure?  No  Yes

ClinRisk

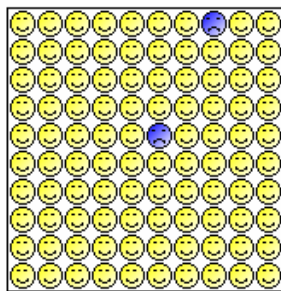
Welcome to the QRISK<sup>®</sup> 3-2018  
risk calculator <https://qrisk.org/three>

Calculate risk

Your results

Your risk of having a heart attack or stroke  
within the next 10 years is:

1.7%



Risk of  
heart attack or stroke



Age at diagnosis:  -  +

PSA (ng/ml):  -  +

Clinical T stage:  1  2  3  4

Hospital admission in last 2 years?:  No  Yes

BRCA:  Negative or Untested  Positive

Histological grade group:  1  2  3  4  5

Gleason score:  3+3  3+4  4+3  8  9 or 10

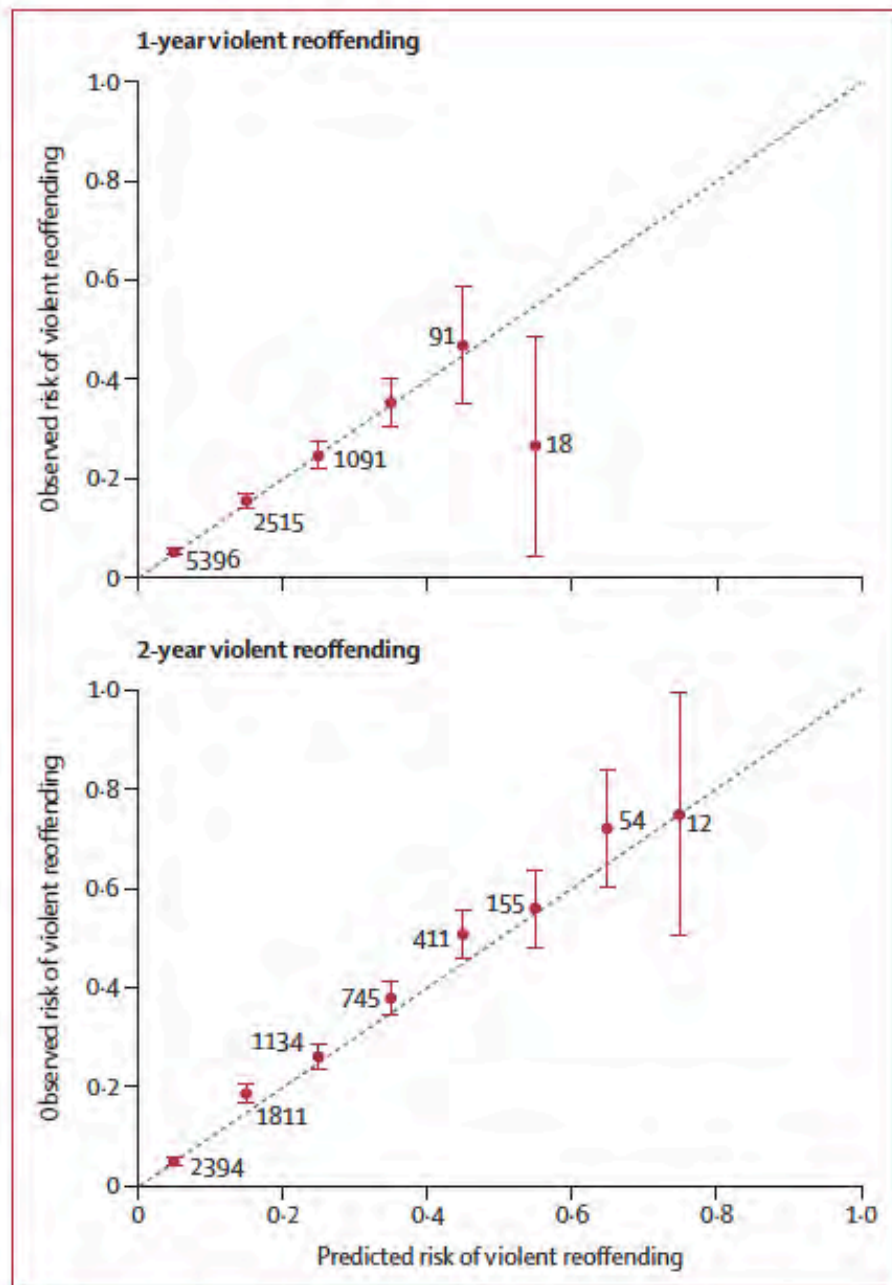
Biopsy data available?:  No  Yes

# Novel tools

- Develop them using large datasets and for relevant populations
- Prespecify predictors, outcomes, statistical methods, performance measures
- Predictors easy to score, not subjective, not require additional interviewing
- Simple, scalable, web-based, free, transparent

# Novel web-based tools

- Released prisoners: **OxRec**
- Forensic psychiatric patients: **FoVOx**
- Sexual offenders: **OxRIS**
- Domestic violence: **OxDOV**
- All freely available on <https://oxrisk.com>



**Figure 3: Model calibration by levels of predicted risk**  
 Data are from the external validation. Error bars represent 95% CIs. Numbers are the number of individuals in each risk category.

# Zeroing in on violent recidivism among released prisoners



Substantial heterogeneity exists among the criminal-offender population,<sup>1-3</sup> and with 30 million individuals released from prisons worldwide each year, the identification of those who are most likely to perpetrate future violence is essential. Fazel and colleagues' study<sup>4</sup> in *The Lancet Psychiatry* is an important advance for enabling such identifications. Using a total cohort of 47 326 prisoners released in Sweden between 2001 and 2009, they showed that 8883 (24%) of the ex-prisoners

positive predictive values are a problem with predicting any rare outcome. This is seen in any medical screening test where the prevalence of the disease is low, and the same applies in forensic psychiatry. For example, just 1% of the released cohort included homicide offenders, and 2% sexual offenders, therefore any methods that attempt to predict such rare outcomes before the event will be limited. In terms of further research into predicting the most severe outcomes, a clue can be derived from Fazel



Jim West/Science Photo Library

See [Articles](#) page 535

discrimination and calibration in both derivation and external validation samples. In terms of its sensitivity and specificity, their scale was as good or better than the nine most commonly used actuarial instruments for violence risk: for risk of violent reoffending at 1 year, sensitivity was 76% (95% CI 73–79) and specificity was 61% (60–62). At 2 years, sensitivity was 67% (95% CI 64–69) and specificity was 70% (69–72). The investigators further provide a web calculator version of the model (OxRec) that is free to use to facilitate risk assessment generally.

Fazel and colleagues' study is an impressive piece of research and, perhaps more importantly, one that has obvious real-world application. Foremost, it provides a framework to assess prisoners who have mental health conditions that could be used to connect them with the appropriate psychiatric, substance use or abuse treatment, and social service agencies in the community.

prominently—are scarce.<sup>8-10</sup> I urge criminal justice practitioners and criminologists to carefully read this Article, capitalise on opportunities to apply the study methods to their own data, and tweak them to reach the most challenging offenders.

**Matt DeLisi**

Center for the Study of Violence, Iowa State University, Ames, IA 50011, USA  
delisi@iastate.edu

I declare no competing interests.

Copyright © DeLisi Open Access article distributed under the terms of CC BY.

- 1 Moffitt TE. Adolescence-limited and life-course-persistent antisocial behavior: a developmental taxonomy. *Psych Review* 1993; **100**: 674–701.
- 2 Vaughn MG, DeLisi M, Gunter T, Fu Q, Beaver KM, Perron BE, Howard MO. The severe 5%: a latent class analysis of the externalizing behavior spectrum in the United States. *J Crim Just* 2011; **39**: 75–80.
- 3 Vaughn MG, Salas-Wright CP, DeLisi M, Maynard BR. Violence and externalizing behavior among youth in the United States: is there a severe 5%? *Youth Viol Juv Just* 2014; **12**: 3–21.
- 4 Fazel S, Chang Z, Frangou T, et al. Prediction of violent reoffending in

OxRisk Home

Recidivism in Prisoners

Mental Illness & Violence

Mental Illness & Suicide

Forensic Psychiatry &  
Violence

Forensic Psychiatry Home

New OxRisk tool validations  
and feasibility studies

OxSelfHarm (Trial)

OxSATS (Trial)

OxRIS (Oxford risk of  
recidivism of sexual  
offenders)

FOxWeb (Calculator Trial)

OxDoV (Domestic violence  
risk calculator)

Sex

Male

Age\*

30

Age at release from prison.

No

Immigrant

First or second generation immigrants (born outside of Sweden).

< 6 months

Length of incarceration

Duration of incarceration for most recent offence.

No

Violent index offence

Most recent offence was homicide, assault, robbery, arson, any sexual offense (rape, sexual coercion, child molestation, indecent exposure, or sexual harassment), illegal threats, or intimidation.

Previous violent crime (before index offence)

No

Violent offence previous to most recent offence.

Civil status\*

Unmarried

At imprisonment. Other includes married, cohabiting, divorced, and widowed.

Highest education\*

Up to age 16

Also in French/Italian/German/Spanish/Greek/Polish/Finnish/Swedish/Chinese/Russian

<https://oxrisk.com/oxrec-9/>

# <https://oxrisk.com/oxrec-9/>

Risk of violent reoffending within 1 year and 2 years

<b>Sex*</b>	Male
<b>Age</b>	30
<b>Immigrant*</b>	No
<b>Length of incarceration*</b>	< 6 months
<b>Violent index offence*</b>	No
<b>Previous violent crime*</b>	No
<b>Civil status*</b>	Unmarried
<b>Highest education*</b>	< 9 years
<b>Employment*</b>	Yes
<b>Disposable income*</b>	Low (<10th percentile)
<b>Neighbourhood deprivation</b>	Known
	0 Higher score = higher deprivation
<b>Alcohol abuse*</b>	No
<b>Drug abuse*</b>	No
<b>Any mental disorder*</b>	No

---

**Risk of violent reoffending within 1 year** 5%

---

**Risk of violent reoffending within 2 years** 8%

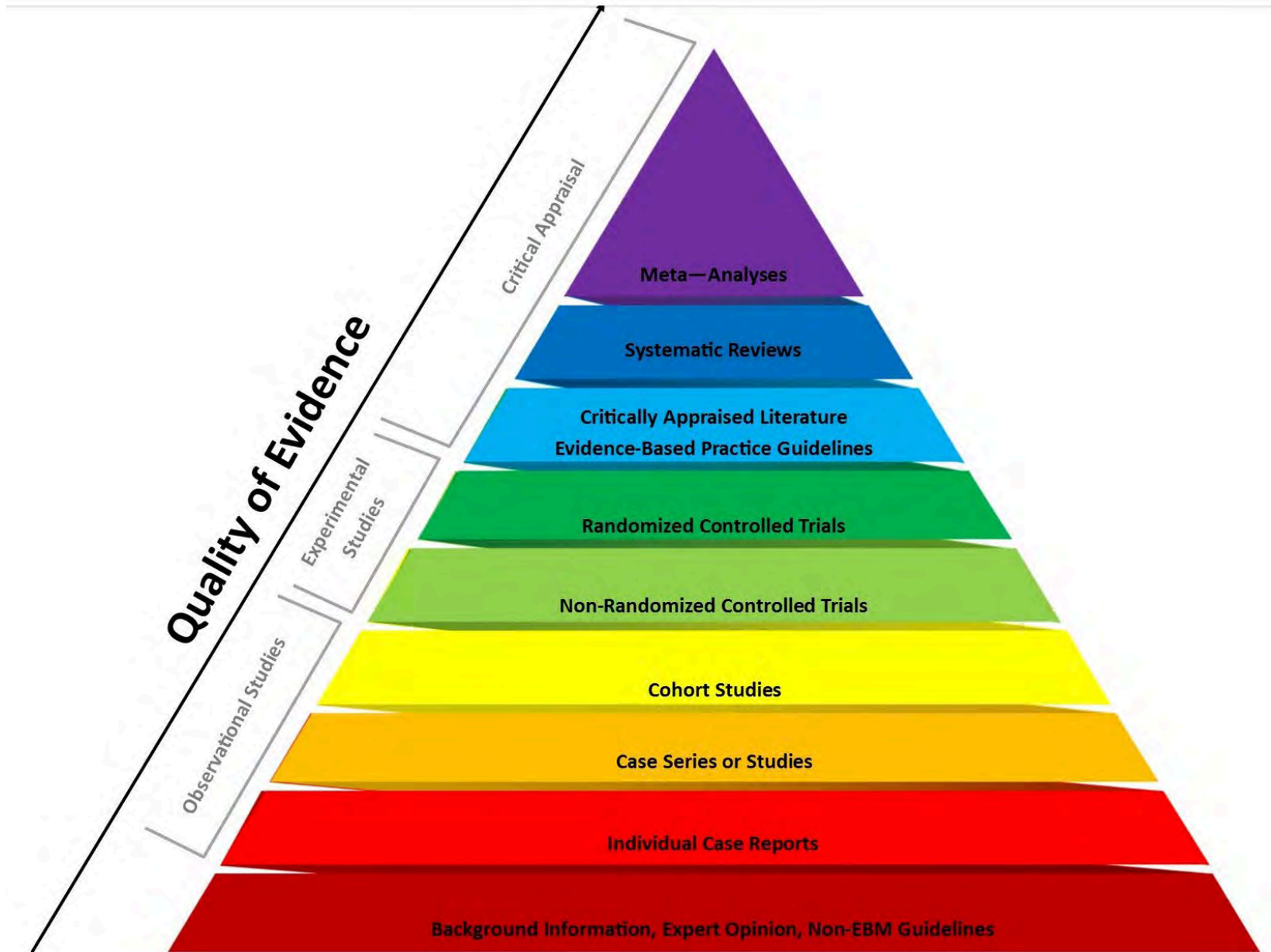


# Summary

- Simple scalable risk calculators are the next generation
- False dichotomy SPJ v actuarial – all tools should support, not replace, decision-making
- Evidence of external validation, especially false negatives and positives and CALIBRATION
- Red flags: missing predictors, no weighting, small samples, reporting one statistic, lack transparency in predictors and results

# Treatment

- Hierarchies of evidence
- Highest are meta-analyses of RCTs
- Complemented by real-world observational studies



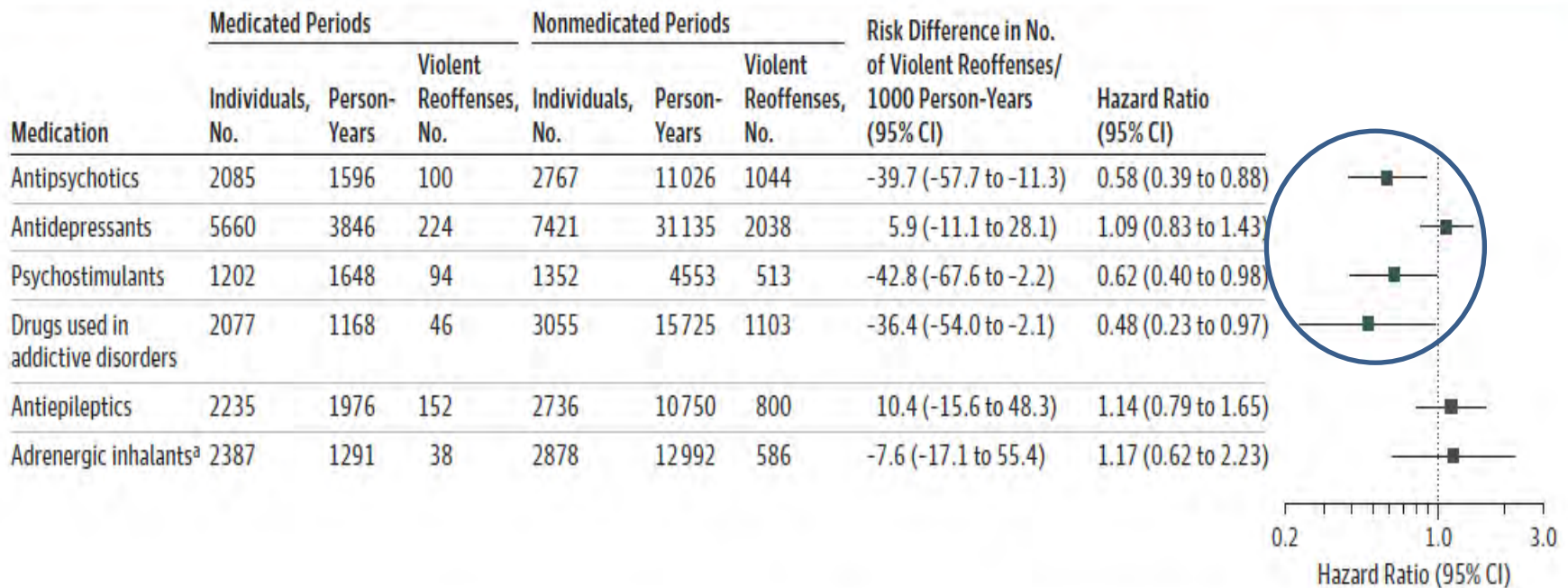
<https://www.researchsquare.com/blog/what-is-the-hierarchy-of-evidence>

# Psychotropic medication

- Evidence from large real-world studies
- Very little RCT evidence – not feasible

# 3 classes of medication reduce risk

Figure 2. Within-Individual Associations Between Psychotropic Medications and Violent Reoffending Following Prison Release



The same individuals could have both medicated and nonmedicated periods. Individuals in the nonmedicated periods included persons who never received medication after prison release, and a small number of

persons in the medicated periods were likely receiving medication the entire duration after release.

<sup>a</sup> Adrenergic inhalants were used as a negative control.

# Findings

- Antipsychotics
- ADHD medications
- Anti-craving medications (e.g. naltrexone, buprenorphine, methadone, acamprosate)
- (No effects gabapentinoids, antidepressants)
- Possible effects beta-blockers

# Psychological treatments

- Weak effects of psychological treatments for recidivism
- Better evidence for depression and anxiety
- Some poor quality studies (before and after; using waiting list controls)
- ?signal for therapeutic communities
- Treatments needs to be followed up in the community

# Summary

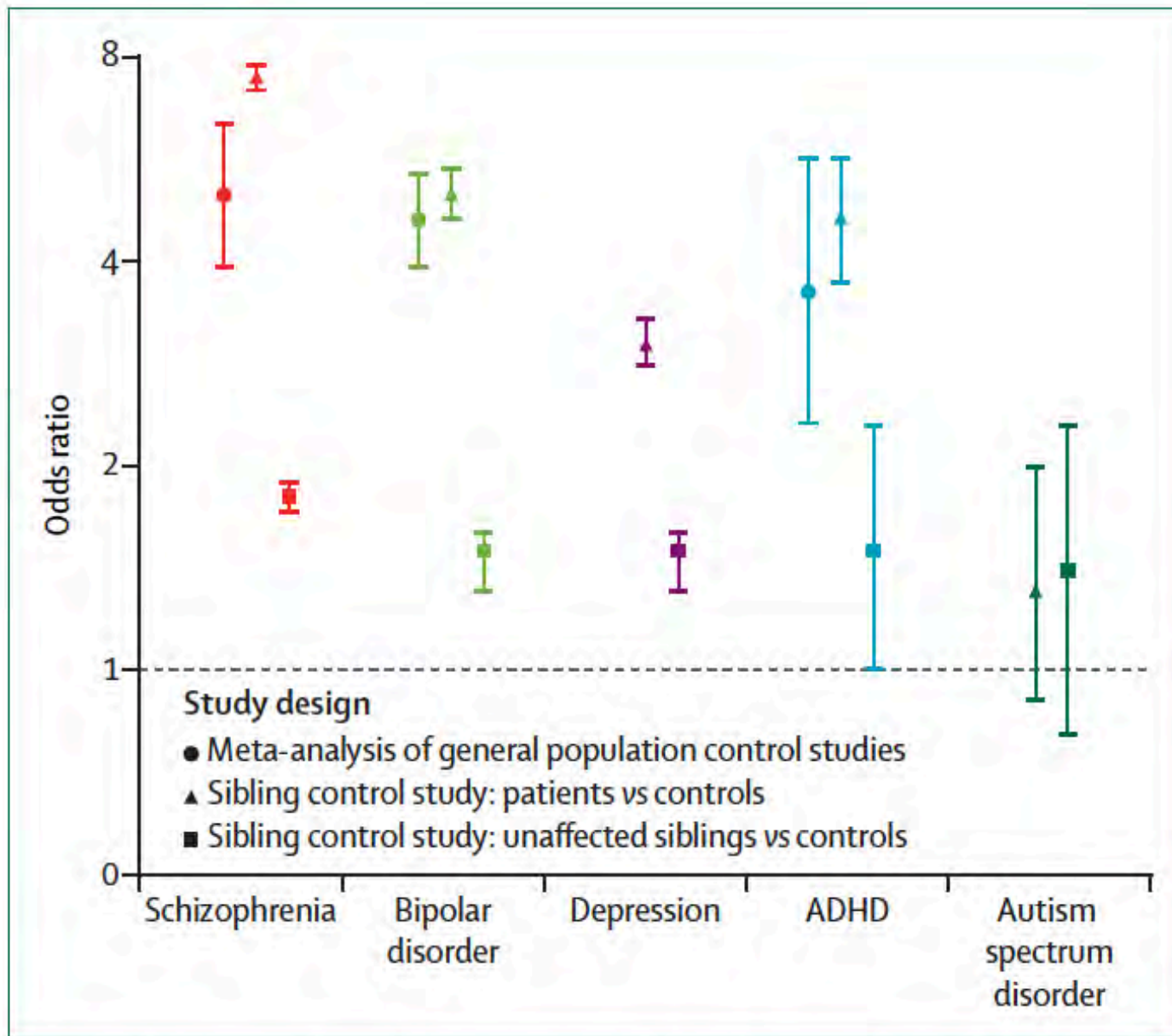
- Good methods matter
- Psychotropic medications (if indicated) have good evidence in support
- Linkage to community treatment is key
- Waiting for better quality evidence on psychological treatments



# Overall

- Mental illness is a strong and replicated risk factor for recidivism
- Simple scalable risk assessment tools
- Mental health services need adequate resourcing in prison with good links to community services

- [Seena.fazel@psych.ox.ac.uk](mailto:Seena.fazel@psych.ox.ac.uk)
- @seenafazel



**Figure 1: Relative risks of violence compared with general population controls from meta-analyses and longitudinal sibling-control studies**

# Prediction of violent reoffending on release from prison: derivation and external validation of a scalable tool



Seena Fazel, Zheng Chang, Thomas Fanshawe, Niklas Långström, Paul Lichtenstein, Henrik Larsson, Susan Mallett

## Summary

**Background** More than 30 million people are released from prison worldwide every year, who include a group at high risk of perpetrating interpersonal violence. Because there is considerable inconsistency and inefficiency in identifying those who would benefit from interventions to reduce this risk, we developed and validated a clinical prediction rule to determine the risk of violent offending in released prisoners.

**Methods** We did a cohort study of a population of released prisoners in Sweden. Through linkage of population-based registers, we developed predictive models for violent reoffending for the cohort. First, we developed a derivation model to determine the strength of prespecified, routinely obtained criminal history, sociodemographic, and clinical risk factors using multivariable Cox proportional hazard regression, and then tested them in an external validation. We measured discrimination and calibration for prediction of our primary outcome of violent reoffending at 1 and 2 years using cutoffs of 10% for 1-year risk and 20% for 2-year risk.

**Findings** We identified a cohort of 47 326 prisoners released in Sweden between 2001 and 2009, with 11 263 incidents of violent reoffending during this period. We developed a 14-item derivation model to predict violent reoffending and tested it in an external validation (assigning 37 100 individuals to the derivation sample and 10 226 to the validation sample). The model showed good measures of discrimination (Harrell's c-index 0.74) and calibration. For risk of violent reoffending at 1 year, sensitivity was 76% (95% CI 73–79) and specificity was 61% (95% CI 60–62). Positive and negative predictive values were 21% (95% CI 19–22) and 95% (95% CI 94–96), respectively. At 2 years, sensitivity was 67% (95% CI 64–69) and specificity was 70% (95% CI 69–72). Positive and negative predictive values were 37% (95% CI 35–39) and 89% (95% CI 88–90), respectively. Of individuals with a predicted risk of violent reoffending of 50% or more, 88% had drug and alcohol use disorders. We used the model to generate a simple, web-based, risk calculator (OxRec) that is free to use.

**Interpretation** We have developed a prediction model in a Swedish prison population that can assist with decision making on release by identifying those who are at low risk of future violent offending, and those at high risk of violent reoffending who might benefit from drug and alcohol treatment. Further assessments in other populations and countries are needed.

**Funding** Wellcome Trust, the Swedish Research Council, and the Swedish Research Council for Health Working Life



*Lancet Psychiatry* 2016;  
3: 535–43

Published Online  
April 13, 2016  
[http://dx.doi.org/10.1016/S2215-0366\(16\)00103-6](http://dx.doi.org/10.1016/S2215-0366(16)00103-6)

See [Comment](#) page 493

Department of Psychiatry,  
Warneford Hospital  
(Prof S Fazel MD, Z Chang PhD)  
and Department of Primary  
Care Health Sciences  
(T Fanshawe PhD), University of  
Oxford, Oxford, UK;  
Department of Medical  
Epidemiology and  
Biostatistics, Karolinska  
Institutet, Stockholm, Sweden  
(Z Chang, Prof N Långström PhD,  
Prof P Lichtenstein PhD,  
Prof H Larsson PhD);  
Department of Medical  
Sciences, Örebro University,  
Stockholm, Sweden  
(Prof H Larsson); Research and  
Evaluation Department,  
Swedish Prison and Probation  
Administration, Sweden  
(Prof N Långström); and School  
of Population and Health  
Sciences, University of  
Birmingham, UK (S Mallett PhD)

Correspondence to:

# Triangulation?

