

# Female Offenders of Lethal and Severe Violence

Mental Health, Risk Factors for Criminality and Offence Behaviour

Karin Trägårdh

Centre for Ethics, Law and Mental Health (CELAM)

Department of Psychiatry and Neurochemistry

Institute of Neuroscience and Physiology

Sahlgrenska Academy, University of Gothenburg



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karin.tragardh@neuro.gu.se

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*The ability to feel pain*

*without letting it*

*destroy you*

*or someone else*

*is a superpower.*

– Salwa Tambe

*Ge inte upp, fortsätt att gå*

*Vägen är lång, och stegen är små*

*Men det går framåt, och stegen är dina*

*Och våra röster ljuder starka och fina*

*Jag ville gråta, och jag ville falla*

*För jag var så trött, men det händer väl alla*

*Ge inte upp, ge lite mer*

*Jag önskar att du kunde se det jag ser*

*Jag ser vida vingar*

Vida vingar – Lisa Ekdahl



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## ABSTRACT

In about 10 % of homicides, offenders are females, forming an understudied group. The main aim of this thesis is to identify the qualities that distinguish female offenders of lethal and severe violence in terms of mental health, risk factors for violent criminality, and offence behaviour. **Paper I** examines incidence rates of female- and male-perpetrated homicide from 1990-2010 and explores similarities and differences between female and male homicide offenders for both those with child versus adult victims. The results indicate that homicide rates by both female and male offenders declined, with gender differences more prominent among offenders with adult victims. **Paper II** characterises female offenders of lethal and severe violence, with versus without a severe mental disorder (SMD), regarding demographics, mental health, substance use, and crime characteristics. Findings reveal that most female offenders faced challenges such as unemployment, adverse experiences, and mental health issues, and committed their crime within close relations. However, those with an SMD more often exhibited psychotic disorders and a more diverse range of victim-offender relationships, while they less often had substance use issues and prior criminality. **Paper III** investigates female offenders of lethal and severe violence, with versus without an SMD, assessing levels of psychopathy and type of violence. The females displayed relatively low levels of psychopathy (PCL-R) and primarily reactive rather than instrumental motives (Violent Incident Coding Sheet). The SMD group showed lower levels of psychopathy, and *provocation*, and higher levels of *arousal* and *short-term planning*. **Paper IV** examines, using established instruments, the relation between measures of risk for violence and of aggression in a life history perspective among female offenders of lethal and

severe violence, identifying the strongest factors associated with lethal violence. The findings suggest that individuals charged with lethal offences exhibited fewer risk and aggression factors than those involved in non-lethal violence. **In conclusion**, female offenders of lethal and severe violence are characterised by adverse experiences and complex features, highlighting the need for targeted interventions across health care, social services, and law enforcement.

**Keywords:** female offenders, mental disorders, lethal violence, homicide, severe violence, risk factors, psychopathy, instrumental violence, reactive violence

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# SAMMANFATTNING PÅ SVENSKA

I ungefär 10 % av alla fall av dödligt våld är gärningspersonerna kvinnor, vilket utgör en understuderad grupp. Huvudsyftet med denna avhandling är att identifiera de egenskaper som utmärker kvinnliga förövare som begått dödligt och grovt våld vad gäller psykisk hälsa, riskfaktorer för våldsbrott och brottsbeteende. **Delarbete I** undersöker incidensen av dödligt våld begånget av kvinnor och män mellan 1990 och 2010 och utforskar likheter och skillnader mellan kvinnliga och manliga förövare till dödligt våld, både för de med barnoffer respektive vuxna offer. Resultaten indikerar att frekvensen av dödligt våld bland både kvinnliga och manliga förövare minskade, med könsskillnaderna mer framträdande bland förövare med vuxna offer. **Delarbete II** karakteriserar kvinnliga förövare till dödligt och grovt våld, med kontra utan allvarlig psykisk störning (APS), vad gäller demografi, psykisk hälsa, substansbruk och brottskaraktäristika. Resultaten visar att de flesta kvinnliga förövarna mötte utmaningar som arbetslöshet, ogynnsamma upplevelser och psykiska problem, och begick brottet i nära relationer. De med en APS uppvisade dock oftare psykotiska syndrom och en mer varierad offer-förövarrelation, medan de mer sällan hade problem med substansbruk och tidigare kriminalitet. **Delarbete III** undersöker kvinnliga förövare av dödligt och grovt våld, med kontra utan APS, och bedömer nivåer av psykopati och typ av våld. Sammantaget uppvisade kvinnorna relativt låga nivåer av psykopati (PCL-R) och främst reaktiva snarare än instrumentella motiv (Violent Incident Coding Sheet). APS-gruppen uppvisade lägre nivåer av psykopati, och *provokation*, samt högre nivåer av *arousal* och kortare *planering*. **Delarbete IV** undersöker, utifrån etablerade instrument, sambanden mellan mått på risk för våld och på aggression i ett livsperpektiv bland kvinnliga förövare av dödligt och grovt våld, och identifierar de starkaste faktorerna associerade med dödligt våld. Resultaten tyder på att individer som åtalats för dödligt våld uppvisade färre risk- och aggressionsfaktorer än de som åtalats för icke-dödligt våld. **Sammanfattningsvis** utgör kvinnliga förövare av dödligt och grovt våld en komplex grupp med ogynnsamma erfarenheter, vilket belyser behovet av riktade insatser inom hälso- och sjukvård, socialtjänst och brottsbekämpande myndigheter.



# LIST OF PAPERS

This thesis is based on the following studies, referred to in the text by their Roman numerals.

- I. Trägårdh, K., Nilsson, T., Granath, S., & Sturup, J. (2016). A Time Trend Study of Swedish Male and Female Homicide Offenders from 1990 to 2010. *International Journal of Forensic Mental Health*, 15(2):125-135.  
doi:10.1080/14999013.2016.1152615
- II. Trägårdh, K., Hildebrand Karlén, M., Andiné, P., & Nilsson, T. (2023). Lethal and Severe Violence: Characterizing Swedish Female Offenders With and Without a Severe Mental Disorder. *Frontiers in Psychiatry*, 2023;14:1143936.  
doi.org/10.3389/fpsy.2023.1143936
- III. Trägårdh, K., Hildebrand Karlén, M., Andiné, P., & Nilsson, T. (2025). Links Between Psychopathy, Type of Violence, and Severe Mental Disorder Among Female Offenders of Lethal Violence in Sweden. *International Journal of Forensic Mental Health*, 0(0).  
doi:10.1177/14999013251345496
- IV. Trägårdh, K., Hildebrand Karlén, M., Andiné, P., & Nilsson, T. Measures of Risk for Violence and of Aggression in a Life History Perspective Linked to Lethal Violence Among Swedish Female Offenders. *Submitted*.

# CONTENTS

Abbreviations .....	xii
Definitions in short.....	xiv
1 Introduction.....	1
1.1 Female offenders.....	4
1.1.1 Time trends.....	4
1.1.2 Demographic and crime characteristics .....	4
1.1.3 Mental health and substance use .....	5
1.1.4 Aggression, violence, and risk .....	6
1.2 Legal setting.....	11
2 Aim.....	12
3 Methods.....	13
3.1 Female and male homicide offenders (Paper I; Cohort I).....	13
3.1.1 Subjects .....	13
3.1.2 Measures.....	13
3.1.3 Procedure.....	14
3.1.4 Statistical analyses.....	14
3.2 Female offenders of lethal and severe violence (Papers II, III, IV; Cohort II)... ..	14
3.2.1 Subjects .....	14
3.2.2 Measures.....	15
3.2.3 Procedure.....	20
3.2.4 Statistical analyses.....	20
3.3 Ethical considerations .....	22
4 Results.....	23
4.1 Female and male homicide offenders (Paper I; Cohort I).....	23
4.1.1 Description, incidence, and time trends (Paper I) .....	23
4.1.2 Demographic, legal, and clinical characteristics (Paper I) .....	23
4.1.3 Crime-scene and offending behaviour in offences with adult versus child victims (Paper I).....	24

4.2	Female offenders of lethal and severe violence (Papers II, III, IV; Cohort II).....	24
4.2.1	Background and demographics (Paper II).....	24
4.2.2	Mental health (Paper II).....	25
4.2.3	Substance use/abuse (Paper II).....	25
4.2.4	Crime characteristics (Paper II).....	25
4.2.5	Psychopathy (Paper III).....	26
4.2.6	Instrumental versus reactive aspects of the violent crime (Paper III).....	26
4.2.7	Associations between psychopathy and instrumental versus reactive violence and their covariation with SMD (Paper III) ....	27
4.2.8	Associations between lethal violence and measures of risk for violence and of aggression in a life history perspective (Paper IV).....	27
4.2.9	The SMD versus no-SMD group: Measures of Risk for violence and of aggression in a life history perspective (Paper IV) .....	28
5	Summary of main findings.....	29
6	Discussion .....	30
6.1	Comments on main findings .....	30
6.1.1	Aim I (Paper I; Cohort I).....	30
6.1.2	Aim II (Paper II; Cohort II).....	34
6.1.3	Aim III (Paper III; Cohort II) .....	35
6.1.4	Aim IV (Paper IV; Cohort II).....	36
7	Strengths and limitations.....	38
8	Conclusion.....	40
9	Future perspectives.....	42
	Acknowledgement.....	43
	References .....	46
	Appendix .....	62

# ABBREVIATIONS

ACE	Adverse Childhood Experiences
CI	Confidence Interval
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, 4 <sup>th</sup> edition
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, 5 <sup>th</sup> edition
DSM-5-TR	Diagnostic and Statistical Manual of Mental Disorders, 5 <sup>th</sup> edition, Text Revision
FAM	Female Additional Manual
FPI	Forensic Psychiatric Investigation
HCR-20	Historical-Clinical-Risk Management-20
ICC	Intraclass Correlation Coefficient
IRR	Incidence-Rate Ratios
LHA	Life History of Aggression Questionnaire
LSI-R	Level of Service Inventory-Revised
OR	Odds Ratio
PCL-R	Psychopathy Checklist-Revised
SMD	Severe Mental Disorder (determined at the FPI)
SPSS	Statistical Package for the Social Sciences
VICS	Violent Incident Coding Sheet
WAIS-R	Wechsler Adult Intelligence Scale-Revised

WAIS-R-NI	Wechsler Adult Intelligence Scale-Revised as a Neuropsychological Instrument
WAIS-III	Wechsler Adult Intelligence Scale, 3 <sup>rd</sup> edition
WAIS-III-NI	Wechsler Adult Intelligence Scale, 3 <sup>rd</sup> edition as a Neuropsychological Instrument
WAIS-IV	Wechsler Adult Intelligence Scale, 4 <sup>th</sup> edition

# DEFINITIONS IN SHORT

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## Adverse experiences/abuse

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Adverse childhood experiences	Physical, sexual, and mental abuse and/or domestic dysfunction during childhood.
Abuse	Physical, sexual, and/or verbal (incl. mental) violence/aggression.

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## Aggression and violence

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Aggression	Behaviour with the aim of harming others.
Violence	A subset of aggression, referring specifically to acts aiming at causing physical damage, whether threatened, attempted, or realised, often resulting in physical impairment, in some cases with lethal outcomes.
Aggression in a life history perspective	Including behaviour of aggression directed outwards, self-directed aggression, and antisocial behaviour (including both aggression and/or violence against others, oneself and/or inanimate objects), regarding the incidence of such behaviour from teenage years forward.

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## Legal terms

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Homicide	International legal term (used in Paper I) constituting a deliberate illegal act of violence by one or more humans leading to the death of one or more other humans. Homicide is synonymous with the Swedish legal term lethal violence (used in Papers II, III, IV), according to the Swedish Code of Statutes 1962:700 Criminal Code, including the following offence classifications:
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	murder, voluntary manslaughter, involuntary manslaughter by assault (also referred to as assault and causing another's death), and infanticide.
Lethal violence	Legal term for homicide offences in Sweden (used in Papers II, III, IV), according to the Swedish Code of Statutes 1962:700 Criminal Code, synonymous with homicide (term used in Paper I). Thus, the term lethal violence does not here include other forms of lethal violence, for example, caused by terrorism and armed conflicts. The term lethal violence includes the following offence classifications: murder, voluntary manslaughter, involuntary manslaughter by assault (also referred to as assault combined with involuntary manslaughter), infanticide, and conspiracy/instigation/preparation to murder.
Attempted lethal violence	Legal term for attempted homicide offences in Sweden (used in Papers II, III, IV). The term attempted lethal violence includes the following offence classifications: attempted murder, attempted voluntary manslaughter, and conspiracy/instigation/preparation to attempted murder.
Gender	Legal gender, defined by legal standards

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**Offenders, age range/categorisation**

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Childhood/adolescence	Individuals/offenders < 18 years.
Adulthood	Individuals/offenders ≥ 18 years.

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**Victims, age range/categorisation**

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Child victims	Victims < 15 years of age.
Youth victims	Victims $\geq 15$ to < 18 years of age (used in Papers II, III, IV).
Adult victims	Victims aged $\geq 15$ years or older (used in Paper I). Victims aged $\geq 18$ years or older (used in Papers II, III, IV).

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# 1 INTRODUCTION

Lethal and severe violence around the globe causes great suffering, with criminalised lethal violence in terms of homicide historically outnumbering both terrorist and armed conflict-related deaths (UNODC, 2023), the latter representing legalised lethal violence when following International Humanitarian Law. Henceforth, in this thesis, the term lethal violence (i.e., the legal term for homicide offences in Sweden, according to the Swedish Code of Statutes, 1962:700, Criminal Code; used in Papers II, III, IV) is used synonymously with homicide (term used in Paper I). Hence, the term lethal violence does not here refer to other forms of lethal violence mentioned above, caused by terrorism and armed conflict. The annual number of homicides internationally has been 440,000 during the years 2019 to 2021, with 458,000 homicides in 2021, which equates to 5.8 homicides per 100,000 world citizens (UNODC, 2023). Accordingly, global homicide trends have generally remained stable during the period from 2000 to 2021. In Sweden, the nation on which the present thesis focuses, the number of cases of lethal violence has varied between 92 and 124 from 2015 to 2024, with 92 homicide cases recorded in 2024, representing 0.9 homicides per 100,000 Swedish inhabitants (Brå, 2025). Thus, Sweden has demonstrated a lower homicide rate compared to the global average. In recent years (2013-2022), there has been a rise in the number of homicides in Sweden, predominantly due to an increase in firearm homicides by male offenders in criminal settings, a trend not seen in other Nordic countries (Brå, 2024).

In approximately 10 % of all homicide cases, the offenders are female, both internationally (UNODC, 2023) and nationally within Sweden (Brå, 2024). This smaller fraction of female offenders still constitutes an understudied group. Although female offenders of lethal violence and their victims represent a minority, this violence matters since every case where someone severely harms or ends another person's life counts. It counts for the victim, the victim's loved ones, the offender, the offender's loved ones, and society as a whole. Ultimately, in one way or another, it matters to you and me, thus all of us. In our society, it is not only vital to protect one another from getting subjected to violence, but it also involves the necessity of consciously considering those who inflict harm and those at risk of doing so. Of course, this is an academic text addressing numbers and figures, but behind these statistics, it is important to remember that this thesis concerns real-life and death, affecting the living and the memory of those lost.

When addressing the large difference in proportion between female and male offenders of lethal violence, that is, one in ten (Brå, 2024; UNODC, 2023), the question “why” males kill others to such a higher degree arises. Or conversely, why do females kill others to such a relatively small extent? Likewise, concerning violent crime in general, the proportion of female offenders has been found to be about 10 %, with even lower numbers among the more persistent violent offenders, which is even more prominent in cases of aggravated violent offences (Falk et al., 2014). Prior research has investigated the predominance of male violence and the different expressions of aggression and violence among females and males (lower prevalence and severity of violence/physical harm committed by females), based on various perspectives such as hormones (Björkqvist, 2018; Sher, 2014) and brain development (Denson et al., 2018; Eliot, 2021), evolutionary psychology (Campbell, 2013), and social cognitive skills (Bennett et al., 2005). Nevertheless, this question of “why” extends beyond the scope of the current thesis. Here, the ambition is to describe and understand the offender's background, mental health, risk factors, and offence behaviour, thereby aiding in identifying the women’s needs, both initially as preventive measures and in cases of crimes committed, ensuring risk management is as effective as possible to inhibit recidivism. Even if the thesis partly investigates the characteristics and time trends of both female and male offenders (Paper I), the main focus is on female offenders (Papers II, III, IV), without comparison with their male counterparts. Though, when addressing female violence, we tend to compare it with male violence, which is also done in part of the current thesis. However, when focusing on male violence, this is rarely contrasted with female violence. Additionally, in research on lethal and severe violence in general, females have often been excluded. Even if such exclusion could be understood due to the low numbers of female offenders, this impacts and in the worst scenarios reduces our understanding and knowledge base regarding female lethal and severe violence. Thus, a goal of the current thesis is to raise awareness concerning women as potential perpetrators in a nuanced and evidence-based manner, rather than dismissing this or falling into fixed stereotypes of women when they commit violent offences. Thus, here the female offenders are in the spotlight, even if some descriptions and comparisons with male offenders are included.

The idea for this project arose from within the clinical work with forensic psychiatric investigations (FPIs), meeting people charged with serious, often violent, crimes. In this setting, the clinicians (forensic psychiatrist, psychologist, social worker, ward staff) meet the person accused during several

weeks, having access to relevant documents concerning the individual, who is assessed with different structured instruments and interviews to determine whether or not the individual has committed the crime influenced by a severe mental disorder (SMD) (for more info., see 1.2 Legal setting). Most frequently, the individuals going through an FPI are males, but a smaller part are females (about 12-19 % during the period 2022-2024) (Rättsmedicinalverket [Swedish National Board of Forensic Medicine], 2025). From a clinical point of view, FPIs concerning females charged with violent crimes, especially lethal ones, stand out. The fact that females are fewer in number has, in one way or another, an impact on how we approach the individual. It is not reasonable to ignore the fact that women accused of a crime, which in itself is norm-breaking, constitute an even bigger violation of social expectations relating to female stereotypes.

In many cases, when meeting females charged with lethal or other severe violent offences as a clinician, mental health issues, categorised as various psychiatric diagnoses, are often assessed co-occurring with problematic life situations, burdened backgrounds, and vulnerability. Nevertheless, this is not always the case based on clinical experience. In some cases, females commit lethal violence without reasons such as mental illness, victimisation, vulnerability, or other complicating factors. It could be due to explanations such as jealousy or financial motives, without any other aggravating factors, which thus stand out as unusual cases from, for example, within the work with FPIs. Of course, as a clinician, you must consider how, for example, gender and norms potentially could affect you as an investigator, in order to prevent potential biases. Prior research has investigated gender biases in the work with FPIs and the diagnostics in the case of female versus male offenders, where female offenders were more likely to be assessed as having an SMD, also when controlling for diagnoses and crime classification (Yourstone et al., 2009; Yourstone, Lindholm, Grann, et al., 2008). While understanding biases is of great importance, this question is not further explored in the current thesis. Taken together, considering the limited knowledge of female lethal and severe violent crimes, the FPIs, previously not studied in this way, offer a unique opportunity to understand and gather insights about the individuals involved. This approach could therefore generate new knowledge, particularly regarding the complex dynamics of synergies within motivating factors and risk factors, regarding female offenders of lethal and severe violence, improving treatments, preventive work, and addressing risk factors in this population more adequately within prison services and forensic psychiatric care.

## 1.1 FEMALE OFFENDERS

### 1.1.1 TIME TRENDS

Even if reports, as mentioned above, have indicated an increase in the number of homicides in Sweden in later years, this rise does not seem to apply to female offenders (Brå, 2024). In studies concerning trends for female-perpetrated homicides internationally, some have demonstrated declines in later compared to earlier periods (Cooper & Smith, 2011; Hansen, 1977; Thomsen et al., 2019), while there are exceptions where the trend showed an opposite pattern (Putkonen et al., 2008). Also, it is relevant to note in the current context that the representation of females committing non-lethal or non-violent offences has increased according to some prior research (de Vogel & Louppen, 2017; Nicholls, Cruise, et al., 2015).

### 1.1.2 DEMOGRAPHIC AND CRIME CHARACTERISTICS

Female offenders of lethal violence (also referred to as female homicide offenders) have shown low levels of primary education (Desta & Venema, 2021; Wilson et al., 2020), and employment (Kazemian et al., 2023; Valenca et al., 2014), which are also lower compared to their male counterparts (Caman et al., 2016; Putkonen et al., 2011). Though, when focusing on homicide offenders with schizophrenia, the opposite gender pattern emerged concerning employment (Wang et al., 2019). Further, female homicide offenders have often experienced adverse childhood experiences (Pflugradt et al., 2018; Raymond et al., 2021), and this is also more common in comparison with male offenders (Ferranti et al., 2013; Putkonen et al., 2011). Contrariwise, female homicide offenders have shown less aggressive behaviour as children and youths compared to male offenders (Yourstone, Lindholm, & Kristiansson, 2008).

When considering crime characteristics and female homicide offenders, it should initially be emphasised that females are less burdened when it comes to criminal history compared to their male counterparts (Carabellese, Felthous, Mandarelli, et al., 2020; Yourstone, Lindholm, & Kristiansson, 2008), and also compared to female offenders of non-lethal violence (Evans et al., 2013). Concerning the offences, a large majority of female homicide offenders, more often compared to males, commit violence within a home setting, and close relations (Allen et al., 2020; Avdija et al., 2021; Carabellese, Felthous,

Mandarelli, et al., 2020; Yourstone, Lindholm, & Kristiansson, 2008). The victims of female homicide offenders are comparably more often of the opposite gender and intimate partners, and, thereafter, children. Concerning cases of children as victims, the female homicide offenders represent a larger proportion of the offender group, about 30-50 % (Liem & Pridemore, 2011; Sturup & Granath, 2015; Tselou et al., 2023) compared to 10 % in all cases of homicide, as previously stated. In terms of methods of violence, females, compared to male offenders, more frequently use sharp force injuries (Flynn et al., 2011), or strangulation/asphyxia or poisoning/intoxication in cases involving child victims (Liem & Koenraadt, 2008). Violence involving the victim and offender, and offenders previously seeking support, is common among female homicide offenders, and more so compared to male offenders (Yourstone, Lindholm, & Kristiansson, 2008). In cases of intimate partner homicide, previous research has noted a higher occurrence of violence directed towards the offender by the victim (Caman et al., 2016). Concerning behaviour after the homicide, females more often sought support and expressed remorse compared to male offenders (Häkkinen-Nyholm et al., 2009).

### **1.1.3 MENTAL HEALTH AND SUBSTANCE USE**

A considerable proportion of female homicide offenders had previously received mental health care and attempted suicide (Kazemian et al., 2023), also more so compared to their male counterparts (Brå, 2024; Putkonen et al., 2011). In forensic psychiatry, psychotic syndromes are prevalent (Kazemian et al., 2023; Raymond et al., 2021; Valenca et al., 2014), and also mood disorders (also labelled affective disorders; i.e., depressive or bipolar disorders) (Pflugradt et al., 2018; Raymond et al., 2021), the latter being more common among females than among their male counterparts (Ferranti et al., 2013). Mood disorders have also been prevalent among female homicide offenders in prison services and are also more prevalent compared to male offenders (Fox et al., 2018). Similarly, personality disorders have stood out as common in prison settings (Pflugradt et al., 2018), especially borderline personality disorder (also referred to as emotionally unstable personality disorder), compared to male offenders (Fox et al., 2018). Nevertheless, this proportionally higher frequency of personality disorders/borderline personality disorder among female offenders has also been demonstrated within forensic psychiatric care (Ferranti et al., 2013). In line with the described gender differences regarding mental health, a population-based descriptive study by Flynn et al. (2011) concluded that female compared to male homicide offenders were both more burdened in terms of mental illness in a life-history

perspective and influenced by mental illness (primarily depressive disorders) at the time of the crime. Based on the reported differences, gender-responsive factors have been emphasised to improve assessments and clinical forensic work, including risk management (Ferranti et al., 2013).

Substance use has been common among female homicide offenders (Putkonen et al., 2008), but not necessarily more so compared to male offenders (de Vogel et al., 2021; Fox et al., 2018; Putkonen et al., 2011). Though in a Finnish study, a more recent cohort of female homicide offenders (compared to an earlier cohort) demonstrated more similarities to their male counterparts in terms of substance use disorder (alcohol) and the influence of alcohol at the time of the crime (Putkonen et al., 2008). Relevant to consider, the later cohort also resembled male offenders more in terms of exhibiting less severe mental illness, and more crimes committed outside close relations. Thus, substance use among female offenders has implications for interventions both within forensic psychiatry and prison settings. Nevertheless, substance use has not emerged as a predictor of recidivism (sample in question included a variation of offences) for female offenders within forensic psychiatry (de Vogel et al., 2021).

### **1.1.4 AGGRESSION, VIOLENCE, AND RISK**

To capture the factors that characterise the individual, their background, and potential motivations behind violence, as well as the context in which crimes are committed, research has focused on various aspects of aggression and violence. This is achieved, for example, by developing the distinction between instrumental and reactive features of the crime (Cornell, 1996), but also by evaluating aggression from a life history perspective (Coccaro et al., 1997). Additionally, dysfunctional personality traits related to delinquency (e.g., psychopathy) (Hare, 1991, 2003), as well as risk factors for violent crime (Douglas, 2013; Webster, 1997), and criminogenic needs (Andrews & Bonta, 1995) have been considered as essential aspects to assess and describe violence and other severe forms of criminality, and ultimately to prevent recidivism. In all these cases, most research has concentrated on male offenders.

#### **1.1.4.1 AGGRESSION AND VIOLENCE**

Aggression and violence are multifaceted concepts, posing challenges in terms of definition. Traditionally, research in this domain has operationalised the occurrence of violence through registered convictions for violent offences. Although explanatory frameworks vary, there is a broad agreement that aggressive and violent behaviour emerges from multifactorial aetiologies

(Anderson & Bushman, 2002; Denson et al., 2018). The General Aggression Model, for example, highlights episodic processes involving personal (incl. personality aspects, shaped by biology, and environment) and situational variables, inner experiences, and analytical and decision-making mechanisms that ultimately influence whether behaviour is impulsive or deliberate (Allen et al., 2018; Anderson & Bushman, 2002). In the current thesis, adhering to the complex aetiology behind aggression and violence, and the mentioned theories, these concepts are defined as follows. *Aggression* is defined as behaviour aimed at harming others. *Violence* is conceptualised as a subset of aggression, referring specifically to acts aimed at causing physical damage, whether threatened, attempted, or realised, often resulting in physical impairment, and in some cases with lethal outcomes.

*Instrumental versus reactive violence/aggression.* One way to categorise type of violence and aggression is the division between instrumental (alt. proactive) and reactive (alt. hostile, affective, or impulsive) (Berkowitz, 1993; Cornell, 1996; Cornell et al., 1996). Instrumental violence is generally *goal-directed* and *planned*, whereas reactive violence is typically distinguished by high emotional *arousal* and occurs in response to perceived *provocation* or threat. While prior research has successfully differentiated between instrumental and reactive offenders and offence types among male populations (Cornell et al., 1996; Tapscott et al., 2012), human behaviour is complex, as indicated by, for instance, the General Aggression Model (Anderson & Bushman, 2002). Additionally, findings concerning female offenders remain uncertain, even though existing evidence suggests a predominance of reactive motives in violent acts committed by women, particularly in cases of homicide (Lehmann & Ittel, 2012; Sea et al., 2020).

*Aggression in a life history perspective.* A wide range of aggressive behaviours and patterns has been included in previous research when considering aggression in a life history perspective, such as outward-directed aggression, self-directed aggression, and antisocial behaviour, collectively capturing potential trait aggression (Coccaro et al., 1997). Thus, compared to the definition of aggression above, aggression from a life history perspective encompasses a broader definition of aggression, including physical harm, as well as aggression directed towards oneself and inanimate objects. The limited research, including females (both non-forensic and correctional settings), when addressing aggression in a life history perspective, has shown heightened levels of aggression, but not as high as among their male counterparts (Coccaro

et al., 1997; Falk et al., 2017). Nevertheless, females have demonstrated comparably higher levels of *self-directed aggression* compared to males.

#### 1.1.4.2 RISK FOR VIOLENCE AND CRIMINOGENIC NEEDS

*Psychopathy.* Violent criminality and recidivism have long been associated with psychopathy (Douglas et al., 2018; Harris et al., 1991). A prevalent instrument used to assess psychopathy is the Psychopathy Checklist-Revised (PCL-R) (Hare, 1991, 2003), also used in the current thesis (Paper III). Psychopathy, according to PCL-R, constitutes a psychological construct defined by a specific constellation of *interpersonal, affective, lifestyle, and antisocial* characteristics, such as manipulateness, diminished empathy, remorse, and guilt, as well as pronounced impulsivity and irresponsibility, along with antisocial dispositions including early onset and versatility in criminal activities. Even though research has primarily emphasised a dimensional construct (Edens et al., 2006; Guay et al., 2018; Hare & Neumann, 2005; Marcus et al., 2004; Sellbom & Drislane, 2021), rather than a categorical one (Harris et al., 1994), classification of psychopathy based on cut-off values has frequently been used both in clinical practice and research (Hare, 2003; Webster, 1997). Although the psychopathy concept has been linked with antisocial personality disorder, it does not represent a formally recognised diagnostic category within the Diagnostic and Statistical Manual of Mental Disorders, 5th edition, Text Revision (DSM-5-TR); instead, such features may be listed as a specifier when diagnosing antisocial personality disorder using the Alternative DSM-5 Model for Personality Disorders (American Psychiatric Association, 2022).

Among female offenders, research has demonstrated quite low levels of psychopathy (Pinheiro et al., 2020), particularly in contrast to male offenders (Coid, Yang, Ullrich, Roberts, et al., 2009; de Vogel & Lancel, 2016; Nicholls et al., 2005). Additionally, psychopathy levels have been reported as even lower in female-perpetrated homicide in contrast to non-lethal violence or non-violent offences (Carabellese, Felthous, Tegola, et al., 2020; Klein Tunte et al., 2014). Based on the gender differences in the level of psychopathy, lower cut-off levels on PCL-R for females have been proposed (de Vogel et al., 2014; Hicks et al., 2010; Klein Tunte et al., 2014; Weizmann-Henelius et al., 2010), for example, when discriminating between those with and without more criminogenic features, such as earlier onset of criminal behaviour and more frequent and versatile criminality (de Vogel & Lancel, 2016; Klein Tunte et al., 2014). However, this line of research is still in its early stage, with more studies needed to ensure accuracy in the conclusions drawn. Additionally,

because females display different patterns in both features and degrees of psychopathy, it is difficult to classify females and also complicated to apply standard as well as adapted cut-off limits. This challenges a taxonomic model and endorses a dimensional structure, in line with what research predominantly advocates (Guay et al., 2018).

*Risk factors for violence and criminogenic needs.* Research on risk assessment for violence has considered historical, clinical, and risk management domains, including the recognition of dynamic risk factors amenable to interventions to reduce such risk (Douglas, 2013; Webster, 1997). Further, the risk-need-responsivity (RNR) model has been influential when aiming at capturing criminogenic risks and needs (Andrews & Bonta, 1995), informed by the “Central Eight” factors associated with criminal behaviour and recidivism. These are divided into the “Big Four” criminal history, antisocial personality traits, procriminal attitudes, and criminal friends/acquaintances, and the “Moderate Four”, that is, malfunctioning family/marital, educational/employment, leisure/activities, and substance use (Andrews & Bonta, 2024; Andrews et al., 2006). Research indicates that across offender populations, including individuals with mental disorders in forensic psychiatric settings, there is substantial overlap regarding the dominant risk factors influencing recidivism (Bonta et al., 2014). Nevertheless, even if researchers have claimed that the RNR and the “Central Eight” are equally relevant to individuals with severe mental illness as they are to those without, these risk/need factors have been studied to a greater extent within prison compared to forensic psychiatric care (Bonta & Lee, 2025). Furthermore, an umbrella review of systematic reviews and meta-analyses has challenged the evidence supporting the RNR model, emphasising the need for more research with higher methodological standards (Fazel et al., 2024).

Further, given that the majority of instruments assessing the risk of violence and crime have primarily been applied and researched within male offender populations, we know less about their suitability within female offender populations (de Vogel, Bruggeman, et al., 2019; Falk et al., 2017; Nicholls, Greaves, et al., 2015). Additionally, divergent pathways are typically observed between female and male offenders (Streb et al., 2022). For instance, concerning homicide, female offenders are less likely to have a criminal record compared to males (Carabellese, Felthous, Mandarelli, et al., 2020; Yourstone, Lindholm, & Kristiansson, 2008). Thus, there is a question of whether gender-neutral risk assessment tools apply to females or not (Garcia-Mansilla et al., 2009). As a result, research and the development of complementary gender-

sensitive and/or alternative risk assessment tools have emerged (de Vogel & Nicholls, 2016; Salisbury et al., 2009), for example the Female Additional Manual (FAM; de Vogel et al., 2014), and the addition of gender-responsive risk factors to the LSI-R (Wolf et al., 2023a). Examples of gender-sensitive risk factors are trauma/adverse experiences (childhood/adulthood), prostitution, intimate partner dysfunction, parental difficulties/stress, pregnancy at a young age, suicidality/self-harm, covert/manipulative behaviour, low self-esteem, and poverty. Nevertheless, research on the predictive validity concerning gender-responsive risk measures for females has shown varied results. Some studies report increased accuracy (Greig, 2014; Van Voorhis et al., 2010; Wolf et al., 2023a), while others find restricted or no support (Andrews & Bonta, 2024; Lieser & Rossdale, 2023; Strand & Selenius, 2019; Wolf et al., 2023b). However, the studies performed using FAM are quite few, and the clinical benefit of using the instrument has been highlighted by professionals (de Vogel, Wijkman, et al., 2019). At the same time, studies on both the HCR-20 version 2 (Coid, Yang, Ullrich, Zhang, et al., 2009; Strand & Selenius, 2019), and version 3 (Lieser & Rossdale, 2023; Wolf et al., 2023b), and the LSI-R (Geraghty & Woodhams, 2015; Gower et al., 2020; Manchak et al., 2009; Palmer & Hollin, 2007; Rettinger & Andrews, 2010; Smith et al., 2009; Vose et al., 2009; Wolf et al., 2023a), have shown predictive validity concerning recidivism among female offenders. Though in most cases, the results have at best demonstrated a moderate effect concerning predictive validity, and in some cases, even low values (de Vogel & de Ruiter, 2005), which is consistent with other research showing fairly weak predictive validity based on common risk factors, regardless of gender (Nilsson et al., 2011), especially in cases of positive predictions (Fazel et al., 2012). Furthermore, as discussed by Noland (2025), it is important to recognise that risk assessments are challenging to evaluate because the initial risk level assessed is likely influenced by relevant measures or treatments implemented, which can affect subsequent outcomes. Therefore, an individual initially considered high risk could have their risk reduced through well-planned risk management, which may influence the research findings in a problematic way if the studies do not account for the entire process, including potential positive effects due to the assessment interventions carried out.

## 1.2 LEGAL SETTING

Since the idea for this project originated from the clinical work with FPIs in Sweden, and given that the thesis is based on two Swedish cohorts, a description of the specific legal context in Sweden is necessary.

Under Swedish law (SFS, 1962:700), all individuals aged 15 and above accused of a crime are held legally responsible for their actions, regardless of questions surrounding their mental state. However, if an individual's mental health is deemed sufficiently severe, they may be assessed as suffering from an SMD, a medico-legal classification encompassing significant psychiatric conditions. These typically include psychotic syndromes or severe depressive episodes with suicidal ideation, but also profound developmental disorders or severe personality disorders characterised by extensive compulsive behaviours or psychotic features, accompanied by a markedly impaired level of functioning. In cases where an offender is found culpable and determined to be influenced by an SMD, Swedish penal law generally mandates compulsory forensic psychiatric care rather than imprisonment.

To establish whether an accused meets the criteria for an SMD, the court may order an FPI, which is conducted by the Swedish National Board of Forensic Medicine. An FPI typically spans up to four weeks and is carried out by a multidisciplinary forensic team comprising a psychiatrist, a psychologist, a social worker, and ward staff. These professionals are granted access to comprehensive documentation, including the suspect's historical and current interactions with social services, healthcare providers, educational institutions, and previous criminal justice interventions. The team also reviews the preliminary police investigation related to the current offence. To enhance the accuracy of the FPI, the forensic team employs various methods, including clinical interviews, psychological testing, and structured assessment tools. Consequently, the quantity and quality of information available from FPIs is substantial, rendering them the most thorough form of psychiatric evaluation conducted in Sweden, and as such, constituting an excellent source of information concerning criminal offenders with mental health problems (for more info. on the Swedish legal setting, incl. FPI, see Bennet et al., 2022; Pouls et al., 2022; Svennerlind et al., 2010).

## 2 AIM

The general aim of this thesis is to capture the qualities that distinguish female offenders of lethal and severe violent crime in terms of mental health, risk factors for violent criminality, offence behaviour, and victim-offender relationships. This was based on four papers with the following specific aims:

- I. To examine whether incidence rates of male-perpetrated and female-perpetrated homicide have changed from 1990 to 2010, and investigate similarities and differences between male and female homicide offenders, as well as compare male and female homicide offenders with child versus adult victims.
- II. To characterise female offenders of lethal and severe violence, and compare those with versus without an SMD, regarding background/demographics, mental health, and substance use/abuse, as well as relate these factors to offence behaviour and victim-offender relationship.
- III. To determine female offenders of lethal and severe violence, with versus without an SMD, regarding the level of psychopathy and type of violence (instrumental vs. reactive) perpetrated.
- IV. To establish the relationships between the outcomes of various risk and aggression measures among female offenders of lethal and severe violence, identify the strongest factors associated with lethal violence, and determine whether the measures differed significantly between the SMD and no-SMD groups.

## 3 METHODS

### 3.1 FEMALE AND MALE HOMICIDE OFFENDERS (PAPER I; COHORT I)

#### 3.1.1 SUBJECTS

In Paper I, the cohort (hereafter referred to as Cohort I) comprised registry data, including all homicide offenders in Sweden from 1990 to 2010, provided by the Swedish National Council for Crime Prevention (Brå) and processed by Karolinska Institutet (KI). To capture all homicides, the following offence classifications were included in the dataset: murder, voluntary manslaughter, involuntary manslaughter by assault (also referred to as assault *and* causing another's death), and infanticide. Based on both the inclusion and the exclusion criteria (for exclusion criteria, see Paper I), the total number for Cohort I was  $N = 1570$ .

#### 3.1.2 MEASURES

The measures used in this paper included the total number of homicides, the annual number of homicides, and population data. Secondly, regarding demographic, legal, and clinical characteristics for all the homicide offenders, as well as the comparison between the females and males (with gender defined by legal standards) during the 21-year inclusion period, the following variables were included: offender age, country of birth, civil status, previously registered criminality, offence classification, sentence, as well as assessed SMD and psychotic disorder (determined at the FPI<sup>1</sup>). Thirdly, to differentiate between female and male homicide offenders with adult victims (here  $\geq 15$  years of age), and fourthly, those with child victims (here  $< 15$  years of age), concerning crime characteristics, the following variables were examined: multiple victims, multiple offenders, victim-offender relationships, victim gender, offender under the influence of substances, methods of violence, crime scene, victim intoxicated, and previous violence between victim and offender.

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<sup>1</sup> In Paper I, referred to as forensic-psychiatric examinations, forensic psychiatric evaluations, or forensic-psychiatric reports.

### **3.1.3 PROCEDURE**

The study was done in collaboration with researchers connected to KI and Brå. The data collection and coding were done by research assistants at Brå, with access to police reports and investigations, court verdicts, FPIs, and, in cases of uncertainty, interviews with investigators in charge.

### **3.1.4 STATISTICAL ANALYSES**

Time trends were studied using incidence-rate ratios (IRR) derived from Poisson regression analyses, with the number of homicides serving as the dependent variable, population data included as the exposure variable, and year as the predictor. This approach allowed for the estimation of the alteration of homicide incidence over time. The IRR reflects the change in the rate of homicides per 100,000 inhabitants.

To examine differences between male and female homicide offenders, categorical variables were analysed using either the Chi-square ( $\chi^2$ ) test or Fisher's exact test. For normally distributed continuous variables, Student's *t*-test was employed. To assess the odds of a female versus a male being the offender in cases with child victims, odds ratios (OR) were used. Throughout the study, 95 % confidence intervals (CI) and two-tailed probability values were reported. A significance threshold of  $p < 0.05$  was used.

Poisson regression analyses were conducted using STATA version 13.1 for Mac, whereas all other statistical analyses were performed using SPSS version 22 for Mac.

## **3.2 FEMALE OFFENDERS OF LETHAL AND SEVERE VIOLENCE (PAPERS II, III, IV; COHORT II)**

### **3.2.1 SUBJECTS**

In Papers II, III, and IV, the focus was on female offenders of lethal and severe violence. The cohort (hereafter labelled Cohort II) for all these sub-studies consisted of all FPIs, performed at the Swedish National Board of Forensic Medicine during the inclusion period 2000 to 2014, concerning females (gender defined by legal standards) who were charged with lethal or attempted lethal violence, including related test materials and subsequent court verdicts.

In Papers II, III, and IV, lethal or attempted lethal violence (i.e., synonymous with homicide or attempted homicide) was defined as the subsequent offence classifications: murder, voluntary manslaughter, attempted murder, attempted voluntary manslaughter, and involuntary manslaughter by assault (also referred to as assault combined with involuntary manslaughter), infanticide, and conspiracy/instigation/preparation to murder or attempted murder. On this basis, Cohort II was  $N = 175$ , divided into the sub-groups SMD versus no-SMD, comprising the majority (approx. 70-80 %) of females charged with these kinds of offences in Sweden during the 15-year inclusion period (Brå, 2008, 2012, 2017, 2020).

### **3.2.2 MEASURES**

A research protocol<sup>2</sup> was developed to cover a broad array of aspects of interest, utilising the large amount of information found in the FPIs. This protocol incorporated the following themes: background/demographics, mental health, substance use/abuse, and crime characteristics, including offence behaviour, victim-offender relationship, as well as previously registered criminality (Paper II). Regarding mental health assessment and potential diagnoses, the DSM-IV (American Psychiatric Association, 2000) was the diagnostic manual utilised during the inclusion period. Thus, the DSM-IV multiaxial system for mental disorders was applied, where Axis I includes disorders such as schizophrenia, mood disorders, anxiety disorders, and substance use disorders, while Axis II includes personality disorders and intellectual disability. The disorder classification according to DSM-IV was employed for categorisation and analysis of diagnoses (in cases with more than one diagnosis, adherent to different categories, these were included in multiple disorder categories), subsequently presented based on the prevalence in the cohort. For clarity, substance use disorders were analysed and presented separately from the other Axis I disorders. Additionally, diagnoses listed under Axis III, concerning medical conditions potentially relevant to mental disorders and psychological functioning, were included. When assessments of general intellectual and neuropsychological functioning were carried out as part of the FPI, the Wechsler Adult Intelligence Scale (WAIS-R/R-NI/III/III-NI/IV) (Kaufman, 2006) was used, and results (ranging from significantly below average to significantly above average) were coded in the research protocol.

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<sup>2</sup> The author can distribute the research protocol (in Swedish).

Further, additional measures based on structured instruments were also included and coded in the research protocol.

*PCL-R – Psychopathy.* For measures of psychopathy, the PCL-R (Hare, 2003) was used (Paper III). The PCL-R comprises 20 items designed to capture diverse dimensions of psychopathy, organised into two overarching *factors: 1 interpersonal-affective* and *2 lifestyle-antisocial*. These are further delineated into four distinct *facets: 1 interpersonal, 2 affective, 3 lifestyle, and 4 antisocial*. *Facet 1 interpersonal* includes four items related to superficial charm, grandiosity, pathological lying, and manipulativeness. *Facet 2 affective* features four items involving emotional shallowness, lack of remorse, guilt, and empathy, as well as failure to take responsibility for one's own actions. *Facet 3 lifestyle* comprises five items concerning the need for stimulation, absence of realistic, long-term goals, impulsivity, and irresponsibility. *Facet 4 antisocial* covers five items such as behavioural problems, juvenile delinquency, and criminal versatility. Each item is rated on a scale from zero to two: “does not apply” (= 0), “partial match” (= 1), or “reasonable good match” (= 2), resulting in a possible *total* score ranging from zero to 40. Regarding interrater reliability, prior research has demonstrated overall high reliability for PCL-R (Grann et al., 1998; Hare & Neumann, 2005; Hicks et al., 2010; Lehmann & Ittel, 2012).

*Violent Incident Coding Sheet (VICS) – Instrumental versus reactive aggression/violence.* For measures of instrumental versus reactive features of the offences, the VICS (Cornell, 1996), was used (Paper III). The VICS framework comprises a primary classification, *instrumental/reactive aggression*, and a set of secondary classifications including *planning, goal-directedness, provocation, arousal, severity of violence, victim-offender relationship, intoxication, and the presence of psychosis*. Paper III concentrated on the primary classification and the first four secondary classifications. The rest of the secondary classifications were not included in the analysis in Paper III, as relevant data on these features in cohort II were reported in Paper II. Within the VICS model, response options for each classification range from four to six ordered categories, progressing from lower to higher levels of the features being assessed (e.g., the primary classification *instrumental/reactive aggression*: 1. Clearly reactive hostile aggression [e.g., interpersonal conflict], 2. Primarily reactive hostile aggression, some instrumental qualities, 3. Primarily instrumental, some reactive qualities, 4. Clearly instrumental aggression [e.g., crime-related incident, drug deal]; or, the secondary classification *provocation* [includes provocation prior to incident,

use subject's perception]: 1. No apparent provocation, 2. Mild provocation [insult, minor argument, confrontation with police], 3. Moderate provocation [serious argument or dispute, threat of assault], 4. Strong [break-up of a romantic relationship, threat of major life change], 5. Very Strong provocation [assault], 6. Exceptionally strong provocation [repeated assault, severe abuse]). The primary classification provides a broad, integrative assessment of the offence as either predominantly instrumental or reactive, whereas the secondary classifications offer a more granular depiction of specific instrumental or reactive features within the violent act. Specifically, constructs such as *planning* and *goal-directedness* are indicative of instrumental aggression, while *provocation* and *arousal* reflect reactive aggression. The interrater reliability for VICS has generally shown high values in prior research (Cornell, 1996; Cornell et al., 1996).

*Historical Clinical Risk Management-20 (HCR-20 V2) – Risk for violent criminality.* Regarding measures of risk for violence, the HCR-20 V2 (Belfrage & Fransson, 2005; Webster, 1997) was used (Paper IV). The HCR-20, a structured professional judgement<sup>3</sup> risk instrument, consists of 20 factors related to static *historical* risk factors, dynamic *clinical* risk factors, and future *risk management* considerations. The *historical* subscale comprises 10 items related to past violence and problems regarding relationships, employment, substance use, mental illness, psychopathy, early disciplinary issues and/or abuse, personality disorder, and previous supervision failure. The *clinical* subscale includes five items involving a lack of insight, negative attitudes, mental illness, impulsivity, and unresponsiveness to treatment. The *risk management* subscale encompasses five items covering unrealistic planning, insufficient professional and/or personal support, non-compliance, and stress-vulnerability. In Paper IV, the risk management component was assessed assuming that the individual would be released immediately following the FPI (i.e., so-called OUT scores). Each item was rated on a scale from zero to two, according to “available information...” evidence “contradicts the presence of this condition/problem” (= 0), “... suggests that this condition/problem exists”

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<sup>3</sup> i.e., An approach that relies on well-defined risk and protective factors derived from a broad literature review instead of specific datasets. Evaluators assess these factors and then apply professional judgment to determine the overall risk, which allows for the inclusion of dynamic risk factors and thus improves the applicability of the assessment in intervention planning. Heilbrun, K., Yasuhara, K., Shah, S., & Locklair, B. (2021). Approaches to Violence Risk Assessment: Overview, Critical Analysis, and Future Directions. In K. S. Douglas & R. K. Otto (Eds.), (2 ed., pp. 3-27). Routledge. <https://doi.org/10.4324/9781315518374-2>

(= 1), and "... clearly shows that this condition/problem exists" (= 2), yielding a maximum *total* score of 40. Although the HCR-20, as a structured professional judgement instrument, endorses a summed judgement of "low", "moderate", or "high risk", such judgements were not assessed in Paper IV. Instead, *total* scores and subscale scores (*historical*, *clinical*, and *risk management*) were reported. Concerning interrater reliability, prior research has demonstrated overall high values for HCR-20 (Coid, Yang, Ullrich, Zhang, et al., 2009; Grimbois et al., 2016).

*Level of Service Inventory-Revised (LSI-R) – Criminogenic risk/needs.* Concerning criminogenic risk/needs, the LSI-R (Andrews, 2007; Andrews & Bonta, 1995; Rättsmedicinalverket [Swedish National Board of Forensic Medicine], 2010) was employed (Paper IV). The LSI-R, an actuarial<sup>4</sup> risk assessment instrument that also incorporates dynamic risk factors, consists of 54 items, each scored as either a binary response ("Yes" or "No") or on a scaled rating from zero to three. These items are divided into ten distinct subscales: *criminal history*, *education/employment*, *finances/financial*, *family/marital*, *accommodation*, *leisure/recreation*, *companions*, *alcohol/drug problem*, *emotional/personal*, and *attitudes/orientation*. The subscale *criminal history* includes 10 items involving prior convictions, arrests, incarceration, institutional/correctional misconduct, record of assault/violence, and current offences. The subscale *education/employment* includes 10 items concerning a history of and current employment/unemployment and education, including problems such as being fired/suspended and functioning regarding performance and interactions (with peers and/or authorities). The subscale *finances/financial* includes two items concerning financial problems and the need for social assistance. The subscale *family/marital* includes four items, involving dissatisfaction, non-rewarding situations, and criminal relatives/partners. The subscale *accommodation* includes three items involving unsatisfactory housing, multiple address changes, and a high-crime neighbourhood. The subscale *leisure/recreation* includes two items involving absence from an organised activity and the potential to make better use of time. The subscale *companions* include five items concerning social isolation and criminal acquaintances/friends. The subscale *alcohol/drug problem* comprises

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<sup>4</sup> i.e., developed and empirically validated for application within a standardised algorithmic framework related to risk indicators associated with violent crime, which then produces a probabilistic estimate of recidivism. Ibid.

nine items, covering history and/or current issues with alcohol/drugs, as well as potential negative consequences due to substance use, such as violating the law or effects on close relations, education/employment, or medical concerns. The subscale *emotional/personal* includes five items, including the degree of interference (i.e., moderate or severe, incl. active psychosis) due to psychological problems, prior and/or current need for mental health/psychological assessment. The subscale *attitude/orientation* comprises four items, such as supporting crime and holding negative views towards conventions, as well as sentence and supervision. The highest possible *total* score on the LSI-R is 54. Although the LSI-R, as an actuarial instrument, may produce a probabilistic estimate of recidivism, such estimation was not considered in Paper IV. Instead, *total* scores and scores for each subscale (*historical*, *clinical*, and *risk management*) were reported. For the LSI-R, satisfactory to moderate interrater reliability has been previously demonstrated (Wolf et al., 2023a).

*Life History of Aggression (LHA) – Aggression in a life-history perspective.* As the measure for aggression in a life history perspective (incl. *aggressive*, *self-destructive*, and *antisocial behaviour*), the LHA (Coccaro et al., 1997) was used (Paper IV). The LHA scale yields a *total* score derived from the sum of the following subscales: *aggression*, *self-directed aggression*, and *consequences/antisocial behaviour* (henceforth labelled *antisocial*). The *aggression* subscale comprises five items that involve verbal and physical aggression directed outward towards inanimate objects, people, or other creatures. The *self-directed aggression* subscale has two items, covering self-harm and suicide attempts. The *antisocial* subscale consists of four items, including conduct problems in educational and/or employment settings that lead to reprimands, as well as antisocial behaviour, both with and without police intervention as consequences. Each item is rated on a scale, ranging from zero to five, based on the reported occurrence of the behaviour since adolescence. The scale categories are: "No occurrence" (= 0), "One event" (= 1), "Two or three events" (= 2), "Four to nine events" (= 3), "10 or more events" (= 4), and "More events than can be counted" (= 5). The maximum attainable *total* score on the LHA is 55 points. Regarding interrater reliability for LHA, prior research has demonstrated overall high reliability (Coccaro et al., 1997).

Taken together, the research protocol, consisting of nominal, ordinal, and in some cases interval measures, comprised many different aspects, in line with the defined aims and adapted to the unique data material, to understand and

characterise the lethal and violent offences and the background and functioning of the female offenders charged with these crimes.

### **3.2.3 PROCEDURE**

First, the research protocol was created and refined in collaboration between the researchers involved. In parallel, the ethics review application was formulated. After approval by the ethical board (for more info., see 3.3 Ethical considerations), the acquisition of the FPIs, related test materials and subsequent court verdicts were handled with the assistance of personnel at the Swedish National Board of Forensic Medicine. Subsequently, licensed clinical forensic psychologists (authors KT, TN, and MHK; research assistant KB), all with experience working with FPIs, coded the data based on the variables in the research protocols and performed the retrospective structured assessments. The additional measures (i.e., the described instruments, see 3.2.2 Measures) were performed as part of the FPI in a minority of the 175 cases for the instruments PCL-R (in 4 % of all cases), HCR-20 (in 18.3 % of all cases), and LSI-R (in 2.9 % of all cases). When this was not the case, that is, in a majority of the cases, the assessments were conducted retrospectively based on all available information (i.e., FPIs, records, and sentences). Regarding VICS and LHA, such assessments were not included in the FPIs and, thus, were always done retrospectively based on available information. In the current project, the decision was made to include gender-neutral risk instruments, as these were used in clinical practice at the time of the research inclusion.

To ensure the validity of the estimates, tests concerning interrater reliability for a majority of the variables used were conducted. To test for interrater reliability, coding was performed by two separate coders in 20% of the cases (KT+TN; KT+MHK; KT+KB). As satisfactory results were achieved, the main part of the coding was performed by KT (for more info., see 3.2.4.1 Interrater reliability, and the resp. Papers II, III, IV). A digital file of the data was created using Excel, where the original file was stored in a safe while pseudo-anonymised copies were used for the analyses.

### **3.2.4 STATISTICAL ANALYSES**

All analyses were mainly done by KT on pseudo-anonymised data, encompassing both the total cohort II and the defined sub-groups of SMD versus No-SMD, thereby minimising the risk of individual detection. Common to Papers II, III, and IV was the use of descriptive methods for the total cohort II, as well as the two main subgroups, the SMD group and the no-SMD group.

For the subgroup comparisons, the Student's *t*-test was employed for continuous variables, and the Chi-square ( $\chi^2$ ) test, or Fisher's exact test, for categorical variables. To analyse associations, Pearson's correlation was used (in Paper III) for continuous linearly related variables, following a normal distribution, while Spearman's correlation was used (in Paper IV) for ordinal or continuous variables with a monotonic relationship. To analyse covariates to dependent outcome variables (i.e., SMD status in Paper III, lethal violence in Paper IV), using independent variables (i.e., PCL-R and VICS scores in Paper III, HCR-20, LSI-R, and LHA scores in Paper IV) relevant to the specific aims of the sub-studies, univariable and multivariable binary logistic regressions were performed. Confidence intervals (95% CI) and two-tailed probability values,  $\alpha$ -level = 0.05, with Bonferroni corrected  $\alpha$ -levels regarding the subgroup comparisons, were employed. To provide some direction regarding the clinical relevance of the findings, the subsequent effect sizes were applied: Cramer's *V* for categorical variables, Cohen's *D* for continuous variables, *r* as strength of association, and OR for logistic regressions (for cut-off values, see Papers II, III, IV). For statistical analyses, either SPSS version 26 (SPSS Inc, Chicago, IL, USA) or JASP version 0.19.1 was employed.

#### 3.2.4.1 INTERRATER RELIABILITY

For the interrater reliability analysis in Papers II, III, and IV, the Intraclass Correlation Coefficient (ICC) (Koo & Li, 2016) was primarily used, with a two-way mixed effects model, single rater type, and absolute agreement, and in some cases, consistency, as definition (ICC cut of values: poor reliability < 0.50; moderate reliability = 0.50–0.75; good reliability = 0.75–0.90; and excellent reliability > 0.90). In Paper II, 50 variables were included in the ICC analyses, demonstrating excellent reliability in the majority of cases, followed by a substantial portion showing good reliability, and a minority with moderate reliability (more info., see Appendix, Supplementary material). In Paper III, the ICC analyses were performed on the PCL-R *total score*, showing good to excellent reliability, and on the VICS primary classification *instrumental/reactive aggression*, and the secondary classification *planning, goal-directedness, provocation, and arousal*. The results were mixed, demonstrating excellent and good ICC values for some variables but moderate and poor ICC values for others. Hence, further interrater reliability analyses were conducted, using percentage exact agreement. This procedure resulted in high values, and thus, good to excellent interrater reliability was obtained for all variables. The reason for the moderate and poor results on some variables was explored, and the lower ICC values were due to most coding being “no” or “zero”, which resulted in low variance and consequently impacted the ICC

analyses. However, the high frequency of agreement on “no” or “zero” codings suggests that reliability across all scales was still considered suitable for inclusion (for more info. concerning the recalibration and application of this analysis practice, see Paper III, and Appendix, Supplementary material). In Paper IV, the ICC analyses were performed on the HCR-20, LSI-R, and LHA *total scores*, where HCR-20 and LSI-R showed good reliability, and LHA excellent reliability (more info., see Appendix, Supplementary material).

### 3.3 ETHICAL CONSIDERATIONS

Paper I was authorised by the Regional Ethical Board in Stockholm (registration number 2014/749-31/5). Papers II, III, and IV (and a register-based follow-up study, intended as a post-doc project) were approved by the Regional Ethical Board in Gothenburg (registration number 2015/788-14).

The primary ethical concern in this thesis pertains to the collection and analysis of integrity-sensitive data. This necessitates rigorous standards for data management and strict adherence to confidentiality concerning protocols. In this study, several precautions have been implemented to safeguard participants' privacy. Notably, all data have been analysed and reported at a group level, ensuring no individual cases are identifiable. Furthermore, the coding key has been stored separately from the pseudo-anonymised data, thereby preventing any potential re-identification of participants.

The study exclusively utilises archival and registry-based information, and the decision concerning exemption from informed consent was based on a careful consideration of the ethical implications. In many cases, a substantial amount of time had elapsed since the individuals were involved in the events from which the data were collected. Reintroducing this context might have risked reopening past trauma and could hinder progress in the individuals' rehabilitation and social reintegration. Further, the potential risk of privacy infringement to the individuals concerned was balanced with the scientific value of research involving an underexplored population. Given the limited existing knowledge about this group, the research was expected to yield valuable insights that could inform more effective preventive and rehabilitative interventions. It was therefore deemed that the potential individual benefits, such as reduced stigma and improved support tailored to the specific needs of this population, outweighed the risks associated with the absence of informed consent in this particular context. Overall, this led to a decision not to apply informed consent, subsequently approved by the ethics board.

## 4 RESULTS

### 4.1 FEMALE AND MALE HOMICIDE OFFENDERS (PAPER I; COHORT I)

#### 4.1.1 DESCRIPTION, INCIDENCE, AND TIME TRENDS (PAPER I)

Of the 1,570 homicide offenders in Sweden, 9.6 % were female ( $n = 150$ ), and 90.4 % male ( $n = 1,420$ ). The 21-year observation time (1990-2010) was divided into three even intervals (1990-1996, 1997-2003, 2004-2010), during which the proportion of female homicide offenders persisted (10.6 %, 8.5 %, and 9.4 %, respectively;  $\chi^2[df\ 2, N = 1,570] = 1.44, p = 0.49$ ). Of the 1,463 homicide offenders with adult victims, 7.8 % were female and 92.2 % male. Among 107 homicide offenders with child victims, 33.6 % were female and 66.4 % male.

Hence, the proportion of female homicide offenders was higher in cases with child victims compared to adult victims. The odds ratio for a female homicide offender having a child versus an adult victim was 6.0 (95 % CI: 3.85 – 9.36).

Between 1990 and 2010, the incidence of female-perpetrated homicide was 0.19 per 100,000 female residents, compared to 1.89 for male-perpetrated homicide per 100,000 male residents. Thus, homicide rates were consistently lower among females. The regression analyses revealed small but significant decreases for both genders: IRR = 0.97 (95 % CI: 0.94–0.99) for females and IRR = 0.98 (95 % CI: 0.97–0.99) for males.

#### 4.1.2 DEMOGRAPHIC, LEGAL, AND CLINICAL CHARACTERISTICS (PAPER I)

Concerning demographics, the female homicide offenders were more likely to have an SMD-status, and less likely to have a prior criminal record. Offence classifications also differed: females were more frequently sentenced for voluntary manslaughter or infanticide, and males for murder or involuntary manslaughter by assault.

### **4.1.3 CRIME-SCENE AND OFFENDING BEHAVIOUR IN OFFENCES WITH ADULT VERSUS CHILD VICTIMS (PAPER I)**

Concerning crime characteristics, the differences between male and female homicide offenders were more prominent in cases with adult rather than child victims. In the homicides with adult victims, female offenders primarily killed male intimate partners or family members, while the male offenders had more diverse victim relationships, often acquaintances or strangers. Further, females more frequently employed sharp violence, while males employed blunt force, firearms, or asphyxiation. Female-perpetrated homicides typically occurred in domestic settings, whereas males were more likely to commit homicide in public or isolated locations. Victims of female offenders were more often under the influence of substances, and prior violence between victim and offender was more common.

The only significant differences between the female and male homicide offenders with child victims were that females more frequently employed asphyxiation rather than blunt force, sharp weapons, or firearms, and less often had a prior criminal record (females 8.3 %, vs. males 57.4 %;  $\chi^2[df\ 1, N = 71 = 15.86, p < 0.001]$ ).

Further, regarding all offenders regardless of gender, the results reveal distinctions between homicides involving adult versus child victims. For example, cases with adult victims more frequently involved offenders under the influence of substances, while cases with child victims more frequently involved multiple victims, girl victims, and intrafamilial victims within a homelike environment.

## **4.2 FEMALE OFFENDERS OF LETHAL AND SEVERE VIOLENCE (PAPERS II, III, IV; COHORT II)**

### **4.2.1 BACKGROUND AND DEMOGRAPHICS (PAPER II)**

Concerning the 175 female offenders of lethal and severe violence (also called female offenders; representing a 15-year inclusion period, 2000-2014), most were not employed or in education at the time of the offence (71.5 %), and

over half lacked stable integration into the job market (53.1 %). A significant portion had reported childhood abuse (56.5 %) and parental substance abuse (48.1 %). In adulthood, 68.5 % had experienced intimate partner violence, often alongside substance abuse by cohabitants (52.1 %). No significant demographic or background distinctions were found between the 84 females (48 %) assessed as having an SMD (the SMD group) and the 91 females (52 %) assessed as having no SMD (the no-SMD group).

#### **4.2.2 MENTAL HEALTH (PAPER II)**

Among the female offenders, the majority had prior psychiatric diagnoses (71.1 %), obtained psychiatric care (81.7 %), and/or had attempted suicide (60.6 %). At the time of the FPI, a significantly higher proportion of the SMD group had psychiatric diagnoses compared to the no-SMD group (100 % vs. 82.4 %; OR = 2.12). Additionally, when differentiating the specific diagnoses assessed within the FPI, the SMD group had markedly higher rates of psychotic disorders (47.6 % vs. 1.1 %; OR = 81.82). In contrast, personality and anxiety disorders were less prevalent among the SMD group.

#### **4.2.3 SUBSTANCE USE/ABUSE (PAPER II)**

The majority of the female offenders had a history (65.3%) and/or current (57.5 %) substance use, with 40.6 % diagnosed with a substance use disorder at the time of the FPI. Compared to the no-SMD group, the SMD group showed significantly lower rates of current substance use (44.2 % vs. 68.9 %), past diagnoses (16.7 % vs. 33.0 %), and prior treatment (23.2 % vs. 39.3 %). The SMD group also received a substance use diagnosis less often during the FPI (27.4 % vs. 52.7 %). No significant group differences were observed in terms of age of onset or severity of substance-related consequences.

#### **4.2.4 CRIME CHARACTERISTICS (PAPER II)**

Most of the female offenders had no prior criminal history (59.5 %), committed the crime in a home setting (80.3 %), and nearly half of them were under the influence of substances at the crime (49.0%), while a minority attempted homicide-suicide (10.6 %). Victims were typically adults (80.7 %), male (71.3 %), with 37.7 % being intimate partners at the time or former intimate partners to the offender. Substance use at the time of the crime by the victims was present in 44.3 %, and similar proportions had previously abused the offender (44.3 %), with 32.6 % doing so during the incident. This abuse history by the victim towards the offender was in line with the frequency of offenders having a history of abusing the victim (39.5 %).

Concerning variations, individuals with an SMD less often had a prior criminal record (26.8 % vs. 52.7 %) and were less frequently charged with lethal violence (28.6 % vs. 47.3 %) than those without an SMD. The SMD group was also less likely to have used substances during the crime (33.4 % vs. 63.0 %). Victim-offender relationships in the SMD group were more varied, with fewer intimate partners (23.8 % vs. 50.5 %) and more children (21.4 % vs. 9.4 %), acquaintances (20.2 % vs. 15.4 %), and strangers (13.1 % vs. 4.4 %), and more females (40.5 % vs. 14.4 %) as victims. Additionally, victims under the influence of substances were less common in the SMD group (23.6 % vs. 63.5 %), as was the occurrence of abuse by the victim against the offender (previously, 25.4 % vs. 61.6%; at the time of the crime, 15.7 % vs. 51.6 %). Conversely, the SMD group showed a higher frequency of attempted homicide-suicide (17.4 % vs. 4.1 %).

#### **4.2.5 PSYCHOPATHY (PAPER III)**

Generally, the female offenders exhibited low PCL-R *total* scores ( $M = 11.01$ ,  $SD = 6.27$ ), and the SMD group scored significantly lower than the no-SMD group on *total* PCL-R ( $M = 9.94$  vs.  $11.99$ ; Cohen's  $D = 0.33$ ) and *facet 1* ( $M = 0.69$  vs.  $1.19$ ; Cohen's  $D = 0.42$ ), with all significant variations reflecting small effect sizes.

#### **4.2.6 INSTRUMENTAL VERSUS REACTIVE ASPECTS OF THE VIOLENT CRIME (PAPER III)**

According to the VICS results, the female offenders predominantly exhibited *reactive* (95.1 %) rather than *instrumental aggression* (4.9 %) at the time of the offence. Most cases had no prior *planning* (67.6 %) and no *goal-directedness* (87.9 %), with a majority experiencing *provocation* (81.1 %) and elevated *arousal* (76.2 %).

Comparing subgroups, the female offenders with an SMD showed higher rates of some *planning* (i.e., less than 24 h; 32.5 % vs. 13.8 %; Cramer's  $V = 0.242$ , medium effect) and very high *arousal* (60.0 % vs. 42.9 %; Cramer's  $V = 0.269$ , medium effect), but showed less exceptionally strong *provocation*, and higher rates of no apparent *provocation* (6.0 % vs. 26.7 %; resp. 28.9 % vs. 9.3 %; Cramer's  $V = 0.365$ , large effect).

#### 4.2.7 ASSOCIATIONS BETWEEN PSYCHOPATHY AND INSTRUMENTAL VERSUS REACTIVE VIOLENCE AND THEIR COVARIATION WITH SMD (PAPER III)

Pearson correlation analyses revealed that, in the SMD group, PCL-R *facets 1* and *2* were correlated with increased VICS *planning* and *goal-directedness* and inversely related to *provocation* and *arousal*. Another pattern was seen in the no-SMD group, where these PCL-R facets were positively associated with VICS *instrumental aggression*, and *facet 2* was also positively associated with *planning*. The associations were generally modest (i.e., medium to small).

Univariable logistic regression identified PCL-R *facet 1*, and VICS *planning*, and *provocation*, as covariates associated with SMD status. Specifically, higher *planning* increased the odds of SMD (OR = 1.703), while lower *provocation* and *facet 1* scores were also predictive (OR = 0.666; 0.696). In the multivariable model, higher levels of VICS *planning* and *arousal*, while lower levels of *provocation*, *goal-directedness*, and PCL-R *facet 1*, constituted significant covariates to SMD status.

#### 4.2.8 ASSOCIATIONS BETWEEN LETHAL VIOLENCE AND MEASURES OF RISK FOR VIOLENCE AND OF AGGRESSION IN A LIFE HISTORY PERSPECTIVE (PAPER IV)

Spearman correlation analyses revealed several significant negative associations between risk for violence and aggression assessment scores (HCR-20 *historical*, *clinical*; LSI-R *total*, *finances/financial*, *leisure/recreation*, *emotional/personal*; LHA *total*, *aggression*, *self-directed aggression*) and lethal violence among offenders. Notably, the LSI-R *emotional/personal* subscale had a medium negative correlation ( $r = -0.390$ ), while other significant correlations were small.

Univariable logistic regression indicated that higher scores on specific subscales, that is, HCR-20 *historical* and *clinical*, LSI-R *financial*, *leisure/recreation*, and *emotional/personal*, as well as LHA *aggression* and *self-directed aggression*, were significantly associated with reduced odds of lethal violence (OR < 1). In the multivariable regression analysis, only the LSI-R *leisure/recreation* and *emotional/personal* subscales remained significant,

both of which were associated with lower odds of lethal violence, as observed in the univariable analysis. Conversely, new significant covariates emerged, including HCR-20 *risk management* and LSI-R *accommodation*, both of which were linked to increased odds of a lethal outcome (OR > 1).

#### **4.2.9 THE SMD VERSUS NO-SMD GROUP: MEASURES OF RISK FOR VIOLENCE AND OF AGGRESSION IN A LIFE HISTORY PERSPECTIVE (PAPER IV)**

Overall, mean scores indicated elevated risk levels for violence and for aggression for the total Cohort II. The SMD group showed significantly higher *total* scores on HCR-20 and its *clinical* subscale, as well as on the LSI-R *emotional/personal* subscale, with medium to large effect sizes. Conversely, the SMD group scored lower on LSI-R subscales *criminal history*, *alcohol/drug problem*, *attitudes/orientation*, and the LHA *antisocial* subscale (here small effect sizes).

## 5 SUMMARY OF MAIN FINDINGS

1. Homicide rates declined over the study period, with the proportion of female offenders remaining stable. Gender differences were more prominent between offenders with adult victims, where female offenders more often targeted intimate partners, used sharp force, had victims who were under the influence of a substance, and had prior experiences of violence with the victim. The proportion of female homicide offenders (compared to male) was higher in cases involving child victims than in cases involving adult victims. (Paper I; Cohort I)
2. The female offenders of lethal and severe violence exhibited high rates of unemployment, prior adverse experiences/abuse, and mental health issues. The SMD group more often had psychotic disorders, attempted homicide-suicide, and children, acquaintances, and females as victims, compared to the no-SMD group. The SMD group less often had substance use disorders, prior criminal records, and lethal violence as index crimes. (Paper II; Cohort II)
3. The findings demonstrated low levels of psychopathy and a high level of violence driven by reactive motives among the female offenders of lethal and severe violence. Psychopathy showed a modest link to instrumental aspects of the offences. The SMD group showed lower PCL-R *total* and *facet 1 interpersonal* scores, slightly higher levels of VICS *arousal* and short-term *planning*, and lower levels of *provocation*. (Paper III; Cohort II)
4. Findings based on scores on the HCR-20 (*historical, clinical*), LSI-R (*total, finances, leisure/recreation, emotional/personal*), and LHA (*overall, aggression, self-directed aggression*) suggest that female offenders charged with lethal offences, with some exceptions in the multivariable analysis (*risk management*, in HCR-20, and *accommodation*, in LSI-R), exhibited fewer risk factors than female offenders involved in non-lethal violence. (Paper IV; Cohort II)

## 6 DISCUSSION

### 6.1 COMMENTS ON MAIN FINDINGS

#### 6.1.1 AIM I (PAPER I; COHORT I)

The incidence rates of female- and male-perpetrated homicides declined from 1990 to 2010, with the proportion of female offenders remaining stable. This finding of an overall decline in homicides in Sweden during the inclusion period could be seen as an indicator of success in homicide prevention during this period. Such a declining trend aligns with some research concerning comparable time periods (Kristoffersen et al., 2014; McCall et al., 2008), but stands in contrast to other studies (Murray et al., 2013; Stickley et al., 2009). This shows that the trends are not universal but presumably influenced by societal prerequisites and interventions. Furthermore, even if the current declining trend of female homicide offenders in Sweden aligns with research in other countries (Cooper & Smith, 2011; Thomsen et al., 2019), it contrasts with a small increase in female-perpetrated homicides during at least part of the same period in Finland (Putkonen et al., 2008). This suggests that homicide trends can vary significantly between countries that are otherwise quite similar. Thereto, the trends from the Finnish study indicate that the female offenders in the later period resembled male offenders more, with greater influence from alcohol abuse, less diminished responsibility (similar to no-SMD), and fewer victims related to familiar contacts, pointing towards a shift concerning the female offenders in Finland, at that time. However, it is essential to consider the various methodologies employed when examining time trends. In Paper I, IRRs were used to estimate changes in homicide incidence over time, including the rate of homicides per 100,000 inhabitants. In contrast, the study by Putkonen et al. (2008) conducted group comparisons to estimate the absolute number of female homicide offenders, which did not account for changes in population size over time. Thus, there could be genuine contrasting time trends in the two countries, but the variation could also be due to differences in the methodologies used in the studies. Despite the somewhat opposing trends, the proportion of female homicide offenders during later years seems to remain relatively stable, both globally (UNODC, 2023) and nationally within Sweden (Brå, 2024). Thus, the increased number of male-perpetrated homicides observed in Sweden, after the study period used in this thesis, has no equivalent when it comes to female-perpetrated homicides according to national reports (Brå, 2024). One possible explanation could be that this increase refers to

firearm homicides committed by male offenders within criminal environments, rather than homicides within close relationships, such as intimate partner or child homicides, conditions traditionally more common for female offenders. Such discrepancies between different settings and victim-offender relationships are also discussed in national reports, where the three most comprehensive and recurring scenarios of homicide in Sweden have been categorised (Brå, 2024). These categories refer to homicide in (1) criminal environments, (2) family contexts, or (3) spontaneous quarrels and disputes with acquaintances, friends, or strangers, often involving substance use. Very few female homicide offenders have committed their crimes within criminal settings, even if other antisocial activity (e.g., preparations for violent crimes, or drug- and weapon-related crimes) could be the case in criminal contexts for involved females, who are still relatively few. Similarly, there is a low prevalence of female homicide offenders in the category of lethal violence within spontaneous quarrels and disputes, even if the pattern of changed offence characteristics among female offenders in the study by Putkonen et al. (2008) appears similar to such a context. Thus, no general trend of increasing female homicide offenders has been confirmed, and hasty conclusions should not be drawn from individual cases where females, for example, have been active in violent offences (incl. homicide) in gang-related conflicts, nor regarding time trends based on the number of homicides without considering the potential change in population numbers. Consequently, the relationship between victim and offender, as well as the homicide context, appears to be significant factors when analysing and comprehending the incidence rates. This suggests that in subsequent years, the rise in cases has transpired outside close relationships and in locations other than the domestic setting, particularly in environments where females are less frequently involved, at least in instances of lethal violence. Therefore, this indicates that society's interventions seem to have a greater effect on reducing violence in close relationships and domestic settings compared to other contexts, such as criminal environments or more less close interactions involving spontaneous quarrels and substance use. This results in a decline or at least no significant increase in the number of female offenders.

Furthermore, the findings regarding female and male homicide offenders demonstrate gender differences, consistent with previous studies, indicating that female homicide offenders are less likely to have a prior criminal record (Carabellese, Felthous, Mandarelli, et al., 2020; Flynn et al., 2011; Yourstone, Lindholm, & Kristiansson, 2008). Similarly, the female homicide offenders are more likely to have an SMD status, indicating being more severely influenced

by mental health issues (here: beyond differences between the groups regarding diagnosed psychotic disorders) (Brå, 2024; Flynn et al., 2011; Putkonen et al., 2011). They are also more often legally classified differently (Steffensmeier & Demuth, 2006), with females more frequently sentenced for voluntary manslaughter or infanticide, whereas males are more often sentenced for murder or involuntary manslaughter by assault. Even if potential gender biases (Yourstone et al., 2009; Yourstone, Lindholm, Grann, et al., 2008) must always be considered, both the current and previous research indicate that these differences most likely reflect actual variations in female versus male homicide patterns, important to recognise in mental health, forensic, and legal contexts. For example, in the context of homicide prevention (i.e. before crimes are committed), a criminal record appears less relevant, while mental health issues seem more relevant for females compared to males. Additionally, the legal outcomes reveal differences that are relevant to consider, such as females being less likely to commit homicide with deliberate, premeditated intent to kill (i.e., murder). Instead, they more often act without premeditation, even if the lethal violence is intentional at the crime scene, often involving circumstances that should be taken into account (e.g., violence/threats from the victim towards the offender, emotional distress; i.e., voluntary manslaughter) Therefore, based on the current findings, and as suggested by other studies (e.g., Ferranti et al., 2013), gender-responsive factors appear relevant to more accurately identify potential female violent offenders and to plan subsequent treatment and risk management within forensic mental health and correctional services.

Regarding female and male homicide offenders with adult versus child victims, a notable observation was that the females accounted for less than eight % of the offenders targeting adult victims, but about 33 % of those who victimised children, figures consistent with other research (Flynn et al., 2011). Furthermore, the gender comparisons between homicide offenders with adult versus child victims revealed more pronounced differences in the former case. For example, the findings showed that, in line with prior studies, female homicide offenders with adult victims more often targeted male intimate partners in a home setting (Allen et al., 2020; Avdija et al., 2021; Carabellese, Felthous, Mandarelli, et al., 2020; Yourstone, Lindholm, & Kristiansson, 2008), victims under the influence of substances, used sharp force violence (Flynn et al., 2011), and had previous experience of violence with the victim (Caman et al., 2016; Yourstone, Lindholm, & Kristiansson, 2008). To understand the more significant differences between female and male homicide offenders with adult victims, contrasted to those with child victims, it is important to consider the victim-offender relationship and the context of the

crimes, as discussed previously regarding time trends. When examining homicides involving child victims, most are committed within close relationships in a domestic setting, regardless of the offender's gender. This contrasts with homicides involving adult victims, where the context varies considerably: female offenders mainly commit these crimes within close relationships, often at home, whereas male offenders are more likely to act violently in other settings, often involving less close relationships. This variation in relations and settings seems to be related to the characteristics of the violence and the degree to which female and male offenders differ.

Additionally, given the more notable differences between female and male homicide offenders with adult versus child victims, the different power dynamics within these victim-offender relationships should also be considered. An adult offender with an adult victim, versus an adult offender with a child victim, involves different power structures with implications for the violence. Thus, in cases with child victims, the female and male offenders were more equal in relation to the victim, compared to cases with adult victims, for example, concerning the victim's gender, method of violence, and number of victims. In cases involving child victims, the gender distribution was more balanced between girls and boys, in line with other research (Tsellou et al., 2023), compared to cases involving adult victims, where males are overrepresented (Avdija et al., 2021; Brå, 2024; UNODC, 2023). This indicates that the victim's gender is less important, or relevant in a different manner, in cases involving children. Further, concerning different methods of violence, asphyxia is more common in cases of child victims, similar to other research findings (Tsellou et al., 2023), versus more sharp violence in the case of adult victims (Brå, 2024). In the same way, the number of victims differs, with more often multiple victims in cases of child victims, in accordance with some other research (Somander & Rammer, 1991) compared to adult victims. Thereto, offenders committing homicide-suicide were more common, and those influenced by substances were less common, in cases of child victims compared to adult victims. This is in line with prior research (Hedlund et al., 2016; Tsellou et al., 2023) and indicates different intervention needs for offenders with adult victims, in need of, for example, substance use treatment, and offenders with child victims who appear more in need of other mental health interventions.

### **6.1.2 AIM II (PAPER II; COHORT II)**

In line with other research, the female offenders of lethal and severe violence generally exhibited high rates of unemployment (Caman et al., 2016; Putkonen et al., 2011; Yourstone, Lindholm, & Kristiansson, 2008), prior victimisation/abuse within close relationships (Evans et al., 2013; Pflugradt et al., 2018; Putkonen et al., 2011; Raymond et al., 2021) and previous mental health issues (Flynn et al., 2011; Kazemian et al., 2023; Putkonen et al., 2011). Prior mental health issues were especially common in the forensic psychiatric population, who exhibited more severe mental disorders. Also aligning with previous studies, persons with SMD more frequently had psychiatric diagnoses, especially psychotic disorders (Raymond et al., 2021; Valença et al., 2021), attempted homicide-suicide, and a broader range of victim-offender relationships (incl. children, acquaintances, and females) compared to the no-SMD group. Conversely, the SMD group less often had anxiety, personality, and substance use disorders, a criminal history, lethal violence as their index crime, and intoxicated intimate male partners as victims. Some of these findings are in accordance with prior studies, for example, concerning the high prevalence of personality disorders among females within prison samples (similar to no-SMD in the present cohort) (Fox et al., 2018; Pflugradt et al., 2018). However, it contradicts other research, such as the quite high frequency of substance abuse observed among females within forensic mental health services (de Vogel et al., 2021; Evans et al., 2013). Such contradictory findings could, of course, be due to genuine variation. However, different legal frameworks might also influence this, as they affect the inclusion versus exclusion criteria for what characterises persons who receive treatment within forensic mental health, compared to those within the prison and probation services. For example, including or excluding individuals whose only diagnoses concern substance use and/or personality disorder within the country's forensic psychiatric care population will have an impact in this regard (inclusion of patients with only these diagnoses is very uncommon in a Swedish context).

Overall, female offenders involved in lethal and severe violence form a vulnerable group, highlighting opportunities for intervention within health care, including mental health, child and maternal care, and social services, as well as the police. Regarding interactions within various institutions in our society, we should be aware of these vulnerabilities and be prepared to ask about and address these factors when working with females. For example, when encountering a pregnant woman with mental health issues such as severe

depression and suicidal ideation, clinicians should explore the need for additional support from the health care unit, and from her social network, and also ask whether she has thoughts of violent/drastring solutions to her perceived problems. Similarly, when in contact with a woman living in a violent and/or oppressive relationship, including violence and possibly substance use, clinicians should inquire and offer assistance regarding both the violence she faces and explore constructive options to manage the stressful situation without resorting to violence against herself or others.

### **6.1.3 AIM III (PAPER III; COHORT II)**

In accordance with previous research, the female offenders of lethal and severe violence generally exhibited low levels of psychopathy (Carabellese, Felthous, Tegola, et al., 2020; Klein Tunte et al., 2014; Pinheiro et al., 2020), and primarily acted out of reactive, rather than instrumental, motives (Lehmann & Ittel, 2012; Mosechkin, 2023; Sea et al., 2020; Vatnar et al., 2018). Furthermore, psychopathy showed a modest link to instrumental aspects of the offences, also consistent with prior studies (Cornell et al., 1996; Lehmann & Ittel, 2012). The SMD group showed lower PCL-R *total* and *facet 1 (interpersonal)* scores, and on VICS, slightly higher levels of *arousal* and short-term *planning* (<24 h before their crime), and lower *provocation* levels. Thus, there were marginally higher levels of psychopathy within the no-SMD group, aligning with prior research (Carabellese et al., 2019). Nevertheless, these levels were generally quite low, suggesting that psychopathic traits do not drive female lethal and severe violence in Sweden, nor should they be the focus for potential interventions aimed at prevention or reducing recidivism, regardless of SMD or not. Additionally, the findings did not support a clear distinction between the SMD and no-SMD groups in terms of instrumental versus reactive features. However, the arousal, especially in the SMD group, combined with provocation, low goal-directedness, and generally minimal planning, depicts a violent scenario marked by threat and intense emotions. This violence mostly occurred in the moment, with no goals other than the violence itself, such as self-defence or revenge. Clarifying this, the SMD group exhibited a higher level of short-term planning and arousal, indicating a potential opportunity for prevention when working closely with women experiencing mental health issues, particularly by assessing high arousal levels like anger and fear, as well as possible rumination concerning violent solutions to their problems. Aligning with these results and prior studies, aiming to reduce female lethal and severe violence, the focus should be on creating safer home environments and close relationships without threats and provocation.

To summarise, the findings demonstrate the complexity behind the violence and within the offenders, as well as the value of using both primary and secondary subscales to understand and effectively benefit from the assessment of instrumental and reactive features of violence perpetrated by females.

#### **6.1.4 AIM IV (PAPER IV; COHORT II)**

Findings regarding the relationships between measures of risk for violence and of aggression in a life history perspective among female offenders of lethal and severe violence revealed that higher scores on the HCR-20 (*historical, clinical*), LSI-R (*total, finances, leisure/recreation, emotional/personal*), and LHA (*total, aggression, self-directed aggression*) were inversely linked to involvement in, and associated with lower odds of, lethal index crimes. Thus, more assessed historical risk factors and, at the time of the assessment, current mental health issues, financial and recreational problems, as well as increased aggression in a life history perspective, both directed outwards and self-directed, appeared to correspond with less frequent lethal charges. However, in the multivariable analysis, the HCR-20 *risk management* and LSI-R *accommodation* also emerged as covariates with higher odds of lethal violence. Thus, conversely, issues related to housing conditions, as well as a need for current and future support in the personal and professional sphere, and stress vulnerability areas, were linked with lethal index crimes. Overall, these results suggest that individuals charged with lethal offences, mainly, but with some exceptions, displayed fewer risk factors than those involved in non-lethal violence. Although such findings align with some results in other research (Suonpää et al., 2023), it may seem counterintuitive that those engaging in the most severe form of violence, lethal violence, exhibit fewer risk factors than those committing non-lethal acts. Nonetheless, forensic agencies should consider these insights to improve prevention and risk management.

Furthermore, the SMD group scored somewhat higher overall and on clinical factors on the HCR-20. In contrast, the no-SMD group achieved higher scores on the LSI-R and LHA, particularly regarding criminal and antisocial features such as criminal history, procriminal attitudes, antisocial aggression, and substance use, except for the LSI-R subscale addressing psychological problems. This distinction, where factors among the SMD group become more noticeable in the HCR-20 and in the no-SMD group in the LSI-R, is relevant to the application of instruments based on RNR in forensic psychiatric care (Bonta et al., 2014; Bonta & Lee, 2025; Fazel et al., 2024). It could be that different risk assessment instruments are more suitable for different female

offender groups, even if the subscales related to mental health issues are particularly prominent for the SMD group in both HCR-20 and LSI-R. However, it may also be the case that these measures complement each other, providing a more nuanced view of how risk management efforts should be directed and contributing to the dialogue with the individual, in this case, the female offender of lethal and severe violence. Recognising the value of diverse perspectives, incorporating gender-responsive assessment measures would enhance this inclusive approach by integrating research and knowledge about common factors (both gender-neutral and gender-responsive), while also personalising assessments and interventions in collaboration with the women involved. Additionally, as mentioned in prior research (Fazel et al., 2024; Fazel et al., 2012; Nilsson et al., 2011), there are challenges concerning risk assessment and their predictive validity in general, thus enhancing the importance of continued research with high methodological quality in this area.

## 7 STRENGTHS AND LIMITATIONS

The current thesis comprises two separate cohorts: Cohort I (Paper I), including all homicide cases in Sweden involving both female and male offenders, comparing those with adult versus child victims; and Cohort II (Papers II, III, IV), focusing on female offenders charged with lethal or attempted lethal violence, comparing those with and without an SMD. These two cohorts, investigated in different ways across the various papers, demonstrate findings that are not without some limitations but that also show some strengths. The first cohort is relatively larger, but only includes a quite small number of female offenders, especially considering those with child victims. A similar number of females is included in the second cohort. Thus, in both cases, this could be viewed as affecting the statistical power to detect significant differences between male and female offenders (Cohort I) and between females with and without an SMD (Cohort II). This is especially relevant given that in some of the papers, quite small effect sizes are observed. At the same time, the number of females included is arguably high compared to in many other studies concerning female offenders - other studies often include markedly fewer female offenders than in the current cohorts (Desta & Venema, 2021; Raymond et al., 2021). Another limitation, potentially affecting both cohorts, is the presence of unsolved or potentially hidden/unreported crimes. However, unsolved crimes are most often committed in criminal environments (Brå, 2024), contexts where females seem to commit lethal crimes to a lesser extent. Thus, it can be assumed that such drop-out would influence the number of male, rather than female, lethal violent offenders. This may result in a slight overestimation of the proportion of female offenders compared to their male counterparts in Paper I. Furthermore, regarding Cohort II, some additional limitations should be acknowledged. First, the inclusion criteria were based on indictments for lethal or attempted lethal offences, not the final court verdicts, resulting in the inclusion of a broader array of criminal acts. Second, some individuals who committed similar offences were not represented in the study. This was due to various factors, including the absence of a court-mandated FPI, as no mental health concerns were apparent, or – for obvious reasons – cases of homicide-suicide.

Concerning generalisability, Paper I employed a population-based cohort design, with the observed gender-related differences likely reflecting actual patterns. Similarly, Papers II, III, and IV encompass a total cohort of all females in Sweden charged with lethal or attempted lethal violence who had

been assessed within an FPI. Thus, this cohort represents the absolute majority of Swedish females in this regard, including genuine differences observed between those with and without an SMD. Together, this enhances the internal validity and generalizability of the findings within similar legal and sociocultural contexts. Thus, even though generalisation of the present findings internationally should be done with caution since legal frameworks regarding lethal violence vary across jurisdictions as do the criteria for diversion to forensic mental health versus prison services, the findings are likely relevant internationally since similar legal standards to Sweden's concept of SMD (e.g., the not guilty by reason of insanity) exist in numerous legal systems (Bennet et al., 2022; Pouls et al., 2022).

To conclude, there is a notable gap in research on female offenders of lethal and severe violence. In this regard, this thesis, based on an extensive body of material covering a wide range of offender information collected from various professional disciplines, constitutes a meaningful contribution to the field. The combined perspectives from each cohort and paper can be considered as a strength since they complement each other, offering a more multifaceted image of female lethal and severe violent offenders. The integration of a broader view on female homicide offenders, including gender comparisons, with a more focused analysis of females involved in lethal and severe violence, alongside a detailed analysis of those with and without SMD, provides additional value and robustness compared to examining the different parts separately.

## 8 CONCLUSION

Lethal and severe violence by female offenders often occurs within close relationships, especially in the home, a place where we should feel safe and secure, among people who should be treating us well. This family context has been described as one out of three homicide settings in Sweden (Brå, 2024), where females are more represented and differ from criminal and other settings where male offenders are more prevalent. The female offender frequently has mental health issues, which are extensive when she is assessed as having an SMD, while levels of psychopathy tend to be quite low. The violence is often characterised by reactive rather than instrumental aggression, though there are variations in this distinction's sub-aspects. As a result, common features among female offenders sometimes evoke potential preconceptions. However, it is essential to recognise that gender does matter, as de Vogel and Nicholls (2016) argue, and that female offenders involved in lethal and severe violence, based on both current and past research, do exhibit mental health issues, including suicidal tendencies, and have a history of adverse experiences, which cannot be neglected. Instead, we should focus on addressing the mental health needs of these women to achieve effective risk reduction and support the individuals to enhance a better life situation and mental health. It is essential to adopt a comprehensive approach to support adverse aspects of female offenders' lives, providing care that meets their social and personal needs across various life areas. Here, the work on guidelines for gender-responsive assessment and treatment, as well as trauma-focused approaches, is relevant (de Vogel, Depla, et al., 2025; de Vogel, Keulen de Vos, et al., 2025), and one-sided, isolated interventions are not ideal. Such an inclusive approach should consider how to meet the complex needs of individuals with multiple issues, whether related to social, trauma, or addiction problems, and tailor interventions accordingly to the specific needs of each individual. Nevertheless, some female offenders do not commit crimes in the "typical" manner, with a "typical" background or motivations usually associated with this group. This requires us all to be mindful of both the frequent patterns and individual pathways to offending, holding two or more thoughts in our minds simultaneously. In some cases, female offenders have no adverse experiences, navigate educational and labour systems without noticeable barriers, display higher levels of psychopathic traits, acting violently outside the home against unfamiliar victims or victims of the same gender, driven by more instrumental aggression and motives. Considering both the more "typical" and the "atypical" female offenders highlights the complexity behind female lethal and severe violence. Therefore,

it is crucial for us, in our efforts to understand and improve prevention and risk management for female offenders, to pay attention to both shared features and unique pathways to crime.

Even if the findings of this thesis largely align with previous research, such confirmation of prior findings constitutes a piece of the puzzle that remains important because knowledge about female offenders of lethal and severe violence is limited, often based on small samples, and focused on specific subgroups. Overall, the findings reveal genuine differences characterising female versus male homicide offenders, and a complex and diverse pattern that cannot be simplified into a clear distinction between female offenders with SMD and no-SMD. There are, therefore, many factors within this intricate pattern that indicate a wide range of intervention needs for the female offenders. In this sense, there is reason to, as previously mentioned, advocate for using both gender-neutral and gender-responsive assessments and treatment interventions, thereby not narrowing our perspectives but rather broadening and including diverse viewpoints. Furthermore, when considering covariates for lethal violence (contrasted to attempted lethal violence), it is not the classification within the SMD versus no-SMD group that appears decisive, even though the former group shows a comparatively lower level of lethal violence in the current cohort. Instead, clinical factors and mental health impacts in both groups (e.g., psychosis, depression, but also personality disorder and substance use) are negatively associated with lethal violence. To conclude, evaluating the contribution of this thesis to the field, it is first and foremost a contribution to knowledge based on data that has not previously been assessed or studied in this group of female offenders, who are generally understudied. Thus, this collection of relevant information and heightened knowledge constitutes a significant contribution to the field of research. This research focus on female offenders of lethal and severe violence will constitute a piece of the puzzle regarding both the broader picture (i.e., background/demographic, mental health and crime characteristics) and within specific areas (e.g., psychopathy, instrumental versus reactive violence, and measures for risk of violence and of aggression in a life history perspective). Furthermore, research on time trends is quite rare, especially in the field of female homicide offenders, and the current comparison between female and male offenders, and those with adult versus child victims, has also contributed to new perspectives and a better understanding in the field.

## 9 FUTURE PERSPECTIVES

Gazing towards the future, based on current and previous research, it would be beneficial to supplement the existing method of identifying common features through quantitative statistics with a more qualitative focus on the women involved in these types of crimes, engaging with them directly through various qualitative approaches. However, more large-scale quantitative studies on common features of female offenders remain important, and due to often small sample sizes, national and international collaborations are desirable. These collaborations should encompass female offenders of lethal and severe violence more broadly, as well as different subgroups. Additionally, the study of time trends should be further examined, ideally taking population changes into account to gain a more comprehensive understanding of the topic. Furthermore, follow-up studies based on various structured instruments are also desirable, considering both the initial measures and outcomes, as well as the impact of interventions offered to, and if possible, in collaboration with the women concerned. Such collaborations could benefit everyone. If the research and clinical communities intensify their efforts, the women involved, along with patients, users and family carers, will profit. Most importantly, the victims of these crimes will be recognised and given proper consideration within society. To summarise, we need to broaden our perspectives and, at the same time, consider the specific pathways to crime for these women, thereby acknowledging the complexity.

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# APPENDIX

## Supplementary material

### Paper II

*Table, supplementary material. Interrater Correlation Coefficient (ICC)<sup>1</sup> regarding variables concerning women, with and without a severe mental disorder<sup>#</sup> (SMD), who were charged with lethal or attempted lethal violence and examined according to a court ordered forensic psychiatric investigation in Sweden, carried out between 2000-2014.*

Variables <sup>2</sup>	ICC value <sup>1</sup>	95% Confidence Interval
<b>Excellent = 1.000</b>		
SMD at the time of the crime	1.000	1.000-1.000
SMD at the time of the FPI	1.000	1.000-1.000
Previous child- and adolescent institutional care	1.000	1.000-1.000
Previous substance use/abuse treatment services	1.000	1.000-1.000
Firearms (methods of violence)	1.000	1.000-1.000
Blunt violence (methods of violence)	1.000	1.000-1.000
Poison (methods of violence)	1.000	1.000-1.000
Strangulation (methods of violence)	1.000	1.000-1.000
Strangulation (by means of aids; methods of violence)	1.000	1.000-1.000
<b>Excellent &gt; 0.900</b>		
Psychiatric diagnoses, at FPI	0.998	0.997-0.999
Offender, age in years	0.994	0.998-0.997
Sharp violence (methods of violence)	0.970	0.941-0.985
Age at debut/onset of substance use/abuse	0.959	0.872-0.987
Mentally abused (offender <18 y)	0.955	0.903-0.979
Sexually abused (offender <18 y)	0.944	0.869-0.975
Substance abuse by guardians (offender <18 y)	0.936	0.871-0.968
Previous substance use/abuse	0.935	0.864-0.969
Substance use/abuse among cohabitants (offender >18 y)	0.928	0.850-0.966
Previous suicide attempt	0.918	0.819-0.963
Use other psychoactive substances than alcohol (present)	0.917	0.832-0.959
Not passed elementary school	0.916	0.819-0.961
Previous psychiatric care	0.914	0.828-0.957
Methods of violence	0.913	0.827-0.956
Previous psychiatric diagnoses	0.911	0.817-0.957
Offender previously physically abused the victim	0.911	0.790-0.963

Severe negative consequences of substance, problematic use/abuse	0.911	0.512-0.983
Abused, other than intimate-partner violence (offender >18 y)	0.909	0.803-0.968
<b>Good = 0.750-0.900</b>		
Fire (methods of violence)	0.883	0.766-0.941
Sexually abused (offender > 18 y)	0.880	0.719-0.949
Offender previously mentally abused the victim	0.874	0.648-0.956
Use alcohol (present)	0.872	0.737-0.938
Abused, intimate-partner violence (offender > 18 y)	0.859	0.694-0.935
Violence/aggression within family (offender < 18 y)	0.858	0.697-0.934
Offense classification/charged with (lethal vs. attempt to lethal)	0.841	0.680-0.920
Used other psychoactive substances than alcohol (previous)	0.817	0.637-0.908
Substance abuse among relatives and cohabitants (offender > 18 y)	0.802	0.572-0.908
Abused (offender < 18 y)	0.775	0.488-0.899
Asphyxia (by means of aids; methods of violence)	0.766	0.519-0.886
Abused (Offender > 18 y)	0.764	0.497-0.890
<b>Moderate = 0.500-0.750</b>		
Offender previously abused victim	0.715	0.252-0.895
Abused, other than primary family (offender < 18 y)	0.708	0.383-0.863
Other methods of violence (methods of violence)	0.579	0.162-0.792

# The concept of a severe mental disorder is the Swedish legal term for when an offender according to a forensic psychiatric investigation is judged to fulfill criteria for compulsory forensic psychiatric care instead of a prison sanction.

<sup>1</sup> For interrater reliability analyses intraclass correlation coefficient (ICC value: average measures) was used, with two-way mixed effects model, single rater type, and absolute agreement as definition.

<sup>2</sup> Eight analyzed variables were not included in the table since the obtained value was either “Zero variance” (due to only “No” and “Do not know” answers, which in a few cases differed between the two raters), or .000 (for variables with limited information for the raters, and therefore mostly answered “No” and “Do not know”, but in a few cases with “Yes” answers). None of these variables were in themselves used in any analysis concerning presented results, but some of them have been added with other variables into overarching categories for analytic use (e.g., “Offender previously threatened victim with physical violence” within the overarching category “Offender previously abused victim”).

### Paper III

**Table, supplementary material.** *Interrater reliability (Intraclass Correlation Coefficient [ICC]; Percentage exact agreement) concerning variables according to Violent Incident Coding Sheet (VICS), and Psychopathy Checklist-Revised (PCL-R) regarding females with and without a severe mental disorder (SMD), charged with lethal/attempted lethal violence and assessed within a court-ordered forensic psychiatric investigation in Sweden, during 2000-2014.*

PCL-R	ICC value <sup>1</sup> (95% CI)	
Total score, Absolute agreement	0.873 (0.549-0.950)	
Total score, Consistency	0.915 (0.831-0.957)	
VICS	ICC value <sup>2</sup> (95% CI)	Percentage exact agreement
<i>Instrumental vs. Reactive Aggression</i>	0.718 (0.430-0.860)	86%
<i>Planning</i>	0.924 (0.847-0.962)	80%
<i>Goal-Directedness</i>	0.346 (-0.333-0.676)	86%
<i>Provocation</i>	0.912 (0.825-0.956)	77%
<i>Arousal</i>	0.846 (0.599-0.932)	54%

<sup>1</sup> For interrater reliability analyses intraclass correlation coefficient (ICC value: average measures) was used, with two-way mixed effects model, single rater type, and absolute agreement and consistency as definitions. ICC-values: poor reliability < 0.50; moderate reliability = 0.50-0.75; good reliability = 0.75-0.90; and excellent reliability > 0.90.

<sup>2</sup> For interrater reliability analyses intraclass correlation coefficient (ICC value: average measures) was used, with two-way mixed effects model, single rater type, and only absolute agreement as the definition since the variables are of ordinal scale type. ICC-values: poor reliability < 0.50; moderate reliability = 0.50-0.75; good reliability = 0.75-0.90; and excellent reliability > 0.90

## Paper IV

**Table, supplementary material.** Interrater reliability (Intraclass Correlation Coefficient [ICC]) regarding variables according to Life History of Aggression (LHA), Historical-Clinical-Risk-20 (HCR-20 V2), and Level of Service Inventory-Revised (LSI-R) concerning females with and without a severe mental disorder (SMD), charged with lethal or attempted lethal violence and assessed within a court-ordered forensic psychiatric investigation in Sweden, during 2000-2014.

LHA	ICC value <sup>1</sup> (95% CI)
<i>Total score, Absolute agreement</i>	0.907 (0.807-0.954)
<i>Total score, Consistency</i>	0.915 (0.831-0.957)
HCR-20	
<i>Total score, Absolute agreement</i>	0,819 (0.586-0.915)
<i>Total score, Consistency</i>	0.849 (0.697-0.924)
LSI-R	
<i>Total score, Absolute agreement</i>	0.838 (0.533-0.931)
<i>Total score, Consistency</i>	0.881 (0.764-0.940)

<sup>1</sup> For interrater reliability analyses intraclass correlation coefficient (ICC value: average measures) was used, with two-way mixed effects model, single rater type, and absolute agreement and consistency as definition. ICC-values: poor reliability < 0.50; moderate reliability = 0.50-0.75; good reliability = 0.75-0.90; and excellent reliability > 0.90.