



REVIEWS

OCCUPATIONAL VIOLENCE IN PARAMEDICINE: AN INTEGRATIVE REVIEW OF PREVALENCE, PREDICTORS, MEASUREMENT GAPS, AND IMPACTS

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Recommended Citation: Majd, S., Bizjak-Mikic, M., & Tombs, A. (2026). Occupational violence in paramedicine: An integrative review of prevalence, predictors, measurement gaps, and impacts. *International Journal of Paramedicine*. (16). 263-285. <https://doi.org/10.56068/EMIU3748>

Keywords: ambulance, occupational violence, workplace aggression, prevalence, predictors, denominators, reporting, PTSD, burnout, emergency medical services, EMS, paramedicine

Disclosures: None.

Funding: None.

Received: May 12, 2026

Revised: June 19, 2026

Accepted: June 23, 2026

Published: October 22, 2026

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ABSTRACT

Background: Violence toward paramedics is a critical international occupational risk, undermining workforce safety, wellbeing, and system sustainability. Occupational violence (OV) includes verbal and psychological aggression, threats, physical assault, and harassment. The WHO identifies paramedics as a high-risk group, linking OV to physical and psychological harm and compromised care quality. Divergent definitions, variable recall windows, and under-documentation produce wide variation in reported prevalence.

Aim: To synthesize international and Australasian evidence on OV prevalence and typology in paramedicine; clarify how denominator choices and reporting behaviors shape observed rates; identify risk contexts and operational predictors; and examine consequences for clinicians, patients, and health systems.

Methods: A structured integrative review searched PubMed, Scopus, Web of Science, CINAHL, and Google Scholar (2000–2026), plus gray literature from WHO, ILO, Safe Work Australia, and national ambulance reports. Quantitative, qualitative, and mixed-methods studies of paramedics and EMS personnel from North America, Europe, Australasia, and selected Asian and Middle Eastern jurisdictions were included. Approximately 60 sources were narratively synthesized, addressing definitional variation, design heterogeneity, and denominator effects.

Results: Lifetime OV exposure among EMS personnel commonly exceeds 60%; 12-month prevalence ranges from 50% to 75%, depending on definitions and sampling. Administrative datasets under-capture incidents, particularly verbal abuse, intimidation, and identity-targeted aggression, whereas point-of-event reporting in electronic patient care records captures more. Violence is mostly patient-initiated, associated with intoxication, acute behavioral disturbance, mental health crises, urban settings, and weekend or night-time operations. Consequences include injury, post-traumatic stress disorder, burnout, emotional exhaustion, reduced therapeutic engagement, and turnover.

Conclusions: OV in paramedicine is common, patterned, and substantially under-documented. Observed prevalence is sensitive to definitions, recall period, and denominator choice, limiting unadjusted incident counts for benchmarking. Prevention and surveillance require standardized definitions, mission-based denominators, point-of-event reporting within clinical workflow, and paired leading and lagging indicators including reporting completeness.

INTRODUCTION

Occupational violence (OV) toward health workers is a worldwide safety challenge. World Health Organization (WHO) identifies health workers as at high risk of violence worldwide, lists paramedics among higher-risk groups, and links violence exposure to physical and psychological harm, reduced job motivation, and compromised quality and continuity of care (World Health Organization, n.d.). The WHO/International Labour Organization (ILO) / International Council of Nurses (ICN) / Public Services International (PSI) Framework Guidelines similarly frame workplace violence in the health sector as a preventable occupational hazard. Such prevention requires coordinated action by employers, workers, and governments, underpinned by reliable data and prevention policies (International Labour Office et al., 2002).

Paramedics face distinct exposure because they deliver care in mobile, uncontrolled environments such as private homes, public spaces, vehicles, and crowded emergency departments (EDs), where security support, escape routes, and environmental controls are not guaranteed (McQueen et al., 2013; Reay et al., 2018). These settings intersect with frequent presentations involving intoxication, acute behavioral disturbance (ABD), delirium, mental health crises, grief, and pain. Operational pressures, dispatch uncertainty, incomplete information, delayed backup or co-response, and system bottlenecks, such as ambulance ramping and ED access block, further heighten the risk of violence (Bonumwezi et al., 2022; Lindridge et al., 2025).

The prehospital environment is closely intertwined with other pressured components of the emergency care system. Recent Australasian reporting on emergency department (ED) safety highlights how overcrowding, long wait times, and inconsistent access to trained security contribute to increasing levels of aggression (Australasian College for Emergency Medicine, 2025). These conditions heighten risks for paramedics during ED arrival and handover, particularly when delays extend or when teams are required to operate in congested triage or waiting areas. The report also notes that under-reporting of incidents remains a significant barrier to meaningful improvement. In parallel, contemporary violence-prevention standards emphasize strong governance, a positive reporting culture, effective data use, post-incident support and continuous quality improvement, offering a practical implementation benchmark for ambulance services and their partner organizations (NHS England, 2024).

Despite decades of observation and growing empirical work, progress in this field continues to be constrained by substantial measurement heterogeneity. Studies vary in what they classify as “violence,” and survey designs differ widely in their recall periods, ranging from career-lifetime to twelve-month or three-month windows. Administrative datasets further under-capture many incidents, particularly verbal abuse, intimidation, and near-miss events, creating an incomplete picture of risk. Together, these inconsistencies hinder meaningful comparison across services and jurisdictions and can distort evaluation when incident counts are interpreted without consideration of reporting maturity. In this review, we examine the empirical landscape underpinning this problem, including definitional and denominator variation, heterogeneity in prevalence estimates, the persistent measurement gap, and the recurrent risk contexts and operational predictors identified across studies. We also consider the consequences for clinicians and

health-care systems, drawing together paramedicine-focused research alongside relevant high-authority guidance.

METHODS

This study adopted an integrative review design to synthesize the evidence on OV in paramedicine and emergency medical services (EMS), with a particular focus on prevalence, predictors, measurement limitations, and system-level impacts. An integrative approach was selected due to the methodological heterogeneity of the available literature, which includes quantitative, qualitative, mixed-methods, surveillance data, and policy reports. This approach enabled the inclusion and synthesis of diverse evidence types while preserving methodological distinctions between study designs. No primary data collection or expert interviews were conducted. The review relied solely on published peer-reviewed literature and authoritative gray literature sources. No contact was made with study authors for additional datasets.

A structured and transparent search strategy was developed to identify relevant literature across multiple sources. Electronic searches were conducted in PubMed (MEDLINE), Scopus, Web of Science, CINAHL, and Google Scholar. While primary searches were undertaken within these databases, Google Scholar was used to identify supplementary peer-reviewed studies and to capture interdisciplinary and emerging literature not yet fully indexed elsewhere. To ensure comprehensive coverage of operational and policy-relevant evidence, gray literature was also systematically searched, including publications from the WHO, the ILO, Safe Work Australia, and the National Health Service (NHS England), as well as publicly available reports from ambulance services across Australasian, North American, and European jurisdictions. These sources were included to address known limitations in academic reporting and to better reflect real-world operational surveillance systems. A broad search strategy was used due to heterogeneity in definitions and reporting systems in occupational violence research within paramedicine.

The search strategy combined controlled vocabulary and free-text keywords using Boolean operators to maximize sensitivity and capture variation in terminology across jurisdictions. Core terms included “occupational violence,” “workplace violence,” “assault,” “aggression,” and “abuse,” combined with paramedicine and EMS terms such as “paramedic,” “emergency medical services,” “EMS,” “prehospital,” “ambulance,” and “out-of-hospital care.” Additional terms included “threats,” “intimidation,” “verbal abuse,” “sexual harassment,” and “near-miss,” ensuring capture of both physical and non-physical forms of occupational violence. Search strings were adapted for each database to account for differences in indexing systems.

The literature search was conducted between June 7, 2025 and February 20, 2026, with the final search update completed on March 6, 2026. No artificial intelligence tools were used for literature searching, study selection, data extraction, or synthesis, and all processes were conducted manually by the authors.

The review was limited to studies published between 2000 and 2026 to reflect the period during which contemporary EMS systems, reporting infrastructures, and occupational violence frameworks have been developed and implemented. This timeframe ensured relevance to current paramedic practice and organizational reporting systems.

Studies were included if they examined occupational violence or workplace aggression in paramedicine or EMS settings and involved paramedics, emergency medical technicians, or other prehospital care providers. Eligible designs included quantitative, qualitative, mixed-methods, observational, surveillance, and systematic review studies. Only English-language publications were included. Studies were excluded if they focused exclusively on hospital inpatient settings, lacked empirical or synthesized data on occupational violence, or were purely opinion-based without substantive relevance.

Study selection followed a structured screening process. Titles and abstracts were first screened for relevance against inclusion criteria, followed by full-text review of eligible studies. Inclusion decisions were made by consensus among the authors to minimize selection bias. Included studies had already undergone peer review at the time of publication, and no additional peer-review process was applied within this integrative review. Approximately sixty peer-reviewed studies and authoritative sources were included.

Given heterogeneity in study designs and outcomes, data were synthesized using a narrative integrative approach. Findings were organized thematically across prevalence and measurement approaches, predictive and contextual risk factors, reporting and surveillance limitations, and consequences for clinicians, patients, and health systems. This approach enabled integration of diverse evidence while maintaining clarity across methodological differences.

A PRISMA flow diagram was not used due to the integrative design of the review; however, structured screening principles were applied throughout to ensure rigor, transparency, and reproducibility.

RESULTS

DEFINITIONS AND TYPOLOGY

Across the included evidence, OV is consistently described as a spectrum of behaviors ranging from verbal abuse and threats to intimidation, physical assault, and sexual harassment (Table 1).

Domain	Description	Key Sources
Core definition	Verbal abuse, threats, intimidation, physical assault, sexual harassment, sexual assault, and behaviors causing psychological harm toward workers	WHO; ILO/ICN/PSI
Expanded typology	Identity targeted abuse (sexist, racist, homophobic), near miss events, and behavioral precursors	Mausz et al.; Drew et al.
Physical violence	Hitting, kicking, biting, spitting, weapon use	Murray et al.; Shabanikiya et al.
Non physical violence	Verbal abuse, threats, intimidation, harassment	Bigham et al.; Sahebi et al.
Sexual violence	Sexual harassment and assault	Shabanikiya et al.; Sahebi et al.
Near miss events	Situations with credible threat or escalation potential without completed assault	IAFC Near Miss System; Murff et al.
Interactional framing	Violence emerges dynamically through interpersonal interaction shaped by environment and system pressures	Drew et al.; ILO/WHO frameworks
Regulatory framing	Workplace violence treated as a preventable psychosocial hazard requiring systematic control	Safe Work Australia; NHS VPR Standard

Table 1. Definitions and typology of occupational violence in paramedicine and emergency care.

Contemporary paramedicine scholarship further highlights identity targeted aggression, such as sexist, racist, or homophobic abuse, not only because of its disproportionate emotional impact but also because it remains markedly under documented in routine reporting systems. This broader conceptualization aligns with international EMS reviews that define violence as encompassing both physical and psychosocial harm (Murray et al., 2020), as well as with qualitative analyses depicting aggression as intentional acts directed at paramedics during out of hospital care (Drew et al., 2024). Although this framing now appears well established, the issue has been recognized in the profession for decades. Industry commentary on violent patient encounters emerged within a decade of EMS gaining formal recognition, with Lewis and colleagues (1978) documenting aggression toward responders and articulating the early insight that “aggression begets aggression” (Lewis, 1978). By the late 1990s, EMS researchers were already quantifying the problem, with prospective field studies recording violent episodes in approximately 5% of calls (Mock et al., 1998) and subsequent surveillance work demonstrating high rates of verbal aggression alongside persistent limitations in routine documentation systems (Taylor et al., 2023).

Australian work health and safety guidance similarly conceptualizes workplace violence and aggression as behaviors capable of causing physical or psychological harm. This imposes duties on employers to identify hazards, implement controls, and continually reassess risk (Safe Work Australia, 2024). National surveillance and EMS specific studies demonstrate pervasive and often under reported exposure to occupational violence, reinforcing the need for structured, system level prevention rather than individual coping strategies (McGuire et al., 2025; Murray et al., 2020; Paulin et al., 2024; Taylor et al., 2023).

Global frameworks, particularly those developed through the ILO/ICN/WHO/PSI Joint Program, emphasize that workplace violence in the health sector arises from multidimensional and interacting causes. These seminal works depict violence as an interactional process in which escalation often emerges from interpersonal dynamics shaped by communication patterns, relational cues, and environmental pressures, rather than being simply the result of static or intrinsic “patient factors.” In line with this understanding, the frameworks advocate for coordinated policy development, structured and systematic risk assessment, evidence based workplace interventions, and continuous monitoring and evaluation, cautioning against reactive or ad hoc approaches (International Labour Office et al., 2002).

A key implication of this multidimensional framing is that studies employing narrow definitions, such as counting only physical assaults, inevitably underestimate the true burden of OV and distort cross study comparisons. Conversely, using broad definitions without careful attention to denominators can inflate headline prevalence figures in ways that shed limited light on operational risk or actionable system improvements.

DENOMINATORS AND THEIR CONSEQUENCES

A persistent methodological challenge across the OV literature is the substantial variability introduced by denominator selection and recall windows, both of which strongly influence reported prevalence. Career lifetime denominators, for example, consistently yield the highest estimates. Systematic reviews indicate that between 57% and 93% of EMS personnel experience some form of violence at least once during their careers

(Murray et al., 2020); however, these cumulative figures offer limited operational value because they do not capture frequency, recency, or exposure adjusted risk. Twelve month recall windows provide a more practical basis for monitoring trends, yet they still suffer from under reporting, partly due to the cultural normalization of violence within paramedicine (Mausz, Braaksma, et al., 2024).

Near miss reporting systems, such as the National Firefighter Near Miss Reporting System, contribute important contextual detail by capturing precursors and situational hazards, including assault risks, environmental threats, and PPE failures. However, in the absence of standardized denominators, these systems primarily support hypothesis generation and learning rather than providing accurate incidence benchmarks (International Association of Fire Chiefs (IAFC), 2005; Murff et al., 2005).

Recent advances in EMS data architecture have begun addressing these limitations by embedding reporting at the point of care. Point of event reporting integrated into electronic patient care records (ePCRs) has substantially increased the capture of violent encounters and enabled the identification of high risk call types using dispatch level markers (Mausz & Donnelly, 2023). Mission based denominators such as incidents per 1,000 missions, provide more exposure adjusted measures by linking violence to discrete operational events. For example, a large Finnish cohort study found that violent behavior occurred in 0.7% of all EMS missions (297 of 40,263), with predictors identifiable through ePCR text mining approaches (Paulin et al., 2024). These developments demonstrate how denominator standardization can support more meaningful comparisons and inform targeted operational responses.

Despite increasing conceptual clarity in recent years, definitional inconsistency remains a major barrier to comparability across the OV literature. Studies vary widely in what they classify as violence, ranging from verbal abuse and threats to physical assault, and in how they distinguish aggression, near miss events and related behavioral precursors. These variations are further compounded by differences in how incidents are coded across reporting systems (Mausz, Braaksma, et al., 2024; Mausz, D'Eath, et al., 2024). Qualitative work in Australian paramedicine demonstrates that aggressive behavior often emerges through dynamic and relational interactions at scenes, challenging static or overly reductive typologies and underscoring the need for EMS specific taxonomies that better reflect the realities of out of hospital care (Drew et al., 2024).

Cross sector evidence similarly shows that effective mitigation strategies are multilayered and context dependent, reinforcing the importance of shared operational definitions to support robust evaluation and comparative learning (Hu et al., 2022) (Table 2).

International guidance provides useful definitional scaffolding, outlining core elements such as rights and responsibilities, recognition and assessment, intervention strategies, and monitoring and evaluation. These frameworks can be adapted to EMS contexts to strengthen consistency, enhance interoperability across systems, and enable meaningful, system wide learning (International Labour Office et al., 2002).

Denominator Type	Typical Recall Window	Reported Prevalence Range	Strengths	Key Limitations	Representative Sources
Career lifetime	Ever experienced	57–93%	Highlights cumulative burden	No temporal or exposure specificity	Murray et al.; Shabanikiya et al.
12 month recall	Past year	~50–75%	Allows annual trend tracking	Recall bias; under reporting of “minor” events	Bigham et al.; Sahebi et al.
Per mission (ePCR)	Point of event	~0.5–1% of missions	Exposure adjusted; operationally actionable	Captures only documented events	Paulin et al.
Incident reporting systems	Variable	Highly variable	Supports local learning	Strongly shaped by reporting culture	Mausz et al.
Near miss databases	Event based	Not prevalence based	Captures precursors and hazards	No standard denominator	IAFC Near Miss

Table 2. Denominators, recall windows, and their impact on reported prevalence.

PREVALENCE HETEROGENEITY AND WHAT IT MEANS FOR BENCHMARKING

Survey and mixed methods research shows that paramedics experience high levels of OV, although reported prevalence varies with study design, definitional scope and recall window. (Table 3).

Study / Review	Setting	Violence Types Included	Prevalence Estimates	Noted Heterogeneity Drivers
Murray et al. (2020)	EMS	Verbal–sexual	57-93% lifetime	Definitions, recall windows, sampling
Shabanikiya et al. (2021)	Paramedics	Overall; verbal; physical; sexual	66%; 58%; 25%; 16%	Tools, regions, scope
Sahebi et al. (2022)	Hospital + prehospital	Overall; verbal; physical; sexual	58.7%; 66.8%; 20.8%; 10.5%	Context dilution; population mix
International position statements	EMS	Threats & violence	55-83%	Non standardized reporting
Canadian survey (Bigham)	Paramedics	Broad	75% (12 month)	Self report; recall bias

Table 3. Prevalence of OV in paramedicine and emergency care: summary of major syntheses.

In a mixed methods survey of 1,676 Canadian paramedics, 75% reported at least one form of violence in the preceding 12 months, with verbal assault (67%) most common, followed by intimidation (41%), physical assault (26%), sexual harassment (14%), and sexual assault (3%) (Bigham et al., 2014). Point of event reporting programs in Canada reinforce this pattern that verbal abuse is the modal exposure and demonstrate substantial under reporting in routine systems (Mausz et al., 2023). More mixed methods programs further confirm that violence is widespread, chronic, and systematically under reported, with organizational cultures that normalize aggression as “part of the job” compounding incomplete documentation (Mausz & Donnelly, 2023; Mausz et al., 2022) (Table 3).

Global syntheses converge on the same message while highlighting major methodological heterogeneity. Murray et al. (2020) reported career lifetime exposure estimates of 57–93%, with verbal abuse typically most prevalent, followed by physical violence and sexual harassment, noting substantial variability arising from differences in definitional thresholds, sampling frames, and recall periods (Murray et al., 2020). These patterns align with international position statements indicating that 55-83% of EMS personnel report threats or violence while on duty (Paramedic Chiefs of Canada, 2019). Meta analytic work strengthens this picture. A paramedic specific systematic review and meta analysis

by Shabanikiya et al. (2021) reported pooled prevalence estimates of 66% for overall violence, 58% for verbal violence, 25% for physical violence, and 16% for sexual harassment, with between study variability attributable to divergent definitions, measurement tools, and regional contexts; this heterogeneity is echoed in broader global analyses (Shabanikiya et al., 2021). An umbrella review by Sahebi et al. (2022), spanning hospital and prehospital settings and including EMTs, found pooled prevalence estimates of 58.7% for any workplace violence, 66.8% for verbal violence, 20.8% for physical violence, and 10.5% for sexual harassment, again underscoring wide methodological and contextual variation (Sahebi et al., 2022).

Collectively, these syntheses show that while OV is consistently prevalent across paramedicine and wider emergency care, inconsistencies in definitions, sampling frames, and operational contexts limit the interpretability of headline rates and point to the need for region specific, methodologically aligned benchmarking (Sahebi et al., 2022; Shabanikiya et al., 2021).

Australasian evidence mirrors these global findings. International systematic reviews indicate that violence in paramedicine is persistent, recurrent, and embedded in routine practice rather than rare or episodic, with EMS personnel experiencing repeated exposures over time (Maguire, 2018). Australian injury surveillance shows that assault related harms constitute a consistent component of paramedic occupational risk across multiple years (Maguire et al., 2014). Qualitative work from the region highlights entrenched, system level features, including cultural normalization and barriers to prevention, while contemporary point of event studies confirm that violence occurs across call types, at scenes, in transit, and during ED handover, with predictors spanning patient factors, environmental context, and system level contributors such as delays and resourcing constraints (Drew et al., 2024; Paulin et al., 2024; Sawyer et al., 2020).

For benchmarking within ambulance services, this heterogeneity demands caution, as single “headline prevalence” figures risk oversimplifying a complex, multifactorial phenomenon. A more informative approach is to use a bundle of indicators that capture exposure by type (e.g., verbal aggression, intimidation, physical violence, sexual harassment), severity (e.g., injuries requiring treatment, psychological harm, lost workdays), contextual variables (e.g., scene environments, mental health related calls, intoxication related presentations, ED handover delays), and reporting completeness, namely, the proportion of incidents formally reported versus those identified through narrative or point of event tools. Research on point of event reporting shows that reporting behavior is shaped by organizational culture, perceived consequences, and system accessibility, making reporting completeness a critical benchmarking dimension (Mausz, Braaksma, et al., 2024). In parallel, system architecture analyses demonstrate that definitions, workflow integration, and data capture maturity substantially influence the visibility of violent events, factors that must be accounted for when comparing services (Mausz & Donnelly, 2023).

THE MEASUREMENT GAP: UNDER DOCUMENTATION, UNDER REPORTING, AND THE EVALUATION PARADOX

A growing body of international research shows that routine clinical documentation substantially underestimates the true burden of OV for paramedics, creating a significant measurement gap between experienced and recorded events. Record based analyses

frequently capture only a small fraction of violent episodes, particularly verbal and identity targeted aggression, while dedicated point of event systems reveal a far richer and more nuanced picture of exposure and harm (Table 4).

Dimension	Survey / Qualitative Evidence	Routine Documentation	Point of Event Reporting
Verbal abuse	Common	Rarely captured	Frequently captured
Identity targeted violence	Common	Largely absent	Explicitly recorded
Near miss events	Widely reported	Absent	Routinely recorded
Contextual detail	Rich	Minimal	High
Psychological harm	Reported	Rare	More visible
Reporting drivers	Culture, safety, meaning	Administrative burden	Workflow integration

Table 4. The measurement gap: experienced vs documented occupational violence.

This discrepancy is illustrated by recent international findings. In Finland, violence was documented in only 0.7% of 40,263 EMS missions, predominantly verbal aggression, despite identifiable predictors such as male patient sex, alcohol involvement, urban settings, and weekend nights, factors that should make many episodes detectable within operational data. Yet the overall documentation rate remained low. In England where the 2023 NHS Staff Survey found that approximately 14% of staff experienced physical violence and around 25% experienced harassment, bullying, or abuse from patients or the public in the previous year. NHS England highlights the importance of considering Staff Survey data alongside organizational incident reporting to understand the full extent of violence and abuse experienced by staff (NHS England, 2024). Complementary evidence from NHS Resolution's 2024 thematic review highlights significant reporting and data integration gaps at provider level, calling for strengthened governance and improved completeness of incident capture (NHS Resolution, 2024).

Studies beyond Europe underline the scale of global under documentation. A mixed methods systematic review of 58 studies across 30 countries found that verbal, discriminatory, and identity targeted abuse is rarely reported through formal channels due to organizational, cultural, and interpersonal barriers (Xu et al., 2025). In Canada, point of event analysis using EVIR data showed that one in four violent reports included sexist, racist, or homophobic abuse, categories largely invisible in routine datasets prior to reporting reform (Mausz, Braaksma, et al., 2024; Mausz, D'Eath, et al., 2024). These findings demonstrate that the documentation gap is both quantitative (missed incidents) and qualitative (missed content, especially identity targeted aggression).

Several interacting factors explain why survey based prevalence estimates consistently exceed rates derived from clinical records. Variability in definitions, particularly whether verbal harassment or discriminatory abuse "counts," suppresses documentation (Spencer et al., 2023; Xu et al., 2025). Operational pressures in urgent, time critical prehospital environments limit opportunities to record threats or sudden behavioral escalation in detail (Paulin et al., 2024). Cultural normalization of OV and perceptions that reporting is futile further deter documentation, patterns that are repeatedly identified in reviews and guidance (Mausz & Donnelly, 2023; National Institute for Occupational Safety and Health, 2024b). These barriers can disproportionately affect minority staff, who experi-

ence elevated risks of harassment and discrimination and may have less confidence that reporting will prompt an effective organizational response (NHS England, 2025).

The consequences of this systematic under documentation are substantial, and multiple jurisdictions describe an evaluation paradox. When organizations improve reporting systems, such as embedding point of event mechanisms in ePCRs, simplifying prompts or strengthening psychological safety, documented incidents often rise initially (Mausz & Donnelly, 2023). In Peel Region (Ontario), a two year implementation generated 941 structured violence reports, interpreted as evidence of improved capture and increased confidence to report rather than a deterioration in safety (Mausz et al., 2023).

Similarly, England’s refreshed Violence Prevention and Reduction (VPR) Standard requires organizations to demonstrate data and evaluation capability and to interpret incident trends in light of reporting maturity and safety culture (NHS England, 2024) (Table 5).

Reporting Change	Observed Effect	Interpretation Risk	Correct Interpretation
ePCR embedded reporting	Incident counts rise	“Violence is increasing”	Reporting completeness improved
Simplified reporting	More non physical events	“Trivial incidents logged”	Previously hidden burden
Psychological safety initiatives	Increased reporting	“Staff less resilient”	Increased trust
Improved data linkage	Better pattern detection	“New risk emerging”	Visibility of existing risk

Table 5. The evaluation paradox in violence surveillance.

Accordingly, there is growing international consensus that reporting completeness must be treated as an outcome in its own right. NHS Resolution’s 2024 thematic review highlights weaknesses in data capture, learning, and governance related to workplace violence incidents and calls for strengthened organizational oversight and use of violence data to inform prevention efforts (NHS Resolution, 2024).

The UK Government’s April 2025 commitment to mandatory national level collection aims to close long standing data gaps that impede targeted prevention. In practice, indicators such as reporting latency, follow up completeness, concordance between narrative clinical documentation and incident logs, and staff perceptions of psychological safety are increasingly recognized as measures of system maturity, with triangulation across data sources recommended in surveillance frameworks such as EMERG (Department of Health and Social Care (DHSC), 2025; National Institute for Occupational Safety and Health, 2024a).

For Australasian ambulance services, these lessons have direct relevance. Evaluating violence prevention must look beyond raw incident counts to incorporate data quality, reporting behavior, and organizational readiness. This means interpreting rising incident numbers as potential markers of healthier reporting culture, triangulated with exposure adjusted indicators and harm outcomes, rather than assuming deteriorating operational risk. Such an approach enables services to recognize genuine reductions in harm while avoiding misinterpretation of improvements in transparency as signs of worsening safety (Mausz & Donnelly, 2023; Paulin et al., 2024).

RISK CONTEXTS AND OPERATIONAL PREDICTORS

Across diverse health systems, most OV encountered by paramedics is initiated by patients, with relatives or bystanders contributing variably across contexts. Multi city surveillance in the United States, using an enhanced reporting system, found that patients were responsible for 73% of assailants and that verbal aggression occurred in 81% of recorded events. Much of this violence emerged from people in acute crisis, with emotional stress reported as the most frequent injury and mental injury severity often exceeding physical harm (Taylor et al., 2023). Qualitative work from Sweden similarly highlights the predominance of patient origin violence while underscoring challenges with police cooperation, the need for clear role allocation, and the potential for relatives to escalate scenes in emotionally charged circumstances (Stjerna Doohan et al., 2024).

International evidence consistently identifies intoxication, mental health crisis, and acute behavioral disturbance (ABD) as major risk contexts. In Finland, alcohol involvement was the strongest predictor of documented violence (OR = 3.464), with urban environments and weekend nights further elevating risk (Paulin et al., 2024). Studies from the Middle East echo these patterns. In Riyadh, emergency department research indicates that workplace violence, predominantly verbal, is widely experienced by healthcare providers, with under reporting linked to cultural normalization and limited confidence in reporting processes (Al-Wathinani et al., 2023). Similarly, a survey of public hospital emergency departments in Dammam reported an annual workplace violence exposure of 47.8%, with under reporting again described as common (Harthi et al., 2020).

The clinical literature describes acute behavioral disturbance (ABD) as a rapidly evolving, physiologically unstable medical emergency, most commonly associated with stimulant or other psychoactive substance use and frequently misinterpreted as primary psychiatric illness. Standard restraint based approaches may exacerbate physiological deterioration and worsen outcomes, highlighting the need for early medical control, minimization of restraint, and structured approaches to de escalation and sedation (Royal College of Emergency Medicine, 2023; Stevenson & Tracy, 2021).

Operational predictors show striking consistency across jurisdictions. Violent incidents tend to cluster during high demand temporal windows, especially weekend nights, and within densely populated urban areas. In Finland, urban environments increased risk by approximately 70% and weekend nights by 35% (Paulin et al., 2024). Contemporary US surveillance shows similar concentration in metropolitan systems, where behavioral emergencies intersect with social vulnerability, reflecting structural determinants of risk (Taylor et al., 2023) (Table 6).

Risk Context	Evidence Consistency	Key Findings	Operational Implications
Intoxication	High	Strongest predictor	Early staging; backup
Mental health crisis / ABD	High	Rapid escalation risk	Structured de escalation
Urban environments	Moderate–high	Higher density risk	Resource allocation
Weekend nights	Moderate	Temporal clustering	Staffing models
ED handover delays	High (Australasia)	Prolonged exposure	System coordination
Police co response	Variable	Does not eliminate risk	Ongoing vigilance

Table 6. Recurrent risk contexts and operational predictors of violence.

Qualitative and operational studies repeatedly emphasize unpredictability, including during co response. Finnish reports note that violence “sometimes occurred suddenly although the police were present,” illustrating that police attendance does not eliminate risk (Paulin et al., 2024). Canadian qualitative work describes some mental health related calls as deceptively calm until abrupt escalation, with distress, fear, or perceived threat around procedures triggering aggression (Ford Jones, 2023). Australian research likewise shows that aggression frequently emerges from dynamic interpersonal interactions shaped by communication, environmental pressures, and relational cues rather than clinical pathology alone (Drew et al., 2024).

These patterns highlight the importance of anticipatory risk assessment. The Aggressive Behavior Risk Assessment Tool (ABRAT)-EMS, adapted from a validated ED tool, demonstrates strong predictive performance with an Area Under the Curve (AUC) of 0.89 in prehospital care. It uses concise indicators such as agitation, confusion, and threatening behavior to identify elevated risk early during patient contact (Kim et al., 2025). ED implementations of the related ABRAT ED have demonstrated violence reduction when paired with targeted signage and workflow adjustments (Kim et al., 2024). These tools are particularly relevant for mental health related calls, which are estimated to comprise approximately 5-15% of 911 activations in some jurisdictions and are commonly addressed through integrated police-mental health co response models (Eloi et al., 2025).

International evidence consistently supports layered operational controls rather than reliance on any single intervention. Swedish clinicians emphasize flexible communication, continuous safety appraisal, and clear role delineation, even when police are present (Stjerna Doohan et al., 2024). Australian and Canadian studies similarly advocate for bundled approaches that combine staging and withdrawal criteria, calm de escalation strategies, supervisory support, tailored staffing, and co response frameworks during predictable high risk periods (Drew et al., 2024; Ford Jones, 2023).

CONSEQUENCES FOR CLINICIANS, PATIENT INTERACTIONS, AND SYSTEMS

The OV in paramedicine extends well beyond the immediate harms of physical assault. Qualitative evidence from a large multistate U.S. EMS agency shows that repeated exposure to violence gradually reshapes clinicians’ approach to patient care, heightening vigilance, eroding trust, and promoting emotional distancing that diminishes compassion and affects subsequent encounters. These themes, personal impact, altered patient interactions, and concerns about career sustainability, are central to the lived experience of frontline paramedics (McGuire et al., 2025). Australian qualitative work similarly demonstrates that aggression is inherently relational and interactional. Paramedics describe withdrawing from therapeutic engagement, modifying communication and operating under persistent anticipatory threat, patterns that plausibly degrade patient experience and the effectiveness of care long after a precipitating incident (Drew et al., 2024).

Psychological sequelae are substantial. A recent systematic review and meta analysis found that post traumatic stress disorder (PTSD) affects a markedly higher proportion of paramedics, with 12 month prevalence estimates commonly approaching one in five, compared with approximately 3% in non exposed working age populations (Hoell et al., 2023). Across the broader first responder literature, post traumatic stress disorder (PTSD)

symptom prevalence is estimated to range from approximately 7% to 37%, reflecting cumulative exposure to threats, assaults, and traumatic events, and aligning with prevalence estimates reported in paramedic specific meta analyses (Lewis-Schroeder et al., 2018; Yu, 2024).

A systematic review commissioned by the U.S. Agency for Healthcare Research and Quality (AHRQ) documents markedly elevated rates of suicidal ideation among EMS clinicians, estimated at approximately 33% in some samples, alongside mild to severe burnout and occupational stress, and identifies low strength evidence that mindfulness based interventions may reduce burnout for up to six months following implementation (Agency for Healthcare Research and Quality, 2024; Agency for Healthcare Research and Quality, 2025). Organizational context amplifies these psychological effects, as perceived futility of reporting, limited managerial support and the normalization of abuse all contribute to emotional burden. Qualitative data repeatedly describe a culture in which workplace violence is viewed as an accepted part of the job with enduring consequences for wellbeing and professional identity (McGuire et al., 2025). Consistent with this, UK ambulance research documents high levels of burnout among frontline staff, with substantial proportions reporting moderate to severe emotional exhaustion and depersonalization, raising concerns about sustained impacts on wellbeing, empathy, and patient centered care (Beldon & Garside, 2022).

Violence related consequences reverberate through workforce capacity and health system sustainability. Surveillance data from the National Institute for Occupational Safety and Health (NIOSH) estimate that approximately 16,900 EMS clinician injuries were treated in U.S. emergency departments in 2020, with events including violence, overexertion, harmful exposures, and transport incidents (National Institute for Occupational Safety and Health (NIOSH), 2024).

The cumulative impact of injury, violence, and unsafe working conditions extends beyond individual harm to undermine workforce sustainability. Workforce turnover remains high, with American Ambulance Association (AAA) studies reporting annual turnover rates of 20-36% among EMTs and paramedics, equating to near-complete workforce turnover every three to four years. Such instability poses a significant risk to workforce continuity and the maintenance of high-quality care (American Ambulance Association, 2022, 2024). Burnout further undermines sustainability as it was demonstrated by a national analysis, reported in the *Journal of the American College of Emergency Physicians*. The results of this analysis showed a high burnout prevalence and significantly increased odds of 10 sick days, as well as two to three fold higher intention to leave the profession among burned out EMS clinicians (Powell et al., 2025).

Additional synthesis work for the AHRQ EMS/911 systematic review confirms high prevalence of depression, anxiety, PTSD, stress, and burnout among EMS personnel. The review protocol highlights a large 2019 survey in which 60% of EMS respondents endorsed feeling burned out and 36% reported not wanting to continue in EMS, signaling significant risks to professional longevity (Agency for Healthcare Research and Quality (AHRQ), 2024). The completed AHRQ executive summary (2025) reinforces these findings, identifying substantial mental health morbidity, including suicidal ideation in some EMS samples, and noting that while interventions such as mindfulness may offer short term reductions in burnout, longer term, system level reforms remain necessary (Agency

for Healthcare Research and Quality, 2025). When viewed alongside qualitative evidence on culture, relational consequences and identity related impacts (McGuire et al., 2025), and policy syntheses on first responder PTSD prevalence and barriers to accessing support (Yu, 2024), the data collectively point to a sustained risk of reduced workforce participation and declining intention to remain in EMS unless organizational reforms directly address OV, its reporting environment, and its cultural entrenchment (Table 7).

Domain	Documented Consequences	Supporting Evidence
Psychological health	PTSD, anxiety, burnout, suicidal ideation	Hoell et al. (2023); AHRQ (2024,2025)
Clinical behavior	Emotional distancing, reduced trust	Drew et al. (2024); McGuire et al. (2025)
Workforce outcomes	Sick leave, turnover intention	Powell et al. (2025); AAA (2024, 2025)
System sustainability	Staffing instability, care continuity risk	NIOSH (2024); AHRQ (2025)

Table 7. Consequences of occupational violence for clinicians and systems.

AUSTRALASIAN ADMINISTRATIVE DATA FROM AMBULANCE SERVICES (2021-2023)

In Australasia, we integrated the 2021-2023 administrative data available from Australian and New Zealand ambulance services to illustrate exposure-adjusted benchmarking challenges and definitional variance.

Across the combined dataset, a total of 2,368 incidents of OV were recorded for the 2021-2022 and 2022-2023 financial years. This includes 1,159 physical incidents, 998 non-physical incidents, and 211 unintentional events. This distribution reflects the broader pattern observed internationally, where non physical aggression, such as verbal abuse, threats, and intimidation, constitutes a substantial proportion of total exposure, while physical violence remains a significant and persistent operational risk (Table 8).

Incident Category	Number of Incidents
Physical violence	1,159
Non physical violence	998
Unintentional incidents	211
Total	2,368

Table 8. Australasian administrative OV data (2021–2023): aggregate illustration.

The relative proportion of unintentional incidents is considerably smaller but still meaningful. This finding underscores the need to recognize not only deliberate acts but also behavioral and environmental factors that can lead to accidental harm. When interpreted collectively, these totals highlight both the magnitude of OV affecting paramedics in the Australasian context and the methodological challenges inherent in aggregated reporting, as variations in definitions, category, scope, and reporting maturity across services influence the overall composition of the data.

DISCUSSION

Three syntheses of international and Australasian evidence on OV reveals three methodological principles that are essential for producing accurate, comparable, and operationally meaningful violence data in paramedicine. These principles include denominator discipline, integrated reporting architecture, and contextual exposure indicators, which address longstanding limitations in how OV is measured, interpreted, and used to inform prevention.

DENOMINATOR DISCIPLINE: WHY EXPOSURE ADJUSTED METRICS ARE ESSENTIAL

The reported prevalence of occupational violence among paramedics varies considerably across studies. This variation is largely attributable to inconsistencies in exposure definitions, reporting systems, and denominator selection across jurisdictions. A key finding across the literature is the extent to which denominator choice influences reported prevalence estimates. Career lifetime recall surveys routinely report that more than half (often more than two thirds) of EMS clinicians experience violence over the course of their careers, with some meta analyses placing exposure between 57% and 93% (Murray et al., 2020; Shabanikiya et al., 2021). These figures are valuable in highlighting cumulative occupational burden but provide little insight into when, where, or under what operational conditions violence occurs. Because career lifetime measures aggregate every violent encounter across many years, they cannot inform risk stratified prevention or real time operational planning.

Twelve month recall denominators offer somewhat more practical information. Yet even these are influenced by recall bias, inconsistent definitions of “violence,” and pervasive cultural normalization among paramedics. This tendency is well documented in both qualitative studies and mixed methods surveys, where many clinicians report only “serious” episodes, omitting verbal, discriminatory, or escalating behaviors that nonetheless shape risk.

For operational decision making, the evidence clearly favors mission based denominators, such as incidents per 1,000 missions or per 10,000 patient contacts. Operational datasets should therefore link each OV event to a defined mission denominator, incorporating dispatch category, time stamp, location type, and crew configuration to enable stratified risk modeling. These allow exposure to be linked to discrete operational units including call types, times, locations, and environmental conditions. Research using integrated ePCR and reporting systems shows the power of this approach. For example, a Finnish cohort analysis of more than 40,000 missions identified violence in 0.7% of all missions, which appears low in isolation but becomes highly meaningful when paired with contextual predictors such as alcohol involvement, urban location, and weekend nights, which substantially increased risk (Paulin et al., 2024). This granularity would be completely lost in a recall based design.

Mission based denominators also enable quasi experimental evaluation methods, including interrupted time series and stepped wedge rollouts, because the underlying exposure unit is stable, comparable, and unaffected by subjective recall. This methodological discipline aligns with emerging EMS research that seeks to move beyond descriptive prevalence toward evaluated prevention, where risk is quantified, interventions targeted, and outcomes measured against exposure adjusted baselines. In this way, denominator discipline becomes the foundation for both surveillance and system level improvement.

REPORTING ARCHITECTURE: EMBEDDING CAPTURE IN EVERYDAY WORKFLOW

A second methodological principle is the need for a reporting architecture that is deeply integrated into paramedic workflow, particularly through electronic patient care records. The literature consistently shows that routine incident systems dramatically under record OV. Verbal abuse, intimidation, identity targeted harassment, and near miss events are especially likely to be omitted, both because clinicians often perceive them as inevi-

table features of the job and because traditional reporting processes are time consuming, poorly aligned with workflow, or perceived as unlikely to lead to meaningful action.

The under reporting problem is not limited to low severity events. Studies comparing administrative datasets with point of event reporting mechanisms reveal stark discrepancies. In Peel Region (Ontario), the introduction of an ePCR embedded reporting tool produced 941 violence reports in 24 months, far exceeding historical incident counts and uncovering patterns, such as the prevalence of sexist, racist, and homophobic abuse, that had previously been largely invisible in routine systems. These insights fundamentally altered the service's understanding of both the scale and nature of OV risk (Mausz, Braaksma, et al., 2024; Mausz & Donnelly, 2023).

However, embedding reporting into workflow introduces a critical interpretative complication. When reporting improves, incident counts may increase even if underlying risk is stable or declining, reflecting the well-recognized evaluation paradox. Without complementary metrics, such increases may be misinterpreted as worsening violence, leading to inaccurate operational conclusions. Accordingly, mature surveillance systems must integrate indicators of reporting quality, including completeness, latency, and concordance across narrative documentation, incident reporting systems, and ePCR data. These measures enable differentiation between true changes in occupational risk and artifacts of improved reporting behavior or system design.

This principle aligns with violence prevention governance standards internationally. For example, the NHS Violence Prevention and Reduction Standard explicitly require organizations to demonstrate data maturity, reporting accessibility, and regular review cycles to ensure consistent interpretation of incident trends (NHS England, 2024). Similar expectations are embedded in Australasian psychosocial hazard regulations, which emphasize employer responsibility for capturing and analyzing psychosocial harm and environmental risk factors (Safe Work Australia, 2024).

To address heterogeneity across domains of occupational violence, it is important to distinguish not only between types of violence but also their underlying operational drivers. Physical violence is most consistently associated with acute behavioral disturbance, substance intoxication, and high-acuity clinical presentations requiring rapid scene management in uncontrolled environments, reflecting reduced behavioral regulation and limited scene predictability during emergency response. In contrast, verbal abuse and threats are more commonly linked to prolonged waiting times, perceived delays in response, and heightened emotional distress among patients and bystanders, reflecting system-interface stress and unmet service expectations. Sexual harassment and identity-based aggression appear more strongly associated with contextual and environmental vulnerability, including low visibility settings, single-crew deployments, and reduced situational control during transport or offload delays. These distinctions suggest that occupational violence in paramedicine is not a uniform phenomenon, but rather a spectrum of behavior shaped by different clinical, environmental, and system-level stressors.

CONTEXTUAL EXPOSURE INDICATORS: ILLUMINATING THE CONDITIONS THAT GENERATE RISK

While denominator discipline and robust reporting systems clarify how often violence occurs, they cannot fully explain why or under what conditions. The third methodolog-

ical principle addresses this gap by emphasizing the importance of contextual exposure indicators, as measures that quantify the operational conditions known to amplify risk.

The literature makes clear that OV clusters in predictable contexts such as intoxication, acute behavioral disturbance, mental health crises, and emotionally charged family environments, and at predictable operational interfaces, particularly the ambulance-ED handover zone. These contexts rarely arise in isolation; they interact with system pressures such as crowding, delays, and inadequate information flow.

One critical contextual indicator is time to backup. When police, clinical supervisors, or additional crews are delayed, paramedics spend longer in uncontrolled environments where risk may escalate suddenly. Several qualitative and observational studies describe clinicians feeling “trapped,” “outnumbered,” or “unsupported” during prolonged waits, especially when managing intoxicated or agitated individuals. These prolonged exposures heighten emotional intensity, increase bystander agitation, and limit opportunities for tactical withdrawal.

A second contextual indicator is staging duration. Staging is a protective measure intended to reduce exposure before scene safety is confirmed. Yet staging duration can become counterproductive when delays result from systemic issues, such as insufficient police availability, ambiguous dispatch information, or conflicting caller descriptions. Prolonged staging may heighten risk by delaying patient assessment, prolonging bystander distress, or undermining trust when a visibly distressed or intoxicated patient perceives the ambulance as “waiting outside.” Tracking staging duration helps services distinguish between clinically appropriate safety behavior and operational bottlenecks that inadvertently escalate scene volatility.

A third indicator of significant importance is ED handover exposure time. The ambulance-ED interface is consistently identified as one of the most violence prone environments. Crowding, long waits, distressed relatives, limited security staffing, and the emotional intensity of emergency settings converge to create conditions ripe for aggression. Australasian data underscore the scale of the problem. South Australia recorded 45,399 hours of ramping in 2023-2024, and only 47% of patients were transferred within recommended timelines (Australian Medical Association, 2025). Each additional minute a paramedic spends in congested corridors or triage areas increases exposure to frustrated patients and families, particularly during periods of access block and resource strain.

Together, these contextual indicators illuminate why occupational violence occurs in particular patterns. Mechanistically, this reflects increased cognitive load, delayed backup availability, and reduced situational control in dynamic prehospital environments. These conditions allow services to detect operational drift, such as gradually lengthening handover delays or increasing response times for police co-attendance, long before incident numbers alone would signal concern. They also help attribute changes in occupational violence rates to underlying system pressures rather than superficial interpretations of “increasing violence.” This distinction is vital for ensuring that prevention strategies address root causes not symptoms.

BRINGING THE PRINCIPLES TOGETHER

When combined, these methodological principles form the scaffolding of a mature OV surveillance and prevention system. Denominator discipline ensures that prevalence estimates reflect exposure. Integrated reporting architecture ensures that data are visible, complete, and timely.

Principle	Purpose	Key Indicators
Denominator discipline	Exposure adjusted measurement	Incidents per 1,000 missions
Integrated reporting	Complete, timely capture	Reporting latency; completeness
Contextual exposure indicators	Explain why risk occurs	Time to backup; staging duration; ED handover time
Triangulation	Valid interpretation	Surveys + ePCR + incident systems

Table 9. Methodological principles for mature ov surveillance and prevention.

Contextual exposure indicators ensure that the operational conditions that generate risk are measured and monitored. Together, they align with modern regulatory frameworks for psychosocial hazard management and with emerging models of system level violence prevention.

Translating these findings into practice requires three parallel system-level actions. The first is the standardization of violence taxonomies across EMS jurisdictions. The second is the embedding of exposure-adjusted reporting within electronic patient care records. The third is the development of national benchmarking dashboards incorporating both incident and reporting-completeness indicators. Without these steps, comparisons between services will continue to reflect measurement artifacts rather than true differences in risk.

LIMITATIONS

The evidence base is heterogeneous. Definitions, recall windows, sampling frames, and documentation practices vary widely. Administrative data under capture events, while survey data are vulnerable to selection and recall bias. We therefore emphasized triangulation, denominator discipline, and reporting completeness rather than pooled prevalence estimates.

CONCLUSIONS

OV in paramedicine is common, patterned, and under documented. Regions aiming to benchmark and reduce risk should: (1) standardize definitions across systems; (2) adopt exposure adjusted, mission based denominators; (3) embed point of event reporting into workflow and track reporting completeness/latency/concordance; and (4) use paired leading/lagging indicators that include contextual exposure (time to backup, handover delay). These principles provide the measurement foundation for evaluating systems level prevention, detailed in the companion paper.

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