



Police use of TASER devices in mental health emergencies: A review[☆]

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ABSTRACT

The proliferation of TASER devices among police forces internationally has been accompanied by concerns about injuries and health effects, and about the use of TASER devices on vulnerable populations such as people with mental illness. TASER devices have generated a flood of research studies, although there remain unanswered questions about some of the key issues. This paper outlines the introduction of TASER devices to policing and their subsequent widespread adoption. The paper considers the role of police in mental health emergencies with a particular focus on use of TASER devices. Some factors contribute to the special vulnerability of people with mental illness to the effects of TASER devices. The paper also reviews research into use of TASER devices and raises issues about conflict of interest in research into TASER devices. We conclude that TASER devices look set to play a significant role in policing in the future. We make suggestions for a future research programme, and suggest guidelines for publication of papers in which there may be a conflict of interest.

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1. Introduction

Police exercise a unique role in the community in responding to a range of emergency situations, including behavioural emergencies. Many behavioural emergencies involve people with either newly presenting mental illness or a history of mental illness, and are frequently complicated by alcohol or other substances. Over the past two decades many police departments internationally have deployed TASER devices as part of their range of options in responding to emergencies. The available literature suggests that people with mental illness are prominent among the groups on whom TASER devices are deployed. Use of TASER devices is a concern to mental health professionals for two reasons. Firstly, police perceptions of people with mental illness as dangerous may contribute to an increased likelihood of use of TASER devices in mental health emergencies compared to criminal arrests. Secondly, the known health risks of TASER devices are heightened in the case of people in mental health crisis who may show central nervous system arousal as a result of high levels of anxiety. People with mental illness also have a high incidence of comorbid physical illness and use of illicit substances, and may be prescribed psychotropic medications that further heighten their risk.

In this paper we review the nature of police involvement in mental health emergencies in community settings, with a particular focus on police use of TASER devices. In addition to addressing the concerns noted above, we also discuss the state of current literature on police

use of TASER devices in mental health emergencies, and make suggestions for a research agenda in this area. The current literature on use of TASER devices pays scant attention to their use on people with mental illness. Questionable claims are made about prevention of suicide, many studies do not present data on people with mental illness, and overall there is a lack of robust research on the incidence of use of TASER devices on people with mental illness. The research literature on TASER devices safety is plagued by selection bias and lack of generalizability to real world circumstances. Concerns about conflict of interest have been reported, most frequently in relation to researchers with financial ties to the manufacturer, TASER International Inc. There is a need for more independent research and more research into the implications of TASER devices use on people with mental illness.

2. TASER devices

TASER devices², alternatively referred to as conducted electrical weapons (CEWs) or conducted electrical devices (CEDs) are hand-held devices designed to deliver short high-voltage, low current energy pulses by means of twin barbs attached to fine wires with the aim of temporarily paralyzing a person by causing painful muscular contraction (Kunz, Grove, & Fischer, 2012). First introduced to police in 1974 (Koscove, 1985), use of TASER devices in engagements with individuals with behavioural disturbances has increased markedly in the past two decades (Crow & Adrion, 2011). Information from the manufacturer of

[☆] TASER is the registered trademark of TASER International, Inc.

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² In this paper we use the proprietary term "TASER" to refer to all currently used electrical behaviour control devices as that is the term most commonly used in the literature. Where researchers have used other terms we follow the terminology used by those researchers.

TASER devices states that the devices are used by more than 16,000 agencies in 40 countries (<http://investor.taser.com/>).

Two major reasons have been offered in the literature for the introduction of TASER devices into policing. Most prominently, TASER devices are considered to offer a “less lethal” police response when compared to firearms because they allow police to effectively contain situations of high risk without resort to lethal force (Vilke & Chan, 2007; White & Ready, 2007). TASER devices also offer the potential that they allow police to effectively contain situations of high risk while reducing the rate of officer injuries.

A before and after study across 12 police departments found a 25% reduction in officer injuries following the introduction of TASER devices (McDonald, Kaminski, & Smith, 2009). The main reason for injury reduction is the reduced need to physically intervene with a resistant person. Further evidence of injury reductions comes from a four year quasi-experimental study which compared officer and suspect injury in police departments with and without TASER devices (Taylor & Woods, 2010). The researchers reported that compared to departments that deployed TASER devices, those without the devices had higher rates of officer and suspect injuries, and higher rates of injuries requiring medical attention. A potentially confounding factor in Taylor and Woods' study was the quite large unexplained increases in all four injury measures in the non-TASER device sites in the post period compared to the preperiod. Benefits of injury reductions are not realised in all situations and under some circumstances, notably those involving multiple forms of police response, use of TASER devices has been associated with a higher rate of officer injuries (Paoline, Terrill, & Ingram, 2011; Terrill & Paoline, 2012). A limitation of the latter studies is that data included dart injuries, which had the effect of inflating the number of injuries recorded (Kaminski, Engel, Rojek, Smith, & Alpert, 2013).

While police use of TASER devices seems to enjoy a high level of public acceptance, this development is not without controversy. With the increased use of TASER devices has come growing concern and public debate about safety of those subject to this technology. In the United States, Amnesty International (2008) has documented 334 deaths following use of TASER devices between 2001 and 2008. The much publicised death of Robert Dziekanski at Vancouver airport (Rolfesen, 2007) has also contributed to public concerns about safety of TASER devices. These concerns are reinforced by news reports of individual deaths following use of TASER devices in Australia (Merhab, 2008) the United States (Hall, 2009) and England (Smith, 2013).

The Amnesty International report and the media attention to the case of Robert Dziekanski and others represent the public face of the debate about the safety of TASER devices, but medical literature also reports a number of adverse effects (Denham & Mallon, 1999; Lim & Seet, 2007; Sanford, Jacobs, Roe, & Terndrup, 2011; Strote & Hutson, 2006). Although TASER devices are reported to be safe in healthy individuals (Bleetman, Steyn, & Lee, 2004), other researchers have concluded that “While less lethal weapons are significantly safer than traditional firearms, no weapon can be entirely non-lethal and no weapon can be made entirely safe.” (Bozeman & Winslow, 2005). The medical literature on TASER devices contains many case reports of injuries from TASER devices and these are discussed later in this paper (for a review, see Pasquier, Carron, Valotton, & Yersin, 2011).

Safety concerns are acknowledged by the manufacturer of TASER devices, whose product information sheet states that use of TASER devices “causes physiologic and/or metabolic effects that may increase the risk of death or serious injury” (Taser International, 2013). The information sheet goes on to note that some individuals, particularly those with “profound agitation”, drug intoxication or chronic drug abuse, may be particularly vulnerable. The warning includes “excited delirium”, a diagnostic category not found in either of the commonly used diagnostic taxonomies, the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSM IVTR) or the World Health Organization's *International Classification of Diseases* (ICD-9) (Takeuchi, Ahern, & Henderson, 2011), but which is used to

describe a syndrome in which people experience severe agitation with lethal consequences (Vilke, Bozeman, Dawes, Demers, & Wilson, 2012). Excited delirium is commonly cited as contributing to deaths when individuals have been subject to TASER device discharge (Jauchem, 2010; Strote & Hutson, 2006).

Use of TASER devices in mental health emergencies has also been subject of debate, with rights groups such as Amnesty International criticising use of TASER devices on people with mental illness. Rates of use of TASER devices in mental health emergencies appear to be high (Ho, Dawes, Johnson, Lundin, & Miner, 2007; O'Brien, McKenna, Thom, Diesfeld, & Simpson, 2011) and use of TASER devices has extended from community to hospital settings (Erwin & Philibert, 2006; Little, Hogbin, & Burt, 2013; O'Brien et al., 2011), including on psychiatric patients in emergency departments (Choudhary, Sabri, & Sabri, 2012). It is clear that the TASER device has appeal to staff in a range of emergency and health settings, and with the potential for proliferation into some unanticipated contexts, especially mental health settings.

3. Police and mental health emergencies

Police involvement in mental health emergencies is not a new phenomenon (for an early review, see Bittner, 1967). In every western country police have traditionally held a role of intervention with people with mental illness in community settings. However concerns about police interaction with individuals with mental illness, often expressed by police themselves, rose markedly during the period of deinstitutionalisation, when large numbers of formerly hospitalised patients were discharged to community living (Lamb, Weinberger, & De Cuir, 2002). At the same time, as hospitals began to downsize, police disposition to hospital became more difficult. Services to people with mental illness were not always available at the point of arrest, leading police to refer to themselves as “street corner psychiatrists” (Teplin & Pruett, 1992). In many western countries mental health services are now predominantly community focussed. Police interaction with people with mental illness is relatively common, and is the focus of a considerable proportion of police time (Godfredson, Thomas, Ogloff, & Luebbers, 2010; Short, MacDonald, Luebbers, Ogloff, & Thomas, 2012; van den Brink et al., 2012; Wells & Schafer, 2006), with use of alcohol and other substances further complicating these encounters.

Frequently, when mental health crises arise in community settings, neither police nor mental health services alone can respond effectively. Mental health teams are not empowered or trained to effect detention and police, while they may recognise features of mental illness, are often not trained in psychiatric assessment. There is a need for police and mental health services to work together in such situations (Laing, Halsey, Donohue, Newman, & Cashin, 2009; Patch & Arrigo, 1999). A large number of jurisdictions have initiated combined police and mental health teams, with a view to identify mental health issues at the point of arrest and diverting detainees from the criminal justice system towards mental health services. While the most well-known and well researched example of such an innovation is the Crisis Intervention Team (CIT) or Memphis Model (Borum, 1998; Compton, Badora, Watson, & Oliva, 2008; Ogloff et al., 2012; Watson & Fulambarker, 2012; Watson, Morabito, Draine, & Ottati, 2008), a range of different models have been developed in different contexts (see Cotton and Coleman (2010)); Herrington and Pope (2013); Steadman, Deane, Borum, and Morrissey (2000). Evaluations of collaborations between police and mental health have generally been positive, with benefits noted in officer attitudes and knowledge, timeliness of mental health service response, and diversion to mental health services. However police contacts with people with mental illness still contain the potential for aggression and violence, and for the need for force in the police response (Johnson, 2011).

Recently, police have explored the use of a range of strategic options aimed at reducing reliance on firearms in situations where a person

subject to arrest is perceived as presenting a danger to themselves, to others or to arresting officers. TASER devices are one such strategic option, and have been promoted as a “less lethal” alternative to firearms (Bleetman et al., 2004; Vilke & Chan, 2007; White & Ready, 2007). Because presentations to police may be undifferentiated at the time of an event, police will consider the full range of tactical options, including TASER devices, as part of their response. It is unsurprising, therefore, that among the groups subject to use of TASER devices are people with mental illness (Ho et al., 2007; Munetz, Fitzgerald, & Woody, 2006; O'Brien et al., 2011). The next section of this paper discusses how officer perception of the dangerousness of people with mental illness may influence the decision to deploy a TASER device when responding to a mental health emergency.

4. Perceptions of dangerousness and police interactions with people with mental illness

While many of those who come to the attention of police do so for reasons of criminality, in a substantial minority of cases police contacts involve people in various states of mental health crisis (Kesic, Thomas, & Ogloff, 2013; Lipson, Turner, & Kasper, 2010). To further complicate the nature of police response, the two groups are not distinct (Cummins, 2012). People in mental health crisis may behave in ways that would otherwise be considered criminal, for example by threatening others, damaging property, or trespassing on private property (Johnson, 2011). While calls might involve individuals with a known history of mental illness, or may even be initiated by mental health services, in other cases it may not be clear, at the time police are contacted, that mental illness is a contributing reason to a call to police.

While perceptions of people with mental illness as dangerous or potentially violent are frequently exaggerated (Markowitz, 2011) a significant subgroup presents an increased risk of violence (Choe, Teplin, & Abram, 2008). This subgroup includes people who are experiencing acute psychosis and who have consumed alcohol or other substances (Van Dorn, Volavka, & Johnson, 2012). A police perception of potential for violence may complicate these interactions, especially if police have had little training in response to mental illness (Ruiz & Miller, 2004; Watson, Corrigan, & Ottati, 2004). Police may also misinterpret the behaviour and demeanour of people with mental illness, contributing to greater likelihood of adverse outcomes from police encounters (Kerr, Morabito, & Watson, 2010). When police response to people with mental illness is driven by perceptions of dangerousness and potential for violence, police are likely to draw more deeply on their use of force options. A study in Victoria Australia, reported that more than 50% of 48 victims of police shootings between 1982 and 2007 had recorded histories of Axis I mental disorders (Kesic, Thomas, & Ogloff, 2010). Even after a programme to improve police response, people with mental illness remained at higher risk of fatal outcome following a police encounter. These findings have implications for deployment of TASER devices, especially as TASER devices are promoted as a safe alternative to lethal weapons. A perception of people with mental illness as dangerous, together with the availability of an apparently safe technology of intervention, may combine to create a low threshold for use of TASER devices in mental health emergencies.

Running counter to suggestions that police may perceive people with mental illness as dangerous and therefore act more coercively towards them, is a body of research that suggests the opposite: that people with mental illness are not more likely to experience police use of force, and that police use of force may even be less likely with this group. Engel and Silver (2001) reported comparable arrest rates between criminal suspects with and without a mental illness, once level of offence, intoxication and resistance were controlled for. A similar finding was reported by Terrill and Mastrofski (2002) whose measure of “mental impairment” was not correlated with police use of force after controlling for relevant confounders. In a study that contradicted the “criminalisation hypothesis” (that police act coercively towards

people with mental illness) Novak and Engel (2005) found that rather than acting more coercively towards people with mental illness, such people were less likely than their criminal counterparts to face arrest, despite being more likely to have committed a serious offence, to be intoxicated or to resist arrest.

Where high rates of police use of force with people with mental illness have been reported, several explanations for this apparent disparity have been offered. These include the relationship between psychosis and hostile or violent behaviour, non-adherence with treatment of people with a diagnosis of psychosis, use of drugs and alcohol, and experiencing stressful events such as homelessness or interpersonal conflict (Johnson, 2011). “Mental illness” as a category, especially if it is identified by police reports, may be too broad to advance understanding of police response without considering subgroups within that category, and the factors that may exacerbate resistive or aggressive behaviour. One group in particular who present problems for police are those with personality disorder. In a recent qualitative study of police officers' views of interactions with people with personality disorder, such people were described as “behaving badly” but also as not being rational (Martin & Thomas, *in press*). Police experienced difficulty in achieving their desired disposition to mental health services, with the result that police, rather than mental health services, are seen as the social agency with most responsibility for this group, at least in terms of any response to disturbed behaviour in the community (Martin & Thomas, *in press*). The researchers noted that personality disorder is not covered by mental health legislation, even although it is a diagnosis associated with a significant level of disturbed behaviour.

5. Health effects of TASER devices

The health effects of TASER devices have been the subject of considerable controversy. Health concerns can be classified into three broad streams: sudden deaths, injuries and adverse effects, and the potential for the electrical energy of a discharge to cause disruption to cardiac functioning. The overall conclusion of this research is that TASER devices are generally safe with healthy, sober subjects, and when used in accordance with the manufacturer's and police departments' guidelines, but there are several important provisos to this conclusion. In their review of morbidity and mortality associated with use of TASER devices Pasquier et al. (2011, p. 185) concluded that “the potential association between use of TASER devices in the field and death is of great concern”. This concern is heightened by the limitations of existing studies, an issue addressed below. TASER devices also have the potential to cause severe injuries and other adverse effects, resulting from the unique penetrating action of the prongs of TASER devices, from muscular contractions, or from falls. The three areas of health concerns related to use of TASER devices are discussed below.

5.1. Sudden deaths

As noted above, a number of newspaper and police reports have recorded sudden unexpected deaths following use of TASER devices. In many cases these deaths have occurred following use of multiple means of restraints, and in individuals affected by stimulant drugs (Jauchem, 2011; Morrison & Sadler, 2001). There is as yet no widely accepted empirical evidence or theoretical account that identifies a causative role for use of TASER devices and sudden death. Zipes (2012) has proposed such a role based on a series of case reports, but that account has been disputed (Ho & Dawes, 2013; Nanthakumar & Waxman, 2013). Where deaths have been reported they are often associated with “excited delirium”, a syndrome whose provenance has been questioned (Paquette, 2003; Truscott, 2008) but which is used to describe sudden deaths in custody associated with severe agitation, and autonomic arousal. Such states are not uncommon in police encounters, and are frequently seen in people with acute mental

illness, creating heightened risk when TASER devices are used with this group. In this regard it should be noted that sudden deaths in custody are not a new phenomenon. Such deaths have been reported long before the advent of TASER devices (Grant et al., 2007), with associated factors including resistance, agitation, restraint, being held in prone position, use of pepper spray, use of prescribed psychotropic medication and use of non-prescribed stimulant drugs (Robison, 2005).

While it might be expected that the deployment of a less lethal device such as TASER devices would impact the rate of sudden deaths in custody and deaths from police use of firearms, at least one epidemiological study has shown a trend in the opposite direction. Lee et al. (2009) reviewed data from 126 sheriff departments in California and found that in the first year following deployment of TASER devices, in-custody deaths increased six fold. In addition, deaths from fire arms doubled, while the rate of officer injuries was unchanged.

A range of factors combine to create a unique risk profile for people with mental illness. These factors include high blood pressure, obesity, cardiac and respiratory disease, and metabolic syndrome (Usher, Foster, & Park, 2006). People with severe mental illness have a range of physical comorbidities (De Hert & Leucht, 2011), are more likely than the general population to use alcohol or other substances (Chwastiak et al., 2006), and may be prescribed drugs with the potential to alter cardiac functioning (Zemrak & Kenna, 2008), heightening the known risks of adverse outcomes. The latter authors also noted that mental health patients may be prescribed multiple drugs and at high doses, and may also be consuming illicit drugs and alcohol, factors that further increase their risk from the use of TASER devices. In a recent review of police department policies for use of conducted energy devices (CEDs) such as TASER devices, Thomas, Collins and Lovrich (2012, p. 421) commented that “the individuals who are most likely to experience adverse health effects post-CED deployment (e.g., mentally ill, intoxicated) are the same individuals who are most likely to be exposed to CEDs”. In summary, the debate over a causative role of TASER devices in sudden deaths remains unresolved and will persist as long as sudden deaths continue to be reported. It is possible that use of TASER devices acts as an indicator of overall level of force in police response rather than a causative factor in its own right. Such a hypothesis is amenable to empirical investigation that may advance the debate over the role of TASER devices in sudden deaths.

5.2. Potential to disrupt cardiac functioning

Many studies have explored the cardiac effects of TASER devices following the results of animal studies that indicated myocardium capture (Nanthakumar et al., 2006). Studies have used electrocardiogram to measure cardiovascular effects of TASER device exposure on healthy individuals. No clinically significant effects or damages to the myocardium were reported in studies by Bozeman et al. (2009), VanMeenen et al. (2010) or Vilke et al. (2008). Increased heart rate and systolic blood pressure have been observed (Vilke et al., 2008), however these were considered to be due to the TASER device creating a pain stimulus (Bozeman et al., 2009). Decreases in PR interval have also been noted but were deemed clinically irrelevant (Vilke et al., 2008). Following a report of a TASER device causing myocardium capture (Cao, Shinbane, Gillberg, & Saxon, 2007), Dawes, Ho, Reardon, and Miner (2010) attempted to repeat this observation experimentally, but echocardiograph data showed no adverse cardiac outcomes. One case of atrial fibrillation has been reported in an otherwise healthy adolescent male (Multerer, Berkenbosch, Das, & Johnsrude, 2009). A recent report on excited delirium syndrome (Bozeman, Ali, & Winslow, 2013) noted prolonged QT interval, a clinical finding common in people prescribed antidepressant and antipsychotic medication (Zemrak & Kenna, 2008).

Overall, the literature on health effects of TASER devices on people with mental illness suggests that the risks are small but not negligible.

Authors are consistent in concluding that TASER devices are not free from risk, a conclusion also reflected in TASER International's product information. In their review of the literature on pathophysiological effects, Kunz et al. (2012) concluded that while the majority of recent scientific publications classify the health risks as minor, there is still uncertainty about some effects. People in mental health crisis should be considered a group with a unique combination of factors that place them at high risk. High levels of autonomic arousal, antipsychotic medication with the potential to cause disturbances of cardiac rhythm, physical health comorbidities, and consumption of illicit drugs are all more likely to occur, and in combination, in people in mental health crisis.

5.3. Injuries

The medical literature contains numerous case reports describing specific injuries such as ocular perforation (Chen, Richard, Murthy, & Lauer, 2006; Li & Hamill, 2013; Ng & Chehade, 2005); retinal detachment (Sayegh, Madsen, Adler, Johnson, & Mathews, 2011); intracranial penetration (Kaloostian & Tran, 2012; Le Blanc-Louvry, Gricourt, Touré, Papin, & Proust, 2012); pneumothorax (Hinchey & Subramaniam, 2009); pharyngeal perforation (Al-Jarabah, Coulston, & Hewin, 2008); and compression fracture of the spine (Sloane, Chan, & Vilke, 2008). One case report described a tonic-clonic seizure after a TASER device barb made contact with the subject's head (Bui, Sourkes, & Wennberg, 2009), although this effect has not been observed in others who have been shot in the head with TASER devices (Kunz et al., 2012).

Despite their reported low risk, TASER devices can have unintended consequences. In addition to the case reports described above, Sharma, Theivacumar, and Souka (2009) reported the case of a 42 year old man who sustained a 7-cm wide and 10-cm deep stab injury to the upper abdomen when the TASER device was deployed to disable him as he held a knife to his chest. In this case use of a TASER device resulted in contraction of the skeletal muscles and as a consequence a potentially lethal injury. Such incidents are rare, and it might be argued that the level of risk in this case was already high, but incidents such as these underscore the frequently made point that like other forms of intervention, TASER devices are not without risks.

6. Research on TASER devices and mental health

A notable gap in the literature on use of TASER devices is in relation to people with mental illness. As noted above, database studies of police use of TASER devices shows that they are frequently used in mental health emergencies in community contexts, but their use also extends to hospital settings. New Zealand research showed that when comparing criminal arrests with mental health emergencies, TASER devices were more than twice as likely to be discharged in response to mental health emergencies as in criminal arrests (O'Brien et al., 2011). The police database also identified cases in which TASER devices were used as part of police response to inpatient mental health services, something that had been reported previously (Erwin & Philibert, 2006) but was unanticipated in the New Zealand context. A limitation of the New Zealand study is that it did not control for other factors contributing to police use of force, such as intoxication, resistance and severity of offence.

Ho et al. (2011) described use of a TASER device by security staff in a general hospital. In Ho et al.'s report one deployment was with an individual who was suicidal, but there is no other analysis of the role played by mental illness in other uses of TASER devices in the hospital. More recently Little et al. (2013) have reported the deployment of a TASER device in a mental health facility in England. In research that does report on use of TASER devices in mental health emergencies the criteria for classification of such cases is often unclear and some of the claims made for the effectiveness of TASER devices do not stand close scrutiny (see O'Brien, 2008 in response to Ho, Miner, Dawes, Lundin, & Johnson, 2008). Given the extent of police involvement with mental health services and their role in responding to mental health emergencies

in the community, the dearth of research into use of TASER devices in mental health emergencies is surprising to say the least.

7. Conflict of interest in research

Research evidence about the safety of TASER devices is dominated by studies whose authors have financial interests in the commercial production, sale, and promotion of TASER devices by police. This issue has been the subject of commentary for several years (Azadani, Tseng, Ermakov, Marcus, & Lee, 2011; O'Brien, 2008; Pasquier et al., 2011; Stanbrook, 2008; Terrill & Paoline, 2012), but over that time nothing has changed substantially. It is notable, too, that researchers affiliated to TASER International are quick to respond to publications reporting risks associated with Tasers, or critiquing the claims of Taser affiliates. While there is nothing improper about Taser-affiliated scientists responding to published reports, overall there appears to be significant commercial interests in the Taser literature, and this has the potential to influence the volume and content of publications. To manage this problem, some journals provide statements of authors' professional affiliations, research interests and affiliations with commercial organisations. For example, a recent publication in *Police Quarterly* (White et al., 2013) included a declaration of conflict of interest in which three authors declared their professional and financial relationships with TASER International. In view of persistent reports of such conflicts of interest the *Police Quarterly* example provides a model which could be emulated by other journals. Unlike pharmaceutical research where numerous corporations fund studies of their products, the issue of conflict of interest in research into TASER devices can be traced to a single proprietary manufacturer, TASER International Inc. A large proportion of studies of use of TASER devices have been conducted by researchers with financial links to the manufacturer (Azadani et al., 2011). Many of these studies have significant methodological problems, such as small and selective samples, exclusion criteria that rule out participants with known risk factors, lack of control groups, and the controlled conditions of the studies which are very different to the real world conditions in which TASER devices are actually used. The caution urged by Pasquier et al. (2011), based on the funding sources and methodological inadequacies of current studies, still applies, and will do until robust, independent studies are available.

8. Discussion

Use of force by police is a relatively rare event in the context of the overall functioning of police (Kesic et al., 2013; White & Ready, 2007) and police encounters with people with mental illness constitute a small proportion of the overall work of police (Kerr et al., 2010). Nevertheless, both are important issues, the more so when police find it necessary to use force with people who are mentally ill. In the context of mental illness, and especially in crisis situations, use of force may lead to increased, rather than reduced resistance (Kerr et al., 2010).

When use of force is proportionate, and in line with the social mandate extended to police, it is seen as legitimate and necessary (Terrill & Paoline, 2012). Given that police interactions with people in mental health crisis at times contain the potential for violence, it is intuitively reasonable that police would seek to use tactical approaches such as TASER devices that seem to reduce the extent of aggressive behaviour. However enthusiasm for new technologies needs to be tempered with awareness of their adverse effects and limitations (Crow & Adrion, 2011) especially where the opinions of police and the scientific community are influenced by commercial interests. The success of programmes of collaboration between police and mental health services shows that response to people experiencing mental health crises in community settings can effectively address safety and health concerns. Such collaborations should also act as a check on use of TASER devices when interpersonal methods of negotiation might bring about a resolution to a crisis situation.

There is no specific literature examining how police training in use of TASER devices should incorporate knowledge related to mental illness. Given the vulnerability of people with mental illness, and their already raised risk of sudden death in custody, Edinger and Boulter (2011) have suggested that police training in use of TASER devices should specifically address mental illness as a risk factor, and that their use with this group should be limited to imminent likelihood of sustaining or causing grievous bodily harm. The elements currently incorporated into police training in mental health response would appear to be a necessary prerequisite for training in use of TASER devices, with an emphasis on communication problems arising from impaired cognition and perceptions, and how that might impact on response to the presentation of a TASER device. Information about the vulnerabilities of people with mental illness, arising from intoxication, substance use, medical comorbidities, and prescribed medication should also be included.

TASER devices look set to play a prominent place in police work in the foreseeable future. One recommendation from this review is that TASER devices are not deployed to officers responding to mental health crises unless those officers have had specific mental health training, for example those trained in CIT teams or other models of collaboration between police and mental health services. Models such as CIT may not be viable in small jurisdictions, but much of the training content is relevant, especially that related to features of mental illness, de-escalation of agitated individuals, and mental health disposition options. The collaborative relationships central to CIT teams can be fostered even where the full model cannot be implemented.

In their review of less lethal weapons Alpert et al. (2011) noted that like other police interventions, technologies such as TASER devices have the potential for over use. The view that TASER devices are a safe and effective option for police may contribute to over use, especially as severe adverse effects are rare, and the procedural justification for use of a TASER device relies heavily on subjective assessments by police officers on the presenting level of risk. These observations reinforce the need for police training, not only in the procedural aspects of their work in mental health emergencies, but also in knowledge, skills and attitudes related to mental illness. The literature evidence is convincing in showing that such training reduces the level of force in police response to people with mental illness, and increases the likelihood of mental health disposition.

There is a need for more research on the use of TASER devices in mental health emergencies. In many jurisdictions, good records of use of TASER devices are maintained, and can provide a rich source of data for researchers. Database research can identify rates of use of TASER devices with different groups in society, and can also monitor trends over time. In large population settings, database studies may provide sufficient numbers to permit multivariate and regression analyses such as those reported by Terrill and Paoline (2012), leading to stronger conclusions about the patterns of use and effects of TASER devices. Kaminski (2009) suggests case-control studies as an alternative to the currently limited range of designs used. Case-control studies have been used in criminology research and have the advantage that they can be used to study relatively rare events such as severe adverse effects of TASER devices. Research would benefit from more theoretically informed design, for example by the focal concerns perspective used by Crow and Adrion (2011). Such a theoretical perspective is conducive to exploring factors that might influence officers' decision-making when deploying TASER devices. There is also a need for qualitative research to explore police officers' experiences of use of TASER devices, both in general and in relation to mental health emergencies.

The issue of conflict of interest in research related to use of TASER devices is a serious one and could in part be addressed by journals adopting more rigorous and consistent standards relating to declaration of conflicts of interest. However there is also a need for more research that is independent of the influence of commercial interests.

9. Conclusion

Use of TASER devices in police response to mental health emergencies remains an underinvestigated phenomenon about which there are many important questions, some significant unresolved debates, and legitimate concerns among mental health professionals. There are as yet no studies of the views or experiences of people with mental illness, meaning that practice is informed solely by the views of professionals, and is subject to the commercial imperatives of the TASER device manufacturer. Our paper has made several recommendations for further research. It is to be hoped that in the near future a body of empirical work will develop which will enable the use and effects of TASER devices in mental health emergencies to be better understood.

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