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SPECIAL ISSUE PAPER

Identifying and Interpreting Domestic Violence in Archaeological Human Remains: A Critical Review of the Evidence

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ABSTRACT This research reviews and discusses the clinical and social science datasets used to identify victims of domestic violence (DV) in the archaeological record. Clinical sources are skewed by law enforcement and cost issues, dominated by Western female data and suggest that DV is a well-documented form of abuse. Social science sources and perspectives, having arisen from activist movements, are more spatiotemporally diverse in breadth and perspective, and challenge the notion that DV is universal and well-documented, but are biased because they rely upon self-survey reports.

Palaeopathology and bioarchaeology have adopted a clinical approach to DV, relying on a pattern of injuries (focussed on the head, face and neck), without critically evaluating whether such datasets are appropriate to the spatiotemporal and socio-cultural diversity present in the archaeological record. A case study evaluating the injury patterns in 964 post-medieval adult females from London (England) demonstrates that the majority of injuries that conform to the clinical model have robust alternative explanations, and only a small minority of females have injuries that may have been produced by interpersonal violence, not necessarily DV.

In conclusion, the review highlights that the perspectives of the elderly and male victims are currently neglected in research, and evidence for injury, especially that which may reflect abuse, necessitates interpretation within a 'web of violence' approach, as DV does not occur in isolation from other violence in a community. It challenges the 'check-list' approach to interpretation and suggests that a closer examination of fracture mechanism combined with injury patterning may be a more informative approach with which to identify DV victims of both sexes and identifies the need to integrate other health data into the interpretation of violence and abuse. Overall, it concurs with the minority of clinical and forensic literature that it might not be possible to differentiate DV and assault victims. Copyright © 2015 John Wiley & Sons, Ltd.

Key words: abuse; domestic violence; fracture; injury patterns

Introduction

This article examines the emotive and highly complex form of trauma described as domestic violence (DV) or intimate partner violence. Examples of this type of abuse in females has been identified in past populations from the very earliest days of palaeopathology, and our ability to distinguish these injuries patterns relies heavily on clinical data (e.g. Shermis, 1983; Walker, 1997, 2001; Novak, 2006; de la Cova, 2012; Elliot-Smith & Wood Jones, 1910). In recent years, archaeology has incorporated new approaches to the study of violence, such as structural violence theory (Galtung, 1969; Farmer, 2004), and provided more nuanced and culturally situated interpretations of the osteological evidence for trauma (e.g. Novak, 2008; Martin *et al.*, 2012; Knüsel & Smith, 2013; Martin & Anderson, 2014a), thereby bringing it closer to a social science perspective, which recognises that trauma is temporally and spatially specific, and a deeply personal experience influenced by notions of gender, the body and identity (Scheper-Hughes & Lock, 1987; Blok, 2000; Scheper-Hughes & Bourgois, 2004; Arendt, 2008; Kirmayer *et al.*, 2008). However, we have failed to more actively

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engage with the extensive literature about DV published by other social science disciplines. Work by these disciplines has shown that it is not limited to women, nor is it a homogenous experience or an isolated episode of violence, but rather that it is connected to other forms of interpersonal violence (i.e. assault/other forms abuse) and occurs within four very different relationship types: intimate terrorism, violent resistance, mutual violent control (MVC) and situational couple violence (Johnson, 2006, 2008; Hamby & Grych, 2013). Most crucially of all, these social science disciplines have shown that the methods used to collect data on DV will either include or exclude many of these relationship types, because the very nature of their abuse means that victims and/or perpetrators will not engage with medical and/or agency services, and therefore, biases will exist between datasets, principally between clinical studies and general social surveys (Johnson, 2006).

Therefore, this research aims to provide a critical examination of the datasets that we rely on to identify victims of domestic abuse in past societies and seeks to show how this form of abuse is not an isolated event but rather part of a'"web," because the causes of violence, from interpersonal to global, are connected, as are the consequences' (Turpin & Kurtz, 1997, 12), and therefore, this form of abuse can only be understood in its wider context.

An overview of domestic violence

Definitions of DV are numerous, with the majority focusing on the heterosexual female experience (e.g. United Nations, 2006). Therefore, it is suggested that the non-gender-specific definition offered by United Kingdom's Home Office (2012) is likely to be more relevant to the study of this type of abuse in past communities:

> Any incident or pattern of incidents of controlling, coercive or threatening behaviour, violence or abuse between those aged 16 or over who are or have been intimate partners or family members regardless of gender or sexuality.

Domestic violence usually takes place between intimate partners but may also be perpetrated by other family members, and in the majority of cases, it is psychological in nature (World Health Organization, 1997; Martin *et al.*, 2002). Cross-cultural and historical studies have shown that no society and status group are free from this type of violence, although the extent to which it is recognised as a form of abuse does vary significantly, because notions and definitions of trauma are always culturally specific (Burbank, 1990; Merry, 1994; World Health Organization, 1997; United Nations Children's Fund, 2000; Jasinski & Kantor, 2001; Rani & Bonu, 2009). This has led some researchers to create their own definitions in order to make sense of their data (e.g. Hattery, 2009) or to distinguish between wife beating (culturally expected behaviour) and battering (resulting in severe injury) (Brown, 1999). Furthermore, the attitudes supporting this form of violence can rapidly change, particularly in response to wider socio-political changes in gender equality (Draper, 1999; Hautzinger, 2007; Mazurana & McKay, 2001; Hayati *et al.*, 2014).

Global and longitudinal studies of violence have discovered that the frequency of DV increases during and after warfare and also in times of economic hardship (Colson, 1995; Tjaden & Thoennes, 1998; Kaye *et al.*, 2005; Raghavan *et al.*, 2006; Humphreys, 2007; De Jesus, 2009; Oyunbileg *et al.*, 2009; Saile *et al.*, 2013). Rural and urban differences in frequency have also been reported, but the extent to which it is conceptualised as an 'urban' problem by the police and medical services may bias these findings (Gilliland *et al.*, 2000; Hilbert & Krishnan, 2000; Davis *et al.*, 2001; Krishnan *et al.*, 2001; Thurston *et al.*, 2006; Eastman & Bunch, 2007). However, cross-cultural studies have found that it is also strongly associated with alcohol and drug abuse, poverty and the perpetrator regularly being involved in fights (Ellsberg *et al.*, 2008; Stockl *et al.*, 2014; Falcao de Oliveira *et al.*, 2014), factors present in both rural and urban settings. Evidence from a range of sources has shown that directly and indirectly, people can be victims and/or perpetrators of violence throughout their lives and that very sadly, exposure to this form of violence during childhood means that adolescents and adults of both sexes are more likely to become victims and may perpetuate these violent relationship dynamics (Jeyaseelan *et al.*, 2004; Skuja & Halford, 2004; Abrahams & Jewkes, 2005; Holt *et al.*, 2008; Cho, 2012; Hamby & Grych, 2013). Above all, as Engle Merry's (2009) review of gender violence reveals, DV cannot be understood separately from the levels of warfare, structural violence and gender inequalities present in a society.

Domestic violence: four different experiences

Within the past decade, scholars have suggested that victims of DV should be subdivided into four separate categories: intimate terrorism (IT), violent resistance, MVC and situational couple violence (Johnson, 2006, 2008) (Table 1). These distinctions are crucial to the study of DV in our discipline, because the type, longevity and frequency of injury vary considerably

Table 1. Categories of domestic, observations about physical injury and their associated sources of data, taken from Johnson (2006, 2008) and Johnson & Leone (2005)

Category	Actions of perpetrator and victim	Observations about injury and health	Most likely data source to be featured in
Intimate terrorism (IT)	Perpetrator uses violence to control partner: most likely to be a male victim* Partner does not use violence Violence is part of a 'web of abuse'	Most likely to be injured Severe and serious injuries needing medical attention Low-rated self-health Post-traumatic stress disorder	Clinical and police sources; see MVC
Violent resistance (VR)	Perpetrator is an IT, and the resister uses violence to exert general control Women most likely to be arrested for perpetrating domestic violence or murder of partner	Women who defend themselves are twice as likely to be injured	Refuge and shelter surveys; general surveys
Situational couple violence (SCV)	Perpetrator is violent, but neither partner uses violence to control the other: gender symmetry in reported perpetrator Separate acts of SCV can appear similar to IT, as violence arises from circumstances	Low likelihood of receiving a serious injury; unlikely to require medical attention	General social surveys
Mutual violent control (MVC)	Both partners use violence to control the other IP, VR or SVC where both partners violent		Agency data: police, support providers and clinical sources

*Biased by limited data from non-heterosexual partners.

between the categories and, as outlined next, victims and perpetrators will not be identified by all sources of data (Table 1) (Johnson & Ferraro, 2000; Johnson & Leone, 2005; Stark, 2006; Johnson, 2008; Johnson *et al.*, 2014). Johnson (2008) illustrates this with the example of the 'battered husband' phenomenon first identified by Steinmetz (1977), a finding that continues to divide DV researchers, because it is not observed across all datasets: large-scale surveys, hospitals, police records and shelters (see the following discussion). As shown in Table 1, this is because the victims and perpetrators of each type will only be accounted for in certain datasets, and the presence of physical injuries is only part of the spectrum of violence experienced by victims (Stark, 1996; Johnson, 2008). Therefore, we should be aware that the clinical data are skewed towards victims of IT or MVC forms of DV, and thus, we are only going to be able to identify past victims of these two relationship types, particularly if we limit ourselves solely to fracture data.

Sources of information

The author observed during the literature review for this research that abuse between partners is portrayed and understood in two contrasting ways. The clinical literature contains many thousands of articles describing the pattern of injuries sustained by victims (usually a woman), and the repeated finding of similar patterns over time gives the impression that this is a well-known and documented experience—that it can be simply reduced to a check-list pattern of physical injuries (e.g. McCauley *et al.*, 1995; Muelleman *et al.*, 1996)—regardless of age, geographic location and gender. The social science literature contrasts sharply, as this research has been strongly driven by feminist theories, because action against this form of violence began as a social change movement (Lehrner & Allen, 2009). They have observed that this experience is incredibly varied and despite years of research, there remain many aspects of this violent interaction that have yet to be documented in sufficient detail, particularly violence between same-sex partners and within polygynous relationships (both sexes) and its connection to structural violence (Jankowiak *et al.*, 2005; Engle Merry, 2009; Messinger, 2014). Importantly, the social science literature also rejects the hypothesis that one behavioural model can be used to explain violence in all relationships (Katerndahl *et al.*, 2014) and that a single model could account for temporal change (Engle Merry, 2009). These biases and issues are most pertinent to archaeology, as the majority of available datasets are derived from Western populations and thus do not accurately reflect the diverse lived experience of many victims (past and present), particularly those in indigenous communities who continue to be impacted by structural violence (e.g. Bopp *et al.*, 2003; Al-Yaman *et al.*, 2006; Native Women's Association of Canada, 2010).

There are many biases that affect officially reported data, which are not specific to the ones discussed in more detail in the succeeding sections, but impact on

the datasets used to identify past examples of this abuse. International review of Ely *et al.* (2004) highlighted several top-level issues: there are no universal definitions of key terms, different methods of data recording are used and there are variations in the techniques used in record keeping. Much of the published data, particularly in the social sciences, are derived from large-sample self-report surveys that are hindered by issues such as how questions are interpreted by the respondent, recall error and selectivity. Although social science datasets are more diverse in terms of geographic origin and ethnic diversity, they still lack longitudinal and replication studies to validate and examine data patterns (Ely *et al.*, 2004).

Data collected by clinical and crime prevention services

The majority of data published by the clinical sciences are, for the most part, generated by people attending 'Accident and Emergency' or 'Emergency Rooms'; data are also gathered by dentists and plastic surgeons. Firstly, the majority of injuries sustained by victims of assault (abuse or from fights) affect the soft tissue, and victims may decide not to seek medical help for their injuries, because they believe that they can attend to these injuries at home; for many, their psychological frailty as victims of abuse means that they are unable to leave their home because of the risk (real or imagined) of punishment by their aggressor (Hester *et al.*, 1997; Tjaden & Thoennes, 1998; Crandall *et al.*, 2004; Hattery, 2009). Furthermore, the geographic location of the dataset must also be considered, because of the influence of legislation and cultural norms. In the USA, clinicians are legally obliged to inform the police when they believe that a victim of abuse has sought treatment, whereas in the UK, this obligation is not present (Hester, 2009); therefore, victims in the USA have another reason not to seek medical help. There is also the crucial issue of arrest policies. In recent years, there has been an increase in the number of women identified by police as perpetrators of abuse (Johnson, 2006; Gerstenberger & Williams, 2013). This has been interpreted by social scientists as evidence to support behaviour observed in their studies (based on questionnaires) but is also believed by many to be part of the recent general increase in female violence observed in European and Western societies (White & Kowalski, 1994; Hester *et al.*, 1997; Salmivalli & Kaukianinen, 2002; Carmo *et al.*, 2011; Cho, 2012). The majority of studies use police data from either the UK or the USA. In the USA, they practice a dual-arrest policy, whereby both partners are arrested and the perpetrator/victim statuses are established later, whereas in the UK, the police avoid arresting both parties and at the scene, try to establish which person is the perpetrator but do not make dual arrests when one party is acting in self-defence (Hester, 2009). Consequently, the data collected by these two countries are not comparable (Novak, 2006), and interpretations of gender symmetries based on their data should be understood in context (e.g. Straus & Ramirez, 2007; Jasinski *et al.*, 2014).

Datasets published from non-Western and/or European societies show that considerable differences exist in assault data, reflecting people's proximity to medical care, the presence of multiple systems of medicine but also the extent to which this violence is considered 'normal' within relationships (i.e. wife beating) and therefore not sufficiently serious enough to warrant a hospital or clinic visit, or else that drawing attention to their victimhood will result in a loss of social status (Burbank, 1994; Douki *et al.*, 2003; Oetzel & Duran, 2004; Ahmed & Elmardi, 2005; Diop-Sidibe *et al.*, 2006; Hodgins *et al.*, 2006; Abramsky *et al.*, 2011; Chan, 2012; Kiser *et al.*, 2013; Hayati *et al.*, 2014). Perhaps, one of the most important biases is the financial cost of seeking medical treatment in many countries across the world, because many victims may only have very limited economic power or resources, either because they are either poverty stricken or else because it is denied to them (Biggerstaff *et al.*, 2002; Raphael, 2002; Chronister, 2006, 2007; Fertig & Reingold, 2007; Lindhorst *et al.*, 2007; Cattaneo & DeLoveh, 2008; Goodman *et al.*, 2009). Economic freedom has also been identified as a key reason why victims do not or will not leave their abuser (Hattery, 2009).

The skill and experience of the people collecting the data also make a difference. Several papers have been published where the observations were made by forensic physicians/dentists, or medical practitioners specially trained in DV, and it is suggested that they may be more successful at identifying injuries than non-specialist practitioners (Reijnders *et al.*, 2006; Tam *et al.*, 2010). Additionally, there are clinical studies focusing on victims, which have examined the range and distribution of injuries in police-identified victims —people who did not self-identify as victims on admission (among others, Kothari & Rhodes, 2006)—and people referred to specialist units by emergency medical providers (Hofner *et al.*, 2009). However, it should be noted that the screening tool chosen by the care provider to 'identify' victims influences the final classification and its reliability (Halpern *et al.*, 2005, 2009), a cautionary lesson for archaeology.

Failings in the data can often arise from professionals who are deemed to be socially responsible for preventing and treating abuse—medical practitioners

and police—failings arising from concepts of patriarchy and masculinity (Radford & Stanko, 1997; Erez, 2002; Garcia & McManimon, 2011). Victims report that they are frequently not believed, particularly if they are male; that assaults within relationships are a private matter and are not always worthy of arrest; personal concepts of what constitutes acceptable levels of violence within personal and family relationships and notions of who are 'victims' and 'perpetrators' override training and legislation; victims are considered to be personally responsible for causing their abuse or that they choose to be victims; many people involved in health care do not consider that their role (e.g. surgeon or dentist) makes them responsible for identifying abuse; and they are often unfamiliar with screening methods, because of their attitude (Little, 2000; Renker, 2002; Mehra, 2004; Coulthard *et al.*, 2004, 2010; Gillis *et al.*, 2006; Thackeray *et al.*, 2007; Trautman *et al.*, 2007; Bhandari *et al.*, 2008; Stevenson *et al.*, 2008; Yut-Lin & Othman, 2008; Gracia *et al.*, 2009; Thompson *et al.*, 2013; McAndrew & Marin, 2012; Melton & Sillito, 2012; Stokoe & Edwards, 2013). Consequently, we must always accept that reported data are both limited and biased in scope and always question the extent to which they are relevant and applicable to studies of past populations.

Social science

The data collected and analysed by social science disciplines are derived from questionnaires and interviews (face to face, telephone, postal and online), the majority of which are from North America, particularly the US National Violence against Women Survey (Johnson, 2008); there are also data published by the United Nations (2006) and the World Health Organization (1997, 2002, 2010). These various methods of data collection have their own range of limitations and biases (see discussion in Schwarz, 1999; Podsakoff *et al.*, 2003; Gosling *et al.*, 2004; Bowling, 2005; Chan, 2009). However, in contrast to data collected by government services, their methods and techniques have been driven by feminist and life-course theories, which mean that these data are often more diverse in terms of socio-economic status, ethnicity and migrant/resident statuses (e.g. Kasturirangan *et al.*, 2004; Sullivan *et al.*, 2005). Their feminist origins mean that they are acutely aware of the impact that patriarchy and structural violence can have on victim experiences (Hunnicutt, 2009; Dobash & Dobash, 1979; Sugarman & Frankel, 1996; Millar & Glendinning, 1989; Mazurana & McKay, 2001; Radford & Stanko, 1997). Most importantly of all, because they ask the victims to describe their experiences in their own words (feminist narrative approach), they are able to capture the broad range of experiences (i.e. physical, psychological and sexual) that the victims (male and female) deem to be violent (Kelly, 1997; Davis *et al.*, 2001; Tjaden, 2004; Johnson, 2008; Murray & Powell, 2009) (a contrary opinion has been posited by Ristock, 2002). These accounts prove that there is no archetypal or stereotypical victim (male or female) (Smith, 2001), contrasting sharply with the definitions and codes used by clinicians and law enforcement agencies to classify and record diseases and assaults (i.e. Wynn *et al.*, 2001; World Health Organization, 2007)

Domestic violence across the life span

Domestic violence is not limited to physical assault, nor is its frequency constant over the course of a relationship, particularly a long-lasting one (Tjaden *et al.*, 1999; Johnson, 2008). Marriage, having children, gaining employment and old age are all critical periods of change (Barrier, 1998; Ruiz-Perez *et al.*, 2006; Johnson, 2008). These stages are recognisable in the life courses or experiences of many past societies (Foner & Kertzer, 1978; Gowland, 2006; Gilchrist, 2008; Buikstra & Scott, 2009; Knudson & Stojanowski, 2009; Appleby, 2010), but the extent to which we can directly map clinically derived age groups onto the life courses of past societies remains questionable. These life events often signal a change in power relations, a driver identified by both perpetrators and victims. Unfortunately, the majority of published data are not always divided by age groups, and instead, the focus tends to be on groups targeted by government policies or those identified as being high risk by police/medical sources (Engle Merry, 2009).

One clinical study, which examined DV across different age groups in the USA, interviewed 6185 married adults. They found a clear pattern: the younger age groups had more physical arguments and sustained more injuries, young and middle-aged women were more likely to sustain injuries and younger men perpetrated the most violence against their spouse (Bookwala *et al.*, 2005). This pattern was also found by Stockl *et al.* (2014) who used data published by the World Health Organization's multi-country study on women's health (15–24 years old), with a lifetime prevalence of abuse (psychological, physical and sexual) ranging from 19% to 66%. These data are supported by other clinical studies, with one study from Hong Kong (China) finding that the victim's mean age was 39 years, with most victims being aged between 31 and 41 years (Lau *et al.*, 2008). Higher rates of trauma in younger and middle adult women are a pattern observed in many

archaeological populations across the world (i.e. Walker, 1997), but without interpreting these results in their specific socio-cultural context, misleading conclusions can be drawn (i.e. Fibiger *et al.*, 2013).

Novak's (2006) novel study used clinical data collected by Bradford Royal Infirmary (England) to investigate injury type and distribution in victims of DV aged between 15 and 69 years. The results showed that 94% of victims were less than 42 years old, and the injury rates for victims increased to a peak between the ages of 25 and 29 years; subsequently, there was steep decline until the age of 45–49 years (Figure 1). Interestingly, Novak (2006) did not observe any data for the 50- to 54-year-olds and 65- to 69-year-olds, and less than 2% for the 55- to 59-year-old and 60- to 64-year-old age groups (Figure 1). The assault rates were higher than for those experiencing accidental trauma from the ages of 20–39 years, showing that women are greater risk from assault compared with accident during these age ranges (Figure 1).

Pregnancy has been identified as vulnerable time for victims of DV (Weiss *et al.*, 2002). For pregnant women, the times of greatest risk are during the first and third trimesters (Nannini *et al.*, 2011), and violent assaults occurred regardless of whether it was a first or subsequent pregnancy (Gyuse *et al.*, 2009). Assaults during pregnancy can result in spontaneous abortion or stillbirth, and both mother and child can die from their injuries, most frequently because of trauma to the placenta (Ribe *et al.*, 1993; Berenson *et al.*, 1994; Spurrett & Murray, 2008; Gulliver & Dixon, 2014). Although there are many similarities in injury type and body distribution between pregnant and non-pregnant victims (i.e. targeting of the head, face and neck), one study found that torso injuries were twice as frequent during pregnancy (Nannini *et al.*, 2008).

Older victims of DV are an understudied group, which should make us question whether they are actually being misclassified as victims of elder abuse (Bennett & Hogan, 2008) and recorded in other datasets. In this group, injuries may only be detected because failing health means that they are more frequently seen by medical staff, who may not recognise that the injuries result from IT or MVC rather than elder abuse (Arber & Ginn, 1995; Arber *et al.*, 2003; Band-Winterstein & Eisikovits, 2009). Old age may also signal a shift in power relations, where because of ill health, the perpetrator becomes the victim or female perpetrators continue their abuse, as studies of elder abuse have observed high rates in married men who are abused by their wives (Bode-Jänisch *et al.*, 2010; de Brito Abath *et al.*, 2010)—no same-sex studies could be found. Additionally, data collected from focus groups found that older women did not feel that they were acknowledged as victims by support providers, because they are less frequently injured (Allen *et al.*, 2007; Beaulaurier *et al.*, 2008). This is also compounded by this group's data being 'hidden' within clinical studies of assault, as data are divided simply into 'child' or 'adult' categories, or else older age groups are totally excluded from studies. For example, one study only included women between the ages of 15 and 49 years (Abramsky *et al.*, 2011).

Models of assault and patterns of injury

Figure 2 and Table 2 provide an overview of the published clinical, forensic and bioarchaeological data for

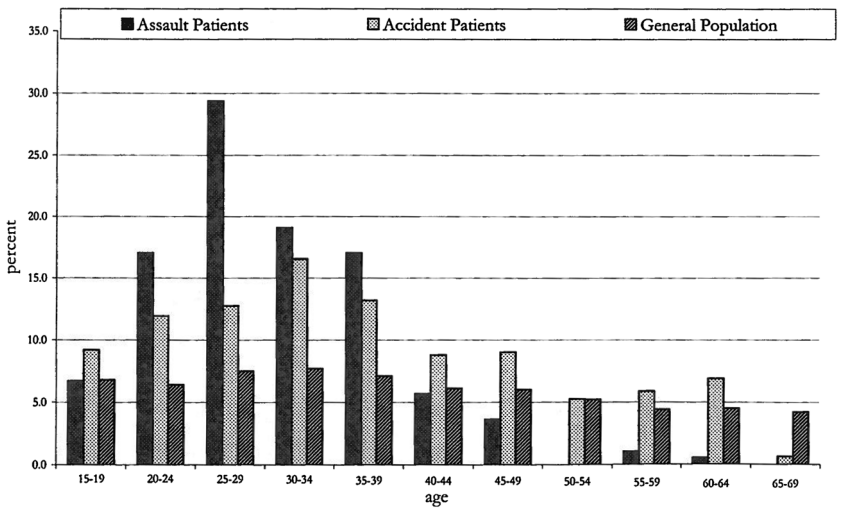

Figure 1. Age distribution for Bradford Royal Infirmary (Yorkshire) assault and accident patients and age distribution of the female population in Bradford, 1997 (City of Bradford, 1996). Used with kind permission from Prof. Shannon Novak (2006, 243; Figure 16.1).

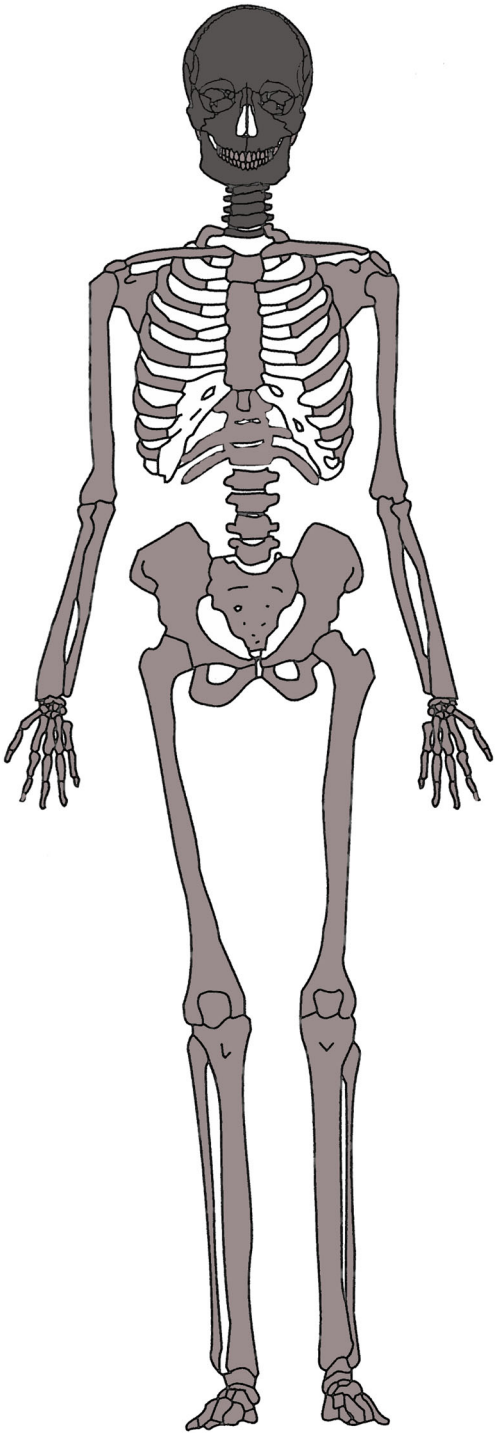

Figure 2. Diagram showing the distribution of injuries reported in the domestic violence literature (grey). The most frequently occurring injuries, particularly observed in young adult women, cluster at the head, face and neck (dark grey) (author). This figure is available in colour online at wileyonlinelibrary.com/journal/oa.

different types of violence reported in the literature: accident, assault, DV, elder abuse, abductions, subordination and beatings. As shown in Table 2, pooling datasets is highly problematic because of inconsistencies in how data are described and reported; consequently, there will be some overlap between categories and injury types. For example, data are published by body area (i.e. upper limb—shoulder to fingers) rather than by specific bone or region of the limb, meaning that some injuries may be underreported such as scapula fractures. These data are also affected by the issues previously noted, whereby the clinical literature does not separate out the injuries sustained by victims of DV and victims of (non-) aggravated assault. Although Table 2 shows that DV displays considerable overlap with accident, assault and elder abuse, the clinical and forensic data show that DV victims are more likely to have injuries to the head, face, neck, as well as arm and multiple injuries (Muelleman *et al.*, 1996; Kyriacou *et al.*, 1999; Spedding *et al.*, 1999; Crandell *et al.*, 2004; Novak, 2006; Allen *et al.*, 2007; Juarez & Hughes, 2014) (Figure 2).

However, the extent to which a reliable clinical model can be established is critiqued by several papers. A study published by a specialist DV unit in Germany raises two issues of importance, firstly, that only a minority of women who were victims of a single act of DV presented with the same pattern of injuries as recurring victims, although the prevalence of head injuries was equal for both first and recurring victims (Seifert *et al.*, 2007). There may also be some potential sex differences in injury distribution. Male victims of DV often have more upper limb injuries compared with other body locations and are less likely to sustain fractures or dislocations, a distinction believed to result from differences between male–female physiques and strengths (Seifert *et al.*, 2007; Carmo *et al.*, 2011). Finally, an Amsterdam-based study examining patterns of violence in over 7000 adults and children determined that there were no clear differences between victims of assaults and DV (Reijnders & Ceelen, 2014). This may be because of similarities in the mechanisms of assault (punches, kicks, etc.), and the general trend for perpetrators to aim blows at the victim's face (e.g. Shepherd *et al.*, 1990; Downing *et al.*, 2003). Interestingly, this conclusion was also reached by a forensic review of identifying DV and intimate partner homicide, which found that victims displayed a mixture of DV and assault injuries (Juarez & Hughes, 2014). Such findings remind us of the interconnectivity of different forms of interpersonal violence that are experienced over a lifetime, with people being both perpetrator and victim and involved in different types of interpersonal violence (Hamby & Grych, 2013).

Studies of past populations rely heavily on clinical evidence to identify assault victims (i.e. fights and

Table 2. An overview of the range and type of injuries and pathologies associated with different types of violence

Body area/bone affected and/or injuries reported	Accidental injuries : vehicle data excluded	Assault injuries	Domestic violence	Elder abuse	Capture/ forced abduction	Subordination/ beatings
Head injuries	✓	✓	✓	✓	✓	✓
Head, face and neck injuries	✓	✓	✓	✓		
Maxillofacial injuries	✓	✓	✓	✓	✓	✓
Orbital fractures	✓	✓	✓			
Zygomatic fractures	✓	✓	✓			
Nasal bone fractures	✓	✓	✓			
Mandibular fractures	✓	✓	✓			
Mandibular dislocations	✓					
Dental injuries (fractures and avulsions): maxillary incisors, mandibular incisors and maxillary canines	✓	✓	✓	✓		
Cervical spine: herniated disc, fracture or dislocation	✓		✓			
Fractures to spine	✓		✓			✓
Fractures to torso (spine, ribs, shoulders and pelvis)	✓	✓	✓	✓	✓	✓
Rib fractures		✓	✓	✓	✓	✓
Upper extremity injuries (shoulder to fingers)	✓	✓	✓	✓	✓	✓
Scapula fractures		✓	✓	✓		✓
Hand injuries	✓		✓			
Lower extremity injuries (hip to toes)	✓	✓	✓	✓	✓	✓
Foot injuries	✓					
Joint subluxation/dislocation	✓	✓	✓	✓		
Sharp-force injuries	✓	✓	✓			
Blunt-force injuries	✓	✓	✓	✓	✓	✓
Injury recidivism		✓	✓	✓		✓
Multiple injuries in one episode		✓	✓	✓	✓	✓
Higher rates of observed in younger and middle-aged adults	✓	✓	✓		✓	✓
Malnutrition			✓	✓		
Co-occurrence of trauma and pathology			✓	✓	✓	✓
In pregnancy: death, stillbirth, injuries to head and neck and injuries to torso	✓		✓			

A tick signifies reported data, but it should not be taken as the absence of evidence, as it is an artefact of the reported data. For example, torso fractures are reported in all trauma types, whereas scapula fractures are only explicitly stated in three types.
Data taken from de Brito Abath *et al*. (2010), Allen *et al*. (2007), Arosarena *et al*. (2009), Baron *et al*. (1996), Bassey *et al*. (2011), Bennett & Hogan (2008), Bhandari *et al*. (2008), Blondiaux *et al*. (2012), Bormann *et al*. (2009), Brink (2009), Caldas *et al*. (2012), Carmo *et al*. (2011), Cil & Kahraman (2013), Court-Brown & Caesar (2006), de la Cova (2012), Eggensperger *et al*. (2007), Flanslow *et al*. (1998), Garbin *et al*. (2012), Gulliver & Dixon (2014), Harrod & Martin (2014), Hartzell *et al*. (1996), Hattery (2009), Juarez & Hughes (2014), Kulvatunyou *et al*. (2012), Kyriacou *et al*. (1999), Lau *et al*. (2008), Martin *et al*. (1990), Muelleman *et al*. (1996), Murphy *et al*. (2013), Nannini *et al*. (2008), Nemutandani *et al*. (2012), Novak (2006), Rahman *et al*. (2013), Reijnders *et al*. (2006), Santos *et al*. (2013), Seifert *et al*. (2007) and Spedding *et al*. (1999).

abuse), but this approach has only received limited discussion within the literature, with Jurmain (2005, 215) cautioning that blunt-force injuries and nasal and zygomatic bone fractures have a 'less secure interpretative basis', and in the forensic literature, one study concluded that 'no fracture or fracture pattern is diagnostic of IPV [intimate partner violence]' (Juarez & Hughes, 2014, 361).

The biases created by our reliance on clinical data are explored using injury data observed in 694 women derived from nine post-medieval (1550–1850) London cemeteries (England) (Table 3), which are curated by the Museum of London (WORD database, 2014). These sites were recorded following the protocols described by Powers (2007, 2012). Injuries caused by surgery (i.e. autopsy) or related to underlying pathologies (i.e. neoplasms or osteoporosis) were excluded. These samples vary by socio-economic status and therefore, by demographic composition but also by religious faith, all factors that have been shown to be directly related to the general health patterns of these populations (Cowie *et al*., 2008; Henderson *et al*., 2013). It should be noted that one is from a free hospital in the city (RLP05), and the population from St Mary and St Michael (LUK04) contains individuals (and their descendents) who migrated from Ireland because of the potato famine in the mid-19th century (Henderson *et al*., 2013).

Following the clinical style of data presentation by Crandall *et al*. (2004) and Spedding *et al*. (1999), where fracture type is omitted, the data are broadly grouped by body area, and the presence of an injury is reported at the crude prevalence rate. A total of 216 (31.1%)

Table 3. Post-medieval cemetery sites from London: religious denomination, socio-economic status, date that the burial location was in use and the number of adult women recorded from each site

Site name and code	Religious denomination and socio-economic status	Dates	Number of aged adult women in years	Reference
Bow Baptist Church (BBP07 and PAY05)	Baptist Low status	1816–1854	18–25: 15 25–35: 34 35–45: 32 ≥45: 23 *N* = 104	Henderson *et al.* (2013)
Chelsea Old Church churchyard (OCU00)	Church of England High status	1695–1842	18–25: 9 25–35: 7 35–45: 17 ≥45: 36 *N* = 69	Cowie *et al.* (2008)
City Bunhill burial ground (GDA06)*	Nonconformist Mixed: addresses of population come from across the city	1833–1853	18–25: 14 25–35: 17 35–45: 6 ≥45: 20 *N* = 57	Connell and Miles (2010)
Cross Bones burial ground (REW92)	Church of England Low status	1729–1852	18–25: 1 25–35: 2 35–45: 11 ≥45: 12 *N* = 26	Brickley *et al.* (1999). Note: WORD data used (2014)
Bishop Challoner School (LUK04)*	Catholic Low status	1843–1854	18–25: 11 25–35: 36 35–45: 34 ≥45: 21 *N* = 102	Henderson *et al.* (2013)
Royal London Hospital (RLP05)	Church of England Hospital cemetery	ca 1841–1860	18–25: 9 25–35: 16 35–45: 14 ≥45: 5 *N* = 44	Fowler and Powers (2012)
St Bride's Church crypt (SB79)	Church of England High status	Late 17th century to 1850	18–25: 6 25–35: 13 36–45: 16 ≥45: 60 *N* = 95	WORD database (2014)
St Bride's lower churchyard (FAO90)	Church of England Low status	1750–1849	18–25: 4 25–35: 21 35–45:30 ≥45: 64 *N* = 119	Miles and Conheeney (2005) Note: WORD data used (2014)
St Marylebone churchyard (MBH04)*	Church of England High status	1750–1853	18–25: 11 25–35: 20 35–45: 22 ≥45: 25 *N* = 78	Miles *et al.* (2008)

*Signifies that the human remains have been reburied.

women sustained an injury, and 27 (3.9%) had more than one injury present. Overall, the most frequently injured body areas were the ribs, vertebrae, lower arm and lower leg, which is similar to fracture epidemiology data (Court-Brown & Caesar, 2006). In contrast to clinical data, the lowest rates were observed in the 18- to 25-year-old category and the highest in those aged ≥45 years (Tables 4 and 5), a result that again corresponds to the findings of Court-Brown & Caesar (2006). Interestingly, in four cemeteries from differing status and religious groups, injuries were not reported for 18- to 25-year-olds (Table 4), suggesting that if any injuries

Table 4. Crude prevalence rate (CPR) of the distribution of injuries in 18- to 25-year-old women (N = 80) by cemetery population and body location

Site code	*N* of recidivists in age group	Injury type	Head	Face	Dentition	Ribs	Scapulae	Vertebrae	Upper arm (clavicle and humerus)	Lower arm	Hand bones	Os coxae	Upper leg	Lower leg (and patella)	Foot bones
BBP07 and PAY05	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	0.7% (1)	—	—	—
		Fracture	—	—	—	—	—	—	—	—	—	—	0.7% (1)	—	—
FAO90	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	—	—
		Fracture	—	—	—	—	—	—	—	—	—	—	—	—	—
GDA06	1	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	—	—
		Fracture	7.1% (1)	7.1% (1)	7.1% (1)	—	—	—	—	—	—	—	—	—	—
LUK04	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	—	—
		Fracture	—	—	—	—	—	9.1% (1)	—	—	—	—	—	—	—
MBH04	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	—	—
		Fracture	—	—	—	9.1% (1)	—	9.1% (1)	—	—	—	—	—	—	—
OCU00	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	—	—
		Fracture	—	—	—	—	—	—	—	—	—	—	—	—	—
		Plastic bowing deformity	—	—	—	—	—	—	—	—	—	—	—	11.1% (1)	
REW92	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	—	—
		Fracture	—	—	—	—	—	—	—	—	—	—	—	—	—
RLP05	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	11.1% (1)	—	—	—
		Fracture	—	—	—	—	—	11.1% (1)	—	—	—		11.1% (1)		11.1% (1)
		Subluxation/ dislocation	—	—	—	—	—	11.1% (1)	11.1% (1)	—	—	—	—	—	—
SB79	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	—	—
		Fracture	—	—	—	—	—	—	—	—	—	—	—	—	—
Total % of injuries per body location			1.2% (1)	1.2% (1)	1.2% (1)	1.2% (1)	—	5% (4)	1.2% (1)	—	—	2.5% (2)	2.5% (2)	1.2% (1)	1.2% (1)

N given in parentheses. CPR% calculated by individual site and age group and for pooled age-group data.

Table 5. Crude prevalence rate (CPR) of the distribution of injuries in ≥45-year-old women (N = 266) by cemetery population and body location

Site code	*N* of recidivists in age-group	Injury type	Head	Face	Dentition	Ribs	Scapulae	Vertebrae	Upper arm (clavicle and humerus)	Lower arm	Hand bones	Os coxae	Upper leg	Lower leg (and patella)	Foot bones
BBP07 and PAY05	3	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	13% (3)	4.3% (1)
		Fracture	—	—	—	4.3% (1)	—	—	—	—	13% (3)	—	—	8.7% (2)	—
FAO90	2	Myositis ossificans	1.6% (1)	—	—	—	—	—	—	—	—	—	—	1.6% (1)	—
		Fracture	3.1% (2)	3.1% (2)	—	15.6% (10)	—	3.1% (2)	—	4.7% (3)	3.1% (2)	—	—	—	1.6% (1)
GDA06	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	5% (1)	—
		Fracture	—	—	—	5% (1)	—	—	5% (1)	10% (2)	—	—	10% (2)	—	—
LUK04	—	Myositis ossificans	—	—	—		—	—	4.8% (1)	—	—	—	—	4.8% (1)	—
		Fracture	—	—	—	4.8% (1)	—	28.6% (6)	—	14.3% (3)	4.8% (1)	—	—	14.3% (3)	9.5% (2)
MBH04	1	Myositis ossificans	—	—	—		—	—	—	—	—	—	—	—	—
		Fracture	—	—	4% (1)	8% (2)	—	4% (1)	4% (1)	16% (4)	4% (1)	—	—	—	—
		Subluxation/ dislocation	—	4% (1)	—	—	—	—	—	—	—	—	—	—	—
OCU00	1	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	5.5% (2)	—
		Fracture	—	—	—	8.3% (3)	—	—	—	5.5% (2)	—	2.8% (1)	—	2.8% (1)	2.8% (1)
REW92	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	—	—
		Fracture	—	—	—	—	—	8.3% (1)	—	—	—	—	—	—	—
RLP05	2	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	—	—
		Fracture	—	—	—	—	—	—	—	40% (2)	—	—	—	—	—
SB79	4	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	1.7% (1)	—
		Fracture	—	—	—	8.3% (5)	—	1.7% (1)	6.7% (4)	5% (3)	—	—	—	3.3% (2)	—
		Subluxation/ dislocation	—	10% (6)	—	—	—	—	—	—	—	—	—	—	—
Total % of injuries for age group per body location			2.5% (2)	2.5% (2)	1.2% (1)	27.5% (22)	—	16.2% (13)	3.75% (3)	28.7% (23)	8.7% (7)	1.2% (1)	2.5% (2)	10% (8)	5% (4)

N given in parentheses. CPR% calculated by individual site and age group and for pooled age-group data.

Table 6. Crude prevalence rate (CPR) of the distribution of injuries in 35- to 45-year-old women (N = 182) by cemetery population and body location

Site code	*N* of recidivists in age group	Injury type	Head	Face	Dentition	Ribs	Scapulae	Vertebrae	Upper arm (clavicle and humerus)	Lower arm	Hand bones	Os coxae	Upper leg	Lower leg (and patella)	Foot bones
BBP07 and PAY05	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	—	—
		Fracture	—	—	—	3.1% (1)	—	3.1% (1)	—	—	3.1% (1)	—	—	—	—
FAO90	3	Myositis ossificans	3.3% (1)	—	—	—	—	—	3.3% (1)	—	—	—	3.3% (1)	—	—
		Fracture	—	—	—	16.7% (5)	—	—	3.3% (1)	6.7% (2)	—	—	—	6.7% (2)	—
GDA06	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	—	—
		Fracture	—	—	—	—	—	—	—	—	—	—	—	—	—
LUK04	6	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	—	5.9% (2)
		Fracture	—	2.9% (1)	—	5.9% (2)	—	14.7% (5)	—	8.8% (3)	8.8% (3)	—	—	2.9% (1)	—
MBH04	2	Myositis ossificans	—	—	—	—	—	—	—	—	4.5% (1)	—	4.5% (1)	—	—
		Fracture	—	—	—	—	—	9% (1)	—	—	13.6% (3)	—	—	—	—
		Subluxation/ dislocation	—	—	—	—	—	9% (1)	—	—	—	—	—	—	—
OCU00	—	Myositis ossificans	—	—	—	—	—	—	—	—	5.9% (1)	—	—	—	—
		Fracture	—	—	—	—	—	—	—	—	—	—	—	—	—
REW92	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	—	—
		Fracture	—	—	—	9.1% (1)	—	—	—	—	—	—	—	—	—
RLP05	1	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	—	—
		Fracture	—	—	—	7.1% (1)	—	7.1% (1)	—	—	—	—	—	—	—
SB79	—	Myositis ossificans	—	—	—		—		—	—	—	—	—	6.2% (1)	—
		Fracture	—	—	—	6.2% (1)	—	—	—	—	—	—	—	—	—
		Subluxation/ dislocation	—	12.5% (2)	—	—	—	—	—	—	—	—	—	—	—
Total % of injuries per body location			0.5% (1)	1.6% (3)	—	6% (11)	—	4.9% (9)	1.1% (2)	2.7% (5)	4.9% (9)	—	1.1% (2)	2.2% (4)	1.1% (2)

N given in parentheses. CPR% calculated by individual site and age group and for pooled age-group data.

Table 7. Crude prevalence rate (CPR) of the distribution of injuries in 25- to 35-year-old women (N = 166) by cemetery population and body location

Site code	*N* of recidivists in age group	Injury type	Head	Face	Dentition	Ribs	Scapulae	Vertebrae	Upper arm (clavicle and humerus)	Lower arm	Hand bones	Os coxae	Upper leg	Lower leg (and patella)	Foot bones
BBP07 and PAY05	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	2.9% (1)	—	—	—
		Fracture	—	—	—	—	—	—	—	—	2.9% (1)	—	—	—	—
FAO90	—	Myositis ossificans	—	—	—	—	—	—	—	4.8% (1)	—	—	—	4.8% (1)	—
		Fracture	—	—	—	9.5% (2)	—	—	—	4.8% (1)	4.8% (1)	—	—	4.8% (1)	—
GDA06	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	—	—
		Fracture	—	11.8% (2)	—	—	—	—	—	—	—	—	—	11.8% (2)	—
LUK04	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	2.8% (1)	—	2.8% (1)	—
		Fracture	—	8.4% (3)	—	5.5% (2)	—	16.7% (6)	2.8% (1)		8.4% (3)	—	—	2.8% (1)	2.8% (1)
MBH04	1	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	—	—
		Fracture	—	—	—	5% (1)	—	5% (1)	—	—	—	—	—	—	5% (1)
OCU00	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	—	—
		Fracture	—	—	—	—	—	—	—	—	14.3% (1)	—	—	—	—
REW92	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	—	—
		Fracture	—	—	—	—	—	—	—	—	—	—	—	—	—
RLP05	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	6.2% (1)	—
		Fracture	—	—	—	—	—	—	—	—	—	—	—	—	—
SB79	—	Myositis ossificans	—	—	—	—	—	—	—	—	—	—	—	—	—
		Fracture	—	—	—	—	—	—	—	—	—	—	—	—	—
Total % of injuries per body location			—	3% (5)	—	3% (5)	—	4.2% (7)	0.6% (1)	1.2% (2)	3.6% (6)	1.2% (2)	—	4.2% (7)	1.2% (2)

N given in parentheses. CPR% calculated by individual site and age group and for pooled age-group data.

were present, they were limited to the soft tissue and therefore, not observable in skeletonised human remains.

Ante mortem fractures were the most frequently observed injury, with the highest rates seen in the ≥45-year-old category; this was the only age group with dental injuries (Table 5). This result is expected because of the cumulative nature of injuries over a lifetime (Glencross, 2011). In two ≥45-year-old women, their rib fractures may have been produced by corset wear (Walker, 2012, 275), and unsurprisingly, only women at the Royal London Hospital had peri-mortem fractures. The high rates of temporomandibular joint subluxation/dislocation reported from St Bride's crypt (SB79) are likely to be influenced by high rates of ante mortem tooth loss in this population and the greater number of ≥45-year-old women present. Only one sharp-force weapon injury was sustained by a 35- to 45-year-old woman (Table 6). Frequencies of myositis ossificans also followed the pattern seen in the fracture data, and only a few women had evidence for fracture dislocations or subluxations/dislocations (Tables 4–7).

If data from the head and face are focused on, only 12 women are affected (5.5% of all injured women), and if the cautionary words of Jurmain (2005) concerning nasal bone fractures apply, very few women in the London sample may be identified as DV victims, as much of the evidence is disputable or can be explained as resulting from other (non-) violent mechanisms. For example, in Bunhill Burial Ground (GDA06) sample, two 35- to 45-year-olds only have nasal bone fractures present (Table 6), which may have been sustained during childhood from accidental mechanisms (Anderson, 1995). In contrast, from the same site, an 18- to 25-year-old has a healed fracture to the mandibular symphysis, associated ante mortem tooth loss and malocclusion and multiple small depressed fractures to the frontal bone (Table 4), injuries much more suggestive of abuse, or indeed assault (Shepherd *et al.*, 1990). Overall, based on the body areas affected and the type of reported injuries, this case study's data conform to the range of injuries seen in victims of IT and MVC. However, there is also considerable overlap with accidental and assault patterns (Tables 2 and 4–7; Figure 2), a result also observed in the forensic literature (Reijnders *et al.*, 2006; Juarez & Hughes, 2014). This not only emphasises the need to pay greater attention to the mechanism of injury (Judd, 2004; Wedel & Galloway, 2014), as that may be more informative than body location in some instances, such as for male DV victims. It also challenges our ability to identify single versus repeat victims (Seifert *et al.*, 2007) and questions whether repeat DV victims can be distinguished from injury recidivists (Judd, 2002).

Domestic violence and associated health outcomes

In recent years, our discipline has recognised that other health variables, such as indicators of stress, frequencies of infection and metabolic diseases should be considered to be relevant to the study of trauma in past populations (Martin, 1997; Martin *et al.*, 2010; Judd & Redfern, 2012; Martin & Osterholtz, 2012; Harrod & Martin, 2014). Such a broadening of perspective brings us closer to contemporary studies of DV (Martin & Anderson, 2014b), where female victims are reported to have significantly more total health problems, hearing loss, gastrointestinal disorders, depression and central nervous system problems compared with non-abused women (Campbell, 2002; Diop-Sidibe *et al.*, 2006; Allen *et al.*, 2007; Costa *et al.*, 2015; Kamimura *et al.*, 2014), and in some countries, victims were also chronically malnourished (Rahman *et al.*, 2013).

Many of these outcomes have also been detected in victims of poverty, social and economic inequalities and colonialism (i.e. structural violence) from archaeological and historical collections (de la Cova, 2010, 2012; Klaus, 2012), reinforcing the fact that DV does not occur in isolation from other forms of violence. It also further emphasises how cautious we should be in our identification of IT and MVC victims in past societies.

It is acknowledged that many of these health conditions may not be detectable in the archaeological record through macroscopic analysis, but we should be aware that if individuals also have evidence for trauma, many of the conditions that we regard as within the expected variation (i.e. cribra orbitalia) could be associated with DV. The importance of demographic trends to understanding how trauma relates to other health conditions is also emerging, with mortality modelling refining the injury recidivist model proposed by Judd (2002), showing that people with multiple cranial injuries (Boldsen *et al.*,) and multiple injuries affecting all areas of the skeleton (Redfern & DeWitte, unpublished) die younger than their non-multiply injured peers. This begs the question whether it is possible to separate out IT and MVC victims, particularly those who are older, from those experiencing other assaults, because these victims are usually young adults (Figure 1) (see also Seifert *et al.*, 2007).

Conclusions

This article has sought to critically review the datasets used to generate models and thereby identify victims of DV in contemporary and past societies. It has shown,

through the use of a case study, that the cumulative nature of injuries over a person's lifetime combined with the influences of socio-economic status and gender, meaning that 'reading' the evidence for abuse is far from clear-cut and that in many cases, injuries may not always be caused by direct blows or indeed be regarded as being sustained in a context of violence. It has also identified that we are often failing to see male victims of DV in the past, because we are more likely to 'read' their injuries as evidence for assault.

At present, the clustering of head, face and neck injuries in young adult women appears to reflect physical violence between partners who are in IT or MVC relationships (Muelleman *et al.*, 1996; Novak, 2006; Johnson, 2008; Lau *et al.*, 2008; Brink, 2009) but not exclusively so, and this result raises issues for how middle-aged and older people, both past and present, are recognised as victims of DV rather than assault or elder abuse. These problems are recognised more widely, as there are a growing number of dissenting voices in the clinical, forensic and social science literature who are concerned about the overreliance on models and 'check-lists' of injury patterning (Engle Merry, 2009; Juarez & Hughes, 2014; Katerndahl *et al.*, 2014; Reijnders & Ceelen, 2014). Such dissenting evidence may increase as more DV studies from outside of the UK and USA are published (see also Walker, 1997), and we must question our overreliance on clinically established injury patterns rather than a broad suite of health variables when studying trauma, particularly abuse.

Changes in perspective within the wider literature give archaeology the opportunity to contribute to DV research, because archaeologically derived human remains provide a diverse temporal overview of this abuse. Above all, we must consider that abuse between partners may not be the only explanation for a person's injuries, as the importance of interpreting human remains in their context shows us time-and-again (Lessa & de Souza, 2006; Torres-Rouff & Junqueira, 2006; Borić & Robb, 2008; Robb & Harris, 2013; Geller & Suri, 2014).

It is imperative that DV is not studied in isolation from a community's notion of gender, life course and evidence for other types of violence (child abuse or warfare), and above all, we should recognise that it is often impossible to isolate the different threads that create a 'web of violence' and its traces, which are incorporated into the bodies of past people.

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