ANROWS

Landscapes

State of knowledge | March 2016

Examination of the health outcomes of intimate partner
violence against women: *State of knowledge paper*

© ANROWS 2016

Australian Government

Australian Institute of Health and Welfare

Australian Institute of Health and Welfare
GPO Box 570, Canberra, ACT 2601, Australia

Examination of the health outcomes of intimate partner violence against women: State of knowledge paper

Prepared by

Ms Miriam Lum On, Project Manager, Australian Burden of Disease Study, AIHW

Ms Julie Ayre, Analyst, Australian Burden of Disease Study, AIHW

Ms Kim Webster, Independent Consultant

Dr Lynelle Moon, National Lead Analyst, Australian Burden of Disease Study, AIHW

This commissioned work is part of the ANROWS Landscapes series. ANROWS Landscapes (State of knowledge papers) are medium length papers that scope current knowledge on an issue related to violence against women and their children. Papers will draw on empirical research, including research produced under ANROWS's research program, and/or practice knowledge.

This report addresses work covered in ANROWS research project 1.7 "The burden of disease impact of violence against women". Please consult the ANROWS website for more information on this project.

This page has intentionally been left blank.

Contents

Abbreviations

ABDS	Australian Burden of Disease Study
ABS	Australian Bureau of Statistics
aHR	adjusted hazard ratio
AIC	Australian Institute of Criminology
AIHW	Australian Institute of Health and Welfare
ALSWH	Australian Longitudinal Study on Women's Health
ANROWS	Australia's National Research Organisation for Women's Safety Limited
aOR	adjusted odds ratio
ATSI	Aboriginal and Torres Strait Islander
AUDADIS-IV	Alcohol Use Disorder and Associated Disability Interview Schedule
BDI	Beck Depression Inventory
BMI	body mass index
BoD	burden of disease
BOCSAR	NSW Bureau of Crime Statistics and Research
CES-D	Centre for Epidemiological Studies – Depression scale
CI	confidence interval
CIDI SF	Composite International Diagnostic Interview: Short Form
CTS	Conflict Tactics Scale
CVD	cardiovascular disease
DALY	disability-adjusted life years
DSM	Diagnostic and Statistical Manual of Mental Disorders
DV	domestic violence
ED	emergency department
ENT	ear, nose and throat
EPDS	Edinburgh Postnatal Depression Scale
F/U	follow-up
FM	fibromyalgia
GBD	Global Burden of Disease
GBV	gender based violence
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
HPV	human papillomavirus
ICD	International Classification of Diseases
IPV	intimate partner violence
NATSISS	National Aboriginal and Torres Strait Islander Social Survey
NZ	New Zealand
OR	odds ratio
PAF	population attributable fractions

PSS	ABS Personal Safety Survey
PTSD	post-traumatic stress disorder
RR	relative risk
STIs	sexually transmitted infections
TOP	termination of pregnancy
VAW	violence against women
WEB	Women's Experience with Battering scale
WHO	World Health Organization
YLD	years lived with disability
YLL	years of life lost

This page has intentionally been left blank.

Executive summary

Violence against women is widely recognised as a global problem that is both prevalent and has serious health, social and economic consequences. While violence against women takes many forms, the most common form, intimate partner violence (IPV), is the focus of this report. The *National Plan to Reduce Violence against Women and their Children 2010-2022* has been implemented in recognition of this issue.

This report presents a systematic review describing the evidence on the health outcomes for women who experience IPV, noting that the causal pathways are complex and subject to a rapidly growing body of knowledge.

This paper also provides a description of data sources that exist on IPV prevalence for Australian women, notably the Australian Bureau of Statistics (ABS) Personal Safety Survey (PSS) 2012, and discusses possible ways forward to address the gap in exposure data for Aboriginal and Torres Strait Islander women.

A key objective will be to inform the inputs required to produce estimates of disease burden attributable to IPV in Australia. Forty-three studies were found to have a sufficient level of evidence to include as potential inputs for the calculations of disease burden in terms of the health loss from specific diseases and injuries.

Based on these studies, the findings confirmed that there is strong evidence of increased risk due to exposure to IPV for depression, termination of pregnancy and homicide. Evidence was also found for a possible increased risk for anxiety, premature birth and low birth weight, cardiovascular conditions and self-harm. It was found that the impact of IPV exposure on alcohol and drug use disorders is bi-directional and risk should be carefully interpreted. These findings are consistent with those found in previous Australian and international burden of disease studies.

In future, where data are available, there is potential to use direct evidence to derive further Australian-specific measures of association of particular health outcomes, such as non-fatal injuries.

Several research gaps were identified, and could be used to guide future research on IPV. There is a need for further evidence of causality by establishing the temporal relationship between the exposure to IPV and health outcomes in women.

Scope of research

Research aims

This state of knowledge paper is a systematic review that aims to describe findings from literature that investigates **the causal evidence on health effects of intimate partner violence (IPV) in women.**

The aim of this report is to:

- systematically review and synthesise the evidence potentially relevant for burden of disease analysis of exposure to IPV and the associated health impacts on Australian women; and
- to be academically rigorous and include details of a repeatable search methodology and citations.

This systematic review will inform further work to produce estimates of the health impact of IPV in Australia, which will be done using the Australian Burden of Disease Study (ABDS) 2011 system that will use updated methodology based on contemporary international best practice refined to match the Australian context. This paper is the first of three documents within this project. A second paper will include the burden of disease estimates and the methodology used to derive them. A third paper will include a summary of both reports and outline implications for future policy and practice in responding to and preventing IPV.

Future reports from this project will make recommendations on the broader field of violence against women including children victimised by violence within their family, and the health impact of violence on Aboriginal and Torres Strait Islander women.

Research questions

To address the aims of the paper, a number of research questions were identified to guide this systematic review:

- What are the health impacts for Australian women aged 15 years and over from IPV?
- What data sources exist with data on IPV prevalence for Australian women generally, and also for Aboriginal and Torres Strait Islander women?
- What inputs and methods have been used to calculate the burden of disease from IPV globally?
- Which data sources, inputs and methods are most appropriate to use for burden of disease estimates of IPV in Australian women?
- Are there any data gaps (whether in regards to availability or quality) that require further investigation?

Outline of this paper

The paper is divided into the following sections:

Background: This section provides the background on the health outcomes of IPV, definitions, the significance of these health outcomes as a public health problem and how it has previously been measured in burden of disease studies. The purpose, methods and implications of burden of disease studies are also discussed.

Data sources on IPV prevalence: This is a brief summary on the range of data sources for IPV prevalence, including:

- National data sources; and
- Indigenous data sources.

Review of evidence on the health outcomes and IPV: This section describes the systematic literature review to summarise the findings on the causal pathways between IPV and health outcomes for use in burden of disease analysis. This includes:

- Context and definitions.
- Methodology (search strategy, study selection and assessment).
- Findings.

Extension topics: This section provides a brief exploration of extension topics, including health outcomes in specific sub-populations, non-partner sexual assault, dating violence and health outcomes in children witnessing IPV.

Discussion: This section provides a discussion of findings and limitations, based on the results of the literature review and the recommended next steps.

Appendix A contains a technical description of risk factor analysis in burden of disease studies.

Appendix B provides summary tables of the reviewed studies.

Background

The impact of intimate partner violence (IPV)

Violence against women is widely recognised as a global problem that is both prevalent and has serious health, social and economic consequences. While violence against women takes many forms, the most common form, intimate partner violence (IPV) (WHO, 2013), is the focus of this report.

IPV affects some 30 percent of women who have ever been in a relationship worldwide (WHO, 2013). In 2012, one in every six women in Australia reported having ever experienced physical or sexual violence by a current or former cohabiting partner (Australian Bureau of Statistics, 2013). While Australian data are limited, prevalence appears to be substantially higher among women identifying as Aboriginal and Torres Strait Islander (Aboriginal and Torres Strait Islander Women's Task Force on Violence 1999; AIHW, 2006; Australian Human Rights and Equal Opportunity Commission, 2006; Cripps, Bennett, Gurrin & Studdert, 2009; McGlade, 2012) and women with disabilities (Healy, 2013).

The UN Declaration definition (1993) of violence against women is:

> any act of gender-based violence that results in, or is likely to result in, physical, sexual or psychological harm or suffering to women, including threats of such acts, coercion or arbitrary deprivation of liberty, whether occurring in public or in private life.

This definition – which recognises that violence against women extends beyond physical and sexual forms – underpins this report. These forms of IPV have wide ranging health consequences for women, in particular mental and reproductive health problems (WHO, 2013). IPV is also a contributor to poverty (Lindhorst, Oxford & Rogers, 2007), housing insecurity (Tually, Faulkner, Cutler & Slatter, 2008), social isolation (Wright, 2012) and education and employment related difficulties (Banyard, Potter & Turner, 2011; Kimerling, Alvarez, Pavao, Mack, Smith & Baumrind, 2009; Staggs, Long, Mason, Krishnan & Riger, 2007; Flood & Fergus, 2008).

The impacts of IPV also extend to children exposed to violence against their mothers. Children so exposed are more likely to have a range of health, development and social problems, both during childhood and later in life (Flood & Fergus, 2008; Holt, Buckley & Whelan, 2008; Humphreys, Houghton & Ellis, 2008; Richards, 2011; Campo, Kaspiew, Moore & Tayton, 2014). In addition to this, these children are at a higher risk of perpetrating or being victims of violence themselves, making IPV a significant contributor to intergenerational cycles of disadvantage (Stith, Rosen, Middleton, Busch, Lundeberg, & Carlton, 2000).

Together these impacts are associated with substantial economic costs both to individual women and their children and to the wider society. International studies suggest that these costs range from between 1 percent and 2 percent of gross domestic product (KPMG, 2014). Assuming the prevalence of IPV remains unchanged from 2009 levels, its cost to the Australian economy in 2021-22 is estimated to be some $15.6 billion per annum (National Council to Reduce Violence against Women and their Children, 2009).

Preventing and reducing the impacts of violence against women is the subject of the *National Plan to Reduce Violence against Women and their Children 2010-2022*, signed by all Australian governments (Commonwealth of Australia, 2011). The plan has a particular focus on prevalent forms of violence against women. In addition to IPV, these include non-partner sexual assault and sexual harassment.

Both men and women can experience IPV and both can perpetrate it. Violence is unacceptable regardless of who perpetrates it or of the gender of the victim. The focus of this report is on violence experienced by women only. In 2012, the prevalence in the male population was lower than for women, with an estimated 5.3 percent of Australian men aged 18 years and over having reported experience of violence by a partner since the age of 15, compared with 17 percent of women (ABS, 2013). Research also shows that there are differences in the nature of IPV experienced by men and women, and that this in turn has consequences for health impacts and their measurement. In particular, violence experienced by women is more likely than that experienced by men to be frequent, prolonged and extreme (Bagshaw, Chung, Couch, Lilburn & Wadham, 2000; Belknap & Melton, 2005; Holtzworth-Munroe, 2005; Kimmel, 2002) and to involve co-occurring physical, sexual and emotional abuse (Swan, Gambone, Van Horn, Snow & Sullivan, 2012; Caldwell & Swan, 2012).

Definitions of IPV

It is recognised that IPV is broader than physical and sexual violence, and can include emotional abuse, including controlling behaviours by a partner. However, these forms of abuse are harder to measure and vary between regional and cultural settings (WHO, 2013). To date, exposure to emotional abuse has been defined and data collected separately in Australian surveys on IPV and in much of the literature. Consistent with this, Table 1 shows the definitions used in this paper which have driven the search terms included in the literature review.

It should be noted that the "definition of IPV is variable and includes formal partnerships, such as marriage, as well as informal partnerships, including dating relationships and unmarried (both defacto or non-cohabiting) sexual relationships" (WHO, 2013).

This report focuses on a narrower scope, limited to current or former cohabiting partners (i.e. excluding current or former dating relationships and boyfriend/girlfriend relationships). This is primarily to reflect the definition used by the ABS PSS 2012 which was selected as the data source to estimate the prevalence of IPV in Australia.

Table 1: Working definitions related to IPV

Term	Definition
Intimate partner violence[a]	Experience of one or more acts of physical and/or sexual violence by a current or former partner since the age of 15 years.
Physical violence[b]	Physical violence includes physical assault and/or physical threat. Physical violence is defined as: being slapped or having something thrown at you that could hurt you, being pushed or shoved, being hit with a fist or something else that could hurt, being kicked, dragged or beaten up, being choked or burnt on purpose, and/or being threatened with, or actually having a gun, knife or other weapon used on you.
Sexual violence[b]	Sexual violence includes sexual assault and/or sexual threat. Sexual violence is defined as: being physically forced to have sexual intercourse when you did not want to, having sexual intercourse because you were afraid of what your partner might do, and/or being forced to do something sexual that you found humiliating or degrading. The definition of humiliating and degrading may vary across studies, depending on the regional and cultural setting.
Emotional abuse[b]	Emotional abuse occurs when a person is subjected to certain behaviours or actions that are aimed at preventing or controlling their behaviour with the intent to cause them emotional harm or fear.
Non-partner sexual violence[a]	Experience of being forced to perform any sexual act that you did not want to by someone other than your husband/partner.

Sources:
(a) Adapted from WHO, 2013
(b) Adapted from ABS, 2013

Causal pathways and health outcomes

This section describes the broad causal pathways from exposure to IPV and the resulting adverse health outcomes.

The widely accepted definition of health is "a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity" (WHO, 1946). This definition includes mental and social dimensions and moves the focus beyond individual physical abilities or dysfunction. In light of this definition, "health loss" is the gap between the population's current state of health and what would be considered ideal population health where everyone experiences long lives free from ill-health.

Causality is a term used in epidemiology that has a number of different interpretations. A cause of adverse health outcomes (often referred to as a risk factor) can be *necessary* for an effect to occur, or *sufficient* where it initiates or subsequently produces an effect. Causes of health loss can be predisposing, enabling, precipitating or reinforcing factors (Last, 2001). All of these aspects can be seen in the case of IPV as a risk factor for health loss. The relationship between factors is often complex, with multiple causal pathways ultimately leading to ill-health and in some cases, death. Causal effects will also vary at the individual and population levels.

For a particular relationship between a risk factor and a disease to be classified as causal in epidemiological studies, a number of criteria are used to assess the relationship (Rothman & Greenland, 1998). The ones most relevant to the current study are:

- **Strength**: Aside from evidence that the presence of the risk factor increases the risk of the disease, stronger relationships are more likely to be causal. In the context of IPV and various diseases, this means that women exposed to IPV need to have higher rates of the particular disease compared with women not exposed to IPV. If the increased risk is large, this is indicative of a potential causal relationship.

- **Temporality**: It is necessary for the cause to precede the effect in time. In the case here, the exposure to IPV needs to occur before the onset of the disease.

- **Consistency**: Repeated relationships in different populations and settings are more likely to be causal. In the case of IPV, this means that the same relationship with a particular disease has been found in a number of studies.

- **Control for potential confounding**: This means that other potential explanations have been eliminated. In the case of IPV and a particular disease, it needs to be clear that the disease was not caused by a factor other than the IPV exposure.

In formal epidemiology terms, associations (also known as correlations) are often described in terms of their statistical significance. While a study may show statistically significant associations, this alone does not mean that the relationship is causal as described above. Also, where a study's results are found not to be statistically significant, this should not be misinterpreted as a lack of a relationship but rather that no evidence of a relationship was found (Kundi, 2006).

In recognition of the public health importance of this subject, the range of causal pathways between IPV and health outcomes is subject to a large and rapidly developing body of literature. However, much of the existing evidence focuses on establishing the magnitude and prevalence of IPV (documented mostly via cross-sectional studies).

The causal pathways between IPV and health outcomes can be viewed within a social determinant of health framework. "Social determinants are the circumstances in which people are born, grow up, live, work and age, and the systems put in place to deal with illness. These circumstances are in turn shaped by a wider set of forces: economics, social policies, and politics" (WHO Commission on Social Determinants of Health, 2008, p. 100). These and other structural factors, including cultural values and gender roles, play a role in the occurrence of IPV.

IPV itself can be classified as an "intermediary" determinant in the Commission on Social Determinants of Health conceptual framework (Solar & Irwin, 2010). Thus it may influence health directly (e.g. causing an injury) as well as other pathways (e.g. through its influence on other social determinants, such as reducing women's social connections or earning capacity). It may also affect health via behavioural risk factors or in interaction with other biomedical factors. For example, substance use disorders may co-exist with harmful tobacco use, thus increasing risk of lung cancer. Likewise, where an intimate partner attempts to control or limit their female partner's access to health care services or prescribed treatments, this can have indirect impacts on health outcomes. An example of this would be a woman not accessing screening services for breast or cervical cancer.

Figure 1 provides an overview of the complex pathways proposed by the World Health Organization (WHO) in its 2013 review of violence against women. These pathways can be direct, indirect or bi-directional.

Figure 1: Example causal pathways between health outcomes and IPV
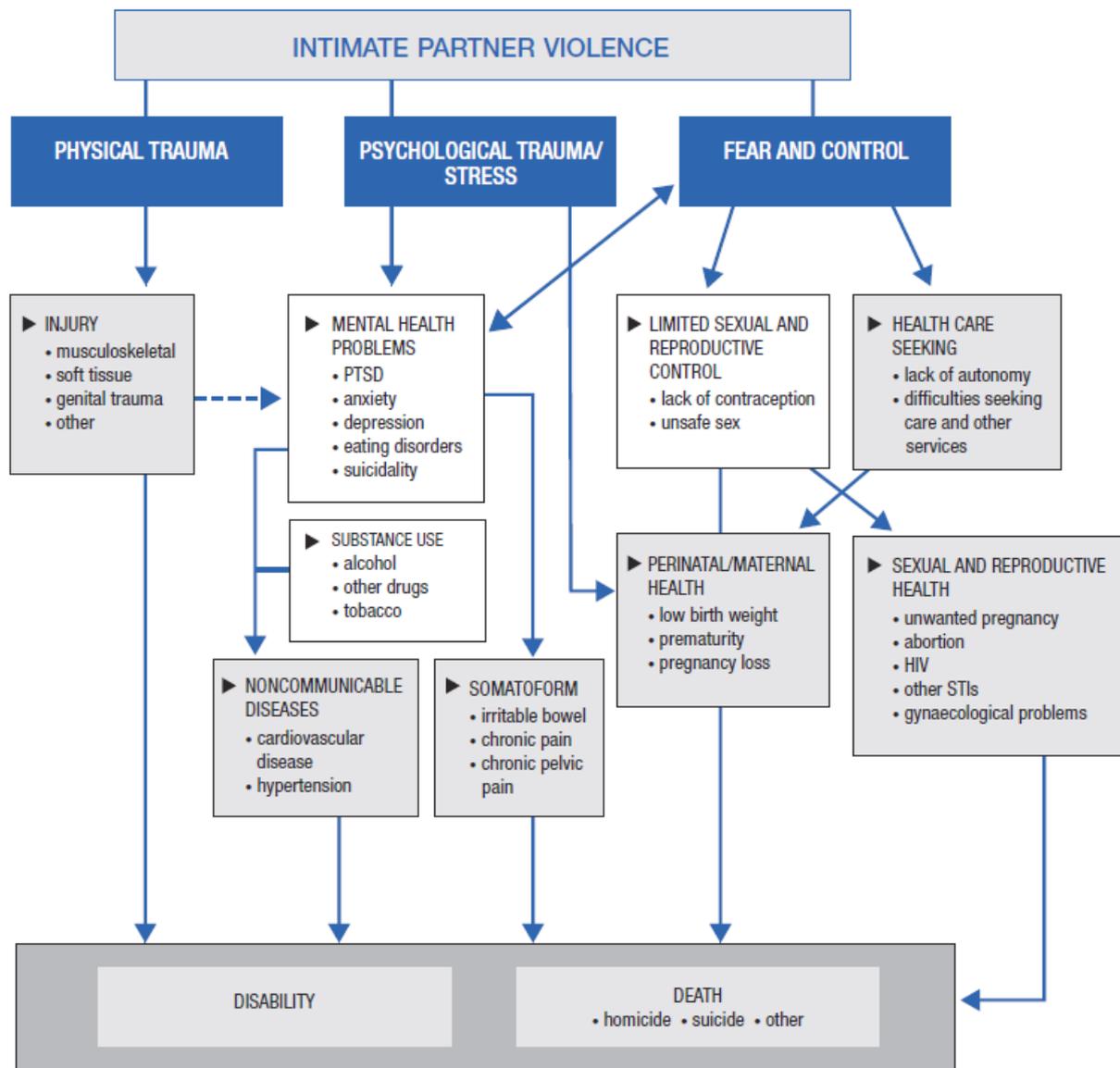
Source: WHO, 2013.

Table 2 provides a non-exhaustive list of health outcomes that have been shown to be associated with IPV, whether causally or not.

Table 2: Health outcomes associated with IPV[a]

Health outcome	Examples
Fatal	Femicide
	Suicide
	Other
Non-fatal	
Injury	Brain injury
	Loss of consciousness
	Genital trauma
	Fractures and sprains
	Lacerations, abrasions and bruising
	Self-harm
Mental health	Depression
	Anxiety
	Eating disorders
	Suicidal ideation
Substance abuse	Alcohol use disorder
	Drug use disorder
Chronic disease	Cancer
	Cardiovascular: hypertension, coronary heart disease, stroke
	Musculoskeletal: arthritis, rheumatoid arthritis, gout, lupus, fibromyalgia
Somatoform	Chronic fatigue, chronic pain, irritable bowel syndrome
Perinatal	Prematurity, low birth weight
Maternal	Antenatal complications (haemorrhage, pre-eclampsia)
	Post-natal depression
Reproductive	Abortion (medical and spontaneous)
	Gynaecological problems
Infections	HIV/AIDS
	Other STIs
Behavioural and biomedical risk factors affecting health	Unsafe sex
	High BMI
	Harmful tobacco/drug/alcohol use
Health care seeking	Lack of contraception
	Lack of autonomy
	Difficulties seeking care or other services

Source: (a) Adapted from WHO, 2013.

Intimate partner violence in burden of disease analysis

What is burden of disease analysis?

Burden of disease analysis is an internationally recognised method of assessing the impact of diseases or risk factors across a population by quantifying the resulting "health loss". As a standardised method is used, impacts of particular diseases and risk factors can be compared with one another. This provides an important basis for governments and health planners to prioritise issues and, potentially, investments. Burden of disease data can also be used to raise awareness about particular diseases or risk factors.

Understanding the population level impact of a disease or risk factor is especially important for determining whether prevention activities are warranted, in addition to responding to affected individuals. Burden of disease estimates can also be used as a basis for monitoring the relative impact of a disease or risk factor over time and are a key data source for estimating economic impacts.

Burden of disease studies can strengthen understanding of the impacts of a disease or risk factor, since a systematic approach to identifying and documenting both prevalence and particular health consequences is required to arrive at an estimate.

Burden of disease analysis measures the total health loss from diseases and injuries, including both the *fatal* impact (from dying prematurely) and the *non-fatal* impact (from living with a disease or injury). These two components are combined to provide the total disease burden. The role of various *risk factors* can also be quantified, by measuring the proportion of the disease burden due to the risk factor. It is the risk factor part of the analysis that can be used to quantify the disease burden from IPV.

There are two key advantages of using burden of disease analysis to assess the health loss from IPV in Australian women. First, it is a comprehensive and rigorous modelling technique that is accepted as the global standard for measuring the health loss from diseases and injuries. And second, it is consistently applied across all diseases and injuries and thus it enables the relative contribution to health loss from other risk factors to be compared (e.g. a person with high cholesterol or iron deficiency).

Previous burden of disease studies

IPV has been included as a risk factor in previous global and Australian burden of disease analyses. The first estimate of burden of disease associated with IPV globally was developed in Victoria by the Department of Human Services using 2001 data (Victorian Health Promotion Foundation, 2004; Vos et al., 2006). Attributable burden due to IPV was subsequently reported in the Australian Burden of Disease Study (ABDS) 2003 (Begg, Vos, Barker, Stevenson, Stanley & Lopez, 2007) and in the Global Burden of Disease (GBD) Study 2010 at an international level (Lim, Vos, Flaxman, Danaei, Shibuya & Adair-Rohani, 2012). IPV was one of 67 risk factors in the global study; it estimated that 16,794 disability-adjusted life years (DALY) for women were attributable to IPV worldwide.

Australian Burden of Disease Study (ABDS) 2011

The Australian Institute of Health and Welfare (AIHW) is currently undertaking the third ABDS. It will provide updated estimates for around 200 diseases and injuries for the reference year 2011. It will also include specific estimates for the Aboriginal and Torres Strait Islander population (AIHW, 2015).

This provides the opportunity to develop revised estimates for IPV taking into account refinements in burden of disease methodology, current data on the prevalence of IPV, and recent evidence and understanding of the health impacts of IPV specific to the Australian context. It is anticipated that the methodology developed for the 2011 estimates could be used for subsequent estimates, enabling monitoring over time.

How is the burden of disease calculated?

The key measure in burden of disease analysis is disability-adjusted life years (DALY). The DALY combines estimates of years of life lost due to premature death (YLL) and years lived with disability (YLD) to count the total years of healthy life lost from disease and injury. One DALY equals one lost year of health life. The ABDS 2011 is currently constructing YLL, YLD and DALY estimates for the nearly 200 diseases and injuries on the study's cause list.

Burden of disease risk factor analysis can then be used to estimate the proportion of the disease burden attributed to IPV. The various steps in the risk factor analysis are outlined below.

Analysis of risk factors in burden of disease studies uses a comparative risk assessment methodology, which is a five-step process:

1. Select risk-outcome pairs to be included in the analysis based on criteria about causal associations.
2. Estimate the population-level distribution of risk factor exposure.
3. Calculate the effect of risk factors on disease outcomes.
4. Define the alternative/counterfactual exposure.
5. Calculate the population attributable fraction.

The comparative risk assessment method undertaken in previous burden of disease studies can be used as a starting point for producing updated Australian IPV estimates of attributable burden. This does not, however, limit the investigation of new risk-outcome pairs or estimates of effect size. The ABDS 2003 (Begg et al., 2007) used the ABS Women's Safety Survey 1996 to estimate the prevalence of exposure to IPV and paired it with the following health outcomes:

- depression and anxiety;
- suicide and self-inflicted injuries;
- homicide and violence;
- chronic obstructive lung disease; and
- lung cancer.

Both the Victorian 2001 and ABDS 2003 studies applied the same relative risks based on analyses of the Australian Longitudinal Study on Women's Health (ALSWH).

To maximise their use, the Global Burden of Disease (GBD) Study 2010 selected risk-outcome pairs according to criteria that assessed (Lim et al., 2012) the likely disease burden and policy relevance; data availability; the strength of evidence for causal effect; and how generalisable the effect sizes were across populations globally.

Subsequently, the GBD 2010 study used relative risks from a systematic review and meta-analysis of the association between IPV and depression outcomes in women (Beydoun, Beydoun, Kaufman & Zonderman, 2012) and paired IPV with the following health outcomes:

- abortion;
- unipolar depressive disorders;
- intentional self-harm; and
- interpersonal violence.

Note that there are variations in the diseases and injuries specifically included in the various burden of disease studies. These differences can be small, such as in the labelling used (e.g. "self-inflicted injuries" to "intentional self-harm"), or in the grouping of the diseases (e.g. separating burden from depression and anxiety), or changes to how injuries are captured. These changes tend not to impact analysis at a disease group level, but can mean that comparison between studies may not be valid.

Further technical details on this can be found in Appendix A.

Box 1 provides a list of key concepts and terms used in burden of disease analysis.

Box 1: Key terms used in burden of disease analysis

Attributable burden[a]: The disease burden attributed to a particular risk factor. It is the reduction in burden that would have occurred if exposure to the risk factor had been avoided.

Cause list [a]: The specific conditions and causes of injury for which estimates are made.

Confounding factor: Factors that can cause or prevent the outcome of interest, are not intermediate variables, and are associated with the factor(s) under investigation.

DALY (Disability-adjusted life year) [a]: A year of healthy life lost, either through premature death or equivalently through living with disability due to illness or injury.

Exposed[c]: A group of people who have been exposed to a cause of disease or health state of interest or possess a characteristic that is a determinant of the health outcome of interest.

Health loss[b]: Health loss is the gap between the population's current state of health and that of an ideal population in which everyone experiences long lives free from ill health or disability. Health loss is estimated using a measure called the DALY (see above).

Morbidity[a]: Refers to ill health in an individual or in a population or group

Mortality[a]: Death

Prevalence[a]: The number or proportion (of cases, instances, and so forth) in a population at a given time.

YLD (Years lived with disability) [a]: Measures the years of what could have been a healthy life that were instead spent in states of less than full health.

YLL (Years of life lost) [a]: Years of life lost due to premature mortality.

Sources:
(a) Adapted from AIHW (2014)
(b) Adapted from NZ MoH (2013)
(c) Adapted from Last (2001)

Data sources on IPV prevalence

Data sources on national IPV prevalence

As part of ABDS 2011, exposure to IPV data will be sourced from the 2012 ABS Personal Safety Survey (PSS). It provides nationally representative, high-quality data on women who report exposure to IPV. The PSS was also conducted in 2005, largely based on the design of the earlier Women's Safety Survey. The definitions used in the PSS are generally consistent with those used in the 2010 Global Burden of Disease (GBD) study 2010 and the WHO (2013) estimates of violence against women.

Despite efforts to limit sampling error and use of robust methods to administer the survey, the information recorded in the ABS PSS 2012 is sensitive in nature and is reliant on a respondent's self-report of their feelings of safety and assault victimisation.

The 2012 ABS PSS does not include dating (boyfriend/girlfriend) relationships within the definition of partner, but the survey does include them as a type of perpetrator. The relationships that do not involve living together may have variable levels of commitment and involvement. For example, this will include persons who have had one date only, regular dating with no sexual involvement, or a serious sexual or emotional relationship. While it is noted that these relationships are not captured in the prevalence data, dating relationships are included within the scope of this literature review. Discussion on non-partner sexual assault and dating violence is included in *Extension topics*.

The scope of the PSS 2012 survey was persons aged 18 years and over, however it asked respondents about their personal exposure to IPV from the age of 15 years. Urban and rural areas in all states and territories were included in the survey, except for very remote areas of Australia. There were 30,200 private dwellings included in the survey, with 17,050 persons participating nationally.

Data sources on IPV prevalence in Aboriginal and Torres Strait Islander women

There are few national exposure data available on the prevalence of IPV in the Indigenous population, as the ABS PSS 2012 did not collect data on the Indigenous status of respondents. In 2006, AIHW surveyed potential data sources to assess whether they could provide reliable estimates of the prevalence of IPV and at that time found that there were no national surveys that included questions corresponding closely to IPV that also sampled a sufficient number of Aboriginal and Torres Strait Islander people to produce reliable estimates (AIHW, 2006). Identifying data sources is particularly problematic given that definitions of "family" and "domestic" violence may be broader in the Indigenous context. According to the 2013 National Community Attitudes towards Violence Against Women Survey (NCAS), Indigenous women were more likely than non-Indigenous women to believe that violence against women is common (90% and 76%, respectively) (Webster et al., 2014). The survey also reported that Indigenous men were more likely to report violence-supportive attitudes than non-Indigenous men were. However, when the level of disadvantage was adjusted for, this result was only evident among disadvantaged Indigenous men (Webster et al., 2014).

Since the AIHW (2006) report was published, the ABS National Aboriginal and Torres Strait Islander Social Survey (NATSISS) 2008 collected information on Indigenous women's exposure to IPV (ABS, 2009). It should be noted that the NATSISS did not ask about IPV in the same manner as the 2012 PSS and therefore cannot produce comparable prevalence estimates. Most importantly, the NATSISS asked respondents to reflect only on the most recent instance of violence when asking about the perpetrator's relationship. As such, the IPV prevalence reported by the NATSISS captured only women whose most recent violence victimisation (in the preceding 12 months) involved a current or previous partner. By contrast, IPV prevalence as measured by the PSS captured women who had experienced violence by a current or previous partner at any point since the age of 15 or in the last 12 months. In addition, the NATSISS only asked about physical violence (including threats of physical violence)—sexual violence was not incorporated so the more complete definition of IPV cannot be derived.

Analysis of the 2008 NATSISS indicated that, among Indigenous women who had been exposed to physical violence in the

previous 12 months, 21 percent reported that the most recent instance of physical violence was perpetrated by a current partner, and 12 percent by a previous partner (ABS, 2009). This excludes (ex-) boyfriends, (ex-) girlfriends and dates. Although these results are not directly comparable to the ABS PSS, they do provide evidence that IPV is a concern in the Indigenous population, and provide a national exposure data source.

Another potential data source is the 2008–2009 ABS Crime Victimisation Survey (ABS, 2010) which also captured data on a national level. The IPV-relevant survey questions were similar to those in the NATSISS, also capturing physical assault and the relationship to the perpetrator. This may allow for a more appropriate comparison between the Indigenous and national populations.

Service utilisation data (e.g. hospitalisations, community health service data and police reports) are also a potential source of data which may provide a proxy means of deriving the prevalence of IPV in Aboriginal and Torres Strait Islander women. These data may provide some insight into the relative frequency of Indigenous and non-Indigenous IPV episodes of violence. It should be noted however that Indigenous status may be under-reported in these data collections. In addition, service utilisation data captures more severe episodes of IPV and are less likely to include instances in which psychological or emotional abuse has taken place in the absence of physical and sexual IPV.

Analysis by the Australian Institute of Criminology (AIC) indicated that for the period 2008– 2010, 42 percent of Indigenous homicides involved an intimate partner, compared to 20 percent of non-Indigenous homicides (Chan & Payne, 2013). This pattern of results is also evident in assault data. The NSW Bureau of Crime Statistics and Research (Grech & Burgess, 2011) reported that the rates of domestic assault, over a 10 year period between 2001–10, were about six times higher for Indigenous women (3,275 per 100,000) than for non-Indigenous women (544 per 100,000) (2011). Similarly, in 2003–04 the rate of hospitalisation for assault related to family violence in Qld, WA, SA and NT hospitals (excluding private hospitals in NT) was higher for Indigenous Australians than for other Australians (AIHW, 2006).

Further investigation is required to determine the most appropriate source of IPV prevalence data for Aboriginal and Torres Strait Islander women. This would include further examination of the 2008 NATSISS data for required disaggregation (e.g. reliability of estimates by age and sex); as well as sensitivity analyses using the proxy approaches suggested, to look at their impact on resulting IPV prevalence rates for Indigenous women, and how these compare to the results from the NATSISS.

Review of evidence on health outcomes and IPV

Context of this literature review

Given the importance of acknowledging and addressing IPV as a problem within the Australian population health context, a systematic review was undertaken to explore and summarise the available evidence on the causal pathways between IPV and health outcomes. The purpose of this was to identify and assess potential evidence for use in burden of disease analysis to produce updated estimates for Australian women aged 15 years and above.

Methodology

Search strategy

To ensure that the review of literature for this report was robust and repeatable a search strategy was defined to cover IPV, health outcomes and the association between them. The search strategy for the formal literature review started with a search of bibliographic databases that cover a wide range of health and sociological research areas for relevant articles. A broad search of these sources was undertaken using a standardised selection of search terms (Table 3).

These search terms ensured that articles could be identified by alternative terms, whilst also limiting the search to a manageable number of results.

The following databases were used:
- ANROWS resources database;
- Medline;
- CINAHL;
- PsychINFO; and
- ProQuest.

Further, a search of grey literature (unpublished) was conducted.

Other literature was sought by considering the reference lists of articles that met selection criteria, as well as articles that have cited the studies that met selection criteria. Searches were conducted to identify government reports on this topic.

Table 3: Search terms [a]

IPV	Health outcome	Risk factor
"domestic violence" OR "DV"	health OR pain OR discomfort OR illness* OR condition* OR disability	predict*
"intimate partner violence" OR "IPV"	depress* OR affective OR mood	risk*
"partner violence"	anxiety OR "phobia" OR GAD OR "generalised anxiety disorder" OR "generalised anxiety disorder" OR "panic" OR PTSD OR "post-traumatic stress disorder" OR OCD OR "obsessive-compulsive disorder"	burden
"gender-based violence" OR "gender based violence" OR GBV	(illicit drug OR tobacco OR alcohol) AND ("harmful use" OR dependence OR abuse OR disorder)	longitudinal
"violence against women" OR VAW	"eating disorder" OR anorexia OR bulimia OR obesity OR "overeating"	effect*
"dating violence"	mental OR disorder*	outcome*
"emotional abuse"	"pregnancy loss*" OR abortion or "foetal death" OR "fetal death" OR prematur*	consequence*
"family violence"	STI OR STIs OR "sexually transmitted infection*" STD* OR "sexually transmitted disease*" OR HPV OR "cervical cancer"	impact*
("physical assault" OR violence OR threat* OR aggression) AND (partner* OR married OR marital OR dating OR couple* OR spouse* OR husband* OR wife OR wives OR boyfriend OR girlfriend)	Injur* OR "self-harm" OR "suicide" OR "emergenc" OR "hospital" OR fall* OR femicide OR homicide OR "musculo-skeletal" OR musculoskeletal	
(rape OR "sexual assault") AND (partner*+ OR married OR marital OR dating OR couple* OR spouse* OR husband* OR wife OR wives OR boyfriend OR girlfriend)		

(a) Use of asterisks* allow slight variations in spelling of search terms, for example the use of plurals.

Screening process

This section outlines the screening process and the selection process applied to the search of the bibliographic databases.

To start, duplicate entries in the search results between the bibliographic databases were removed. Books, theses, chapters and conference paper abstracts were not included.

Titles and abstracts of papers were screened to determine if they related to the burden of disease associated with IPV. This was undertaken separately by two independent team members to limit bias. Disagreements were discussed and resolved. All studies were sorted into four preliminary categories:

1. **Direct evidence:** Articles that provided direct evidence on inputs or data sources that can be used to calculate the burden of disease from IPV.

2. **Indirect evidence:** Articles that provided evidence on health outcomes and IPV (e.g. study related to health outcomes not defined as a cause within burden of disease analysis).

3. **Extension:** Articles that provided evidence on extension subject areas/data gaps (e.g. non-partner sexual assault and children victimised by IPV).

4. **Excluded:** Articles that have been excluded due to screening criteria (e.g. study based on low-income country population or on a topic outside the scope of the report).

Full text papers from the direct evidence category, in addition to papers and report from grey literature that appeared to meet the inclusion criteria were read to determine eligibility for full assessment. Those studies that were screened as indirect and extension underwent a shorter review for broader assessment. Papers that appeared relevant but were inaccessible (e.g. due to copyright issues) were noted but not assessed.

Inclusion criteria to screen papers

Language

Only studies written in English were included.

Relevance of region

Ideally, studies should refer to populations that are generalisable to the **Australian population**. Therefore, only studies from **high-income countries** were included. WHO defines high-income countries as Australia, Canada, Croatia, Czech Republic, Denmark, Finland, France, Germany, Hong Kong, Iceland, Ireland, Israel, Japan, Netherlands, New Zealand, Norway, Poland, South Korea, Spain, Sweden, Switzerland, United Kingdom of Great Britain and Northern Ireland, United States of America (WHO, 2013).

Currency of literature

Where possible, studies with data collected or relating to periods of time **after 2001** were included. This also aims to ensure consistency with the data used in the ABDS 2011.

Target population

Again, to maintain consistency, a study met the selection criteria if the **majority of the sample are women** aged 15 years or older, noting that many articles document impacts on both adult men and women. Estimates had to be generalisable across the population; however, it is acknowledged that specific sub-populations could be more vulnerable to IPV and have differing levels of exposure (e.g. women with disabilities, military service women).

Key terms

Studies had to include content related to the research questions, determined via the inclusion of the key terms.

Categorisation and assessment of papers

According to the agreed methodology, only studies providing direct evidence that demonstrated a convincing predictive/causal relationship between IPV and health outcomes can be used in burden of disease analysis. The GBD Study 2010 used the World Cancer Research Fund (American Institute for Cancer Research, 2007) grading system to clarify the levels of evidence (see Box 2). These levels of evidence were used to guide assessment of the papers and ensure consistency with the current Australian Burden of Disease Study.

Direct evidence

Studies were assessed for the quality of the study design, their accessibility and timeliness, credibility, representativeness and sources of bias or error.

Study design

To assess/quantify the causal relationship between IPV and health outcomes only studies that measured the outcomes following exposure were included. (Due to the nature of the subject matter of IPV, randomised controlled trials are rare). Ideally, study design should be cohort (longitudinal). See Box 3 for definition of terms relating to study design.

Comparability

Studies needed to use definitions of IPV that were comparable with those defined within the scope of the state of knowledge paper. There were three options of comparability:
1. consistent if the definition was the same as the reference definition;
2. comparable if the definitions could be aligned; and
3. inconsistent if the definitions were different and could not be aligned.

Credibility

Studies should be undertaken by a credible institution such as a national or state/territory statistical agency or a recognised university or research organisation. For epidemiological studies, ideally, estimates from the data source were published and peer-reviewed. There were four options for credibility:
1. published and peer-reviewed;
2. published and not peer-reviewed;
3. not published and peer-reviewed; and
4. not published and not peer-reviewed.

Accessibility/timeliness

Studies had to be able to be available to the reviewers in sufficient time for analysis. This criterion identified issues of accessibility, and assisted with prioritisation of studies where such issues exist.

To be considered as direct evidence, a study must have provided information on any one of the key data inputs for risk factor analysis: risk-outcome pairs or effect sizes. Studies had to clearly demonstrate a temporal relationship between exposure to IPV and the outcome, and adjust for confounders.

Indirect evidence

This category included studies that provided evidence that was based mainly on findings from cross-sectional studies or studies that are not generalisable to the target population, such as observations from clinical investigations. These studies have been referred to in the findings and discussion, however are unlikely to be directly used as inputs to the burden of disease analyses.

Box 2: Levels of evidence used by GBD 2010[a]

Convincing evidence

Evidence based on epidemiological studies showing consistent associations between exposure and disease, with little or no evidence to the contrary. This available evidence is based on a substantial number of studies including prospective observational studies and where relevant, randomised controlled trials of sufficient size, duration and quality showing consistent effects. The association should be biologically plausible.

Probable evidence

Evidence based on epidemiological studies showing fairly consistent associations between exposure and disease, but for which there are perceived shortcomings in the available evidence or some evidence to the contrary, which precludes a more definitive judgment.

Possible evidence

Evidence based mainly on findings from case-control and cross-sectional studies. Insufficient randomised controlled trials or observational studies available. Evidence based on non-epidemiological studies, such as clinical or laboratory investigations are supportive.

Insufficient evidence

Evidence based on findings of a few studies, which are suggestive, but insufficient to establish an association between exposure and disease. Little or no evidence is available from randomised controlled trials. More well designed research is needed to support the tentative associations.

Source:
(a) Adapted from Lim et al. 2012.

Box 3: Definitions of epidemiological studies

Case-control study[a] – An observational study which compares health outcomes between cases (people with a specified disease, chronic condition, or type of injury) and controls (people without the disease, condition or injury). Subjects are selected on the basis of their disease/injury status with data on previous exposures/risks then collected.

Cohort study[b] – An observational study which follows a group of people (a cohort) who are initially free of the outcome of interest over a period of time. The rate at which those with a particular exposure develop the outcome of interest can be compared to those without that exposure. Cohort studies can provide strong information about the causation of the outcome of interest and the most direct measures of the associated disease risk.

Cross-sectional study[c] – A study that examines the relationship between disease (or other health state) and other variables in a specific population at one particular point in time. This type of study generally cannot determine the temporal relationship of cause and effect.

Effect size or measure[c] – A statistical measure that quantifies the effect of a factor on the magnitude or frequency of a health outcome. Many statistical measures are effect sizes, for example, the odds ratio and the relative risk.

Epidemiological study[c] – A study that investigates the distribution and contributing factors of a health-related state or event in specified populations. This type of study includes, for example, cohort studies, case-control studies, cross-sectional studies and randomised control trials.

Meta-analysis[c] – A synthesis of results from individual but comparable studies. Statistical methods are used to calculate a pooled effect size which takes into account differences in sample sizes and event rates across the studies.

Odds ratio (OR)[d] – A particular statistical measure of association between an exposure and health outcome that represents the ratio of two odds. For example, the ratio of the odds of becoming ill to the odds of remaining well.

Relative risk (RR)[e] – Another statistical measure of association between an exposure and health outcome that quantifies the magnitude of the increased risk associated with the particular exposure of interest. It is calculated as the ratio of the risk of the disease among the exposed group to the risk in the unexposed group.

Sources:
(a)   Adapted from CDC (2015) and Beaglehole, Bonita & Kjellström (1993)
(b)   Adapted from Beaglehole, Bonita & Kjellström (1993)
(c)   Adapted from Last (2001)
(d)   Adapted from CDC (2015) and Moon & Gould (2000)
(e)   Adapted from Beaglehole, Bonita & Kjellström (1993) and Moon & Gould (2000)

Inclusion in extension

This category included studies relating to:

- health outcomes in children that are associated with victimisation or witnessing of IPV; and
- non-partner sexual assault.

These papers contribute to the identification of data gaps in evidence, but will not be directly used in the final burden of disease analyses.

The number of papers included in each step of the review process was formatted into a flowchart figure for ease of description (see Figure 2).

Figure 2: Flowchart of review process - identification, screening, eligibility and findings

IDENTIFICATION
- 8165 studies identified through databases
- 829 duplicates removed
- 12 studies identified through grey literature/handsearching

SCREENING
- 7336 titles and abstracts screened for inclusion
- 7274 assessed as excluded/extension/indirect evidence
- 2 inaccessible

FINDINGS
- 70 assessed as direct evidence
- 43 included as potential inputs to BoD analysis

Findings

Selection of studies

A total of 7336 abstracts were independently screened. Additionally, a number of meta-analyses were also investigated to ensure all relevant articles were identified. Upon agreement between the two reviewers, 70 papers/reports were identified as potentially being grouped as "direct evidence" and obtained for a full-text review. Two were excluded, as they were not available for review.

Forty-three studies were identified as potential inputs to calculations of the disease burden caused by IPV in terms of the health loss from specific causes. This section presents the findings from the systematic review and summarises the details of the studies.

Of the 70 studies reviewed, cross-sectional, case-control and cohort studies were broadly included, as well as a number of systematic reviews that had undertaken further meta-analyses to derive pooled effect sizes. Although the literature search focused on studies with a publication year from 2001, the data collections that these studies relate to spanned back to 1987.

Of the studies, 29 used the preferred longitudinal cohort design. Most of the cohort studies adjusted for confounding variables, and provided an odds ratio as the measure of the association between IPV and the health outcome. This compares the odds of the outcome in an exposed group with the odds of the same outcome in an unexposed group. An odds ratio can be considered largely equivalent to a relative risk in some circumstances, however this can be misleading if the prevalence of the health outcome is high within the sample. This is a noteworthy problem, as for many of the studies relating to depression, prevalence was found to be greater than 10 percent of the sample. Conversely, for health outcomes that are (relatively) rare, such as preterm births, this is not a problem.

Of the 43 studies, a small number (6) were Australian population specific, with the vast majority coming from American and Canadian studies. Encouragingly, even with the small number of Australian studies, all of these were of cohort design. Despite being the strongest form of evidence of a causal association, cohort studies also had limitations. Due to the nature of IPV, it is harder to retain women who are experiencing IPV in longitudinal studies, and thus loss to follow up was a problem in some cases.

Methodological considerations

General study design

Sample sizes ranged between 358 and 254,282 participants, with over 65 percent of selected studies having a sample size greater than 1000. The age range of the population was important to consider and had to align with the population of interest (15 years and up). As a guide, if a study had a sample of more than 500 it was considered appropriate for most health outcomes. Likewise, some studies, while undertaken in high-income countries, focused on women from low-income (e.g. women recruited in homeless shelters) or particular ethnic minorities (e.g. Spanish speaking Latinas in the United States).

While some of the selected studies had relatively large sample sizes, most of those had a cross-sectional design that, while providing a prevalence ratio, did not generally allow for establishing a temporal relationship between IPV and health outcomes. Additionally, recall bias in cross-sectional studies can preclude them from use in burden of disease analysis. For example, one study asked women to recall IPV during pregnancy and associated birth outcomes up to 20 years following the event (Coker, Sanderson & Dong, 2004). Demonstrating the temporal aspect of exposure is critical to assess baseline IPV exposure and subsequent health outcome. For example, whether exposure was captured by the measure/scale as lifetime ("ever exposed") or within the last 12 months or within a specific period ("during pregnancy"). These temporal factors are best tested through longitudinal cohort studies; however, these also require a large amount of resources over time.

Measuring the health outcomes

For some studies, there were differences between measurement of the health outcome or its definition. Some studies measured symptoms or harmful use, while others used clinically diagnosed disease. For example, the study by Exner-Cortens, Eckenrode and Rothman (2013) found teenage victims of psychological IPV to be at increased risk of heavy episodic drinking. However, this is not necessarily a clinically diagnosed alcohol use disorder or dependence and this should be carefully considered before applying these results as a proxy. Inclusion of a study in this review also discriminated on the reliability of the measure used to identify the health outcome (for example, clinical confirmation of diagnosis versus self-reported). This was especially noticeable in studies on mental health outcomes.

Measuring IPV

The most common measure of IPV used by studies in the current review is the Conflict Tactics Scales (CTS; Straus, 1979)

and its revised form (CTS2; Straus, Hamby, Boney-McCoy & Sugarman, 1996). These are the most widely used measures of self-reported IPV and are used extensively internationally (WHO, 2013). The CTS2 includes separate scales for physical assault, psychological aggression, negotiation, injury and sexual coercion; the last two of these were absent in the original version of the scale, however it does not measure control (Dekeseredy, 2000). Importantly, the items focus on specific acts of violence such as being slapped, punched, kicked or hit with an object. This avoids issues regarding differences in how individuals might classify behaviour as violent (Devries et al., 2013). It should be noted that few identified studies using this scale reported on psychological aggression as distinct from physical and sexual abuse.

The Abuse Assessment Screen (Norton, Peipert, Zierler, Lima & Hume, 1995) and the Women's Experience with Battering (WEB) scale (Smith, Earp & DeVellis, 1995) were also used. Similarly to the CTS2, the Abuse Assessment Screen asks about specific acts of emotional, physical and sexual abuse, but focuses solely on abuse during pregnancy. By contrast, WEB does not ask about specific acts of violence and instead assesses women's emotional responses to battering and perceptions of susceptibility to IPV.

The current review also identified numerous "adaptations" of the CTS2 scales. Although these were originally based on an instrument that has a considerable body of supporting research, it is difficult to ascertain the extent to which such alterations may have reduced the reliability and validity of these "new" measures. Crucially, all of the above measures are self-reported and thus susceptible to external factors such as whether the respondent felt they had sufficient privacy whilst completing the questionnaires. Another source of measurement of IPV is hospital medical records that indicate whether partner abuse was involved in an external injury and coded using the *International Classification of Disease and Injury*. Although these cases are clinically determined, it is important to consider that this measure is also ultimately reliant on disclosure of abuse.

Systematic reviews

A number of the studies were systematic reviews that conducted meta-analyses to generate pooled odds ratios. The WHO (2013) estimates of violence against women were based on relative risks derived in a number of unpublished meta-analyses. These meta-analyses were based on a broad review of literature, however as their scope was global, many of the studies focused on women in developing countries. To illustrate, for HIV and other sexually transmitted infections the authors identified five relevant cohort studies. Of these, only one study was based on a sample in a high-income country (which was El-Bassel, Gilbert, Wu, Go, & Hill, 2005). A similar approach was used for the GBD 2010 study, where only one Australian study was used in the meta-analysis undertaken by Beydoun and colleagues (2012). This calls into question the applicability of the WHO and the GBD study relative risks in the Australian context for this risk factor that may have strong socio-cultural influences.

Other considerations

There are limitations to using studies that were based on service utilisation data (e.g. hospitalisations or emergency department presentations) as they generally only represent those seeking healthcare at the most severe end of exposure to IPV. In most cases, this is likely to lead to an over- or under-estimation of the association within the total population. An example of this is a retrospective cohort study that compared emergency department presentations for self-harm amongst victims of IPV and other emergency department patients (Boyle, Jones & Lloyd, 2006). This study found that patients suffering domestic assault were more likely to present with self-harm than controls (RR 3.6, 95% CI 2.1-6.5). However, the study was not able to demonstrate a temporal association between the self-harm and domestic assault presentations.

Lastly, confounding factors that can cause or prevent a health outcome of interest and are associated with the factor under investigation should have been controlled for in studies. For example, in studies looking at depression associated with IPV, a woman's previous history of depression should be adjusted for to ensure that the health effect is due to the IPV. Other common examples of confounders are childhood sexual abuse, childhood maltreatment, socioeconomic status, and age.

Health outcomes

The following section is a summary of the evidence found during the literature review. The main health outcomes have an adjoining table in Appendix B with detailed tables of the assessed studies. Table 4 below summarises the findings for each of the health outcomes.

Table 4: Summary of findings on strength of evidence by health outcome

Health outcome	No. relevant studies	Level of evidence that IPV may result in the health outcome amongst Australian women
Depression	16	Convincing
Termination of pregnancy and spontaneous abortion	6	Convincing
Homicide	2	Convincing
Anxiety	3	Probable
Self-harm and attempted suicide	4	Probable
Postnatal depression	6	Possible
Preterm and low birth weight	9	Possible
Cardiovascular	2	Possible
Alcohol use disorder	9	Possible (may be bidirectional)
Drug use disorder	7	Possible (may be bidirectional)
Assault	1	Possible (with further additional analysis of hospital separations)
Antepartum haemorrhage	2	Possible
All other perinatal outcomes	5	Insufficient
Other mental health	2	Insufficient
HPV and cervical cancer	–	Insufficient
Diabetes	–	Insufficient
Musculoskeletal	–	Insufficient
Insomnia	–	Insufficient

Mental health outcomes

Depression

There is a substantial body of research, including systematic reviews and meta-analyses, on the association between depression and IPV (see, for example, Devries et al., 2013; Beydoun et al., 2012; Lagdon et al., 2012; Trevillion et al., 2012, Golding 1999). Sixteen studies were identified (Table B1), which differed in several important ways, such as the measure of depression, sample size, age and covariates. The literature suggests there is a strong link between childhood abuse and IPV, as well as between childhood abuse and depression (Devries et al., 2013). As such, this is an important covariate to include in the analysis, along with other confounders such as age, socioeconomic status and prior history of depressive symptoms. Some studies excluded participants with a history of depression to ensure that only new cases of depression were captured, or controlled for previous depression in their analysis. Overall, most studies found that IPV increased the risk of subsequent depression. This includes two Australian studies, both using the Australian Longitudinal Study on Women's Health (ALSWH), with one including 4 year follow-up data (Taft & Watson, 2008) and showing an odds ratio of 2.06 (1.74–2.43). Only three studies did not find evidence of a relationship between IPV and depression (Chuang, Cattoi, McCall-Hosenfeld, Camacho, Dyer, & Weisman, 2012; Exner-Cortens et al., 2013; and Rich, Gidycz, Warkentin, Loh & Weiland, 2005).

This review found 16 studies providing evidence on the link between IPV and depression in scope of this study on the burden of disease due to IPV in Australian women.

Postnatal depression

Several large studies focused on postnatal depression, as a distinct mental health issue (Table B2) and found evidence of an association between IPV and depression specific to women in and around pregnancy. Postnatal depression has not been incorporated as a stand-alone cause into a burden of disease study to date. However, further work may be justified to determine the best approach for incorporating this into burden of disease analysis, taking into account any overlap with the depression estimates.

This review found six studies providing evidence on the link between IPV and postnatal depression in scope of this study on the burden of disease due to IPV in Australian women.

Anxiety

The current review identified three studies that provided evidence of the impact of IPV on subsequent anxiety disorders

(Ehrensaft, Moffit & Caspi 2006; Okuda, Olfson, Hasin, Grant, Lin & Blanco, 2011; Vos et al., 2006). Details of these studies are provided in Table B3, noting that anxiety disorders were controlled for in the same manner as depressive disorders. Each of the studies reported that IPV significantly predicted subsequent anxiety disorders, with adjusted odds ratios of 2.3 (95% CI 1.8–2.9) (Okuda et al., 2011) and adjusted rate ratios of 1.83 (95% CI 1.36–2.47) (Vos et al., 2006). Ehrensaft and colleagues (2006) reported adjusted odds ratios separately for post-traumatic stress disorder (aOR = 6.42, 95% CI 2.28–18.04) and generalised anxiety disorder (aOR = 2.70, 95% CI 0.92–7.92).

This review found three studies providing evidence on the link between IPV and anxiety in scope of this study on the burden of disease due to IPV in Australian women.

Alcohol use disorder

Devries and colleagues (2014) conducted a meta-analysis of the literature on alcohol use and physical/sexual IPV victimisation. The authors concluded that these behaviours are strongly associated with each other and that there is some evidence for bi-directionality (that is, that alcohol use predicts subsequent IPV *and* IPV can predict subsequent alcohol use). Five studies were included in the meta-analysis for the impact of IPV on alcohol use, resulting in a combined odds ratio of 1.25 (95% CI 1.02–1.52). Authors also discussed that few studies controlled for partner drinking, baseline levels of IPV and drinking behaviour.

By contrast, the present review focused on the impact of IPV and subsequent alcohol use (Table B4). A key feature of these studies is that the outcome variable tended to focus on heavy episodic drinking; with only two studies applying diagnostic criteria (Ehrensaft, Moffit & Caspi, 2006; Okuda et al. 2011). The latter was a large nationally representative study of US adults with a cross-sectional design. An incidence rate was calculated by separating persons whose alcohol dependence had started during the year from those who had a history of alcohol dependence before this period. This provides stronger evidence than other cross-sectional analyses, although not as strong as in a longitudinal designed study. Longitudinal studies were also identified although not using diagnostic criteria for the outcome variable. Results were inconsistent, with some studies reporting no significant differences in alcohol use before and after exposure to IPV.

This review found nine studies providing evidence on the link between IPV and alcohol use disorders in scope of this study on the burden of disease due to IPV in Australian women.

Drug use disorder

The current search of the literature identified seven studies examining the impact of IPV on drug use (excluding alcohol and tobacco) (Table B5). As was the case for alcohol, few of these used diagnostic criteria. This is particularly important for drug use as there was substantial variability in definitions of use. For example, Ackard, Eisenberg and Neumark-Sztainer (2007) defined marijuana use as more than weekly, whereas Simmons, Knight and Menard (2015) defined this as more than once in the previous 12 months. Okuda and colleagues (2011) found that IPV predicted incident drug use disorders (aOR= 3.8, 95% CI 2.3–6.1) in the United States. These were assessed according to the alcohol use disorder and associated disability interview schedule (AUDADIS-IV). A smaller study in New Zealand also found evidence of a relationship between marijuana dependence and IPV (Ehrensaft, Moffit & Caspi, 2006).

This review found seven studies providing evidence on the link between IPV and drug use disorders in scope of this study on the burden of disease due to IPV in Australian women.

Other mental health outcomes

The study by Ouellet–Morin, Fisher, York-Smith, Fincham-Campbell, Moffitt, and Arseneault (2015) (described in Table B1), also investigated women who reported at least one psychotic symptom according to the Psychosis Screening Questionnaire. Although this was not intended to be diagnostic of a psychotic disorder, the results indicated that there was some association between partner violence and subsequent psychosis spectrum symptoms (aOR= 2.75, 95% CI 1.33–5.65).

The study by Okuda and colleagues (2011) was the only study that considered bipolar disorder (see summary of the study in Table B4). This study reported that persons who were victims of IPV were significantly more likely to meet criteria for Bipolar I, even after adjusting for demographic and socioeconomic variables (aOR = 2.5, 95% CI 1.4–4.2).

As these results are from a small number of studies, they are not considered sufficient evidence on which to base burden of disease estimates.

Maternal and perinatal health outcomes

Previous research has indicated that the risk of IPV for women is greater during pregnancy and the post-natal period (Bowen, Heron, Waylen & Wolke, 2005; Taft, 2002; Gazmararian, Lazorick, Spitz, Ballard, Saltzman & Marks, 1996). Violence during this time has specific implications for health outcomes for both the mother and baby. There is a substantial body of research that focuses on the impact of IPV on termination of pregnancy (TOP), premature births and low birth weight outcomes. Cross-sectional studies are considered to provide

some evidence of causation if the recruitment strategy captured women at the point at which a birth outcome occurred as such designs reduce selection and recall bias. This is due to birth being an event rather than a long-term condition, and therefore the requirement to control for previous disease does not apply here.

Termination of pregnancy and spontaneous abortion

Hall, Chappell, Parnell, Seed and Bewley (2014) conducted a meta-analysis on the association between IPV and TOP and concluded that there were high rates of physical, sexual and emotional abuse amongst women seeking TOP. However, that analysis did not identify any studies that investigated temporal relationships between IPV and TOP. This current review identified six studies that met criteria for possible inclusion in burden of disease analysis (Table B6). Only one of these studies was longitudinal (Taft & Watson, 2007). Taft and Watson (2007) found that IPV significantly predicted first TOP (OR=3.75, 95% CI 2.78–5.05). The study recruited Australian women aged 22–27 years at follow-up. It should be noted that this represented a relatively young sample in which most of the participants were below Australia's average age at first pregnancy (27 years) (Taft & Watson 2007).

Another study analysed the prevalence of IPV in a sample of 1,003 American women who were seeking elective termination and a control group comprised of women continuing their pregnancy in the same family planning clinic (Bourassa & Bérubé, 2007). A greater proportion of women seeking elective abortion (25.71%) than continuing pregnancy (9.34%) had been exposed to IPV in the previous year (p<0.0001). This difference was also apparent when only physical and/or sexual IPV was considered (7.14% and 1.84%, respectively, p<0.0001).

The remaining studies were cross-sectional in nature and reported the proportion of women seeking termination who were exposed to IPV (Chibber, Biggs, Roberts & Foster, 2014; Jones, Moore & Frohwirth, 2011; Saftlas, Wallis, Shochet, Harland, Dickey & Peek-Asa, 2010).

One study (Gulliver & Dixon 2014) was found providing evidence that exposure to IPV during pregnancy increases the risk of spontaneous abortion (miscarriage). That study used linked data in New Zealand to examine various health outcomes in pregnant women. It found that women with a hospitalisation for assault during pregnancy were more likely to have a spontaneous abortion (aRR=1.8, 95% CI 1.4–2.4). The Taft & Watson (2007) study also found higher rates of miscarriage.

In applying these inputs, it will be important to acknowledge any differences in definition between spontaneous miscarriage and abortion (both elective and medical before 20 weeks gestation).

This review found six studies providing evidence on the link between IPV and termination of pregnancy and spontaneous abortion in scope of this study on the burden of disease due to IPV in Australia.

Preterm and low birth weight

Shah and Shah's (2010) review and meta-analysis of the literature on the links between IPV and birth outcomes found that overall, there was evidence that low birth weight and preterm births were associated with exposure to domestic violence. The present study identified 9 studies investigating the impact of IPV on preterm birth and low birth weight (Table B7). In assessing these studies, consideration should be given to whether factors known to impact on preterm and low birth weight have been controlled for, particularly if they are also associated with IPV. These include, for example, smoking status, alcohol use, and also maternal age (Shah & Shah, 2010). Most studies controlled for maternal age, but only three controlled directly for smoking status and alcohol use (Coker, Sanderson & Dong, 2004; Janssen, Holt, Sugg, Emanuel, Critchlow, & Henderson, 2003; Watson & Taft, 2013).

In general, studies defined preterm birth as less than 37 weeks gestation and low birth weight as <2,500g. Presence or absence of these conditions was based on a mixture of self-report (Coker et al., 2004; Taft & Watson, 2007) and medical charts or other documented clinical data (Gulliver & Dixon 2014; Janssen et al., 2003; Pavey, Gorman, Kuehn, Stokes & Hisle-Gorman, 2014; Silverman, Decker, Reed & Raj, 2006; Tiwari et al., 2008; Urquia, O'Campo, Heaman, Janssen & Thiessen, 2011; Watson & Taft 2013). It was felt that self-reported preterm or low birth weight may be an adequate measure of these conditions, but that self-reported IPV during pregnancy could introduce recall bias if the pregnancy had taken place several years ago (see Coker et al., 2004 as an example).

Results were inconsistent across studies, with several of the larger studies (samples of more than 100,000 women) reporting that IPV during pregnancy significantly predicted preterm birth and/or low birth weight (Gulliver & Dixon, 2014; Pavey et al., 2014; Silverman et al., 2006). In contrast, there were two smaller studies that based birth outcome on medical records and also controlled for smoking and alcohol use during pregnancy; these found no significant effects of IPV exposure during pregnancy on birth outcome (Janssen et al., 2003; Watson & Taft, 2013).

This review found nine studies providing evidence on the link between IPV and preterm and low weight birth in scope of this study on the burden of disease due to IPV in Australia.

Other maternal health outcomes (antenatal complications and perinatal outcomes)

This review identified a number of studies that investigated the impact of IPV on other maternal health outcomes that are relevant to burden of disease analysis, with inconsistent findings (Table B8). Leone, Lane, Koumans, DeMott, Wojtowycz, Jensen, and Aubry (2010) found that women exposed to IPV during pregnancy had a greater likelihood of birth trauma such as placental abruption, even after controlling for sociodemographic variables, tobacco, alcohol and drug use. The study also found increased rates of other antenatal complications such as pre-eclampsia and gestational diabetes. Likewise, Gulliver and Dixon (2014) reported significant associations between IPV exposure during pregnancy and placental abruption and antepartum haemorrhage. Pavey and colleagues (2014) reported that exposure to IPV was not associated with respiratory conditions or hypoxic event in neonates. Similarly, Silverman and colleagues (2006) did not find a significant association between IPV and pre-eclampsia, oedema or gestational diabetes.

This review found five studies providing evidence on the link between IPV and other birth outcomes in scope of this study on the burden of disease due to IPV in Australia.

Sexually transmitted infections (STIs)

STIs (including HIV/AIDS)

There is a substantial body of research on the relationship between IPV and HIV/AIDS (see Campbell, Baty, Ghandour, Stockman, Francisco & Wagman, 2008, and Li, Marshall, Rees, Nunez, Ezeanolur & Ehiri, 2014, for reviews). In assessing the existing evidence, it is particularly important that differences in sampling be taken into consideration. For example, the association between IPV and HIV diagnosis may be stronger in African studies than in US studies because of the higher prevalence of HIV in African countries (Campbell et al., 2008). For the purposes of this review, it was important that the sample is broadly representative rather than focusing on specific high risk sub-groups, given this caveat.

The current review did not identify any longitudinal studies that used a nationally representative sample in a high-income country.

Human papillomavirus (HPV) and cervical cancer

Exposure to STIs, specifically human papillomavirus (HPV), places women at greater risk of developing cervical cancer (WHO, 2015). No longitudinal studies were identified in the current review; however, there are some cross-sectional studies that provide some evidence of an association between IPV and

a diagnosis of cervical cancer. For example, in 2006–07 Coker, Hopenhayn, DeSimone, Bush and Crofford (2009) sampled 4,732 US women aged 18–88 years. Lifetime exposure to IPV was significantly associated with lifetime self-reported cervical cancer, adjusting for demographic factors, drug use and smoking (aOR = 2.7, 95% CI 1.8–4.0). The association was similar for sexual IPV, physical IPV and stalking by an intimate partner. Again, in assessing the evidence regarding the impact of IPV and cervical cancer, it is crucial that causation can be inferred, particularly considering the relatively long period between HPV infection (as a result of IPV) and subsequent development of cervical cancer. For this reason, cross-sectional studies are particularly weak if only recent (i.e. 12-month) IPV is reported and age at diagnosis is not available.

Non-communicable and other chronic conditions

There was little focus in the literature on the impact of IPV on key non-communicable conditions and other chronic conditions such as diabetes, cardiovascular disease and musculoskeletal conditions. However, some studies were identified and are summarised in Table B9. Such isolated studies provided insufficient evidence to include the conditions as risk-outcome pairs for burden of disease analysis. There are also particular challenges in gathering the evidence of links between IPV and chronic conditions, notably the often long lag between exposure and disease.

Diabetes

Mason, Wright, Hibert, Spiegelman, Jun, Hu and Rich-Edwards (2013) sampled 64,732 adult US women in 2001 and followed-up 6 years later as part of the Nurses' Health Study II. IPV was measured by self-report items as well as the Women's Experiences of Battering (WEB) scale as a proxy for psychological IPV. Analyses found that, after controlling for age, childhood abuse, socio-economic variables and risk factors for diabetes, severe psychological IPV (WEB scores ≥40) predicted incidence of type 2 diabetes (aHR=1.61, 95% CI 1.09–2.38). Neither self-reported lifetime sexual, nor physical IPV, significantly predicted the incidence of type 2 diabetes once additional factors were controlled for.

Cardiovascular conditions

Two studies investigated the impact of IPV on cardiovascular conditions. Mason, Wright, Hibert, Spiegelman, Forman, and Rich-Edwards (2012) used the same cohort as described above for Mason and colleagues (2012), but limited the sample to women aged 37–54 at baseline and analysed follow-up data 6 years later. IPV was measured in the same way as described

above for Mason and colleagues' 2013 study. The incidence of hypertension was measured by self-reported diagnosis received from a physician. This analysis also excluded participants who had hypertension at baseline or were using antihypertensive medication. Results indicated that, again, severe psychological IPV, but not physical or sexual IPV, was found to predict later hypertension diagnosis (aHR= 1.24, 95% CI 1.02–1.53). This controlled for age, childhood abuse, socio-economic variables and risk factors for hypertension.

A second study sampled 5593 Norwegian women aged 30–60 years who had no CVD or CVD-medication use at baseline in 2000–01 (Stene, Jacobsen, Dyb, Tverdal, & Schei, 2013). Participants were asked about lifetime physical, sexual and psychological IPV. Between 2004 and 2009 prescription data for various CVD-related medications (cardiac therapy, antihypertensive, diuretics, peripheral vasodilators, beta blocking agents, calcium channel blockers, agents acting on the renin-angiostenin system and lipid-modifying agents) were analysed for this cohort. Although it is acknowledged that such medications could be used for other reasons and is therefore a weaker measure of cardiovascular conditions, antihypertensive drug use was associated with previous sexual or physical IPV (IRR=1.36, 95% CI 1.09–1.70) (Stene et al., 2013).

Musculoskeletal conditions

Ruiz-Pérez and colleagues (2009) employed a case-control design of 287 women diagnosed with fibromyalgia (FM) (case) and 287 women without FM (control) in a Spanish rheumatology and ENT clinic in 2004. IPV was self-reported and based on the WHO multi-country study on women's health and life-events. After adjusting for socio-economic variables, social support and psychological distress, results indicated that FM was not significantly associated with a history of IPV.

Insomnia

Another example of a health outcome that can be associated with IPV is sleep disorders, particularly insomnia and nightmares; however, there is a scarcity of literature in this space. In some cases, these sleep disorders are seen as symptoms or predictors of mental health outcomes (Pigeon, Cerulli, Richards, Perlis & Caine, 2011). A study by Astbury, Bruck and Loxton (2011) using data from the ALSWH found that higher levels of sleep difficulties were reported in women who had experienced forced sex (OR=1.95, 95% CI 1.66–2.26), and remained statistically significant, after adjusting for key psychological and socioeconomic variables.

As these results are based on a small number of papers, they are not considered sufficient evidence on which to base burden of disease estimates.

Non-fatal injury

Assault

The present systematic review identified a number of studies relating to injury due to IPV that were based on admission to accident and emergency departments (see, for example, Adsett, Thomson, Kieser & Tong, 2013 and Lau, Ching, Tong, Chan, Tsui & Kam, 2008). The advantage of such studies is that hospital data are clinically ascertained rather than based on self-reports, and that a large representative sample is readily available. Lau and colleagues (2008) reported that, for the accident and emergency department of a Hong Kong hospital, tenderness and haematoma/bruising were relatively common in admissions associated with IPV (48% and 32%, respectively), followed by abrasions (21%), erythema (10%) and lacerations/cuts (7%). However, such studies only reflect cases seen in emergency departments, and therefore may not be representative of the population exposed to IPV. It is likely that less severe injury would not result in presentation to the emergency department. Therefore, hospitalisation data may overestimate the risk of more serious conditions such as fractures and head injuries if these aspects are not reflected in the study design. This is supported by the results of a large NZ sample, in which participants recalled lifetime prevalence of injuries due to IPV (Fanslow & Robinson, 2011). By far the most common of these were abrasions and bruises (82.9%). The prevalence of other injuries was much lower, with the next most common injuries being ear or eye injuries (30.1%), cuts, punctures and bites (29.7%) and fractures (21.9%).

Emergency department studies may be more appropriate for some specific types of injuries, particularly those that are more likely to require admission to hospital. Adsett and colleagues (2013) analysed NZ emergency department hospital data and concluded that 37.7 percent of facial fractures (dental and maxillofacial trauma) resulted from domestic assault (21.1 percent in persons of European descent). It could be argued that this estimate is more reliable than estimates based on conditions that are less likely to require medical attention.

One cross-sectional study was identified that considered the risk of serious injuries when exposed to IPV (Coker, Davis, Arias, Desai, Sanderson & Brandt, 2002). This study was based on a large sample of US women aged 18–65 years. Women whose health problem occurred before exposure to IPV were excluded from the analysis, and risk ratios were adjusted for race, health insurance status and age, and childhood physical and sexual abuse. The results confirmed that physical IPV was associated with injury (aRR =2.8, 95% CI 2.2–3.7) whereas psychological IPV was not. Although cross-sectional, this study goes some way to remove confounding effects of injury

prior to IPV exposure. In regards to the ultimate purposes of this review, however, the outcome variable ("serious injury") would be difficult to apply as it is subjective and poorly defined.

Given the small number of studies with estimates of the increased risk of assault due to exposure to IPV, it may be necessary to investigate direct evidence on the increased risk, such as using hospital or police report data.

As this review did not find substantial evidence of the magnitude of the increased risk of assault due to IPV, it is recommended that Australian hospitalisation and police report data be further explored to produce updated estimates for the burden of disease analysis.

Self-harm and attempted suicide

A recent systematic review found that there was a consistent association between IPV and suicidal ideation despite substantial differences in study methods, samples and measurement (McLaughlin, O'Carroll & O'Connor 2012). The review identified five longitudinal studies, although only two were conducted in high-income countries (Parsons & Harper, 1999; Blasco-Ros, Sànchez-Lorente & Martinez, 2010). Both were excluded from this review due to small sample size. Similarly, the nine identified case-control studies were from high-income countries but tended to be based on clinical samples and/or were small in sample size.

This current review identified three longitudinal studies (Ackard et al., 2007; Exner-Cortens et al., 2013; Van Dulmen, Klipfel, Mata, Schinka, Claxton, Swahn & Bossarte, 2012) which investigated self-reported suicide attempts and controlled for suicide attempts at baseline or at a previous follow-up (Table B10). None of the studies reported that exposure to IPV increased an individual's risk of suicide attempts. This result was maintained even when controlling for baseline IPV (Exner-Cortens et al., 2013; Van Dulmen et al., 2012), socioeconomic status, and childhood maltreatment (Exner-Cortens et al. 2013). An additional cross-sectional study reported that deliberate self-harm in the previous 12 months was significantly associated with IPV taking place more than 12 months ago, taking into account socioeconomic variables and smoking status (aRR= 2.53, 95% CI 1.81–3.56) (Vos et al. 2006).

No studies were identified using our selection criteria that investigated exposure to IPV and suicide attempts resulting in death. However, there may be scope to investigate direct evidence on this aspect from other Australian data.

This review found four studies on the link between IPV and self-harm/suicide in scope of this study on the burden of disease due to IPV in Australia.

Fatal injury

Homicide

In Australia, intimate partners accounted for 23 percent of all homicide victims recorded within the National Homicide Monitoring Program (NHMP) between 2002–03 and 2011–12, of which females were the majority (Cussen and Bryant, 2015). This is consistent with a recent systematic review that, using Australian data, conservatively estimated that 22 percent of female homicides were carried out by an intimate partner (Stöckl, Devries, Rotstein, Abrahams, Campbell, Watts & García Moreno, 2013). Conservative estimates were calculated by classifying cases with missing information as non-partner homicides.

This review found strong direct evidence on the link between IPV and homicide appropriate for use in this study on the burden of disease due to IPV in Australia.

Risk factors

Tobacco

In addition to direct health outcomes, exposure to IPV can also increase exposure to other risk factors (i.e. other factors increasing the risk of particular diseases or injuries). A study of American nurses found that exposure to emotional abuse increased the likelihood of tobacco smoking, and this increased with co-occurrence of physical and sexual assault (Jun, Rich-Edwards, Boynton-Jarrett & Wright, 2008). Likewise, women who experienced violence in pregnancy are more likely to smoke (Fanslow, Silva, Robinson & Whitehead, 2008). Smoking is thought to be a means of reducing stress, and has been shown to be linked to substance abuse (Bonomi, Anderson, Reid, Rivara, Carrell & Thompson, 2009). Ackard and colleagues, (2007) found significant associations between smoking cigarettes and adolescent dating violence. Vos and colleagues (2006) also reported that young Australian women exposed to IPV more than 12 months ago were more likely to currently smoke (RR=2.79, 95% CI 2.33–3.34).

Unsafe sex

In lieu of longitudinal evidence of the relationship between IPV and HIV, this review has also considered the impact of IPV on unsafe sex. The latter is a critical factor in contracting STIs, including HIV/AIDS (Teitelman, Dichter, Cederbaum & Campbell, 2008a). Maman, Campbell, Sweat and Gielen (2000) have described three mechanisms by which IPV and subsequent unsafe sex may lead to higher incidence of HIV: (1) increased rates of forced sex with an infected partner; (2) limited or compromised ability to employ safe sex practices, and (3) increased sexual risk taking behaviours.

This current review identified a number of longitudinal studies in high income countries that investigated the impact of IPV on unsafe sex. These tended to sample specific groups such as women receiving methadone treatment (El-Bassel et al., 2005) or women in shelters or low-income housing (Tucker, Wenzel, Elliott, Marshall & Williamson, 2004).

By comparison, two studies were identified that were based on a nationally representative sample. These studies analysed results from the US National Longitudinal Study of Adolescent Health, in which young women aged 12–18 years were asked about dating violence/victimisation and health outcomes, and followed up 5 years later (Exner-Cortens et al., 2013; Teitelman, Ratcliffe, Dichter & Sullivan, 2008b). The results were consistent; teen dating violence at baseline did not predict subsequent unprotected sex (Teitelman et al., 2008b) or "sexual risk" (a variable that included unprotected sex, other sexual risk behaviours and previous diagnosis of an STI) (Exner-Cortens et al., 2013). These results are interesting, given that (1) baseline teen dating violence predicted teen dating violence at 5 year follow-up, and (2) at follow-up, recent teen dating violence (i.e. past 12 months) was associated with lower likelihood of consistent condom use in the past 12 months (aOR= 1.59, 95% CI 1.16–2.18) (Teitelman et al., 2008b).

These results are consistent with a cross-sectional analysis of young Australian women aged 22–27 in 2000 (Vos et al., 2006). Women who reported IPV in the previous 12 months were more likely to report that a doctor had told them they had an STI (RR=2.24, 95% CI 1.40–3.58). This association was also significant for IPV experienced more than 12 months ago (RR=1.54, 95% CI 1.15–2.08).

Extension topics

A number of potential extensions to the scope of health outcomes analysed within the broader field of violence against women are discussed in this section. While these topics were not the focus of the literature review, there are a number of important conceptual distinctions and gaps in the research that need to be explored.

It is important to acknowledge that IPV can vary between population groups. A brief exploration was made into the health outcomes for Aboriginal and Torres Strait Islander women, women with a disability and refugee and migrant women.

Health outcomes in Aboriginal and Torres Strait Islander women

The current review found very few studies and data sources that reported results by Indigenous status, or that specifically sampled Indigenous women. This is a notable gap in the literature, and may reflect the tendency for research concerned with Aboriginal and Torres Strait Islander women to focus on broader concepts such as family violence that includes kinship- and community-related violence (AIHW, 2006). While noting the limitations in the prevalence data outlined in *Data sources on IPV prevalence*, if estimates of the burden of disease from IPV were to be produced for the Indigenous population, while not ideal, the assumption would need to be made that the risk-outcome pairs and the associated relative risks were equivalent to those in the general population.

Health outcomes in women with a disability

Women with disabilities (or activity limitations) are at greater risk of interpersonal abuse (Healey, Howe, Humphreys, Jennings & Julian, 2008; Hughes, Lund, Gabrielli & Powers, 2011). In this context, IPV can extend to disability-specific abuse, such as manipulation of medication, refusal to assist with daily activities and restriction of access to communication devices. Furthermore, women with disabilities may encounter disability-specific perpetrators, such as personal assistance service providers and medical providers. Research has proposed that factors associated with disability such as increased isolation, dependence (whether physically, emotionally or financially) and system or cultural barriers may contribute to the greater vulnerability of this group (Healey, 2013; Plummer & Findley, 2011).

Analysis of a large nationally representative Canadian cross-sectional survey conducted in 1999 compared 5-year IPV rates in women with activity limitations (including those that are a result of mental or physical conditions) and the general female population (Cohen, Forte, Du Mont, Hyman & Romans, 2006; Du Mont & Forte 2014). The results indicated that women with activity limitations were 1.5 times as likely to be victim to physical and emotional abuse, and 2.5 times as likely to be victim to sexual violence. Women with activity limitations were, on average, victim to a greater number of IPV types, and were more often exposed to multiple (or recurring) incidents. These findings are supported by a large longitudinal study in the US, which found that baseline physical and mental health impairment predicted IPV 3 years later (Hahn, McCormick, Silverman, Robinson & Koenen, 2014). This risk was greater for women with mental health impairment (OR=1.93, 95% CI 1.63–2.28) than for those with physical health impairment (OR=1.26, 05% CI 1.04–1.53).

Analysis of the 1999 Canadian survey indicated that women with activity limitations were more likely to report that injuries due to IPV had resulted in time off from everyday activities compared to the general female population (Forte, Cohen, Du Mont, Hyman & Romans, 2005). The results indicated however, that injuries in this group were not likely to result in hospitalisation or medical attention. The same study also reported that female victims of IPV who had activity limitations were more likely to use sleeping, anxiety or depression medication compared to women with no activity limitations.

While there is evidence of IPV prevalence being higher in women with disabilities, there is limited research on the risk of health impacts from IPV for these women. The available evidence suggests that the health outcomes (e.g. mental health, injuries etc.) are similar to those described for IPV in the general female population.

A question was included in the ABS PSS 2012 to establish whether respondents had a disability or long-term health condition at the time of the survey. However, two factors point to the survey being likely to under-represent people with disabilities, in particular those with a profound or severe communication disability. First, for safety, privacy and methodological reasons, a specific requirement of the PSS was that interviews were conducted in private. Where a respondent needed the assistance of another person to communicate, the interview could not proceed. Second, the survey scope excludes people with a disability who usually live in non-private dwellings (e.g. residential care facilities).

Examination of the health outcomes of intimate partner violence against women

Health outcomes in refugee and immigrant women

Twenty-eight percent of the Australian population—approximately 6.6 million people—are born overseas (ABS, 2015). Research examining the prevalence and health outcomes of IPV among refugee and immigrant women is rare. There are a number of factors that may influence prevalence, or more serious or prolonged exposure and associated health impacts in refugee and immigrant women. Among these are greater exposure to known risk factors in their country of origin (e.g. gender inequality, lower levels of female literacy); exposure to discrimination and social exclusion of some immigrant groups (Sockolov & DuPont, 2005), language and cultural barriers to accessing services and seeking safety (Kasturirangan et al., 2004; Taylor & Putt, 2007); particular cultural practices (Trijbetz, 2013; Wong & Mellor, 2014); and the stresses associated with adjustment to different gender relations which may be involved, especially for those migrating from countries with more traditional and inequitable gender regimes (Fisher, 2009; Pittaway, 2004; Rees & Pease, 2007; Zannettino, 2012). Immigrant women may be isolated from family and friends in their new country of residence, often having to live with their husband's extended family due to cultural standards and economic necessity (Raj & Silverman, 2002). Past exposure to violence (e.g. traumatic experiences and torture in the course of fleeing persecution or in refugee camps and detention centres) has also been identified as a risk factor for both perpetration and victimisation (Allimant & Ostapiej-Piatkowski, 2011; Pittaway, 2004). Women so exposed may suffer the compounding impacts of different forms of violence and abuse.

Past Australian research that compared women born in Australia with those born overseas *as an aggregate* suggests that the prevalence of violence is about the same in both groups (Mitchell, 2011; Mouzos & Makkai, 2004). However, there is a great diversity within Australia's overseas-born population, with around 200 birthplace groups represented (Victorian Government, 2013). This diversity makes it difficult to enumerate samples of individual birthplace groups of adequate size for research purposes in population-based surveys, while at the same time limiting the extent to which findings based on an aggregate of respondents from different country-backgrounds can be applied to any particular group. For example, international studies show substantial diversity in the prevalence of IPV between nations with lifetime rates ranging from between 12.9 percent and 61 percent of women (Garcia-Moreno, Jansen, Ellsberg, Heise & Watts, 2006). This diversity is understood to result from variations in social conditions in different contexts and their impacts on the risk of violence (WHO & LSHTM, 2013). It is probable that this variation in the prevalence of IPV is represented among the population group of overseas-born women in Australia. That is, prevalence is likely to be lower than in those born in Australia in some groups, while higher in others.

There are also factors in the settlement environment that may increase the risk of violence such as lack of social support outside the family and fear of engagement with police or other legal services (Kasturirangan, Krishnan & Riger, 2004; Taylor & Putt, 2007). Again, there is likely to be variation in the levels of exposure to these risks between groups. These are significant barriers to estimating burden of disease for women born overseas that are meaningful for the purposes of guiding policy and practice due to the diversity of issues.

The ABS PSS 2012 collected information on country of birth, language spoken at home and the first language spoken by the respondent. However, a barrier to using PSS 2012 data for the purposes of establishing the prevalence of IPV among women from migrant and refugee backgrounds is the requirement of the PSS to conduct interviews in private (see "women with disabilities" above). Interviewing was available in some, although not all, languages other than English. For these reasons, the survey is likely to under-represent women from migrant and refugee backgrounds, especially those with limited proficiency in English.

Health outcomes due to non-partner sexual assault

Non-partner sexual assault (NPSA) is being forced to perform any unwanted sexual act by someone other than your spouse/partner after the age of 15. This can include sexual assault by strangers, acquaintances and people who are known (including family and relatives), or sexual assault perpetrated by a boyfriend, girlfriend or date (ABS, 2013). However, this falls outside of the scope of the definition of IPV used in this review.

A number of studies have analysed health outcomes of sexual assault according to whether the perpetrator is a stranger or known to the victim, and if they are known to the victim, whether they are an acquaintance, friend, partner or relative. In their review, WHO (2013) noted difficulties with definitional overlaps with IPV in many of the prevalence data sources, a lack of population-based studies and found that current exposure to NPSA was rarely reported. As part of the WHO study, a literature review was undertaken to estimate global prevalence (Abrahams, Devries, Watts, Pallitto, Petzold, Shamu & García-Moreno, 2014), finding that the lifetime prevalence of NPSA was 7.2 percent (95% CI 5.3- 9.1).

The literature highlights that the key health outcomes associated with sexual assault include post-traumatic stress disorder (PTSD), depression, anxiety, alcohol and drug use, and suicidal ideation and attempts (Campbell, , Dworkin, & Cabral, 2009; Chen et al., 2010; Mason & Lodrick, 2013; Walsh, Galea & Koenen, 2012). WHO (2013) found that health outcomes were not well defined and variations in results prohibited a meta-analysis.

Importantly, the impact of sexual assault may differ depending on the type of relationship between victim and offender. This may be due to, for example, the level of interpersonal involvement, financial complications, the extent of physical violence and threats made during the assault (including the use or threat of weapons), and the likelihood of repeated instances of sexual assault (Culbertson & Dehle, 2001). Few studies on the impacts of sexual assault are longitudinal (and therefore are unable to demonstrate causation or a temporal relationship), nor able to be used to analyse the impacts according to victim-offender relationship. The cross-sectional nature of these studies is a notable problem as sexual assault in adulthood may be predicted by childhood sexual assault (Classen, Palesh & Aggarwal, 2005). Childhood sexual assault itself is also associated with mental health problems, and as such, any analyses not controlling for childhood sexual assault experiences may distort the results. This indicates a gap in the literature for nationally representative studies that can decisively demonstrate a relationship between non-partner sexual assault and health outcomes, particularly in regards to mental health.

Health outcomes due to dating violence

A further extension area that requires noting is dating violence and IPV occurring in adolescents.

The term "partner" in the ABS PSS 2012 is used to describe co-habiting (married or de facto) relationships, thus excluding those in informal, unmarried or dating relationships. As there is a general trend in the Australian population in deferring cohabitation until a later age and as the crude marriage rate is decreasing (ABS, 2014a); this may lead to some underestimation of the prevalence of IPV. This also reflects a difficulty in determining what proportion of dating relationships are "intimate partner" relationships. Respondents to the PSS experiencing emotional abuse were only asked about current and previous partners, thus only exposure to physical and sexual violence can be analysed for dating relationships.

Sexual violence perpetrated by a boyfriend/girlfriend or date may also be captured via NPSA. However, physical violence perpetrated by a boyfriend/girlfriend or date would not be. These definitional overlaps will require further exploration if specific burden of disease estimates were required for violence occurring in intimate, but non-cohabitating relationships.

While the focus of the review was on all women aged 15 years or over, of these, five studies focused on adolescents (Ackard et al., 2007; Bourassa & Berube, 2007; Exner-Cortens et al., 2013; Roberts, Klein & Fisher, 2003; Teitelman et al., 2008b). These studies found that dating violence was a significant problem among adolescents, resulting in depression and alcohol use related health outcomes. Three of these studies were based on data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), an American longitudinal study of a nationally representative sample of adolescents in grades 7-12 during 1994-95. The Add Health cohort has now been followed into young adulthood, most recently in 2008. Five years following exposure to dating violence, females reported increases in heavy alcohol use, depressive symptoms, suicidal ideation and tobacco smoking (Exner-Cortens et al., 2013). Note that these studies have been separately reported in Appendix B.

Health outcomes in children witnessing IPV

Exposure to interparental violence can have substantial and lasting impacts on a child's mental health (Wood & Sommers, 2011) and can place these children at increased risk of poor mental health in adult life, particularly in regards to depression and alcohol dependence (Roustit, Renahy, Guernec, Lesieur, Parizot & Chauvin, 2009). Further, childhood witnessing of IPV can increase the risk of subsequent experience of IPV as an adult (for both perpetration and victimisation) (Stith et al., 2000).

Several meta-analyses have assessed the evidence for behavioural and psychological outcomes of witnessing IPV as a child (Campo et al., 2014; Chan & Yeung, 2009; Evans, Davies & DiLillo, 2008; Holt et al., 2008; Kitzmann, Gaylord, Holt & Kenny, 2003; Wolfe, Crooks, Lee, McIntyre-Smith & Jaffe, 2003; Wood & Sommers, 2011). In general these reviews have broadly categorised outcomes related to mental illness according to three categories: post-traumatic syndrome symptoms, internalising behaviours (characterised by symptoms of depression and anxiety), and externalising behaviours (characterised by behaviour associated with ADHD and conduct disorder).

In particular, Evans and colleagues (2008) built upon two initial meta-analyses (Kitzmann et al., 2003; Wolfe et al., 2003) to address discrepancies in conclusions about age and sex as moderators, and to extend the analysis to include trauma symptoms. This meta-analysis reported that there were small-moderate associations between children witnessing IPV and increased internalising (characterised by symptoms of depression and anxiety) and externalising (characterised by symptoms of ADHD and conduct disorder) behaviours. This association with externalising behaviours was stronger amongst boys than girls, and there was no significant gender difference for internalising behaviours. The meta-analysis also reported a strong association between witnessing IPV and trauma, but cautioned that this was based on a much smaller number of studies. No effect of age was found.

Importantly, most of the reviews identified limitations of the literature. These include reliance on cross-sectional studies, differences in definitions of witnessing IPV (for example, Holt and colleagues (2008) discussed overhearing IPV and witnessing cuts and bruises after an incident), the influence of age and gender, and competing impacts of other factors such as concurrent parental mental disorders and other forms of child abuse. Levendosky, Bogat and Martinez-Torteya (2013) have also argued that validity and reliability of diagnostic criteria for PTSD may be weaker in very young children. Overall, it appears that there is some evidence of a detrimental impact on child mental health although it is unclear to what extent these outcomes are specifically attributable to witnessing IPV

during childhood. Further evidence would be required before making recommendations on how these health outcomes could be captured in burden of disease analysis.

A short review by the Australian Institute of Criminology (Richards, 2011) outlined the current knowledge about the extent of this exposure. The estimates in the PSS on this, which show around 60 percent of women experiencing IPV with children in their care, indicated their children had witnessed violent episodes. It also notes a number of challenges in collecting information, including the extent of the exposure (such as underestimation of the extent of the exposure by parents, and fear of forced family separations).

Health outcomes by type of IPV

It is important to discuss how the findings from this literature review vary between exposure to different forms of violence (physical and sexual) and emotional abuse separately, and when these sub-types of IPV co-occur (Garcia-Moreno, Jansen, Ellsberg, Heise, & Watts, 2006; Mouzos & Makkai, 2004; ABS, 2014b; Basile, Arias, Desai, & Thompson, 2004). Few studies report results by these sub-types of IPV separately, and this is a potential barrier to disentangling the impacts of different patterns of violence and abuse in burden of disease estimates.

Expert opinion maintains that emotional/psychological abuse, in the form of controlling behaviours, is intrinsic to the tactics of abuse. That is, IPV is commonly perpetrated in a methodical and strategic manner to gain power and control in a relationship (Stark, 2007). Physical, sexual and emotional forms of violence and abuse can be used to belittle, control and intimidate women, and diminish their independence by isolating them from sources of economic and social support (Postmus, McMahon, Warrener, & Macri, 2011; Stark, 2007; Starrratt et al., 2008). This understanding of the dynamics of IPV suggests that it is the co-occurrence of emotional/psychological, physical and sexual forms of abuse that are particularly harmful to mental health (Lewis, Griffing, Chu, Jospitre, Sage, Madry, & Primm, 2006; Postmus et al., 2011). While there is some debate in the literature (Wangmann, 2011), this pattern of co-occurring forms is supported by population-based studies across the globe (Garcia-Moreno et al., 2006; Antai, 2011; Dalal & Lindqvist, 2012; Gage, 2005; Heise, 2012; Graham-Kevan & Archer 2008; Kiss, Schraiber, Heise, Zimmerman, Gouveia & Watts, 2012), including Australia (Mouzos & Makkai, 2004). These studies show that emotional/psychological abuse commonly co-occur with physical violence and that experiencing one of these forms substantially increases the risk of experiencing the other.

While it is not within scope of this paper, it should be acknowledged that measuring emotional abuse is complex, with subjective scales of severity and differences in cultural settings (WHO, 2013; Murphy & Hoover, 1999). Another factor to consider is evidence in the literature that women may be less likely to recognise emotional abuse and/or find it difficult to pinpoint the time when emotional abuse commenced (Mackinnon, 2008). This may result in non-recognition or delayed recognition, and ultimately in underreporting of emotional abuse at the population level.

While emotional abuse frequently co-occurs with physical and sexual violence, it may also occur independently or may be the predominant form of abuse (Wangmann, 2011). Studies of women experiencing emotional or psychological abuse suggest that it has significant health impacts (Doherty & Berglund, 2008; McDonald, 2012; McKinnon, 2008; Postmus

et al., 2011; Theran, Sullivan, Bogat & Sutherland, 2006). This indicates the need to consider including women who report emotional or psychological abuse (but not physical or sexual forms) in burden of disease estimates. The Victorian 2001 study (Victorian Health Promotion Foundation, 2004) and ABDS 2003 were unable to do this due to unavailability of exposure data. However, data on emotional abuse were collected in the ABS PSS 2012.

There were only three studies in our review that investigated emotional abuse separately (Coker et al., 2002; Exner-Cortens et al., 2013; Woolhouse, Gartland, Hegarty, Donarth & Brown, 2012). To illustrate, Woolhouse and colleagues 2012 reported that the adjusted odds ratio of experiencing postnatal depression following exposure to emotional abuse alone was 2.72 (95% CI 1.72-4.13); however, this was less than if experiencing physical abuse alone (aOR 3.94, 95% CI 2.44-6.36).

Unsurprisingly, the risk of non-fatal injuries (e.g. fractures, lacerations, abrasions and bruising) were found to be more likely in women exposed to physical violence (Adsett et al., 2013; Coker et al., 2002; Fanslow & Robinson, 2011; Lau et al., 2008). In some studies, physical IPV alone was reported in the paper (e.g. Ehrensaft et al., 2006) or sexual and physical IPV were not reported separately (e.g. Chuang et al., 2012). As noted in the previous section on NPSA, few studies focus on sexual violence by an intimate partner separately from physical abuse.

Discussion

Given the importance of acknowledging and addressing IPV as a problem within the Australian population health context, a systematic review was undertaken to explore and summarise the findings on the impact of IPV on health outcomes. The context of this is to inform the inputs required to produce estimates of disease burden due to IPV in Australia.

This review was conducted after a global literature review that included information on the links between IPV and various health outcomes (WHO, 2013). This current review has a narrower scope focusing on findings in high-income countries only, reflecting social and cultural influences on and of IPV. It also expands the time period of the review to 2015 to capture more recent research.

Summary of review findings

The findings from this current review confirm that IPV has important effects on the health of women, and that there is a growing body of evidence that can be drawn upon for burden of disease analysis. In total, there were 43 studies providing evidence on the link between IPV and various health outcomes, relevant for the current study that will be used to update estimates of the burden of disease due to IPV in Australian women.

There were particular health outcomes that stood out as having strong and convincing or probable evidence of increased risk due to exposure to IPV: depression, termination of pregnancy and homicide. A proportion of the studies reviewed found a moderate or strong positive association between IPV and depression with most odds ratios in the range 1.5 to 2.5, a finding also found in the WHO review (WHO, 2013). Our findings of a strong link with termination of pregnancy also mirrors the WHO review. For terminations, the Australian study (using ALSWH data) found an odds ratio of 3.75 (2.78–5.05), which was higher than that found in the WHO review; this may reflect differing access to terminations in various countries. Related to this, we also found convincing evidence of a link between IPV and miscarriage, a relationship not highlighted in the WHO report. Homicide was also included in the list of linked conditions in the WHO report. Our finding of around 22 percent of female homicides being due to IPV is based on strong direct evidence (i.e. based on detailed and validated Australian data).

A number of other conditions were found to have some evidence of a relationship, though somewhat weaker than those listed above. This included alcohol and drug use disorders, and preterm and low birth weight outcomes. Our findings for alcohol use disorders focused on the impact of IPV on subsequent alcohol use, acknowledging the bi-directionality of these two factors. It was therefore important that the studies controlled for baseline alcohol use. We found somewhat inconsistent results, with some studies showing a positive effect, and others no significant effect. Similarly for drug use disorders (excluding alcohol), we found variable results, with some showing an association and others no association.

For preterm and low birth weight outcomes, it was important that the studies controlled for other factors that may lead to these outcomes, such as maternal age, smoking status and alcohol use: only a small number of studies controlled for the

latter two. Results for these outcomes were also inconsistent across studies, with some showing a relationship and others not.

The previous Victorian study and the ABDS 2003 studies on the burden of disease from IPV used analysis of the ALSWH to provide some of the relative risks. The ALSWH is a population-based cohort study of over 50,000 Australian women, beginning in 1996. It is important to note that those analyses were done when the ALSWH did not have follow-up data available, and additional cohorts have been recruited. There are now a number of years of follow-up data available, which would enable clearer analyses demonstrating the required temporal relationships.

The review highlighted the complexity in the aspects of the various studies that need to be taken into account when comparing them, and assessing them for potential inclusion in burden of disease studies. These factors included the measurement of IPV and of the particular health outcome, whether causality was well demonstrated (strength of the relationship, temporality, consistency, and whether the relevant confounders were controlled for).

Research gaps

Following on from this review, these findings highlight several research gaps that should be noted in the interpretation of the future work to update burden of disease estimates. Identification of these gaps can help inform future research and thus contribute to the growing knowledge base on IPV. These include:

- Further work is required to investigate the evidence around non-communicable and chronic disease outcomes and IPV (e.g. cardiovascular disease). This also extends to particular risk factors for these diseases.
- We found limited information on the link between STIs and IPV.
- Further research studies on non-fatal injuries (such as assault and self-harm) are required. There may be some scope to undertake analysis of particular Australian datasets to provide direct evidence on these health outcomes, particularly hospitalisation data.
- While we found a number of Australian specific studies, there is a need for more research that takes into account the unique and diverse Australian population, political, geographical and cultural factors, and how the results can be used for policy and program decision-making.
- There is a need for more evidence from longitudinal research, rather than cross-sectional studies. Longitudinal studies can provide evidence of causality by establishing a temporal relationship between the exposure to IPV or NPSA and the health outcome. Similarly, further evidence on the health outcomes attributable to witnessing IPV during childhood is required before these health outcomes could be included in burden of disease analysis.
- In particular, there is a paucity of research on the health outcomes of violence for migrant and refugee women and women with disabilities. Likewise, there is the need for improved data collection on exposure among these sub-populations.
- Notably, both the availability of prevalence data and evidence on the subsequent health outcomes for Indigenous women are a known gap and this requires further investigation of potential data sources to produce burden of disease estimates.

Limitations of the review

The findings described in this paper should be considered in light of the context of the study. While this paper has aimed to be broad enough to highlight the health outcomes associated with IPV, it was done with the aim of identifying the potential inputs for the forthcoming update of the burden of disease analysis. For example, a key focus was on research studies that used similar definitions of IPV to those used in the PSS, as that is the intended source of the prevalence of IPV for the burden of disease analysis. Therefore, there may be other studies that provide more general findings on the links between IPV and health outcomes that have not been included in this study.

As the scope of the main study is on IPV, we have done a less extensive review of other related aspects. These include non-partner sexual assault, dating violence and children witnessing IPV. A brief summary of these aspects are included in *Extension topics*. We have also included some specific information on research in relation to IPV in Aboriginal and Torres Strait Islander women and other sub-population groups (e.g. women with disability and migrant/refugee women), noting the particular data challenges in this area.

While efforts were made to be as inclusive as possible within the search strategy, it is recognised that not all relevant evidence may have been included in this review. There is a vast and growing body of literature on IPV and some studies may have been missed or unintentionally excluded, and others were excluded due to the criteria applied with consideration to the agreed scope of this review.

Use of findings within burden of disease analysis

In burden of disease analysis, there is often the problem of needing to deal with imperfect data (whether it is insufficient prevalence data or inputs such as relative risks); however the general approach is to produce estimates where there is a sound degree of plausibility (Vos et al., 2006). With this approach in mind, many of the studies reviewed provide insufficient evidence to demonstrate causality between IPV and health outcomes for burden of disease analysis. However, there may be potential to undertake further analysis to derive measures of association or to use direct evidence based on further analysis of existing datasets as outlined above. There will also need to be a technical assessment to determine the appropriate relative risks to use. This will cover aspects such as whether we can use available meta-analyses; and if not, whether new meta-analyses are needed or if the relative risks be sources from one high-quality study. This technical assessment will need to take into account various methodological aspects including the types of measures and methods used in the various studies, as outlined earlier in the discussion.

There are also some cases where a particular health outcome may not be applicable for burden of disease analysis, such as where it is not a disease or injury concept within the 2011 Australian study (e.g. postnatal depression is currently not a separate disease). Further work is required on how this type of evidence can be incorporated into the estimates on burden of disease due to IPV in Australia, for example consideration of postnatal depression as a stand-alone disease concept.

Conclusion

Violence against women, including IPV, is a significant and complex problem globally and within Australia, with an estimated 17 percent of all Australian women aged 18 years and over reporting experience of partner violence since the age of 15 in 2012 (ABS, 2013).

Seventy studies were reviewed, with 43 assessed as having a sufficient level of evidence for use as potential inputs for the calculations of the disease burden in terms of the health loss from specific diseases and injuries. The findings confirmed that there is strong evidence of increased risk due to exposure to IPV for depression, termination of pregnancy and homicide. These findings are consistent with the inputs used in the Victorian study, ABDS 2003, GBD 2010 and the recent WHO (2013) report *Global and regional estimates of violence against women: Prevalence and health effects of intimate partner violence and non-partner sexual violence*.

A number of research gaps were also highlighted that could inform future research on the health outcomes in women exposed to IPV. There is potential to undertake additional analysis to derive measures of association or to use direct evidence based on existing datasets for some health outcomes, such as non-fatal injuries. An emerging area to be further explored, beyond previous analyses, are the health outcomes due to emotional abuse, independent of physical or sexual abuse, due to availability of exposure data, which became available in 2013 as collected in the ABS PSS 2012.

References

Aboriginal and Torres Strait Islander Women's Task Force on Violence. (1999). *The Aboriginal and Torres Strait Islander Women's Task Force on Violence*. Brisbane: Department of Aboriginal and Torres Strait Islander Policy and Development.

Abrahams, N., Devries, K., Watts, C., Pallitto, C., Petzold, M., Shamu, S., & Garcia-Moreno, C. (2014). Worldwide prevalence of non-partner sexual violence: A systematic review. *The Lancet, 383*(9929), 1648–1654.

Ackard, D. M., Eisenberg, M. E., & Neumark-Sztainer, D. (2007). Long-term impact of adolescent dating violence on the behavioral and psychological health of male and female youth. *Journal of Pediatrics, 151*, 476-81.

Adsett, L., Thomson, W. M., Kieser, J. A., & Tong, D. C. (2013). Patterns and trends in facial fractures in New Zealand between 1999 and 2009. *New Zealand Dental Journal, 109*, 142-7.

Agrawal, A., Ickovics, J., Lewis, J. B., Magriples, U., & Kershaw, T. S. (2014). Postpartum intimate partner violence and health risks among young mothers in the United States: A prospective study. *Maternal and Child Health Journal, 18*, 1985-92.

Allimant, A., & Ostapiej-Piatkowski, B. (2011). Supporting women from CALD backgrounds who are victims/survivors of sexual violence: Challenges and opportunities for practitioners. Melbourne: Australian Centre for the Study of Sexual Assault.

Al-Yaman, F., Van Doeland, M. & Wallis, M. (2006). *Family violence among Aboriginal and Torres Strait Islander peoples* (Cat. no. IHW 17). Canberra: AIHW.

Antai, D. (2011). Traumatic physical health consequences of intimate partner violence against women: What is the role of community-level factors? *BMC Women's Health, 11*(1), 56.

Astbury, J., Bruck, D., & Loxton, D. (2011). Forced sex: A critical factor in the sleep difficulties of young Australian women. *Violence and Victims, 26*(1), 53-72.

American Institute for Cancer Research. (2007). *Food, nutrition, and physical activity, and the prevention of cancer: A global perspective*. Washington, DC: AICR.

Australian Bureau of Statistics. (2009). *National Aboriginal and Torres Strait Islander Social Survey 2008* (Cat. no. 4714.0). Canberra: ABS.

Australian Bureau of Statistics. (2010). *Crime victimisation, Australia, 2008–09* (Cat. no. 4530.0). Canberra: ABS.

Australian Bureau of Statistics. (2013). *Personal Safety, Australia, 2012* (Cat. no. 4906.0). Canberra: ABS.

Australian Bureau of Statistics. (2014a). *Marriages and divorces, Australia, 2013* (Cat. no. 3310.0). Canberra: ABS.

Australian Bureau of Statistics. (2014b). *Australian social trends, 2014* (Cat. no. 4102.0). Canberra: ABS.

Australian Bureau of Statistics.. (2015). *Migration, Australia, 2013–14* (Cat. no. 3412.0). Canberra: ABS.

Australian Human Rights and Equal Opportunity Commission. (2006). *Ending family violence and abuse in Aboriginal and Torres Strait Islander communities: Key Issues. An overview paper of research and findings by the Human Rights and Equal Opportunity Commission, 2001–2006.* Canberra: The Commissioner.

Australian Institute of Health and Welfare. (2014). *Assessment of Global Burden of Disease 2010 methods for the Australian context* (Working paper no. 1). Canberra: AIHW.

Australian Institute of Health and Welfare. (2015). *Burden of disease.* Retrieved 5 November, 2015, from http://www.aihw.gov.au/burden-of-disease/

Bagshaw, D., Chung, D., Couch, M., Lilburn, S., & Wadham, B. (2000). *Reshaping responses to domestic violence.* Canberra: Office for the Status of Women, Department of Prime Minister and Cabinet.

Banyard, V. L., Potter, S., & Turner, H. (2011). The impact of interpersonal violence in adult women's job satisfaction and productivity: The mediating roles of mental and physical health. *Psychology of Violence, 1*(1), 16–28.

Basile, K., Arias, I., Desai, S., & Thompson, M. (2004). The differential association of intimate partner physical, sexual, psychological, and stalking violence and posttraumatic stress symptoms in a nationally representative sample of women. *Journal of Traumatic Stress, 17*(5), 413-421.

Beaglehole, R., Bonita, R., Kjellström, T., & Organization, W. H. (2006). Basic epidemiology (2nd ed.). Geneva: WHO.

Belknap, J., & Melton, H. (2005). Are heterosexual men also victims of intimate partner abuse? Retrieved from VAWnet National Electronic Network on Violence Against Women website http://www.xyonline.net/sites/default/files/Belknap,%20Are%20heterosexual%20men%20also.pdf

Begg, S., Vos, T., Barker, B., Stevenson, C., Stanley, L., & Lopez, A. D. (2007). *The burden of disease and injury in Australia, 2003.* Canberra: AIHW.

Beydoun, H. A., Beydoun, M. A., Kaufman, J. S., Lo, B., & Zonderman, A. B. (2012). Intimate partner violence against

adult women and its association with major depressive disorder, depressive symptoms and postpartum depression: A systematic review and meta-analysis. *Social Science & Medicine, 75*, 959–975.

Blasco-Ros, C., Sanchez-Lorente, S., & Martinez, M. (2010). Recovery from depressive symptoms, state anxiety and post-traumatic stress disorder in women exposed to physical and psychological, but not to psychological intimate partner violence alone: A longitudinal study. *BMC Psychiatry, 10*, 98.

Bonomi, A. E., Anderson, M. L., Reid, R. J., Rivara, F. P., Carrell, D., & Thompson, R. S. (2009). Medical and psychosocial diagnoses in women with a history of intimate partner violence. *Archives of Internal Medicine, 169*, 1692-7.

Bossarte, R. M., Simon, T. R., & Barker, L. (2006). Characteristics of homicide followed by suicide incidents in multiple states, 2003-04. *Injury Prevention, 12*(Supp. 2), ii33-ii38.

Bourassa, D. & Bérubé, J. (2007). The prevalence of intimate partner violence among women and teenagers seeking abortion compared with those continuing pregnancy. *Journal of Obstetrics & Gynaecology Canada, 29*, 415-23.

Bowen, E., Heron, J., Waylen, A., & Wolke, D. (2005). Domestic violence risk during and after pregnancy: Findings from a British longitudinal study. *BJOG: An International Journal of Obstetrics & Gynaecology, 112*(8), 1083-1089.

Boyle, A., Jones, P., & Lloyd, S. (2006). The association between domestic violence and self-harm in emergency medicine patients. *Emergency Medicine Journal, 23*, 604-7.

Caldwell, J., & Swan, S. C., (2012). Gender differences in intimate partner violence outcomes. *Psychology of Violence*, 2, 42–57.

Campbell, J. C., Baty, M. L., Ghandour, R. M., Stockman, J. K., Francisco, L., & Wagman, J. (2008). The intersection of intimate partner violence against women and HIV/AIDS: A review. *International Journal of Injury Control and Safety Promotion, 15*(4), 221-231.

Campbell, R., Dworkin, E., & Cabral, G. (2009). An ecological model of the impact of sexual assault on women's mental health. *Trauma, Violence, & Abuse*, 10, 225–246.

Campo, M., Kaspiew, R., Moore, S., & Tayton, S. (2014). *Children affected by domestic and family violence. A review of domestic and family violence prevention, early intervention and response services.* Melbourne: Australian Institute of Family Studies.

Center for Disease Control and Prevention. (2015). Principles of epidemiology in public health practice: Glossary (3rd ed.). Retrieved August 21, 2015 from http://www.cdc.gov/OPHSS/CSELS/DSEPD/SS1978/Glossary.html

Chan, A., & Payne, J. (2013). *Homicide in Australia: 2008–09 to 2009–10 National Homicide Monitoring Program annual report.* Retrieved from: http://aic.gov.au/publications/current%20series/mr/21-40/mr21/04_homicide.html

Chan, Y. C., & Yeung, J. W. K. (2009). Children living with violence within the family and its sequel: A meta-analysis from 1995–2006. *Aggression and Violent Behavior, 14*(5), 313-322.

Chen, L. P., Murad, M. H., Paras, M. L., Colbenson, K. M., Sattler, A. L., Goranson, E. N., ... & Zirakzadeh, A. (2010). Sexual abuse and lifetime diagnosis of psychiatric disorders: Systematic review and meta-analysis. *Mayo Clinic Proceedings, 85*(7), 618-629.

Chibber, K. S., Biggs, M. A., Roberts, S. C. M., & Foster, D. G. (2014). The role of intimate partners in women's reasons for seeking abortion. *Women's Health Issues, 24*, e131-8.

Chuang, C. H., Cattoi, A. L., McCall-Hosenfeld, J. S., Camacho, F., Dyer, A., Weisman, C. S. (2012). Longitudinal association of intimate partner violence and depressive symptoms. *Mental Health in Family Medicine, 9*, 107-14.

Classen, C. C., Palesh, O. G., & Aggarwal, R. (2005). Sexual revictimization a review of the empirical literature. *Trauma, Violence, & Abuse, 6*(2), 103-129.

Cohen, M. M., Forte, T., Du Mont, J., Hyman, I., & Romans, S. (2006). Adding insult to injury: Intimate partner violence among women and men reporting activity limitations. *Annals of Epidemiology, 16*(8), 644-651.

Coker, A. L., Davis, K. E., Arias, I., Desai, S., Sanderson, M., Brandt, H. M., Smith, P. H. (2002). Physical and mental health effects of intimate partner violence for men and women. *American Journal of Preventive Medicine, 23*(4), 260-8.

Coker, A. L., Hopenhayn, C., DeSimone, C. P., Bush, H. M. & Crofford, L. (2009). Violence against women raises risk of cervical cancer. *Journal of Women's Health, 18*, 1179-85.

Coker, A. L, Sanderson, M., & Dong, B. (2004). Partner violence during pregnancy and risk of adverse pregnancy outcomes. *Paediatric and Perinatal Epidemiology, 18*, 260-9.

Council of Australian Governments. (2011). *The national plan to reduce violence against women and their children: Including the first three-year action plan.* Canberra: FAHCSIA.

Cripps, K., Bennett, C. M., Gurrin, L. C. & Studdert, D. M. (2009). Victims of violence among Indigenous mothers living with dependent children. *Medical Journal of Australia*, 191(9), 481–485.

Culbertson, K. A., & Dehle, C. (2001). Impact of sexual assault as a function of perpetrator type. *Journal of Interpersonal Violence, 16*(10), 992-1007.

Cussen, T., & Bryant, W. (2015). Domestic/family homicide in Australia (Research in practice no 38). Retrieved from Australian Institute of Criminology website http://www.aic.gov.au/publications/current%20series/rip/21-40/rip38.html

Dalal, K., & Lindqvist, K. (2012). A national study of the prevalence and correlates of domestic violence among women in India. *Asia-Pacific Journal of Public Health, 24*(2), 265–277.

Dekeserdy, W. S. (2000). Current controversies on defining nonlethal violence against women in intimate heterosexual relationships: Empirical implications. *Violence Against Women*, 6(7), 728-46.

Devries, K. M., Child, J. C., Bacchus, L. J., Mak, J., Falder, G., Graham, K., ... & Heise, L. (2014). Intimate partner violence victimization and alcohol consumption in women: A systematic review and meta-analysis. *Addiction, 109*(3), 379-391.

Devries, K. M., Mak, J. Y., Bacchus, L. J., Child, J. C., Falder, G., Petzold, M., ... & Watts, C. H. (2013). Intimate partner violence and incident depressive symptoms and suicide attempts: A systematic review of longitudinal studies. *PLOS Medicine, 10*(5).

Doherty, D., & Berglund, D. (2008). *Psychological abuse: A discussion paper*. Ottawa, Canada: Public Health Agency of Canada.

Ehrensaft, M. K., Moffitt, T. E., & Caspi, A. (2006). Is domestic violence followed by an increased risk of psychiatric disorders among women but not among men? A longitudinal cohort study. *The American Journal of Psychiatry, 163*(5), 885-892.

El-Bassel, N., Gilbert, L., Wu, E., Go, H., & Hill, J. (2005). Relationship between drug abuse and intimate partner violence: A longitudinal study among women receiving methadone. *American Journal of Public Health, 95*(3), 465-470.

Evans, S. E., Davies, C., & DiLillo, D. (2008). Exposure to domestic violence: A meta-analysis of child and adolescent outcomes. *Aggression and Violent Behavior, 13*(2), 131-140.

Exner-Cortens, D., Eckenrode, J., & Rothman, E. (2013). Longitudinal associations between teen dating violence victimization and adverse health outcomes. *Pediatrics, 131*(1), 71-78.

Fanslow, J. L., & Robinson, E. M. (2011). Physical injuries resulting from intimate partner violence and disclosure to healthcare providers: Results from a New Zealand population-based study. *Injury Prevention, 17*(1), 37-42.

Fanslow, J., Silva, M., Robinson, E., & Whitehead, A. (2008). Violence during pregnancy: Associations with pregnancy intendedness, pregnancy-related care, and alcohol and tobacco use among a representative sample of New Zealand women. *Australian and New Zealand Journal of Obstetrics and Gynaecology, 48*(4), 398-404.

Fisher, C. (2009). *The exploration of the nature and understanding of family and domestic violence within Sudanese, Somalian, Ethiopian, Liberian and Sierra Leonean communities and its impact on individuals, family relations, the community and settlement*. Perth, WA: Association for Services to Torture and Trauma Survivors.

Flach, C., Leese, M., Heron, J., Evans, J., Feder, G., Sharp, D., & Howard, L. M. (2011). Antenatal domestic violence, maternal mental health and subsequent child behaviour: A cohort study. *BJOG: An International Journal of Obstetrics & Gynaecology, 118*(11), 1383-1391.

Flood, M., & Fergus, L. (2008). *An assault on our future: The impact of violence on young people and their relationship*s. Sydney: White Ribbon Foundation.

Forte, T., Cohen, M. M., Du Mont, J., Hyman, I., & Romans, S. (2005). Psychological and physical sequelae of intimate partner violence among women with limitations in their activities of daily living. *Archives of Women's Mental Health, 8*(4), 248-256.

Gage, A. J. (2005). Women's experience of intimate partner violence in Haiti. *Social Science & Medicine, 61*(2), 343–364.

Garcia-Moreno, C. Jansen, H. A. F. M., Ellsberg, M., Heise, L., & Watts, C. H. (2006). Prevalence of intimate partner violence: Findings from the WHO multi-country study on women's health and domestic violence. *The Lancet, 368*(9543), 1260–1269.

Gazmararian, J. A., Lazorick, S., Spitz, A. M., Ballard, T. J., Saltzman, L. E., & Marks, J. S. (1996). Prevalence of violence against pregnant women. *JAMA, 275*(24), 1915-1920.

Golding, J. M. (1999). Intimate partner violence as a risk factor for mental disorders: A meta-analysis. *Journal of Family Violence, 14*(2), 99-132.

Graham-Kevan, N., & Archer, J. (2008). Does controlling behavior predict physical aggression and violence to partners? *Journal of Family Violence, 23*(7), 539-548.

Grech, K., & Burgess, M. (2011). *Trends and patterns in domestic violence assaults: 2001 to 2010* (Issues paper, no 61). Sydney: NSW Bureau of Crime Statistics and Research.

Gulliver, P. J., & Dixon, R. S. (2014). Immediate and long-term outcomes of assault in pregnancy. *Australian and New Zealand Journal of Obstetrics and Gynaecology, 54*(3), 256-262.

Hahn, J. W., McCormick, M. C., Silverman, J. G., Robinson, E. B., & Koenen, K. C. (2014). Examining the impact of disability status on intimate partner violence victimization in a population sample. *Journal of Interpersonal Violence, 29*(17), 3063-85.

Hall, M., Chappell, L. C., Parnell, B. L., Seed, P. T., & Bewley, S. (2014). Associations between intimate partner violence and termination of pregnancy: A systematic review and meta-analysis. PLoS Medicine, 11(1). doi: 10.1371/journal.pmed.1001581

Healey, L. (2013). *Voices against violence: Current issues in understanding and responding to violence against women with disabilities.* Melbourne: Women with Disabilities Victoria..

Healey, L., Howe, K., Humphreys, C., Jennings, C., & Julian, F. (2008). *Building the evidence: A report on the status of policy and practice in responding to violence against women with disabilities in Victoria*. Melbourne: Women's Health Victoria and Victorian Women with Disabilities Network.

Heise, L. L. (2012). *Determinants of partner violence in low and middle-income countries: Exploring variation in individual and population level risk*. London: London School of Hygiene and Tropical Medicine.

Holt, S., Buckley, H., & Whelan, S. (2008). The impact of exposure to domestic violence on children and young people: A review of the literature. *Child Abuse & Neglect, 32*(8), 797-810.

Holtzworth-Munroe, A. (2005). Male versus female intimate partner violence: Putting controversial findings into context. *Journal of Marriage and Family*, *67*(5), 1120-5.

Hughes, R. B., Lund, E. M., Gabrielli, J., Powers, L. E., & Curry, M. A. (2011). Prevalence of interpersonal violence against community-living adults with disabilities: A literature review. *Rehabilitation Psychology, 56*(4), 302–319.

Humphreys, C., Houghton, C., & Ellis, J. (2008). *Literature review: Better outcomes for children and young people experiencing domestic abuse – directions for good practice*. Edinburgh: The Scottish Government.

Janssen, P. A., Holt, V. L., Sugg, N. K., Emanuel, I., Critchlow, C. M., & Henderson, A. D. (2003). Intimate partner violence and adverse pregnancy outcomes: A population-based study. *American Journal of Obstetrics and Gynecology, 188*(5), 1341-7.

Jones, R. K., Moore, A. M., & Frohwirth, L. F. (2011). Perceptions of male knowledge and support among US women obtaining abortions. *Women's Health Issues, 21*(2), 117-23.

Jun, H. J., Rich-Edwards, J. W., Boynton-Jarrett, R., & Wright, R. J. (2008). Intimate partner violence and cigarette smoking: Association between smoking risk and psychological abuse with and without co-occurrence of physical and sexual abuse. *American Journal of Public Health*, 98*(3),* 527-35.

Kasturirangan, A., Krishnan, S., & Riger, S. (2004). The impact of culture and minority status on women's experience of domestic violence. *Trauma Violence & Abuse, 5*(4), 318–32.

Keiley, M. K., Keller, P. S., & El-Sheikh, M. (2009). Effects of physical and verbal aggression, depression, and anxiety on drinking behavior of married partners: A prospective and retrospective longitudinal examination. *Aggressive Behavior, 35*(4), 296-312.

Kim, J., & Lee, J. (2013). Prospective study on the reciprocal relationship between intimate partner violence and depression among women in Korea. *Social Science & Medicine, 99*, 42-48.

Kimerling, R., Alvarez, J., Pavao, J., Mack, K. P., Smith, M. W., & Baumrind, N. (2009). Unemployment among women: Examining the relationship of physical and psychological intimate partner violence and posttraumatic stress disorder. *Journal of Interpersonal Violence, 24,* 450–63.

Kimmel, M. S. (2002). "Gender symmetry" in domestic violence: A substantive and methodological research review. *Violence Against Women*, 8(11), 132–63.

Kiss, L., Schraiber, L. B., Heise, L., Zimmerman, C., Gouveia, N., & Watts, C. (2012). Gender-based violence and socioeconomic inequalities: Does living in more deprived neighbourhoods increase women's risk of intimate partner violence? *Social Science & Medicine, 74*(8), 1172–9.

Kitzmann, K. M., Gaylord, N. K., Holt, A. R., & Kenny, E. D. (2003). Child witnesses to domestic violence: A meta-analytic review. *Journal of Consulting and Clinical Psychology, 71*(2), 339–52.

KPMG. (2014). *Too costly to ignore: The economic impact of gender based violence in South Africa*. [n. p.]:KPMG South Africa.

Kundi, M. (2006). Causality and the interpretation of epidemiological evidence. *Environmental Health Perspectives, 114*, 969–74.

Last, J. (Ed.). (2001). A dictionary of epidemiology (4th ed.). New York: Oxford University Press.

Lau, C. L., Ching, W. M., Tong, W. L., Chan, K. L., Tsui, K. L., & Kam, C. W. (2008). 1700 Victims of intimate partner violence: Characteristics and clinical outcomes. *Hong Kong Medical Journal, 14*(6), 451-7.

Leone, J. M., Lane, S. D., Koumans, E. H., DeMott, K., Wojtowycz, M. A., Jensen, J., & Aubry, R. H. (2010). Effects of intimate partner violence on pregnancy trauma and placental abruption. *Journal of Women's Health, 19*(8), 1501-1509.

Levendosky, A. A., Bogat, G. A., & Martinez-Torteya, C. (2013). PTSD symptoms in young children exposed to intimate partner violence. *Violence Against Women, 19*(2), 187-201.

Lewis, C. S., Griffing, S., Chu, M., Jospitre, T., Sage, R. E., Madry, L., & Primm., B. J. (2006). Coping and violence exposure as predictors of psychological functioning in domestic violence survivors. *Violence Against Women, 12*(4), 340-54.

Li, Y., Marshall, C. M., Rees, H. C., Nunez, A., Ezeanolue, E. E., & Ehiri, J. E. (2014). Intimate partner violence and HIV infection among women: A systematic review and meta-analysis. *Journal of the International AIDS Society, 17*(1).

Lim, S. S., Vos, T., Flaxman, A. D., Danaei, G., Shibuya, K., Adair-Rohani, H., ... & Davis, A. (2013). A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: A systematic analysis for the Global Burden of Disease Study 2010. *The Lancet, 380*(9859), 2224-60.

Lindhorst, T., & Beadnell, B. (2011). The long arc of recovery: Characterizing intimate partner violence and its psychosocial effects across 17 years. *Violence Against Women, 17*(4), 480-99.

Lindhorst, T., Oxford M., & Rogers M. G. (2007). Longitudinal effects of domestic violence on employment and welfare outcomes. *Journal of Interpersonal Violence, 22*(7), 812–28.

Loxton, D., Schofield, M., & Hussain, R. (2006). Psychological health in midlife among women who have ever lived with a violent partner or spouse. *Journal of Interpersonal Violence, 21*(8), 1092-1107.

Malta, L. A., McDonald, S. W., Hegadoren, K. M., Weller, C. A., & Tough, S. C. (2012). Influence of interpersonal violence on maternal anxiety, depression, stress and parenting morale in the early postpartum: A community based pregnancy cohort study. *BMC Pregnancy and Childbirth, 12,* 153.

Maman, S., Campbell, J., Sweat, M. D., & Gielen, A. C. (2000). The intersections of HIV and violence: Directions for future research and interventions. *Social Science & Medicine, 50*(4), 459-78.

Mason, F., & Lodrick, Z. (2013). Psychological consequences of sexual assault. *Best Practice & Research Clinical Obstetrics & Gynaecology, 27*(1), 27-37.

Mason, S. M., Wright, R. J., Hibert, E. N., Spiegelman, D., Forman, J. P., & Rich-Edwards, J. W. (2012). Intimate partner violence and incidence of hypertension in women. *Annals of Epidemiology, 22*(8), 562-67.

Mason, S. M., Wright, R. J., Hibert, E. N., Spiegelman, D., Jun, H. J., Hu, F. B., & Rich-Edwards, J. W. (2013). Intimate partner violence and incidence of type 2 diabetes in women. *Diabetes Care May, 36,* 1159-65.

McDonald, F. (2012). *Spotlight on economic abuse: A literature and policy review.* North Collingwood, VIC: Good Shepherd Youth and Family Service.

McGlade, H. (2012). *Our greatest challenge: Aboriginal children and human rights.* Canberra: Aboriginal Studies Press.

McLaughlin, J., O'Carroll, R. E., & O'Connor, R. C. (2012). Intimate partner abuse and suicidality: A systematic review. *Clinical Psychology Review, 32*(8), 677-89.

McKinnon, L. (2008). *Hurting without hitting: Non-physical contact forms of abuse* (Stakeholder paper 4). Sydney: Australian Domestic and Family Violence Clearinghouse.

Mitchell, L. (2011). *Domestic violence in Australia: An overview of the issues.* Canberra: Department of Parliamentary Services.

Moon, G., & Gould, M. (2000). Epidemiology: An introduction. Buckingham, UK: Open University Press.

Mouzos, J., & Makkai, T. (2004). *Women's experiences of male violence: Findings from the Australian component of the International Violence Against Women Survey (IVAWS)* (Research and Public Policy Series no. 56). Canberra: Australian Institute of Criminology.

Murphy, C. M., & Hoover, S. A. (1999). Measuring emotional abuse in dating relationships as a multifactorial construct. *Violence and Victims*, 14*(1),* 39-53.

National Council to Reduce Violence against Women and their Children. (2009). *The cost of violence against women and their children.* Canberra: FAHCSIA.

New Zealand Ministry of Health. (2013). *Health loss in New Zealand: A report from the New Zealand Burden of Diseases, Injuries and Risk Factors Study, 2006-2016.* Wellington: Ministry of Health.

Norton, L. B., Peipert, J. F., Zierler, S., Lima, B., & Hume, L. (1995). Battering in pregnancy: An assessment of two screening methods. *Obstetrics & Gynecology, 85(3),* 321-5.

Okuda, M., Olfson, M., Hasin, D., Grant, B. F., Lin, K. H., & Blanco, C. (2011). Mental health of victims of intimate partner violence: Results from a national epidemiologic survey. *Psychiatric Services, 62*(8), 959-62.

Ouellet-Morin, I., Fisher, H. L., York-Smith, M., Fincham-Campbell, S., Moffitt, T. E., & Arseneault, L. (2015). Intimate partner violence and new-onset depression: A longitudinal study of women's childhood and adult histories of abuse. *Depression and Anxiety, 32*(5), 316-24.

Parsons, L. H., & Harper, M. A. (1999). Violent maternal deaths in North Carolina. *Obstetrics & Gynecology, 94*(6), 990-3.

Pavey, A. R., Gorman, G. H., Kuehn, D., Stokes, T. A., & Hisle-Gorman, E. (2014). Intimate partner violence increases adverse outcomes at birth and in early infancy. *The Journal of Pediatrics, 165*(5), 1034-9.

Pigeon, W. R., Cerulli, C., Richards, H., He, H., Perlis, M., & Caine, E. (2011). Sleep disturbances and their association with mental health among women exposed to intimate partner violence. *Journal of Women's Health, 20*(12), 1923-9.

Pittaway, E. (2004). *The ultimate betrayal: An examination of the experiences of domestic and family violence in refugee communities* (Occasional Paper 5). Sydney: Centre for Refugee Research, University of New South Wales.

Plummer, S. B., & Findley, P. A. (2012). Women with disabilities' experience with physical and sexual abuse: Review of the literature and implications for the field. *Trauma, Violence, & Abuse, 13*(1), 15-29.

Postmus, J. L., McMahon, S., Warrener, C., & Macri, L. (2011). Factors that influence attitudes, beliefs, and behaviors of students toward survivors of violence. *Journal of Social Work Education, 47*(2), 303–19.

Raj, A., & Silverman, J. (2002). Violence against immigrant women: The roles of culture, context, and legal immigrant status on intimate partner violence. *Violence Against Women, 8*(3), 367-98.

Rees, S., & Pease, B. (2007). Domestic violence in refugee families in Australia. *Journal of Immigrant & Refugee Studies, 5*(2), 1–19.

Rich, C. L., Gidycz, C. A., Warkentin, J. B., Loh, C., & Weiland, P. (2005). Child and adolescent abuse and subsequent victimization: A prospective study. *Child Abuse & Neglect, 29*(12), 1373-94.

Richards, K. (2011). *Children's exposure to domestic violence in Australia* (Trends and issues in crime and criminal justice no. 419). Canberra: Australian Institute of Criminology.

Roberts, T. A., Klein, J. D., & Fisher, S. (2003). Longitudinal effect of intimate partner abuse on high-risk behavior among adolescents. *Archives of Pediatrics & Adolescent Medicine, 157*(9), 875-81.

Rothman, K. J., & Greenland, S. (1998). *Modern epidemiology* (2nd ed.). Philadelphia, PA: Lippincott.

Roustit, C., Renahy, E., Guernec, G., Lesieur, S., Parizot, I., & Chauvin, P. (2009). Exposure to interparental violence and psychosocial maladjustment in the adult life course: Advocacy for early prevention. *Journal of Epidemiology and Community Health, 63*(7), 563-68.

Ruiz-Pérez, I., Plazaola-Castaño, J., Cáliz-Cáliz, R., Rodríguez-Calvo, I., García-Sánchez, A., Ferrer-González, M. Á., ... & García, I. L. C. (2009). Risk factors for fibromyalgia: The role of violence against women. *Clinical Rheumatology, 28*(7), 777-86.

Saftlas, A. F., Wallis, A. B., Shochet, T., Harland, K. K., Dickey, P., & Peek-Asa, C. (2010). Prevalence of intimate partner violence among an abortion clinic population. *American Journal of Public Health, 100*(8), 1412-15.

Shah, P. S., & Shah, J. (2010). Maternal exposure to domestic violence and pregnancy and birth outcomes: A systematic review and meta-analyses. *Journal of Women's Health, 19*(11), 2017-31.

Silverman, J. G., Decker, M. R., Reed, E., & Raj, A. (2006). Intimate partner violence victimization prior to and during pregnancy among women residing in 26 US states: Associations with maternal and neonatal health. *American Journal of Obstetrics and Gynecology, 195*(1), 140-8.

Simmons, S. B., Knight, K. E., & Menard, S. (2015). Consequences of intimate partner violence on substance use and depression for women and men. *Journal of Family Violence, 30*(3), 351-61.

Smith, P. H., Earp, J. A., & DeVellis, R. (1995). Measuring battering: Development of the Women's Experience with Battering (WEB) Scale. *Women's Health, 1*(4), 273-88.

Solar, O., & Irwin, A., (2015). *A conceptual framework for action on the social determinants of health* (Social Determinants of Health Discussion Paper 2) Geneva: WHO.

Staggs, S. L., Long, S. M., Mason, G. E., Krishnan, S., & Riger, S. (2007). Intimate partner violence, social support, and employment in the post-welfare reform era. *Journal of Interpersonal Violence, 22,* 345–367.

Stark, E. (2007). *Coercive control: How men entrap women in personal life*. New York: Oxford University Press.

Stene, L. E., Jacobsen, G. W., Dyb, G., Tverdal, A., & Schei, B. (2013). Intimate partner violence and cardiovascular risk in women: A population-based cohort study. *Journal of Women's Health, 22*(3), 250-58.

Stith, S. M., Rosen, K. H., Middleton, K. A., Busch, A. L., Lundeberg, K., & Carlton, R. P. (2000). The intergenerational transmission of spouse abuse: A meta-analysis. *Journal of Marriage and Family*, *62*(3), 640-54.

Stöckl, H., Devries, K., Rotstein, A., Abrahams, N., Campbell, J., Watts, C., & Moreno, C. G. (2013). The global prevalence of intimate partner homicide: A systematic review. *The Lancet, 382*(9895), 859-65.

Straus, M. A. (1979). Measuring intrafamily conflict and violence: The conflict tactics (CT) scales. *Journal of Marriage and the Family, 41*(1), 75-88.

Straus, M. A., Hamby, S. L., Boney-McCoy, S., & Sugarman, D. B. (1996). The revised conflict tactics scales (CTS2) development and preliminary psychometric data. *Journal of Family Issues, 17*(3), 283-316.

Suglia, S. F., Duarte, C. S., & Sandel, M. T. (2011). Housing quality, housing instability, and maternal mental health. *Journal of Urban Health, 88*(6), 1105-16.

Swan, S. C., Gambone, L. J., Van Horn, M. L., Snow, D. L. & Sullivan, T. P. (2012). Factor structures for aggression and victimization among women who used aggression against male partners. *Violence Against Women, 18*(9), 1045–66.

Taft, A. (2002). *Violence against women in pregnancy and after childbirth*. Sydney: Australian Domestic and Family Violence Clearinghouse.

Taft, A. J., & Watson, L. F. (2007). Termination of pregnancy: Associations with partner violence and other factors in a national cohort of young Australian women. *Australian and New Zealand Journal of Public Health, 31*(2), 135-42.

Taft, A. J., & Watson, L. F. (2008). Depression and termination of pregnancy (induced abortion) in a national cohort of young Australian women: The confounding effect of women's experience of violence. *BMC Public Health, 8*(1), 75.

Taylor, N., & Putt, J. (2007). *Adult sexual violence in Indigenous and culturally and linguistically diverse communities in Australia* (Trends & issues in crime and criminal justice, no. 345). Canberra: Australian Institute of Criminology.

Teitelman, A. M., Dichter, M. E., Cederbaum, J. A., & Campbell, J. C. (2008a). Intimate partner violence, condom use and HIV risk for adolescent girls: Gaps in the literature and future directions for research and intervention. *Journal of HIV/AIDS Prevention in Children & Youth, 8*(2), 65-93.

Teitelman, A. M., Ratcliffe, S. J., Dichter, M. E., & Sullivan, C. M. (2008b). Recent and past intimate partner abuse and HIV risk among young women. *Journal of Obstetric, Gynecologic, & Neonatal Nursing, 37*(2), 219-27.

Theran, S. A., Sullivan, C. M., Bogat, G. A., & Sutherland, C. (2006). Abusive partners and ex-partners: Understanding the effects of relationship to the abuser on well-being and social support. *Violence Against Women, 12(10),* 950–969.

Tiwari, A., Chan, K. L., Fong, D., Leung, W. C., Brownridge, D. A., Lam, H., ... & Ho, P. C. (2008). The impact of psychological abuse by an intimate partner on the mental health of pregnant women. *BJOG: An International Journal of Obstetrics & Gynaecology, 115*(3), 377-84.

Trijbetz, T. (2013). *Domestic and family violence and people from immigrant and refugee backgrounds* (Fast facts no. 11). Sydney: Australian Domestic and Family Violence Clearinghouse.

Tually, S., Faulkner, D., Cutler, C., & Slatter, M. (2008). *Women, domestic and family violence and homelessness: A synthesis report.* [Adelaide]: Flinders Institute for Housing, Urban and Regional Research Flinders University.

Tucker, J. S., Wenzel, S. L., Elliott, M. N., Marshall, G. N., & Williamson, S. (2004). Interpersonal violence, substance use, and HIV-related behavior and cognitions: A prospective study of impoverished women in Los Angeles County. *AIDS and Behavior, 8*(4), 463-74.

United Nations. (1993). Declaration on the Elimination of Violence against Women. Retrieved June 18, 2015 from http://www.un.org/documents/ga/res/48/B48r104.htm.

Urquia, M. L., O'Campo, P. J., Heaman, M. I., Janssen, P. A., & Thiessen, K. R. (2011). Experiences of violence before and during pregnancy and adverse pregnancy outcomes: An analysis of the Canadian Maternity Experiences Survey. *BMC pregnancy and childbirth, 11*(1), 42.

Van Dulmen, M. H., Klipfel, K. M., Mata, A. D., Schinka, K. C., Claxton, S. E., Swahn, M. H., & Bossarte, R. M. (2012). Cross-lagged effects between intimate partner violence victimization and suicidality from adolescence into adulthood. *Journal of Adolescent Health, 51*(5), 510-16.

Victorian Government. (2013). *Victoria' advantage. Victoria's multicultural affairs and citizenship policy.* Melbourne: Victorian Government.

Victorian Health Promotion Foundation. (2004). *The health costs of violence: Measuring the burden of disease associated with intimate partner violence.* Melbourne: Victorian Health Promotion Foundation.

Vos, T., Astbury, J., Piers, L. S., Magnus, A., Heenan, M., Stanley, L., ... & Webster, K. (2006). Measuring the impact of intimate partner violence on the health of women in Victoria, Australia. *Bulletin of the World Health Organization, 84*(9), 739-44.

Walsh, K., Galea, S., & Koenen, K. C. (2012). Mechanisms underlying sexual violence exposure and psychosocial sequelae: A theoretical and empirical review. *Clinical Psychology, 19*(3), 260-75.

Wangmann, J. (2011). *Different types of intimate partner violence: An exploration of the literature.* Sydney: Australian Domestic and Family Violence Clearinghouse.

Watkins, L. E., Jaffe, A. E., Hoffman, L., Gratz, K. L., Messman-Moore, T. L., & DiLillo, D. (2014). The longitudinal impact of intimate partner aggression and relationship status on women's physical health and depression symptoms. *Journal of Family Psychology, 28*(5), 655-65.

Watson, L. F., & Taft, A. J. (2013). Intimate partner violence and the association with very preterm birth. *Birth, 40*(1), 17-23.

Webster, K., Pennay, P., Bricknall, R., Diemer, K., Flood, M., Powell, A., Politoff, V., Ward, A. (2014). *Australians' attitudes to violence against women: Full technical report, Findings from the 2013 National Community Attitudes towards Violence Against Women Survey (NCAS).* Melbourne: Victorian Health Promotion Foundation.

Wolfe, D. A., Crooks, C. V., Lee, V., McIntyre-Smith, A., & Jaffe, P. G. (2003). The effects of children's exposure to domestic violence: A meta-analysis and critique. *Clinical Child and Family Psychology Review, 6*(3), 171-87.

Wong, J. & Mellor, D. (2014) Intimate partner violence and women's health and wellbeing: Impacts, risk factors and responses. *Contemporary Nurse: a Journal for the Australian Nursing Profession, 46*(2), 170-9.

World Health Organization. (1946). Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948. http://www.who.int/about/definition/en/print.html.

World Health Organization. (2013). *Global and regional estimates of violence against women: Prevalence and health effects of intimate partner violence and non-partner sexual violence.* Retrieved May 1, 2015 from http://apps.who.int/iris/bitstream/10665/85239/1/9789241564625_eng.pdf.

World Health Organization. (2015). *Human papillomavirus (HPV) and cervical cancer* (Fact sheet no. 380). Retrieved June 9, 2015 from http://www.who.int/mediacentre/factsheets/fs380/en/.

World Health Organization Commission on Social Determinants of Health. (2008). Closing the gap in a generation: Health equity through action on the social determinants of health: Final report. Geneva: WHO.

World Health Organization, & London School of Hygiene and Tropical Medicine.(2010). *Preventing intimate partner and sexual violence against women: Taking action and generating evidence,* Geneva: WHO.

Wood, S. L., & Sommers, M. S. (2011). Consequences of intimate partner violence on child witnesses: A systematic review of the literature. *Journal of Child and Adolescent Psychiatric Nursing, 24*(4), 223-36.

Woolhouse, H., Gartland., D., Hegarty, K., Donath, S., & Brown, S. J. (2012). Depressive symptoms and intimate partner violence in the 12 months after childbirth: A prospective pregnancy cohort study. *BJOG: An International Journal of Obstetrics & Gynaecology, 119*(3), 315-23.

Wright, E. M. (2012). The relationship between social support and intimate partner violence in neighborhood context. *Crime & Delinquency,* [ahead-0f-print]. doi:10.1177/0011128712466890

Zannettino, L. (2012). ".... There is no war here: It is only the relationship that makes us scared": Factors having an impact on domestic violence in the Liberian Refugee Communities in South Australia. *Violence Against Women, 18*(7*), 807–28.*

Zlotnick, C., Johnson, D. M., & Kohn, R. (2006). Intimate partner violence and long-term psychosocial functioning in a national sample of American women. *Journal of Interpersonal Violence, 21*(2), 262-75.

Appendix A: Technical description of risk factor analysis

The various steps in the risk factor analysis are outlined below. Analysis of risk factors in burden of disease studies uses a comparative risk assessment methodology, which is a five-step process:

1. Select risk-outcome pairs to be included in the analysis based on criteria about causal associations.

2. Estimate the population-level distribution of risk factor exposure.

3. Calculate the effect of risk factors on disease outcomes.

4. Define the alternative/counterfactual exposure.

5. Calculate the population attributable fraction.

1. Risk-outcome pairs

Risk-outcome pairs map diseases and injuries to known risk factors for that condition. For example, high fasting plasma glucose is a risk factor for diabetes. The disease or injury concepts are selected as mutually exclusive concepts, of significant population impact on either mortality or morbidity, are of national policy interest, and have data of sufficient quality and quantity available for disease modelling.

2. Population distribution of exposure

The application of a clear and consistent definition of risk factor exposure is a key requirement for estimating the proportion of the population "at-risk". Detailed estimates are required by age and sex groups.

3. Estimates of effect

Burden of disease studies use relative risks to quantify the causal association between risk factors and disease outcomes. Relative risk compares the size of the effect in two different groups of people. For example, a relative risk of 2 means that one group has twice the risk of developing the disease compared to the other group. These are largely drawn from published studies and meta-analyses. Effect sizes need to be adjusted for confounding factors. For example, the relative risk of coronary heart disease due to physical inactivity is adjusted for age (a confounder) but is not adjusted for high blood pressure, as the latter lies along the causal pathway.

4. Counterfactual definition

The estimated contribution of a risk factor to disease burden is calculated by comparing the observed risk factor distribution to an alternative, hypothetical scenario (the counterfactual) that represents the ideal risk factor exposure—which would result in the lowest levels of disease or injury. This scenario could be an increase or decrease in levels of exposure or changes in behaviour compared to what is currently observed in the population. Here, the theoretical-minimum-risk exposure distribution is zero exposure to IPV.

5. Calculation of population attributable fractions

In burden of disease analysis, population attributable fractions (PAFs) determine the proportion of a particular disease that could have potentially been avoided if the population had never been exposed to a risk factor. The calculation of PAFs requires the inputs outlined above, including the relative risk (RR) and prevalence of exposure in the population.

Appendix B: Summary table of studies

Table B1. Summary of studies that investigated the impact of IPV on depression

No.	First author (year)	Year of data collection	Study design	Sample	Type of IPV (dependent variable)	Depression (outcome variable)	Results
IPV (previous or current married or de-facto relationship)							
1	Chuang (2012)	2004–05	Longitudinal (2y F/U)	N=1,404, 18–45y, US	IPV (12m)	High risk depressive symptoms (CES-D ≥4).	Analysis controlled for baseline depressive symptoms, continued exposure to IPV (at F/U), age group, race, education, marital status, income, greater social support, physically active, binge drinking and drug use and smoking. Baseline IPV did not predict depressive symptoms.
2	Coker (2002)	1995–96	Cross-sectional	N=6,790 women, 18–65y, US	Physical aggression, sexual abuse, psychological abuse\n\nCTS, forced sex questions, and power and control scale	Depressive symptoms (SF-36 Health survey/ BDI).	IPV victims whose health problem occurred before they experienced IPV were eliminated. Depressive symptoms were associated with physical/sexual IPV (aRR **2.1** (1.8–2.6) and verbal (psychological only) IPV (aRR **1.8** (1.3–2.4)), adjusting for age, race, health insurance status, and childhood physical and sexual abuse.
3	Ehrensaft (2006)	1990	Longitudinal (8y F/U)	N=449, 18y, NZ	IPV (physical) – partner conflict calendar	Major depressive episode (12m) (Diagnostic interview schedule for DSM-III-R criteria at baseline, DSM-IV at F/U).	Analysis controlled for baseline MDE and juvenile conduct disorder. Clinically abusive relationship at age 26 predicted major depressive episode (OR **2.46** (1.16–5.26)).
4	Kim (2013)	2006–09	Longitudinal (1y,2y,3y,4y F/U)	N=3,153 married women aged 15+y	IPV (adapted version of CTS)	Depression (past week) (CES-D-11).	Analysis controlled for age, education, social support and household income at baseline. IPV at baseline was positively associated with depression, and negatively associated with the growth rate of depression.
5	Loxton (2006)	1996	Longitudinal (F/U at 2y) (ALSWH)	N=11,310, 45–50y, Australia	Lifetime abusive relationship (self-report)	Current depression\n\n(CES-D ≥10).	Analysis adjusted for marital status, income management and area of residence. aOR **1.06** (1.04–1.06)

No.	First author (year)	Year of data collection	Study design	Sample	Type of IPV (dependent variable)	Depression (outcome variable)	Results
6	Okuda (2011)	2004–05	Cross-sectional	N=25,626 men and women aged 18+y, US	CTS Form R (physical/ sexual)	Incidence psychiatric disorder (alcohol use disorder and associated disabilities interview schedule IV (AUDADIS-IV)) – "incidence" refers to participants who did not have the disorder in the previous 12m.	Results indicated that IPV in the previous 12 months predicted major depressive disorder (aOR **1.8** (1.2–2.8). OR adjusted for race, age, education, individual income, family income, employment status, marital status, sexual orientation. Did not report results by sex (although prevalence of IPV victimisation did not differ significantly between genders).
7	Ouellet-Morin (2015)	1995	Longitudinal (baseline when mother gave birth, F/U at 5y and 7y)	N=1,052 women giving birth to twins, UK	CTS Form R (baseline and 5y F/U)	Depression (Diagnostic interview schedule (DSM-IV). Prevalence was more than 9.8% at 5y F/U and 13.5% at 7y F/U.	Analysis excluded participants at baseline with previous history of depression, and controlled for childhood maltreatment, socioeconomic deprivation, antisocial personality and young motherhood. IPV predicted new onset of depression at 5y F/U(aOR **1.72** (1.07–2.77)) and 7y F/U (aOR **2.64** (1.74–4.01).
8	Rich (2005)		Longitudinal (2m F/U)	N=551 university students, most 18-19y, US	Physical/verbal IPV (CTS)	BDI-II.	Path analysis controlled for baseline depressive symptoms, child sexual abuse and trauma. Results indicated baseline IPV did not significantly predict subsequent depressive symptoms.
9	Suglia (2011)	1996–97	Longitudinal (from birth of child, 1y, 3y F/U)	N=2,104 women with a child, US	Physical/sexual IPV (prior to 1y F/U)	Composite international diagnostic interview (short form) (CIDI-SF) according to DSM IV criteria for depression.	Adjusted for race/ethnicity, education level, age, marital status and economic hardship. Women with probable depression at 1y F/U excluded from analysis so that only new cases were considered. Results were not significant. Prior to 12 months aOR **1.09** (0.6–1.9).
10	Taft (2008)	1996 (ALSWH)	Longitudinal (4y F/U)	N=9,683, 18–23y	Lifetime IPV (ever been in a violent relationship with a partner/spouse)	Probable depression (CES-D 10 (scores ≥10)).	Analysis adjusted for sociodemographic including Indigenous status, and "doctor ever told you that you have depression" >4 years ago (asked at F/U). aOR **2.06** (1.74–2.43)

No.	First author (year)	Year of data collection	Study design	Sample	Type of IPV (dependent variable)	Depression (outcome variable)	Results
11	Vos (2006)	2000 (ALSWH)	Cross-sectional	N=14,739 Women aged 22–27y, Australia	Past 12m/more than 12m ago	Self-reported depression – "ever been told in last 4 years".	Depression was significantly associated with IPV more than 12 months ago (aRR **1.96** (1.59–2.42). Controlled for socioeconomic variables and smoking status.
12	Watkins (2014)		Longitudinal (4m, 8m, 12m F/U)	N= 375, mean age 21.86y, US	IPV from current partner (previous 12m at baseline, previous 4m at F/U) (CTS-R) – psychological and physical	Depression symptoms (Depression anxiety stress scale (Henry & Crawford, 2005)).	Physical IPV but not psychological IPV was significantly associated with depression symptoms.
13	Zlotnick (2006)	1987–88	Longitudinal (5y F/U)	N=~3,173 women aged 19+ y, US	Physical IPV by partner married to or living with	Depressive symptoms (CES-D).	Controlled for age and depression at baseline. Baseline IPV significantly predicted subsequent depressive symptoms (β = 6.96, p<.01).
Adolescent dating violence							
14	Ackard (2007)	1999	Longitudinal (5y F/U)	N=822 women, mean age ~15y, US	Adolescent dating violence >12m ago (physical/sexual)	High depressive symptoms (top-scoring quartile using scale by Kandel and Davies (1982).	Analysis adjusted for high depressive symptoms at wave 1. Women exposed to adolescent dating violence at baseline were more likely to demonstrate high depressive symptoms (aOR =**1.92** (1.22–3.00)).
15	Exner-Cortens (2013)	1994–95	Longitudinal (5y F/U) (Ad health)	N=2,816 women, 13–19y at baseline, US	Psychological dating violence (only), psych and physical dating violence (CTS2)	Depression (CES-D).	Controlled for baseline IPV. Depression scores on CES-D were not associated with psychological dating violence only but were for psychological and physical dating violence (b=0.90 (0.12–1.67)). Analyses controlled for race, age, SES, child maltreatment, pubertal status and depression at baseline.
16	Roberts (2003)	1995	Longitudinal (1y F/U) (Ad health)	N=2,206 women, 11–21y, US	CTS at F/U	CES-D (baseline + F/U).	Analysis controlled for sociodemographic variables, prior abuse in wave 1 (unclear whether IPV specific), number of intimate partners, baseline depressed mood. β =0.18 (0.10–0.26).

Table B2. Summary of studies that investigated the impact of IPV on postnatal depression

No.	First author (year)	Year of data collection	Study design	Sample	Type of IPV (dependent variable)	Depression (outcome variable)	Results
1	Agrawal (2014)	2001–05	Longitudinal (RCT) (6m and 12m postpartum F/U)	N=734, 14–25y, women at <24 weeks gestation, US	CTS (6m, 12m) (includes emotional, physical and sexual IPV)	CES-D.	Analysis controlled for age, education, race/ethnicity, employment, parity, STD history, relationship status, intervention group. When IPV was present at 6m and 12m depression scores were not significantly different. When IPV was absent at 6m and present at 12m, depression scores increased significantly (M=12.2 (SE=0.7) vs 14.4 (M=14.4 SE=0.7, respectively).
2	Flach (2011)	1991–92	Longitudinal (baseline 18 weeks gestation, 2m, 8m, 21m and 33m postpartum F/U)	N=13,617 children-mother dyads, UK	Antenatal domestic violence (cruelty/physically hurt)	Probable clinical depression (EPDS score ≥13 at 8 weeks postpartum).	Analysis adjusted for maternal antenatal depressive symptoms, paternal postnatal depressive symptoms, size of child adjusted for gestational age. At 8 weeks postpartum, antenatal domestic violence predicted probable maternal depression (aOR **1.29** (1.02–1.63)). Borderline results.
3	Malta (2012)	2008	Cohort (<25w gestation, 34–36w gestation F/U, 4m postpartum F/U)	N=1,319, Canada	IPV status assessed at 34–36 weeks gestation	Postnatal depression (EPDS ≥10).	Analysis adjusted for income, past mental health problems, low social support during pregnancy (early or late), optimism, low energy, exposure to child maltreatment. Exposure to partner violence did not significantly predict depression.
4	Tiwari (2008)	2005–06	Longitudinal (32–36 gestation, 1w postpartum F/U)	N=3,036 women at 32–36 weeks gestation, Hong Kong	IPV (1 week postpartum, lifetime, previous 12m and during pregnancy) (Abuse assessment screen)	Postnatal depression (EPDS score ≥10).	Analysis adjusted for demographics, socioeconomic status, chronic illness in family and in-law conflict. Psychological only but not physical/sexual IPV significantly predicted postnatal depression (aOR **1.84** (1.12–3.02)).
5	Urquia (2011)	2006	Cross-sectional (Maternity Experiences Survey)	N=6,421 women at delivery, aged ≥15y, Canada	Adapted from Violence Against Women Survey (physical/sexual)	Postpartum depression (EPDS ≥13).	Analysis controlled for maternal age, marital status and immigration status, low income household. Women were excluded from analysis if they had been diagnosed with depression or were taking antidepressants before pregnancy. Any abuse during pregnancy predicted postpartum depression (aOR **2.6** (1.5–4.6)), as did abuse before and during pregnancy (aOR **3.4** (1.7–6.8)).

No.	First author (year)	Year of data collection	Study design	Sample	Type of IPV (dependent variable)	Depression (outcome variable)	Results
6	Woolhouse (2012)	2003–05	Cohort (3m, 6m and 12m postpartum F/U)	N=1,305 pregnant women aged ≥18y in metropolitan hospitals, Australia	Composite abuse scale (12m) (emotional/physical) at 12m F/U	Probably major depression (EPDS score ≥13).	Analysis controlled for maternal age, relationship status, maternal country of birth, maternal income during the year before pregnancy, highest educational qualification, employment status, previous depression (any time before, 12 months before or during pregnancy). Results indicated that physical abuse and emotional abuse were associated with increased risk of depressive symptoms postpartum (aOR **3.94** (2.44–6.36) and 2.72 (1.75–4.13), respectively).

Table B3. Summary of studies that investigated the impact of IPV on anxiety

No.	First author (year)	Year of data collection	Study design	Sample	Type of IPV (dependent variable)	Anxiety (outcome variable)	Results
1	Ehrensaft (2006)	1990	Longitudinal (8y F/U)	N=449, 18y, NZ	IPV (physical) – partner conflict calendar	Anxiety (12m) (Diagnostic interview schedule for DSM-III-R criteria at baseline, DSM-IV at F/U).	Analysis controlled for baseline anxiety and juvenile conduct disorder. Clinically abusive relationship at age 26 predicted PTSD (OR **6.42** (2.28–18.04)) but not Generalised Anxiety Disorder (OR **2.70** (0.92–7.92)).
2	Okuda (2011)	2004–05	Cross-sectional	N=25,626 men and women aged 18+y, US	CTS Form R (physical/sexual)	Incidence psychiatric disorder (alcohol use disorder and associated disabilities interview schedule IV (AUDADIS-IV)) – "incidence" refers to participants who did not have the disorder in the previous 12m.	Results indicated that IPV in the previous 12 months predicted anxiety (OR **2.3** (1.8–2.9)). OR adjusted for race, age, education, individual income, family income, employment status, marital status, sexual orientation. Did not report results by sex (although prevalence of IPV victimisation did not differ significantly between genders).
3	Vos (2006)	2000 (ALSWH)	Cross-sectional	N=14,739 Women aged 22–27y, Australia	Past 12m/more than 12m ago	Self-reported anxiety – "ever been told in last 4 years".	Anxiety was significantly associated with IPV more than 12 months ago (aRR **1.83** (1.36–2.47)). Controlled for socioeconomic variables and smoking status.

Table B4. Summary of studies that investigated the impact of IPV on alcohol use disorder

No.	First author (year)	Year of data collection	Study design	Sample	Type of IPV (dependent variable)	Alcohol use (outcome variable)	Results
IPV (previous or current married or de-facto relationship)							
1	Coker (2002)	1995–96	Cross-sectional	N=6,790 women, 18–65 years, US	Physical aggression, sexual abuse, psychological abuse CTS, forced sex questions, and power and control scale	Heavy alcohol use (alcohol 3–4 times per week and ≥4 drinks/day).	IPV victims whose health problem occurred before they experienced IPV were eliminated. Heavy alcohol use was associated with physical/sexual IPV (aRR **2.6** (1.6–4.3)) and verbal (psychological only) IPV (aRR **3.2** (1.6–6.6)), adjusting for age, race, health insurance status, and childhood physical and sexual abuse.
2	Ehrensaft (2006)	1990	Longitudinal (8y F/U)	N=449, 18y, NZ	IPV (physical) – partner conflict calendar	Alcohol dependence (12m) (Diagnostic interview schedule for DSM-III-R criteria at baseline, DSM-IV at F/U). Prevalence was more than 10% of sample.	Analysis controlled for baseline alcohol dependence and juvenile conduct disorder. Clinically abusive relationship at age 26 did not predict alcohol dependence.
3	Keiley (2009)		Longitudinal (2.5 y F/U plus 2y retrospective reporting at each time point)	N=195 couples with a child aged 6–12y, mean age of women: 37y, US	Marital conflict (CTS2 (couples form))	Alcohol dependence (alcohol dependence scale, Michigan alcoholism screening test).	IPV from husband to wife (whether verbal or physical aggression) did not predict subsequent drinking behaviour.
4	Okuda (2011)	2004–05	Cross-sectional	N=25,626 men and women aged 18+y, US	CTS Form R (physical/sexual)	Incidence psychiatric disorder (alcohol use disorder and associated disabilities interview schedule IV (AUDADIS-IV)) – "incidence" refers to participants who did not have the disorder in the previous 12m.	Results indicated that IPV in the previous 12 months predicted alcohol use disorders (aOR **2.3** (1.8–3.1), including alcohol abuse and dependence. OR adjusted for race, age, education, individual income, family income, employment status, marital status, sexual orientation. Did not report results by sex.

No.	First author (year)	Year of data collection	Study design	Sample	Type of IPV (dependent variable)	Alcohol use (outcome variable)	Results
5	Simmons (2015)	1990	Longitudinal (3y F/U)	N=358 women, 23–31y, US	12 month IPV by partner married to or living with (CTS)	Problem alcohol use (used at least 2–3 times/week).	Analysis controlled for previous alcohol use, age, marital status, race and depression symptoms. IPV victimisation at baseline (minor or violent) did not predict problem alcohol use at follow up.
6	Vos (2006)	2000 (ALSWH)	Cross-sectional	N=14,739 Women aged 22–27y, Australia	Past 12m/more than 12m ago	"alcohol abuse" (not defined).	Alcohol abuse was significantly associated with IPV more than 12 months ago (aRR **1.47** (1.03–2.10). Controlled for socioeconomic variables and smoking status.
7	Zlotnick (2006)	1987–1988	Longitudinal (5y F/U)	N=~3,173 men and women aged 19+y, US	Physical IPV by partner married to or living with	30-day alcohol use (modified version of the National Survey of Alcohol and Drug Abuse questions).	Controlled for age. No significant difference was reported for alcohol use at follow up.
Adolescent dating violence							
8	Ackard (2007)	1999	Longitudinal (5y F/U)	N=822 women, mean age ~15y, US	Adolescent dating violence >12m ago (physical/sexual)	Alcohol consumption ≥weekly/daily.	Analysis adjusted for alcohol consumption at baseline. Results were non-significant (aOR **1.26** (0.79-2.01).
9	Exner-Cortens (2013)	1994–5	Longitudinal (5y F/U) (Ad health)	N=2,816 women, 13–19y at baseline, US	Psychological dating violence (only), psych and physical dating violence (CTS2)	Heavy episodic drinking (≥2 episodes/month during previous 12m). Prevalence not reported.	Controlled for baseline IPV. Heavy episodic drinking was associated with psychological dating violence only (aOR **1.44** (1.03–2.01)), but not with psychological and physical dating violence (aOR 0.98 (0.64–1.48)). Analyses controlled for race, age, SES, child maltreatment, pubertal status and heavy episodic drinking at baseline.

Table B5. Summary of studies that investigated the impact of IPV on drug use disorder

No.	First author (year)	Year of data collection	Study design	Sample	Type of IPV (dependent variable)	Drug use (outcome variable)	Results
IPV (previous or current married or de-facto relationship)							
1	Coker (2002)	1995–96	Cross-sectional	N=6,790 women, 18–65y, US	Physical aggression, sexual abuse, psychological abuse CTS, forced sex questions, and power and control scale	Recreational drug use ≥monthly.	IPV victims whose health problem occurred before they experienced IPV were eliminated. Recreational drug use was not significantly associated with physical/sexual IPV or verbal (psychological only) IPV, adjusting for age, race, health insurance status, and childhood physical and sexual abuse. Physical/sexual (aRR **1.4**, 0.6-2.2), verbal only (aRR **0.5**, 0.2-1.3).
2	Ehrensaft (2006)	1990	Longitudinal (8y F/U)	N=449, 18y, NZ	IPV (physical) – partner conflict calendar	Marijuana dependence (12m) (Diagnostic interview schedule for DSM-III-R criteria at baseline, DSM-IV at F/U).	Analysis controlled for baseline marijuana dependence and juvenile conduct disorder. Clinically abusive relationship at age 26 predicted marijuana dependence (OR **10.14** (3.62–28.39)).
3	Okuda (2011)	2004–05	Cross-sectional	N=25,626 men and women aged 18+y, US	CTS Form R (physical/ sexual)	Incidence psychiatric disorder (drug use disorder and associated disabilities interview schedule IV (AUDADIS-IV)) – "incidence" refers to participants who did not have the disorder in the previous 12m.	Results indicated that IPV in the previous 12 months predicted drug use disorders (aOR **3.8** (2.3–6.1), including drug abuse and dependence. OR adjusted for race, age, education, individual income, family income, employment status, marital status, sexual orientation. Did not report results by sex.
4	Simmons (2015)	1990	Longitudinal (3y F/U)	N=358 women, 23–31y, US	12m IPV by partner married to or living with (CTS)	Marijuana and illicit drug use (used at least once during previous 12m).	Analysis controlled for previous drug use, age, marital status, race and depression symptoms. IPV victimisation at baseline (minor or violent) did not predict problem drug use at follow up.
5	Vos (2006)	2000 (ALSWH)	Cross-sectional	N=14,739 Women aged 22–27y, Australia	Past 12m/more than 12m ago	"Illicit drug use" (not defined) .	Drug use was significantly associated with IPV more than 12 months ago (aRR **1.23** (1.02–1.48). Controlled for socioeconomic variables and smoking status.

No.	First author (year)	Year of data collection	Study design	Sample	Type of IPV (dependent variable)	Drug use (outcome variable)	Results
Adolescent dating violence							
6	Ackard (2007)	1999	Longitudinal (5y F/U)	N=822 women, mean age ~15y, US	Adolescent dating violence >12m ago (physical/sexual)	Marijuana use ≥monthly.	Analysis adjusted for alcohol use at baseline. Adolescent dating violence predicted marijuana use (aOR **2.12** (1.22–3.70)).
7	Exner-Cortens (2013)	1994–95	Longitudinal (5y F/U) (Ad health)	N=2,816 women, 13–19y at baseline, US	Psychological dating violence (only), psych and physical dating violence (CTS2)	Marijuana use and other drug use (during previous 12m).	Controlled for baseline IPV. Neither marijuana nor other drug use were associated with psychological dating violence only or with psychological and physical dating violence. Analyses controlled for race, age, SES, child maltreatment, pubertal status and drug use at baseline.

Table B6. Summary of studies that investigated the impact of IPV on termination of pregnancy and spontaneous abortion

No.	First author (year)	Year of data collection	Study design	Sample	Type of IPV (dependent variable)	Birth outcome (outcome variable)	Results
1	Bourassa (2007)	2001–03	Case control	N=1,003, mean age=25.3, 54% single Canada	12mIPV (all types, physical/sexual) (adapted version of abuse assessment screen)	Elective termination.	A greater proportion of women seeking elective abortion (25.71%) than women continuing pregnancy (9.34%) had experienced IPV in the previous year (*p*<0.0001). A greater proportion of women seeking elective abortion (7.14%) than women continuing pregnancy (1.84%) had experienced physical and/or sexual IPV in the previous year (*p*<0.0001). Rate ratio can be derived.
2	Chibber (2014)	2008–10	Cross-sectional	N=954 women seeking abortion, aged 15+y, US	Experienced IPV from the man involved in the pregnancy	Termination of pregnancy.	9% of women seeking abortion identified having abusive partners. Rate ratio can be derived.
3	Gulliver (2014)	2001–06	Linked data (longitudinal)	N=254,282 (355 with assault during pregnancy), NZ	Hospital records of pregnancy-related assault	Spontaneous abortion.	Analysis adjusted for maternal age and ethnicity. Women who were assaulted during pregnancy were more likely to have spontaneous abortion (aRR **1.8** (1.4–2.4).
4	Jones (2011)	2008–09	Cross-sectional	N=9,493 women seeking abortion services, US	Experienced IPV from the man involved in the pregnancy	Termination of pregnancy.	6.9% of respondents presenting for abortion were exposed to either physical or sexual abuse by the man involved in the pregnancy (5.8% physical, 2.6% sexual). Rate ratio can be derived.
5	Saftlas (2010)	2007–08	Cross-sectional	N=986 women seeking abortion	12m IPV - Modified abuse assessment screening tool and women's experience with battering scale (physical/sexual abuse)	Termination of pregnancy.	9.9% of participants were exposed to physical IPV, 2.5% to sexual IPV, 10.8% to physical/sexual IPV.
6	Taft (2007)	1996	Cohort (ALSWH),(4y F/U)	N=9,683, 18–23y, Australia	Lifetime abuse by partner (non-specific items about recent abuse were also measured)	First termination of pregnancy (self-report) and miscarriage.	Women who had been exposed to partner violence and had recently been exposed to violence were more likely to have a termination (OR **3.75** (2.78–5.05)). Women who had been exposed to partner violence and had recently been exposed to violence were more likely to have a miscarriage (OR **5.29** (3.72–7.52)).

Table B7. Summary of studies that investigated the impact of IPV on preterm/low birth weight

No.	First author (year)	Year of data collection	Study design	Sample	Type of IPV (dependent variable)	Birth outcome (outcome variable)	Results
1	Coker (2004)	1997–98	Cross-sectional	N=755, 18–65	Abuse during pregnancy (abuse assessment screen)	Preterm delivery (<37 weeks), low birthweight (<2,500g), preterm *and* low birthweight (and other combinations). Self-reported.	Analysis controlled for age at pregnancy, race, current health insurance coverage, marital status, and smoking during or before pregnancy. IPV significantly predicted preterm delivery (aRR **1.7** (1.1–2.6)), low birthweight (aRR **2.0** (1.4–3.1)), and preterm and low birthweight (aRR **2.4** (1.5–4.0)). Caution is advised due to recall bias.
2	Gulliver (2014)	2001–06	Linked data (longitudinal)	N=254,282 (355 with assault during pregnancy), NZ	Hospital records of pregnancy- related assault	Preterm labour.	Analysis adjusted for maternal age and ethnicity. Women who were assaulted during pregnancy were more likely to have preterm labour (aRR **3.1** (2.6–3.6).
3	Janssen (2003)	1999–2000	Cross-sectional	N=4,759 women giving birth, Canada	IPV during pregnancy (physical)	Preterm birth (<37 weeks).	Analysis adjusted for income quintile and race/ethnicity and use of substances (alcohol, illicit drugs or tobacco). Women who experienced physical IPV were not significantly more likely to have a preterm birth (aOR **1.29** (0.43-3.82).
4	Pavey (2014)	2006–07	Retrospective cohort	N=173,026 infants with active duty military parents, mean age=29y, US	Case file evidence of IPV	Low birth weight/ preterm birth.	Analysis adjusted for infant sex, parent marital status, parent age, active duty parent sex and military rank. IPV predicted low birth weight (aOR **1.72** (1.32–2.23)).
5	Silverman (2006)	2000–03	Retrospective cohort	N=118,579, US	12 month IPV (before and during pregnancy) (physical)	Preterm (<37 weeks). Low birth weight (<2,500g). (from birth certificate data)	Women exposed to IPV during pregnancy were more likely to have a child with low birth weight (aOR **1.21** (1.04–1.42) adjusted for race and public assistance). Preterm delivery was not significantly predicted by IPV exposure during pregnancy.

No.	First author (year)	Year of data collection	Study design	Sample	Type of IPV (dependent variable)	Birth outcome (outcome variable)	Results
6	Taft (2007)	1996	Cohort (ALSWH),(4y F/U)	N=9,683, 18-23y, Australia	Lifetime abuse by partner (non-specific items about recent abuse were also measured)	Premature birth. (self-report)	Women who had been exposed to partner violence and had recently been exposed to violence were more likely to have a premature birth (OR **3.15** (1.53–6.49)).
7	Tiwari (2008)	2005–06	Cross-sectional	N=3,245 women at 32–36 weeks gestation recruited from antenatal clinics in public hospitals, Hong Kong	IPV (1 week postpartum, lifetime, previous 12m and during pregnancy) (Abuse assessment screen)	Preterm delivery. Low birth weight. (medical chart). Reported as a continuous variable.	Obstetric outcomes did not differ significantly as a result of IPV.
8	Urquia (2011)	2006	Cross-sectional	N=6,421 women giving birth, aged 15+y, Canada	24m IPV and before/during/after pregnancy (adapted from Violence Against Women Study)	Preterm birth (<37 weeks). Small for gestational age (weighs below 10th percentile by Canadian population-based reference).	Analysis controlled for maternal age, marital status and immigration status, low income household. Any abuse during pregnancy did not predict preterm birth (aOR **1.2** (0.6–2.1)), neither did abuse before and during pregnancy (aOR **1.4** (0.6–3.2)). Any abuse during pregnancy did not predict SGA (aOR **1.0** (0.6–1.7)), neither did abuse before and during pregnancy (aOR **1.2** (0.6–2.6)).
9	Watson (2013)	2002–04	Case control	N=1726 All women having singleton/twin birth between 20 and 31 weeks' gestation, Australia (Victoria)	12m IPV (composite abuse scale)	Antepartum haemorrhage precipitating preterm birth.	Analysis adjusted for maternal age (twins only), country of birth, education, marital status, parity, smoking, alcohol, illicit drug use during pregnancy. Very preterm birth was not significantly predicted by physical or emotional IPV exposure (2.25-2.68).

Table B8. Summary of studies that investigated the impact of IPV on other birth outcomes

No.	First author (year)	Year of data collection	Study design	Sample	Type of IPV (dependent variable)	Birth outcome (outcome variable)	Results
1	Gulliver (2014)	2001–06	Linked data (longitudinal)	N=254,282 (355 with assault during pregnancy), NZ	Hospital records of pregnancy- related assault	Placental abruption. Uterine rupture Antepartum haemorrhage.	Analysis adjusted for maternal age and ethnicity. Women who were assaulted during pregnancy were more likely to have placental abruption (aRR 3.9 (2.2–7.0) and antepartum haemorrhage (aRR 5.1 (4.1–6.3)) but not uterine rupture.
2	Janssen (2003)	1999–2000	Cross-sectional	N=4,759 women giving birth, Canada	IPV during pregnancy (physical)	Antepartum haemorrhage (2nd or 3rd trimester) (medical chart). Intrauterine growth restriction.	Analysis adjusted for income quintile and race/ethnicity and use of substances (alcohol, illicit drugs or tobacco). Women who experienced physical IPV were significantly more likely to have antepartum haemorrhage (aOR **3.51** (1.27–9.72)). Women who experienced physical IPV were not significantly more likely to have babies born with intrauterine growth restriction (aOR **2.83** (0.94–8.50)).
3	Leone (2010)	2000–02	Cross-sectional	N=2,873 women giving birth, US	12m IPV (physical) (self-report/prenatal chart)	Pregnancy trauma. Placental abruption. (hospital chart data)	Analysis controlled for socio-demographic variables, tobacco, alcohol and drug use, preeclampsia, gestational diabetes during pregnancy. Women exposed to IPV had greater likelihood of pregnancy trauma (aOR **32.08** (14.33–71.80)) and placental abruption (aOR **5.17** (1.37–19.51)).
4	Pavey (2014)	2006–07	Retrospective cohort	N=173,026 infants with active duty military parents, mean age=29y, US	Case file evidence of IPV	Respiratory condition Hypoxic/asphyxia events.	Analysis adjusted for infant sex, parent marital status, parent age, active duty parent sex and military rank. IPV did not predict respiratory conditions or hypoxic/asphyxia events.
5	Silverman (2006)	2000–03	Retrospective cohort	N=118,579, US	12m IPV (before and during pregnancy) (physical)	High blood pressure or oedema. Diabetes (gestational). (from birth certificate data)	Neither high blood pressure/oedema nor diabetes were significantly predicted by IPV exposure during pregnancy.

Table B9. Summary of studies that investigated the impact of IPV on non-communicable and other disease

No.	First author (year)	Year of data collection	Study design	Sample	Type of IPV (dependent variable)	NCD (outcome variable)	Results
Diabetes							
1	Mason (2013)	2001	Longitudinal (6y F/U)	N=64,732 women working in health sector, US (Nurses Health Study II)	Self-report and WEB (psychological IPV). Severe psychological IPV = WEB scores ≥40	Self-reported physician diagnosis of diabetes.	Analyses controlled for age, childhood abuse, socio-demographic variables and risk factors for diabetes. Severe psychological IPV predicted incidence of type 2 diabetes (aHR=**1.61** (1.09–2.38)). Neither lifetime physical or sexual IPV predicted incidence of type 2 diabetes.
Cardiovascular disease							
2	Mason (2012)	2001	Longitudinal (6y F/U)	N=51,434 women aged 37–54 working in health sector, US (Nurses Health Study II)	Self-report and WEB (psychological IPV). Severe psychological IPV = WEB scores ≥40	Self-reported physician diagnosis of hypertension.	Patients reporting hypertension or use of antihypertensive medication at baseline were excluded from analysis. Analyses controlled for age, childhood abuse, socio-demographic variables and risk factors for hypertension. Severe psychological IPV predicted incidence of hypertension (aHR=**1.24** (1.02–1.53)). Neither lifetime physical or sexual IPV predicted incidence of hypertension.
3	Stene (2013)	2000–01	Longitudinal (prescription data collected 4–9 years later)	N=5,593 women aged 30–60y, Norway	Self-report lifetime physical, sexual and psychological IPV	Prescription data for various CVD-related medications (cardiac therapy, antihypertensive, diuretics, peripheral vasodilators, beta blocking agents, calcium channel blockers, agents acting onahe renin-angiostenin system and lipid-modifying agents)	Incidence antihypertensive drug use was associated with previous sexual or physical IPV (IRR 1.36 (95% CI 1.09–1.70)). Analysis adjusted for age and systolic and diastolic blood pressure.

No.	First author (year)	Year of data collection	Study design	Sample	Type of IPV (dependent variable)	NCD (outcome variable)	Results
Musculoskeletal conditions							
4	Ruiz-Pérez (2009)	2004	Case-control	N=287 women diagnosed with fibromyalgia (case), 287 controls	Self-reported	Clinician diagnosis.	After adjusting for sociodemographic variables, social support and psychological distress, fibromyalgia was not significantly associated with a history of IPV.

Table B10. Summary of studies that investigated the impact of IPV on injury (including self-harm and suicide attempts)

No.	First author (name)	Year of data collection	Study design	Sample	Type of IPV (dependent variable)	Injury (outcome variable)	Results
IPV (previous or current married or de-facto relationship)							
1	Adsett (2013)	1999-2009	Cross-sectional	N=26,637	Assault (interpersonal violence) as reported in medical records	Maxillofacial fractures.	Study did not disaggregate findings by sex, however found that 37.7% of facial fractures were due to interpersonal violence.
2	Coker (2002)	1995–96	Cross-sectional	N=6,790 women aged 18–65y, US	Physical/sexual/ psychological IPV (CTS)	Injury "have you ever sustained a serious injury, such as a spinal cord, neck or head injury, that is disabling or interferes with your normal activities?".	IPV victims whose health problem occurred before they experienced IPV were eliminated. RR were adjusted for race, health insurance status and age, and childhood physical and sexual abuse. Physical IPV predicted injury (aRR **2.8** (2.2–3.7)) but psychological IPV did not.
3	Van Dulmen (2012)	1995–96	Cohort (6y, 12y F/U)	N=4,675, mean age 16.5y	12m IPV (baseline, 6y) 18 month IPV (12y)	Suicide attempts (previous 12m, self-report).	Analysis controlled for previous suicidality and previous IPV. IPV victimisation did not predict subsequent suicidality.
4	Vos (2006)	2000 (ALSWH)	Cross-sectional	N=14,739 Women aged 22–27y, Australia	Past 12m/more than 12m ago	Deliberate self-harm (12m).	Deliberate self-harm was significantly associated with IPV more than 12 months ago (aRR **2.53** (1.81–3.56). Controlled for socioeconomic variables and smoking status.
Adolescent dating violence							
5	Ackard (2007)	1999	Longitudinal (5y F/U)	N=822 women, mean age ~15y, US	Adolescent dating violence >12m ago (physical/sexual)	Suicide attempt (self-report) ("Have you ever tried to kill yourself?").	Analysis adjusted for suicide attempt at baseline. Adolescent dating violence did not predict suicide attempt behaviour.
6	Exner-Cortens (2013)	1994–95	Longitudinal (5y F/U) (Ad health)	N=2,816 women, 13–19y at baseline, US	Psychological dating violence (only), psych and physical dating violence (CTS2)	Attempted suicide (12m) (self-report).	Controlled for baseline IPV. Suicide attempts were not associated with psychological dating violence only or with psychological and physical dating violence. Analyses controlled for race, age, SES, child maltreatment, pubertal status and suicide attempts at baseline.

This page has intentionally been left blank.

ANROWS