

EMBARGO: 00:01H (UK time) Friday April 4, 2008. In North America the embargo lifts at 18:30 (EDT) Thursday April 3, 2008

# Intimate partner violence and women's physical and mental health in the WHO multi-country study on women's health and domestic violence: an observational study



Mary Ellsberg, Henrica A F M Jansen, Lori Heise, Charlotte H Watts, Claudia García-Moreno, on behalf of the WHO Multi-country Study on Women's Health and Domestic Violence against Women Study Team\*

## Summary

**Background** This article summarises findings from ten countries from the WHO multi-country study on women's health and domestic violence against women.

**Methods** Standardised population-based surveys were done between 2000 and 2003. Women aged 15–49 years were interviewed about their experiences of physically and sexually violent acts by a current or former intimate male partner, and about selected symptoms associated with physical and mental health. The women reporting physical violence by a partner were asked about injuries that resulted from this type of violence.

**Findings** 24 097 women completed interviews. Pooled analysis of all sites found significant associations between lifetime experiences of partner violence and self-reported poor health (odds ratio 1.6 [95% CI 1.5–1.8]), and with specific health problems in the previous 4 weeks: difficulty walking (1.6 [1.5–1.8]), difficulty with daily activities (1.6 [1.5–1.8]), pain (1.6 [1.5–1.7]), memory loss (1.8 [1.6–2.0]), dizziness (1.7 [1.6–1.8]), and vaginal discharge (1.8 [1.7–2.0]). For all settings combined, women who reported partner violence at least once in their life reported significantly more emotional distress, suicidal thoughts (2.9 [2.7–3.2]), and suicidal attempts (3.8 [3.3–4.5]), than non-abused women. These significant associations were maintained in almost all of the sites. Between 19% and 55% of women who had ever been physically abused by their partner were ever injured.

**Interpretation** In addition to being a breach of human rights, intimate partner violence is associated with serious public-health consequences that should be addressed in national and global health policies and programmes.

**Funding** WHO; Governments of the Netherlands, Norway, Sweden, Switzerland, and UK; Rockefeller Foundation; Urban Primary Health Care project of the Government of Bangladesh; Swedish Agency for Research Cooperation with Developing Countries (SAREC/Sida); United Nations Fund for Population Activities (UNFPA); and Trocaire.

## Introduction

In the past decade, increasing attention has focused on the effects of male partner violence on women's physical and mental health. Studies of visits to emergency departments in the USA and elsewhere have suggested that physical abuse is a major cause of injury in women.<sup>1–4</sup> Population-based studies have suggested that 20–75% of women who are physically abused by a partner report injuries due to violence at some point in their lives.<sup>5–7</sup> Nonetheless, injury is not the most common physical health outcome of abuse by male partners. Epidemiological and clinical studies have noted that physically and sexually violent acts by intimate partners are consistently associated with a broad array of negative health outcomes, including gynaecological disorders, adverse pregnancy outcomes, irritable bowel syndrome, gastrointestinal disorders, and various chronic-pain syndromes.<sup>8–10</sup> Abused women have more physical symptoms of poor health, and more days in bed than do women who have not been abused.<sup>11–16</sup> Physical and sexual violence have also been associated with psychiatric problems, including depression, anxiety, phobias, post-traumatic stress disorder, suicidality, and alcohol and drug abuse.<sup>17–22</sup>

Research on the health effects of partner violence has been constrained by several factors. Most studies have been undertaken on clinical rather than population-based samples, mainly in north America and Europe. Furthermore, many studies have had small sample sizes, and have not controlled analyses for potential confounders. Violence has not been defined or measured consistently in the studies, making comparisons difficult.<sup>23,24</sup>

The aim of the WHO multi-country study was to explore the magnitude and characteristics of different forms of physical, sexual, and emotional violence against women, with particular emphasis on violence perpetrated by male intimate partners. The study attempted to overcome obstacles of comparability encountered in previous studies by use of population-based surveys that included a standardised questionnaire, and with standardised training and data-collection procedures across participating sites.<sup>25–28</sup> A further objective of the study was to assess the extent to which physical and sexual violence by intimate partners is associated with a range of health outcomes.

This report presents findings on partner violence and women's self-reported physical and mental health.

*Lancet* 2008; 371: 1165–72

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\*Members listed at end of paper

WHO, Geneva, Switzerland  
(H A F M Jansen PhD,  
C García-Moreno MD);  
PATH, Washington, DC, USA  
(M Ellsberg PhD, L Heise BA);  
and London School of Hygiene  
and Tropical Medicine, London,  
UK (Prof C H Watts PhD)

Correspondence to:  
Dr C García-Moreno, Department  
of Reproductive Health and  
Research, WHO, 20 Avenue  
Appia, 1211 Geneva 27-CH,  
Switzerland  
garciamorenoc@who.int

Details on study methods, sampling, response rates, and findings on the prevalence of different types of partner violence in these same study sites have been reported elsewhere.<sup>25–28</sup>

## Methods

### Sample design

Population-based surveys were done in 15 sites, in ten study countries, between 2000 and 2003. Trained female

interviewers completed interviews with women aged 15–49 years. Sites and countries were selected to enable comparisons between different regions and, when possible, between urban and rural settings within countries. In five countries (Bangladesh, Brazil, Peru, Thailand, and United Republic of Tanzania), surveys were done in the capital or a large city and one province or region, the latter usually being rural. In the other five countries, only one site was surveyed, because of logistical and financial

	Self-reported health is poor or very poor		Difficulty walking		Difficulty with daily activities		Pain		Memory loss		Dizziness		Vaginal discharge		Ever-partnered women	
	%	AOR (95% CI)	%	AOR (95% CI)	%	AOR (95% CI)	%	AOR (95% CI)	%	AOR (95% CI)	%	AOR (95% CI)	%	AOR (95% CI)	n	%
<b>Bangladesh city violence†</b>																
No	12.5	..	1	..	15.8	..	25.8	..	12.5	..	43.6	..	22.3	..	640	46.6
Yes	19.4	1.4 (1.0–1.9)	24.1	1.4 (1.0–1.8)	22.2	1.5 (1.1–1.9)	35.7	1.6 (1.2–2.0)	20.2	1.8 (1.3–2.5)	63.8	1.9 (1.5–2.4)	43.7	2.0 (1.6–2.6)	733	53.4
Total															1373	100
<b>Bangladesh province violence†</b>																
No	16.3	..	21.2	..	22.8	..	27.9	..	11.8	..	59.3	..	38.7	..	509	38.2
Yes	21.1	1.3 (1.0–1.7)	29.1	1.4 (1.1–1.8)	29.4	1.3 (1.0–1.7)	38.9	1.5 (1.2–1.9)	17.4	1.5 (1.1–2.1)	73.0	1.7 (1.3–2.4)	50.9	1.6 (1.3–2.0)	820	61.7
Total															1329	100
<b>Brazil city violence†</b>																
No	3.7	..	8	..	10.2	..	30.4	..	9.0	..	23.3	..	24.9	..	668	71.1
Yes	8.5	2.0 (1.1–3.7)	12.1	1.3 (0.8–2.1)	16.9	1.8 (1.1–2.7)	46.0	1.9 (1.4–2.6)	18.8	2.3 (1.5–3.6)	36.8	2.2 (1.6–3.0)	29.8	1.5 (1.1–2.1)	272	28.9
Total															940	100
<b>Brazil province violence†</b>																
No	14.4	..	1	..	14.0	..	25.7	..	8.0	..	28.9	..	19.7	..	750	63.1
Yes	28.1	1.8 (1.3–2.4)	19.2	1.5 (1.1–2.1)	24.7	1.8 (1.3–2.4)	40.0	1.8 (1.4–2.3)	16.7	2.1 (1.4–3.1)	43.4	1.7 (1.3–2.2)	30.4	1.9 (1.5–2.6)	438	36.9
Total															1188	100
<b>Ethiopia province‡ violence†</b>																
No	1.8	..	0.3	..	0.1	..	20.1	..	0.3	..	3.3	..	2.3	..	657	29.3
Yes	3.5	2.0 (1.0–3.9)	0.5	1.4 (0.3–7.0)	0.2	NA	21.1	1.1 (0.9–1.4)	0.9	2.8 (0.6–12.4)	3.6	1.1 (0.6–1.8)	4.2	2.0 (1.1–3.6)	1589	70.7
Total															2246	100
<b>Japan city violence†</b>																
No	3.0	..	3.7	..	8.9	..	8.3	..	6.7	..	14.2	..	4.5	..	1080	84.6
Yes	5.6	1.9 (0.9–4.0)	5.1	1.4 (0.7–2.8)	14.8	1.7 (1.1–2.7)	12.2	1.5 (0.9–2.4)	14.3	2.3 (1.5–3.8)	22.4	1.8 (1.2–2.6)	6.6	1.6 (0.9–3.1)	196	15.4
Total															1276	100
<b>Namibia city violence†</b>																
No	2.9	..	4	..	4.2	..	8.2	..	4.8	..	15.9	..	10.4	..	876	64.1
Yes	6.3	2.1 (1.2–3.6)	11.4	2.6 (1.7–3.9)	9.8	2.6 (1.6–4.0)	14.9	2.0 (1.4–2.9)	11.4	2.4 (1.6–3.7)	29.1	2.1 (1.6–2.8)	15.9	1.6 (1.1–2.2)	491	35.9
Total															1367	100
<b>Peru city violence†</b>																
No	4.5	..	7.4	..	14.2	..	28.7	..	11.1	..	23.2	..	36.8	..	530	48.8
Yes	9.2	1.9 (1.1–3.2)	17.1	2.7 (1.8–4.0)	22.7	1.9 (1.3–2.6)	42.8	1.9 (1.5–2.5)	17.7	1.8 (1.2–2.5)	34.2	1.6 (1.2–2.1)	51.1	1.7 (1.3–2.2)	556	51.2
Total															1086	100
<b>Peru province violence†</b>																
No	10.9	..	1	..	12.0	..	31.4	..	16.4	..	34.7	..	36.4	..	475	31.0
Yes	18.8	1.6 (1.2–2.3)	23.0	2.0 (1.5–2.7)	24.7	2.4 (1.8–3.3)	40.4	1.5 (1.2–1.9)	26.6	1.7 (1.3–2.3)	47.2	1.6 (1.3–2.0)	49.5	1.8 (1.4–2.2)	1059	69.0
Total															1534	100
<b>Samoa violence†</b>																
No	1.8	..	6.5	..	5.5	..	22.2	..	4.5	..	43.5	..	1.5	..	649	53.9
Yes	1.3	0.6 (0.2–1.6)	7.4	1.1 (0.7–1.8)	7.0	1.3 (0.8–2.0)	29.2	1.4 (1.1–1.9)	4.9	1.0 (0.6–1.8)	55.1	1.6 (1.2–2.0)	4.1	2.6 (1.2–5.5)	555	46.1
Total															1204	100

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	Self-reported health is poor or very poor		Difficulty walking		Difficulty with daily activities		Pain		Memory loss		Dizziness		Vaginal discharge		Ever-partnered women,	
	%	AOR (95% CI)	%	AOR (95% CI)	%	AOR (95% CI)	%	AOR (95% CI)	%	AOR (95% CI)	%	AOR (95% CI)	%	AOR (95% CI)	n	%
(Continued from previous page)																
<b>Serbia and Montenegro city violence†</b>																
No	3.6	..	10.5	..	7.9	..	25.9	..	6.1	..	25.4	..	12.1	..	907	76.3
Yes	8.5	2.0 (1.1-3.6)	17.4	1.5 (1.0-2.2)	14.2	1.7 (1.1-2.6)	36.8	1.6 (1.2-2.1)	13.2	2.0 (1.3-3.2)	29.9	1.2 (0.9-1.6)	20.6	2.2 (1.5-3.2)	281	23.6
Total															1188	100
<b>Thailand city violence†</b>																
No	12.5	..	11.5	..	12.6	..	17.2	..	19.1	..	44.4	..	5.7	..	617	58.9
Yes	19.7	1.6 (1.2-2.3)	20.0	1.9 (1.3-2.7)	16.5	1.3 (0.9-1.9)	24.8	1.5 (1.1-2.0)	31.6	2.0 (1.5-2.6)	53.5	1.4 (1.1-1.8)	11.9	2.2 (1.4-3.5)	431	41.1
Total															1048	100
<b>Thailand province violence†</b>																
No	17.8	..	1	..	13.9	..	18.8	..	21.5	..	56.7	..	8.0	..	539	52.6
Yes	27.0	1.6 (1.2-2.2)	16.1	1.5 (1.1-2.3)	21.2	1.7 (1.2-2.4)	27.5	1.6 (1.2-2.1)	30.3	1.6 (1.2-2.1)	69.5	1.6 (1.2-2.1)	17.1	2.5 (1.6-3.7)	485	47.4
Total															1024	100
<b>United Republic of Tanzania city violence†</b>																
No	1.9	..	12.2	..	9.7	..	19.2	..	14.4	..	16.4	..	7.1	..	846	58.7
Yes	2.3	1.2 (0.6-2.6)	21.5	2.0 (1.5-2.7)	15.8	1.8 (1.3-2.5)	29.4	1.8 (1.4-2.3)	25.0	1.9 (1.5-2.5)	23.2	1.6 (1.2-2.1)	11.1	1.6 (1.1-2.3)	596	41.3
Total															1442	100
<b>United Republic of Tanzania province violence†</b>																
No	3.4	..	13.4	..	12.7	..	21.5	..	11.6	..	15.7	..	7.4	..	554	44.1
Yes	6.1	1.6 (0.9-2.9)	14.4	1.0 (0.7-1.4)	15.4	1.1 (0.8-1.6)	28.0	1.3 (1.0-1.7)	14.6	1.3 (0.9-1.8)	26.2	1.9 (1.4-2.5)	13.2	1.9 (1.3-2.8)	702	55.9
Total															1256	100

AOR=adjusted odds ratio (adjusted for age, current marital status, and education). \*Percentages are given for women reporting that their general health is poor or very poor or reporting symptoms of ill health within the 4 weeks before the interview (three lowest items on five-point scale). †Denotes whether or not women experienced physical or sexual violence, or both, by an intimate partner at any point in their lives. Percentage of women reporting violence by site is presented in final column. ‡Self-reported general health was measured in the same way as in all other sites, whereas the other health indicators were measured by use of equivalent questions in the Composite International Diagnostic Interview (CIDI).

**Table 1: Percentage of ever-partnered women reporting selected symptoms of ill health\* according to experience of physical or sexual violence, or both, by an intimate partner, by site**

considerations. A rural province was used in Ethiopia, and a single large city was used in Japan, Namibia, and Serbia and Montenegro. In Samoa, the whole country was sampled. Sites are referred to by country name followed by “city” or “province”. Additional detailed information on study methods is reported elsewhere.<sup>25,26</sup>

A standardised questionnaire was developed, and translated into 14 languages. Women who had ever had an intimate male partner were asked about their experiences of physical violence and sexual violence on the part of a current or former partner. The questions referred to specific violent acts at any time in the respondent’s life and experiences of these acts during the 12 months before the interview.

Women who reported physical violence by a partner were then asked whether their partner’s acts had resulted in injuries. Follow-on questions asked about frequency, types of injuries, and whether health services were needed and used.

Before being questioned about experiences of violence, all women, irrespective of partnership status, were asked about their health status: whether they considered their general health to be excellent, good, fair, poor, or very poor

(five-point scale). Women were considered to be reporting poor or very poor health, if they reported one of the two lowest categories. All women were asked whether they had experienced physical symptoms during the 4 weeks before the interview, including difficulties with walking or daily activities, pain, memory loss (by use of a five-point scale), dizziness, and vaginal discharge (yes or no). For the analysis of the physical symptoms measured with the five-point scale, women were scored “poor” if they had responded with one of the three lowest categories.

Mental health was assessed by use of a self-reporting questionnaire of 20 questions (SRQ-20), developed by WHO to screen for emotional distress and validated in many settings.<sup>29</sup> The SRQ-20 was integrated into the health section of the questionnaire. It asked respondents whether, within the 4 weeks before the interview, they had experienced symptoms associated with emotional distress, such as crying, inability to enjoy life, tiredness, and suicidal thoughts. After the SRQ-20, women were asked about suicidal thoughts and attempts to commit suicide at any point in their lives.

The definition of ever-partnered women included women who had ever been married or lived with a partner (and

	Unadjusted OR	95% CI	Adjusted OR	95% CI
Self-reported general health: poor or very poor	1.9	1.7–2.1	1.6	1.5–1.8
Difficulty walking in past 4 weeks	2.0	1.8–2.1	1.6	1.5–1.8
Difficulty with daily activities in past 4 weeks	1.9	1.8–2.1	1.6	1.5–1.8
Pain in past 4 weeks	1.8	1.7–2.0	1.6	1.5–1.7
Memory loss in past 4 weeks	2.0	1.9–2.2	1.8	1.6–2.0
Dizziness in past 4 weeks	2.0	1.9–2.2	1.7	1.6–1.8
Vaginal discharge in past 4 weeks	2.3	2.1–2.5	1.8	1.7–2.0
Ever suicidal thoughts	2.4	2.2–2.6	2.9	2.7–3.2
Ever suicidal attempts	3.5	3.0–4.1	3.8	3.3–4.5

Adjusted ORs were adjusted for site, age group, current marital status, and education. \*ORs and 95% CI are given for the odds of health problems in ever-partnered women who have ever experienced physical or sexual violence by an intimate partner, relative to the odds of health problems in women who have not experienced violence. These all-sites ORs were calculated by use of multiple logistic regression techniques on a pooled dataset, including all 15 sites for self-reported health status and suicidal thoughts and attempts, and all sites except Ethiopia for all other health conditions.

**Table 2: Logistic regression models for the associations\* between selected health conditions and experience of intimate-partner violence in ever-partnered women, on pooled dataset for 15 sites**

therefore had been at risk of intimate partner violence). In practice, the definition varied slightly between countries, in accordance with the local conditions and notions of partners. Except in Japan, Namibia, and Peru, former non-cohabiting sexual partners were not included.

We developed ethics guidelines; adherence to them was monitored in all sites by the core research team.<sup>30,31</sup> The guidelines emphasised the importance of ensuring confidentiality and privacy, both as a means to protect the safety of respondents and field staff, and to improve the quality of the data. Ethical approval for the study was obtained from WHO's ethical review group (WHO Secretariat Committee for Research in Human Subjects), from the local institutions and, where necessary, national ethical review boards.

### Statistical analysis

Data were analysed by use of SPSS 11.0 and STATA, version 8. Bivariate descriptive analysis and multivariate logistic regression modelling were done to study associations between violence by a partner and self-reported health problems. Unadjusted and adjusted odds ratios (OR) with 95% CIs were calculated for the odds of health problems in ever-partnered women who had experienced violence by a partner, relative to the odds of health problems in women who had not experienced violence by a partner. Multiple logistic regression analyses were done for each site, separately adjusting for age, education and marital status, and for a pooled dataset (including all 15 sites) adjusting for site, age, education, and marital status. No significant interactions were found between sites and experiences of violence in the pooled analyses. SRQ-20 mean scores for women who had experienced partner violence were compared with those for non-abused women. This procedure is different from the standard use of SRQ-20 for screening, which is based on country-specific cut-off points that are indicative of emotional distress. Because the instrument had not previously been validated

in the study countries and the mean scores varied widely in the sites, in each site, significance was measured by use of negative binomial-regression techniques.

### Results

24097 eligible women completed the interview (ie, 97% of all eligible women), of which 19568 women were ever-partnered.<sup>25</sup> Only the ever-partnered women were included in the analysis. 15–71% of ever-partnered women reported that they had experienced physical or sexual violence, or both, at some point in their lives by a current or former partner. A description of the women interviewed and characteristics of violence is reported elsewhere.<sup>25</sup> In most sites, women who reported violence by a partner were significantly more likely than women who had not experienced violence to report that their general health was poor or very poor. Significant associations were also noted between lifetime experiences of violence by a partner and women's reports of specific symptoms of ill health. Table 1 shows percentages and adjusted ORs for each health problem by site. For all but one site (Samoa), there was an association between violence and poor self-reported health, and the association was statistically significant in most sites (95% CI do not include 1.0). For most specific health problems, in most places, significant associations existed between reported violence and self-reported specific health problems.

Table 2 shows the unadjusted and adjusted ORs for the pooled dataset. According to the pooled multiple logistic regression models, women with lifetime experiences of physical or sexual violence, or both, by a partner were significantly more likely to report poor or very poor health (OR 1.6 [95% CI 1.5–1.8]), and that within the past 4 weeks they had experienced difficulties with walking (1.6 [1.5–1.8]) or daily activities (1.6 [1.5–1.8]), pain (1.6 [1.5–1.7]), memory loss (1.8 [1.6–2.0]), dizziness (1.7 [1.6–1.8]), and vaginal discharge (1.8 [1.7–2.0]).

In all sites, mean scores of the SRQ-20 were significantly higher for women who had experienced abuse than that for non-abused women (table 3). The pooled multiple logistic regression analysis, adjusting for site, age, education, and marital status, showed that women who had experienced physical or sexual violence, or both, were significantly more likely to have thought of ending their lives (2.9 [2.7–3.2]) or to have attempted on one or more occasions to end their lives (3.8 [3.3–4.5]; table 2). The figure shows percentages of women who reported having suicidal thoughts, according to whether they had experienced violence by a partner. These associations were also significant (data not shown) in most sites, and not significant (data not shown) for Ethiopia province for suicidal thoughts, and for Bangladesh province, Ethiopia province, and the United Republic of Tanzania province for suicidal acts.

Table 4 shows the numbers of women who had ever suffered physical violence by a partner and, of them, the percentage who reported having been injured as a consequence of an assault by a partner, for each site. The

prevalence of injury in ever-abused women ranged from 19% (Ethiopia province) to 55% (Peru province). The frequency with which women experienced injury as a consequence of violence ever in her life (once or twice, three to five times, and more than five times) also varied between sites. In Bangladesh city, Brazil, Namibia city, Peru, Samoa, Serbia and Montenegro city, and Thailand, over 15% of ever-injured women reported that injury as a consequence of violence had happened more than five times ever in her life, whereas in Bangladesh province, Ethiopia province, Japan city, and the United Republic of Tanzania, the reported frequency of repeated injuries was lower. In Ethiopia province, only 1% of ever-injured women reported being injured more than five times ever in her life.

Most ever-injured women reported minor injuries (bruises, abrasions, cuts, punctures, and bites), but in some sites, more serious injuries were also relatively common. In Namibia city, 56 of 127 (44%) of ever-injured women reported injuries to the eyes and ears, 24 of 127 (19%) women reported fractures, and 11 of 127 (9%) women reported broken teeth as a consequence of physical violence by a partner (data not shown). In both sites in Bangladesh and in Peru province, at least half of ever-injured women reported that they had lost consciousness because of a violent incident (table 4).

Of those who had ever been injured by a partner, between 23% (Thailand province) and 80% (Bangladesh province) reported that they needed health care for an injury at least once (these percentages do not take into consideration whether health care was actually received or not; table 4). The highest proportions were recorded for Bangladesh, Japan city, Namibia city, Peru province, and the United Republic of Tanzania, where over 50% of ever-injured women reported having needed health care for an injury.

## Discussion

This study has shown significant associations between lifetime experiences of physical or sexual violence, or both, by a male intimate partner, and a wide range of self-reported physical and mental health problems in women. These associations do not seem to be explained by differences in age, education, or marital status in any of the sites.

Because of the cross-sectional design of the study, we were unable to establish whether exposure to violence occurred before or after the onset of symptoms. Therefore, we cannot conclude that there is a causal link between experiences of abuse and indicators of ill health. Theoretically, women who reported ill health could have been more vulnerable to violence: mental-health problems, for instance, could be risk factors for experiencing partner violence. Factors such as alcohol misuse could have increased the risk of ill health and of violence. However, previous studies on women's health, by use of longitudinal research designs and theoretical reasoning, suggest that reported health problems are mainly outcomes of abuse

	Mean SRQ-20 score	p (negative binomial regression)	Total ever-partnered women, n
<b>Bangladesh city</b>			
No experience of partner violence	5.4	..	640
Experience of partner violence	7.9	<0.0001	733
<b>Bangladesh province</b>			
No experience of partner violence	5.2	..	509
Experience of partner violence	7.4	<0.0001	820
<b>Brazil city</b>			
No experience of partner violence	4.6	..	668
Experience of partner violence	7.4	<0.0001	272
<b>Brazil province</b>			
No experience of partner violence	5.2	..	750
Experience of partner violence	8.4	<0.0001	438
<b>Ethiopia province</b>			
No experience of partner violence	2.3	..	659
Experience of partner violence	2.7	<0.0001	1602
<b>Japan city</b>			
No experience of partner violence	1.5	..	1080
Experience of partner violence	2.6	<0.0001	196
<b>Namibia city</b>			
No experience of partner violence	3.3	..	876
Experience of partner violence	5.3	<0.0001	491
<b>Peru city</b>			
No experience of partner violence	5.1	..	530
Experience of partner violence	8.1	<0.0001	556
<b>Peru province</b>			
No experience of partner violence	7.0	..	475
Experience of partner violence	9.8	<0.0001	1059
<b>Samoa</b>			
No experience of partner violence	2.7	..	649
Experience of partner violence	3.6	<0.0001	555
<b>Serbia and Montenegro city</b>			
No experience of partner violence	2.6	..	907
Experience of partner violence	4.4	<0.0001	282
<b>Thailand city</b>			
No experience of partner violence	4.4	..	617
Experience of partner violence	6.9	<0.0001	431
<b>Thailand province</b>			
No experience of partner violence	5.5	..	539
Experience of partner violence	7.9	<0.0001	485
<b>United Republic of Tanzania city</b>			
No experience of partner violence	2.5	..	846
Experience of partner violence	4.7	<0.0001	596
<b>United Republic of Tanzania province</b>			
No experience of partner violence	2.5	..	554
Experience of partner violence	4.0	<0.0001	702

\*Based on WHO screening for emotional distress: a self-reporting questionnaire of 20 questions (SRQ-20).

**Table 3: Mean SRQ-20 scores for emotional distress in ever-partnered women according to experience of physical or sexual violence, or both, by an intimate partner, by site\***

rather than precursors.<sup>7,8</sup> Furthermore, our findings meet several criteria for the inference of causality, including strength of some of the associations, consistency of the



association, evidence of temporal direction for some health outcomes (ie, this refers to the findings of the injuries that took place after rather than before violent acts and to the fact that we measured recent symptoms of health, whereas the violence could have taken place at any time in her life), and the plausibility of the effect. For injuries reported as a consequence of physical abuse, a causal link is assumed.

The data on experiences of violence and injuries could be affected by recall or reporting bias, because women were

asked about situations from a long time previously. Reporting bias might have led to overestimation of violent events. However, in view of the time that had passed, experiences of violence might well have been generally under-reported, especially if they occurred more than 1 year before the interview. Previous research<sup>23,32,33</sup> on disclosure of violence suggests that under-reporting is a much greater threat to validity than over-reporting of violence. Studies of injury recall have shown that minor injuries are more likely than severe injuries to be under-reported with recall periods of 1 year or more.<sup>34,35</sup> It is possible that people who report ill health are more likely to recall or report experiences of violence: for instance, women who felt depressed or were in ill health might have recalled more negative events than other women. However, disclosure of violence is more likely to be affected by methodological issues associated with interviewer skill and questionnaire design than by personal characteristics of respondents.<sup>23,32,33</sup> In the WHO study, several measures were implemented consistently across sites to maximise disclosure of violence, and we do not believe that differential reporting in women with poor health is a substantial threat to validity.<sup>25,27</sup> If anything, we think that underestimation of violence would tend to dilute, rather than strengthen the associations between violence and health outcomes. Reports of current health may be less likely to be affected by recall bias than reports of past events.

In many of the sites where positive associations between violence and symptoms of ill health did not reach statistical significance, a plausible explanation is that low reporting of symptoms decreased the statistical power of the analysis. For example, for Ethiopia province, Japan city, Samoa, and the United Republic of Tanzania

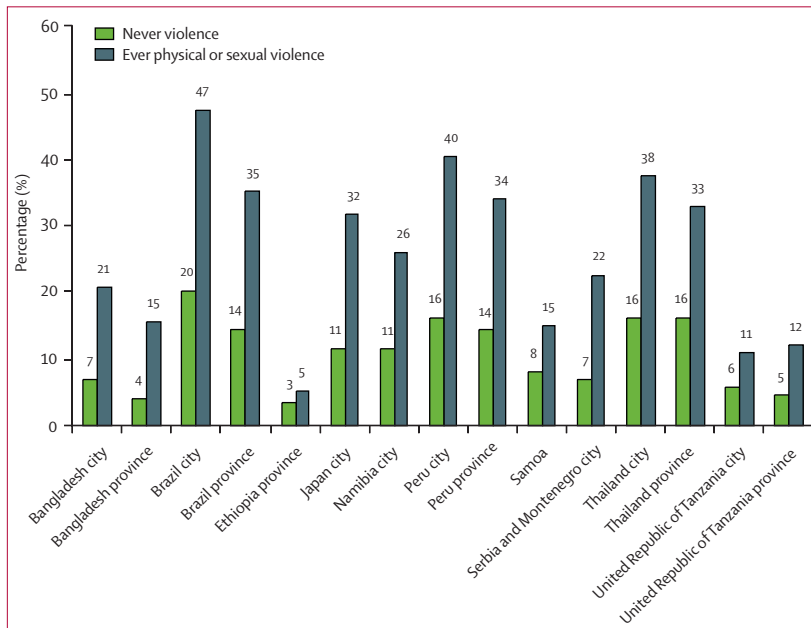


Figure: Suicidal thoughts according to experience of physical or sexual partner violence, or both, by an intimate partner, reported by ever-partnered women, by site

	Women ever physically abused by partner		Women ever injured by intimate partner						
	Women ever physically abused by partner	Women ever injured	Frequency of injuries			If ever unconscious			Ever needed health care for injuries
			1 or 2 times	3-5 times	>5 times	<1 h	≥1 h	Never	
Bangladesh city	546	146 (26.7%)	85 (58.2%)	37 (25.3%)	24 (16.4%)	51 (34.9%)	22 (15.1%)	73 (50.0%)	100 (68.5%)
Bangladesh province	557	138 (24.8%)	76 (55.1%)	46 (33.3%)	16 (11.6%)	40 (29.0%)	40 (29.0%)	58 (42.0%)	111 (80.4%)
Brazil city	256	102 (39.8%)	53 (52.0%)	24 (23.5%)	25 (24.5%)	10 (9.8%)	5 (4.9%)	87 (85.3%)	40 (39.2%)
Brazil province	401	150 (37.4%)	88 (58.7%)	29 (19.3%)	33 (22.0%)	21 (14.0%)	8 (5.3%)	121 (80.7%)	57 (38.0%)
Ethiopia province	1099	210 (19.1%)	181 (86.2%)	26 (12.4%)	3 (1.4%)	25 (11.9%)	31 (14.8%)	154 (73.3%)	70 (33.3%)
Japan city	154	41 (26.6%)	26 (63.4%)	11 (26.8%)	3 (7.3%)	1 (2.4%)	2 (4.9%)	38 (92.7%)	22 (53.7%)
Namibia city	417	127 (30.5%)	58 (45.7%)	44 (34.6%)	25 (19.7%)	19 (15.0%)	10 (7.9%)	98 (77.2%)	84 (66.1%)
Peru city	527	242 (45.9%)	136 (56.2%)	62 (25.6%)	44 (18.2%)	35 (14.5%)	11 (4.5%)	196 (81.0%)	74 (30.6%)
Peru province	936	519 (55.4%)	206 (39.7%)	188 (36.2%)	121 (23.3%)	221 (42.6%)	49 (9.4%)	249 (48.0%)	301 (58.0%)
Samoa	488	144 (29.5%)	78 (54.2%)	31 (21.5%)	35 (24.3%)	40 (27.8%)	8 (5.6%)	96 (66.7%)	51 (35.4%)
Serbia and Montenegro city	271	81 (29.9%)	30 (37.0%)	22 (27.2%)	29 (35.8%)	15 (18.5%)	0 (0%)	66 (81.5%)	31 (38.3%)
Thailand city	237	120 (50.6%)	55 (45.8%)	28 (23.3%)	37 (30.8%)	10 (8.3%)	2 (1.7%)	108 (90.0%)	37 (30.8%)
Thailand province	344	151 (43.9%)	95 (62.9%)	23 (15.2%)	33 (21.9%)	8 (5.3%)	4 (2.6%)	139 (92.1%)	34 (22.5%)
United Republic of Tanzania city	473	137 (29.0%)	99 (72.2%)	29 (21.2%)	9 (6.6%)	11 (8.0%)	10 (7.3%)	116 (84.7%)	84 (61.3%)
United Republic of Tanzania province	586	173 (29.5%)	116 (67.1%)	41 (23.7%)	15 (8.7%)	18 (10.4%)	22 (12.7%)	133 (76.9%)	100 (57.8%)

Table 4: Prevalence of injuries among physically abused women; severity and frequency of injuries in women ever-injured by an intimate partner, by site

province, women's reporting of poor health overall was extremely low (3% or less in women who had not reported violence) compared with other sites, such as Thailand province, where 18% of non-abused and 27% of abused women reported poor health [table 1]).

The association between violence by an intimate partner and selected physical symptoms of illness is supported by other findings.<sup>5,8,15–17,36,37</sup> Notably, we recorded an association between self-reported experiences of ill-health that occurred in the previous 4 weeks and lifetime experiences of partner violence. Although this finding does not prove causality, it provides evidence for the direction of the temporal association between violence and ill health. Given that in all sites but one (Ethiopia), at least one third of ever-abused women had not experienced violence within the last 12 months (data published elsewhere<sup>25</sup>), this finding suggests that the effect of violence might last long after the actual violence has ended. Other studies have shown that the severity and duration of violence is more predictive of health problems than when it occurred.<sup>7,10,19,38</sup>

Self-reported ill health, a subjective measure, has been shown to predict morbidity in countries where this has been tested.<sup>39–41</sup> Differences in amounts of reported ill health between sites are to be expected, and are undoubtedly affected by cultural variations in perceptions of health and ill health. We assessed the relationship between violence and women's perceived health and well-being within each site, to ensure that cultural differences in reporting were taken into account.

Our findings linking self-reported mental-health problems and suicidality with partner violence are consistent with findings from many studies in developing and developed countries.<sup>7,9,18–23,34,42–44</sup>

The findings of our study on injury are consistent with research elsewhere that established partner violence as a common cause of injury to women.<sup>1,2,4,45</sup> Severity of violence seems to have varied between the sites.<sup>25</sup> The high occurrences of loss of consciousness reported in some sites are especially alarming. Further qualitative research is needed to fully understand these findings, because the term “loss of consciousness” might have different meanings in different cultural contexts and languages.

We used a single composite variable that represented experiences of physical or sexual violence, or both, to represent exposure to violence. Because physical and sexual violence might affect women's health in different ways, such a composite exposure variable probably underestimated the associations between violence and health outcomes (ie, the association of one variable might have diluted the association of the other). Physical and sexual violence were combined in one variable, because considerable overlap was noted between experiences of sexual and physical partner abuse, with 20–50% (data published elsewhere<sup>25</sup>) of women in most sites having experienced both kinds of violence: consequently, the specific effect of each of these types of violence by itself was difficult to establish. Although all significant

associations were controlled for respondents' age, education, and marital status, not all potential confounders have been accounted for in this analysis.

Further analysis of our data will study these associations in greater depth, by comparing different exposures to violence, for example, by type of partner violence (physical, sexual, and emotional violence), time frame (current or past), and additional potential confounding factors, such as alcohol use or unemployment, violence by non-partners, and potential interactions with other individual, household, and community characteristics.

The findings of the WHO study have shown that violence is not only a substantial health problem by virtue of its direct effects, such as injury and mortality, but also that it might contribute to the overall burden of disease as a risk factor for several other serious health problems. The extent to which the associations between partner violence and reported ill health in women are consistent across sites both within and between countries is striking. This observation suggests that experiences of physical or sexual violence, or both, by a partner are associated with increased odds of reports of poor physical and mental health, irrespective of where a woman might live, her cultural or racial background, or the extent to which violence might be tolerated or accepted in her society or by herself. In addition to being a breach of human rights, the high prevalence of partner violence and its associations with poor health—including implied costs in terms of health expenditures and human suffering—highlight the urgent need to address partner violence in national and global health-sector policies and programmes.

#### Contributors

All authors participated in the study design, study implementation, interpretation of the findings, and revision of the final manuscript before submission. HAFMJ set up and supported data collection and processing in the countries, and managed the database centrally. ME and HAFMJ were responsible for data analysis and drafting of the manuscript. CG-M was the study coordinator.

#### WHO Multi-country Study on Women's Health and Domestic Violence against Women (VAW) Study Team

##### Core Research Team:

ME, HAFMJ, LH, CW, and CG-M.

See webappendix for the country principal investigators.

**Steering Committee**—Jacquelyn Campbell (Co-Chair), Johns Hopkins University, USA; Lucienne Gillioz, Bureau d'Egalite, Switzerland; Rachel Jewkes, MRC, South Africa; Ivy Josiah, Women's Aid, Malaysia; Olav Meirik (Co-Chair), Instituto Chileno de Medicina Reproductiva, Chile; Laura C Rodrigues, LSHTM, UK; Irma Saucedo, Mexico; Berit Schei, University of Trondheim, Norway; and Stig Wall (Umeå University, Sweden).

#### Conflict of interest statement

We declare that we have no conflict of interest.

#### Acknowledgments

The study was only possible because of the dedication and hard work of all of those involved, both internationally and in the countries concerned. We would like to acknowledge and thank the more than 24000 women who participated in the study, and who gave their time to answer our questions and share their life experiences with us. Implementation of the study was supported by many people in all of the participating institutions. We gratefully acknowledge the collaborating institutions in the countries, and the interviewers and other office and field staff in the countries, who all worked with immense dedication and commitment to ensure the

See Online for webappendix

successful implementation of the study. The study was supported with funding provided to WHO from the Governments of the Netherlands, Norway, Sweden, Switzerland, and the UK, and the Rockefeller Foundation (who also provided the use of their meeting place in Bellagio in May, 2004, for a meeting of the WHO VAW Study team). WHO provided the funding for the implementation of the study in six of the eight initial countries: Brazil, Japan, Namibia, Peru, Thailand, and the United Republic of Tanzania, with some of these countries receiving additional funds from local sources. In Bangladesh, the study was funded by the Urban Primary Health Care project of the Government of Bangladesh; in Ethiopia by the Swedish Agency for Research Cooperation with Developing Countries (SAREC/Sida); in Samoa, by the United Nations Fund for Population Activities (UNFPA); and in Serbia and Montenegro, by Trocaire. We also thank Mohamed Ali, WHO, and Oona Campbell, LSHTM, UK, for providing valuable comments to the report.

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First, as with laboratory science, studies on global health monitoring must meet the benchmark of replication by other scientists. Replication requires that methods be described in sufficient detail and that data used by authors in their analyses be available to interested researchers. Second, health statistics should be clearly identified in tables, figures, and results as crude statistics, corrected statistics, or predicted statistics. Where crude data are presented, the onus is on the authors to justify why known biases should not be corrected. Where corrections have been made, these must be detailed as part of the methods. Where predicted statistics are used or incorporated with corrected data into regional and global figures, these hybrids must be clearly identified. Third, uncertainty intervals should be reported that are grounded in some theory of measurement. Wherever possible, uncertainty intervals should reflect not only sampling error, but also the uncertainty generated through correction for known biases and model fitting.

The Global Health Tracking section will be open to submissions from all scientists—at international agencies, academic institutions, and ministries. Final editorial decisions will be made exclusively by *The Lancet*. It is expected that the IHME will kick-start this call for

papers with six or more reports each year, covering topics such as adult mortality, causes of death, burden of disease, effective coverage of interventions, technical quality of providers, aid flows, national health accounts, and human resources. Please submit contributions to Global Health Tracking directly to *The Lancet*. We hope this initiative will signal a renewed commitment to global accountability for health goals.

\*Richard Horton, Chris Murray, Julio Frenk  
*The Lancet*, London NW1 7BY, UK (RH); Institute for Health Metrics & Evaluation, University of Washington, Seattle, WA, USA (CM); Bill & Melinda Gates Foundation, Seattle, WA, USA (JF); Institute for Health Metrics and Evaluation, Seattle, WA, USA (JF); and Carso Health Institute, Mexico City, Mexico (JF)

We declare that we have no conflict of interest.

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## Intimate-partner violence and women's health

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In today's *Lancet*, Mary Ellsberg and colleagues<sup>1</sup> tackle intimate-partner violence, a very important direct cause of physical and psychological injury. The researchers studied the effect of gender-based violence in 15 selected sites in ten countries. 15–71% of women who had ever had a partner reported that they had experienced physical or sexual violence (or both) by a current or former partner. A quarter to a half of these women had had severe injuries, fractures, broken teeth, or other serious health problems.

In many countries, women are viewed as inferior to, or even owned by, men. Intimate-partner violence accounts for between 5–20% of healthy years of life lost in women aged 15–44 years.<sup>2</sup> Gender-based violence was long thought of as a private family matter in many countries; although, in the past few years it has been recognised as both a public-health problem and a human-rights violation. Violence has been linked

to various health outcomes, both immediate and long-term (panel).<sup>3</sup>

The study was well designed, using standardised methods and accounting for possible biases. The strengths of the study are the number (and variety) of the sample sites and the large sample size with a very high response rate. In addition, the researchers ensured that the questionnaire was understood by all participants.

Although cultural variation in perceptions of health and ill-health was taken into account, variation in perceptions of violence was not. There might also have been some misclassification bias. Women who reported violence by an intimate partner might be more likely to recall such events than women who did not; however, this did not affect the validity of the findings as it would lead to underestimation rather than overestimation of violence.

The association between lifetime experience of intimate violence and self-reported poor health (difficulty

**Panel: Outcomes of intimate-partner violence<sup>3</sup>****Physical**

Abdominal and thoracic injuries, bruises and welts, chronic pain, disability, fibromyalgia, fractures, gastrointestinal disorders, irritable bowel syndrome, lacerations and abrasions, ocular damage, decreased physical function

**Psychological and behavioural**

Alcohol and drug misuse, depression and anxiety, eating and sleep disorders, feelings of shame and guilt, phobias and panic disorders, physical inactivity, poor self-esteem, post-traumatic stress disorder, psychosomatic disorders, smoking, suicidal behaviour and self harm, unsafe sexual behaviour

**Sexual and reproductive**

Gynaecological disorders, infertility, pelvic inflammatory disease, pregnancy complication, sexual dysfunction, unwanted pregnancy, unsafe abortion, sexually transmitted infections, including HIV

**Fatal health consequences**

AIDS-related mortality, maternal mortality, homicide, suicide

walking, difficulty with daily activities, pain, memory loss, dizziness, and vaginal discharge) gave odds ratios of 1.6 to 1.8, with narrow confidence intervals.

Some of the indicators of poor general health were subjective and non-specific, making the connection to violence questionable. The temporal association between exposure to violence and poor general health was not clear, which makes it hard to define cause and effect. The same is true for the link between violence and mental illness, which might be a predisposing factor for victimisation. I agree with the authors that the association between the injuries reported by women in their study and exposure to violence was causal; however, the role of confounders cannot be assessed. The study described the prevalence of domestic violence in the surveyed countries, which was one of the study objectives, but the prevalence rates were not clearly mentioned in the findings, and a comparison between the prevalence rates of these countries would be interesting.

Domestic violence against women is a worldwide problem; it is more aggressive (and accepted) in the Middle East and east Asia. In China,<sup>4</sup> a study from an out-patient gynaecology clinic used the same definitions and methods as today's study showed that 43% of the women seeking care had experienced sexual or physical violence

at some point in their lifetime, whereas 21% reported violence in the past year. According to the Human Rights Commission of Pakistan, of 400 cases of domestic violence reported in 1993 in the province of Punjab, nearly half ended with the death of the wife.<sup>3</sup> A researcher from Oakland University, Rochester, USA, studied the incidence of violence (and crimes) against women in one middle eastern country. Of 89 homicides, 38 involved female victims. Analysis of the court files showed that a male relative of the victim, mainly the brother, committed most of these murders. The most common cause provided in the files was so called honour crime.<sup>5</sup>

Violence against women and girls during wars, for example in Iraq since the start of the 2003 war, has risen sharply. According to a Human Rights Watch report, as a result of the invasion, women and girls face increased sexual violence and abduction, which was almost unheard of before.<sup>6</sup>

The issue here is that violence against women is always dealt with through a sensitive approach by considering it gender-based and a human-rights violation, but we need to address all the factors that predispose to violence. Violence has devastating consequences for the women who experience it, and a traumatic effect on those who witness it, especially children.<sup>7</sup> Stopping violence against women today would help to curb future delinquency.<sup>8</sup>

Accurate and comparable data on violence against women are needed to strengthen advocacy efforts, help policy makers understand the problem, and guide the design of preventive interventions. Unfortunately, data-collection efforts that measure the scope and magnitude of the situation of violence against women are hampered by several factors. These include the influence of social and cultural norms in determining what constitutes violence, changes in reported rates of abuse according to the definition of violence used, the way questions are asked, the type of target population, and the setting of the interview. Under-reporting of violence is a common problem for several reasons: minor injuries might pass without being reported; violence is viewed as normal in certain communities; victims are too frightened of their partners to report the incident; sexual abuse and violence are rarely discussed in certain cultures; and verbal assault, an important type of gender violence, is often overlooked or under-researched.

Future studies with a longitudinal cohort design should go further to measure the mortality and life expectancy among women who are victims of intimate-partner violence.

Riyadh K Lafta

Mustansiriya Medical School, Baghdad, Iraq  
riyadhlafta@yahoo.com

I declare that I have no conflict of interest.

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## Screening for neuroblastoma: a resurrected idea?

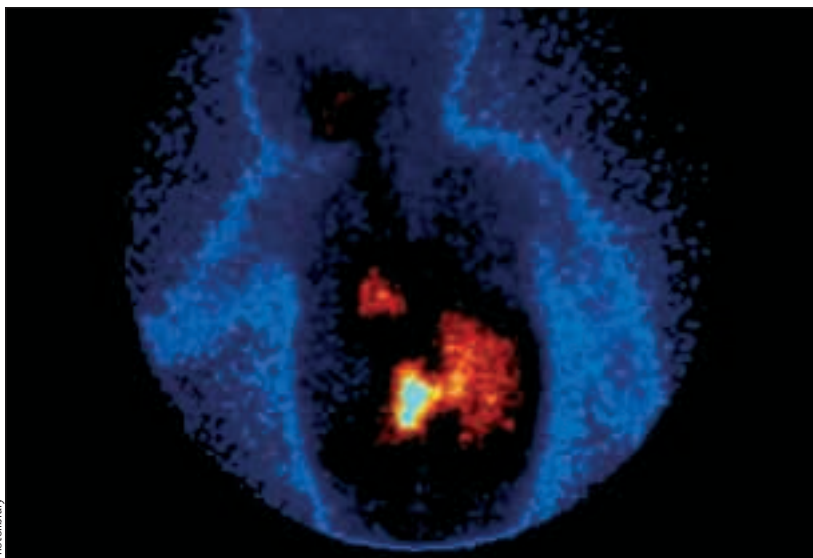
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Neuroblastoma is common, often lethal, and the only solid tumour of early childhood studied by large-scale screening.<sup>1</sup> Screening involves urinary assay of catecholamine metabolites from tumour cells. If neuroblastoma was to begin as benign but progress to more aggressive disease with unfavourable prognosis, screening ought to reduce mortality. Unfortunately, neuroblastoma is at least two entities.<sup>2</sup> Biologically favourable neuroblastoma starts in infancy, typically stays benign, and completely regresses spontaneously in many patients. However, about half of cases develop after the age of 18 months with metastatic disease, and

these patients do poorly despite aggressive treatment with little improvement in survival over the past 25 years.<sup>1</sup> Molecular and pathological features accurately determine prognosis at diagnosis.<sup>2–4</sup>

Screening for neuroblastoma at the age of 6 months was pioneered in Japan 35 years ago.<sup>5</sup> Because survival seemed to be improved in pilot programmes,<sup>6</sup> nationwide screening started in 1984. Decisions to nationalise screening in Japan were initially based on survival data,<sup>5,6</sup> which can be artificially raised if screening increases incidence, rather than reduces mortality. The early work also lacked concurrent controls and consistency in ascertainment of cases and deaths.

A later population-based study offered screening to a 5-year birth cohort of about 500 000 infants in Quebec, Canada, where urinary screening for other disorders was well established.<sup>7</sup> Concurrent US and Canadian control populations of 4.2 million infants were followed up, with rigorous ascertainment for births and deaths. The incidence of neuroblastoma doubled in Quebec compared with control populations, with no lowering of the incidence of unfavourable disease. Cumulative mortality at 8 years was no different from that in concurrent or retrospective controls.<sup>7</sup> An even larger study investigated screening at the age of 1 year in six German states (2.6 million infants) compared with no screening in ten states (2.1 million infants).<sup>8</sup> Despite screening at a later age than in the Quebec or Japanese studies, the German results were similar to those from Quebec.



Scintigram showing stage IV neuroblastoma