ACADEMY ON VIOLENCE & ABUSE

ADVANCING HEALTH EDUCATION & RESEARCH

Hidden Costs in Health Care: The Economic Impact of Violence and Abuse

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The mission of the Academy on Violence and Abuse (AVA) is to advance health education and research on the prevention, recognition, treatment, and health effects of violence and abuse.

VISION

By expanding health education and research, AVA will integrate knowledge about violence and abuse into the training of health professionals, promote the health of all people, protect the most vulnerable, and advance health policy that promotes safe families, workplaces, and communities.

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HIDDEN COSTS IN HEALTH CARE:
THE ECONOMIC IMPACT OF VIOLENCE AND ABUSE

Every year millions of Americans are exposed to violence and abuse as victims, witnesses, and perpetrators. Violence and abuse occur in all age groups, at all socioeconomic levels, and throughout all of society's structure.

It is obvious that these experiences impose a direct economic burden on the healthcare system. What has been less obvious is the even greater cost due to the long-term health consequences of such experiences. These long-term negative health consequences are increasingly being recognized as major health concerns and the true cost to the health care system may reach hundreds of billions of dollars a year.

It is imperative that stakeholders — insurance companies and purchasers of health care (including state and federal agencies) — are made aware of the connection between many chronic health conditions and the antecedent experiences of abuse. Common conditions such as heart disease, diabetes, back pain, stroke, mental illness and asthma are all shown to occur more frequently or more severely in those who have been exposed to violence in their lives. But this is only the beginning. All body systems are included and the list of associated adverse health effects keeps growing.

Figure 1 illustrates the conditions and health risk behaviors that are known or suspected to have a correlation with lifetime exposure to abuse. Given the breadth of the associations illustrated here, it starts to become clear that demand for health care services is likely to be significantly increased in the population of those who have experienced abuse.

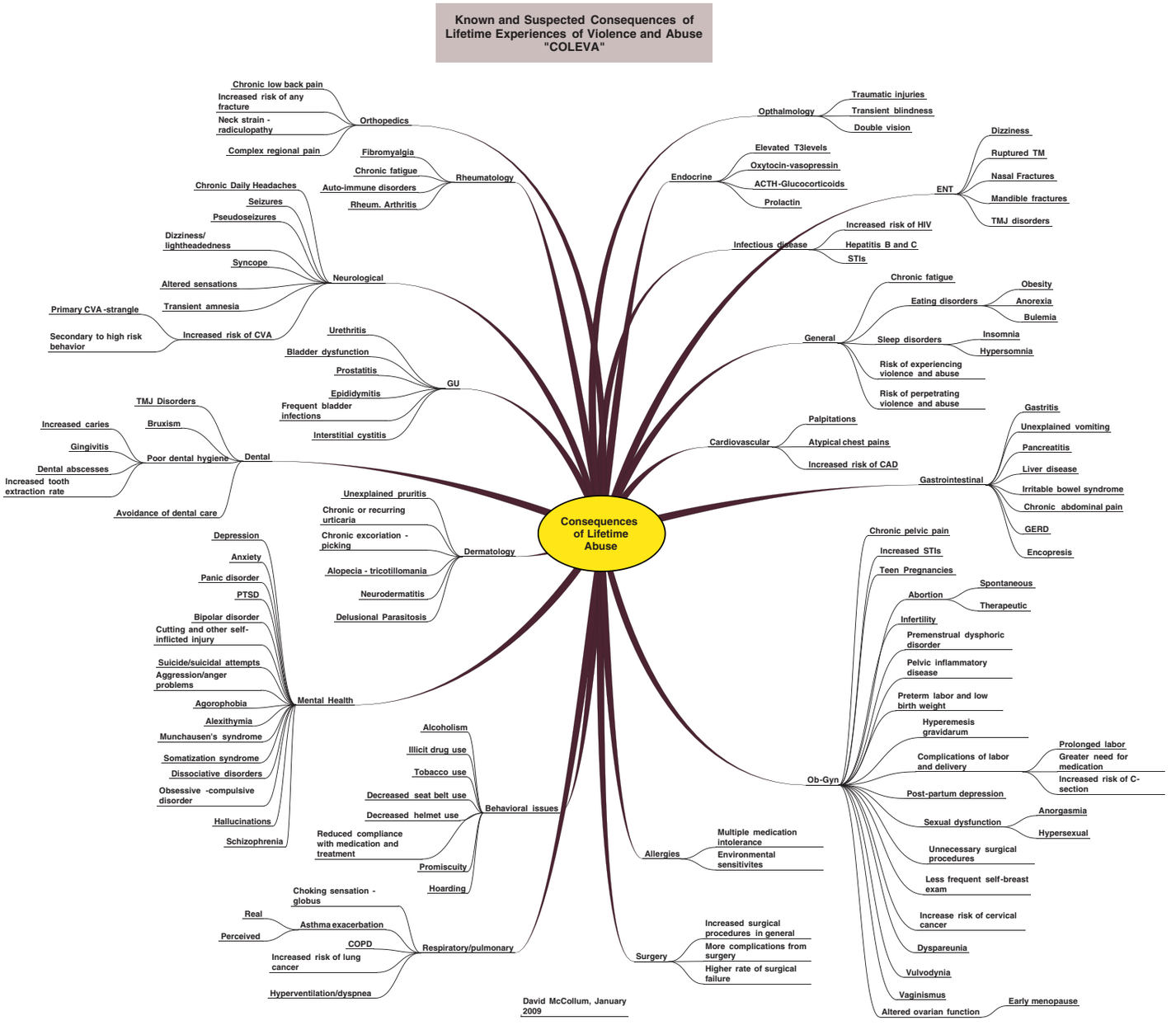
If the purchasers of health care and the insurers of health care understand the significant contributions that violence and abuse make to the utilization and cost of health care services, then, logically, there should be a demand for a change in the way health care is delivered. Health care providers would need to be trained to appropriately and adequately identify and respond to their patients' experiences of violence and abuse.

Up to now, the health care system has failed to adequately recognize the consequences of abuse, to respond and treat patients in a manner that is compassionate and healing, and to incorporate appropriate prevention strategies.

This paper reviews a sampling of the literature that supports the contention that violence and abuse lead to a significant increase in health care utilization and costs.

As used here, the term "violence and abuse" encompasses a continuum of experiences in which multiple variations of harm, neglect, abuse, and interpersonal violence occur between people. Violence and abuse is preferred over such traditional terms as "domestic violence" and "intimate partner violence" because these terms have often been used in limited contexts or have addressed only physical, sexual, or psychological harm by a current or former partner or spouse. The use of these terms sometimes limits our thinking about these issues and makes it more difficult to understand the complex dynamics that must be considered in order to provide patient-centered care. Moreover, the traditional categories do not reflect the fact that the various forms of violence and abuse act together as part of a common etiology underlying many different health conditions.

Figure 1: Known and Suspected Consequences of Lifetime Experiences of Violence and Abuse



PREVALENCE

People experience multiple forms of violence, as victims, witnesses, and perpetrators at different times in their lives. Regardless of when or how these incidents occur, what these experiences have in common is their effect on the long-term health status of those who are exposed to them. Fortunately, evidence also suggests that these health consequences can be effectively addressed using organized systems of care management, such as the chronic disease management model. [1]

Reliable estimates of the overall prevalence of violence and abuse are not readily available. Most studies have focused on one or another aspect of abuse or violence in traditional (compartmentalized) terms. The project that comes closest to providing the basis for an overall estimate is the National Violence Against Women Survey conducted by the U.S. Justice Department and the Centers for Disease Control between November 1995 and May 1996.

On the basis of findings from the National Violence Against Women Survey, published in 1998, researchers estimated that 1.5 million women and 834,732 men reported physical assault or rape by intimate partners in the United States. The survey results indicate that more than one-third of American women reported experiences with physical and/or sexual violence by a husband, partner, or intimate friend at some point in their lives. [2]

Finklehor et al. [3] provide an excellent overview of what is known about the prevalence of exposure to various forms of child maltreatment. They cite studies that document the frequency of victimization and the association of such experiences with adverse physical, psychological and social outcomes. But they also describe how the fragmentation of these studies into the traditional categories of maltreatment leads to a number of methodological problems and underestimation of overall prevalence.

Given the evidence linking exposure to violence with health status, this prevalence has obvious implications for the health care delivery system. For example, an estimated 24 to 54 percent of all women seen in the Emergency Department have a lifetime history of violence and abuse. [4] Another recent study by researchers at the University of Chicago found that 31 percent of patients admitted to the emergency department self-reported experiences of abuse in their current relationship using an electronic screening tool. [5]

Violence and abuse have serious long-term medical consequences that last long after the initial trauma as shown by the work of Felitti and Anda. They have published over fifty articles showing the relationship between adverse childhood experiences (ACEs) and longer term chronic illness, high-risk health behaviors, reduced life span and more. A summary of their work recently published by the Centers for Disease Control suggests that roughly 28.3% of adults acknowledge having experienced physical abuse as a child. Approximately 21% have experienced sexual abuse and about 11% report having experienced some form of emotional abuse. [6]

Koss and Heslet reported as long ago as 1992 that those who had experienced abuse accessed the health care system 2 to 2.5 times as often as those not exposed to abuse. They suggested that medical care could be improved if physicians were to identify the underlying cause of the patient's symptoms, referring to violence victimization. [7] Nearly two decades later, health care providers still too often fail to adequately address violence and abuse in practice, resulting in significantly higher health care costs.

VIOLENCE AND ABUSE AND POOR HEALTH OUTCOMES

As mentioned above, a growing body of evidence demonstrates that exposure to violence and abuse increases the risk of negative health outcomes. [4, 8-12] These outcomes manifest themselves in more physical health problems, higher use of medical and mental health care services, higher levels of depression, more frequent suicide attempts, and increased abuse of alcohol and other substances. [13-16] Other research has found associations between exposure to violence and abuse and increased surgical procedures, mental health services, and visits to general practitioners, emergency departments, and hospitals. [6, 18, 19]

Violence and abuse are closely associated with conditions seen in the health care setting on a daily basis. Unfortunately, the possibility that exposure to violence and abuse is a predisposing factor in these conditions is not widely acknowledged or acted upon in practice. As a result, the health care system spends many billions of dollars each year treating the consequences of this exposure — too often without addressing the underlying causes.

HIDDEN COSTS OF VIOLENCE AND ABUSE

Patients use clinics and hospitals for health complaints that are often "proxies" for underlying problems related to exposure to violence and abuse. [19] For example, studies of women in the primary care setting indicate that many patients who had experienced childhood violence now suffer multiple symptoms which, while not seen as the reason for the visit and often not recorded in the chart, result in increased primary care visits throughout their lives. [20]

A study of primary care utilization by adult women found significantly higher frequencies for 22 out of 29 physical symptoms in patients who also reported a history of childhood sexual abuse (according to a self-reported survey). Eleven of the 22 symptoms were reported by more than 25 percent of women who had experienced childhood sexual abuse. [21] Table 2 illustrates the range of complaints found to be associated with a history of sexual abuse.

Similarly, Rivara et al. [11] found that significant differences in health care costs and utilization between children whose mothers had experienced violence and abuse and those whose mothers had not. This study provides further evidence that the effect of exposure is long-lasting. It found that even after the abuse stopped, the children of mothers who experienced violence and abuse continued to experience higher utilization and costs. Moreover, this study found that children living in households with chronic stress such as violence and abuse had a lifelong increased risk of acute disorders.

Table 2. Physical Symptom Frequencies According to Childhood Sexual Abuse Status (self-report data)

	CSA (a) (n=87)		No CSA (b) (n=293)		
Symptoms	**n**	**%**	**n**	**%**	**x2**
Asthma	11	12.6	23	7.9	ns
Trouble getting breath	23	26.7	19	6.5	27.4
Backaches	48	55.2	112	38.2	7.9
Soreness of muscles	39	45.3	74	25.3	12.69
Feeling weak	27	31	22	7.6	32.71
Heavy feeling in arms or legs	13	15.5	21	7.2	5.44
Feeling faint or dizzy	21	24.4	29	9.9	12.15
Hot/cold spells	29	33.7	38	13	19.53
Migraine headaches	24	27.6	57	19.5	ns
Other headaches	43	50.6	118	40.3	ns
Pain in heart/chest	20	23.3	18	6.2	21.46
Skipped heart beats	13	14.9	19	6.5	6.17
Low blood sugar	14	16.1	20	6.8	7.07
Nausea/stomach upset	32	36.8	71	24.2	5.35
Stomach pain	28	32.6	38	13.1	17.48
Ulcers	7	8.2	15	5.1	ns
Loose bowels	23	26.4	60	20.5	ns
Hard, painful stools	23	26.4	42	14.3	6.93**
Breast problems	6	7	18	6.2	ns
Problems with periods	28	32.2	58	19.9	5.80*
Yeast in vagina	16	18.6	22	7.5	9.07**
Diseases from sex	8	9.2	4	1.4	13.45***
Pain in lower belly	17	19.8	22	7.5	10.82**
Bladder problems	20	23	17	5.8	22.42***
Not liking sex	23	26.4	33	11.3	12.29***
Eating too little	13	15.1	16	5.5	8.77**
Too thin from starving	2	2.3	4	1.4	ns
Eating too much	47	54	86	29.4	17.95***
Making yourself vomit	5	5.8	4	1.4	5.68*

*p < .05; ** p < .01; *** p < .001. CSA, child sexual abuse; ns, not statistically significant.
SOURCE: Hulme. [21]

The lifelong physical and mental health consequences of childhood trauma have been highlighted in the Adverse Childhood Experiences (ACE) Study, the largest study done to date, which examined the health and behavioral effects of negative childhood experiences. [23, 24] The original ACE study was conducted by the Centers for Disease Control and Prevention in cooperation with researchers at the Kaiser Permanente Department of Preventative Medicine in San Diego. This study categorized and scored a large set of survey responses in order to investigate the effects of negative childhood experiences on adult health status. [25, 26] These and other similar studies illustrate that exposure to these experiences is strongly predictive of future poor health status.

Exposure to adverse childhood experiences has been found to be associated with an array of dysfunctional outcomes in later life including addiction, sexually transmitted disease, obesity, fractures, and medical conditions including diabetes, heart disease, and chronic obstructive pulmonary disease. A recent article by the ACEs Study Group found a connection between early experience with violence and abuse and increased use of prescribed psychotropic medication throughout adulthood. [27]

VIOLENCE, ABUSE AND CHRONIC DISEASE

Exposure to violence and abuse appears to be a contributing factor in the growing American chronic disease epidemic. Data from Stanton suggests that $1.9 trillion, or 16 percent of the US gross domestic product (GDP), was spent on health care (compared to 9 percent in 1980). It was estimated that $6,280 was spent per person, but that individuals with chronic health problems generate the greatest financial burden on the health care system and account for disproportionate amounts of overall spending. [28]

It has been estimated that one-quarter of the population has one or more of five major chronic conditions with an estimated total spending of $62.3 billion in 1996. [28] This includes direct treatment costs but does not account for the increases in costs likely to result from multiple comorbid conditions. Not surprisingly, chronic conditions are, along with trauma, among the most costly conditions to manage and treat. (See Table 3)

Table 3. Comparison of the top five most expensive health conditions with top five major chronic conditions (associated with exposure to violence and abuse). Stanton [28]

Top Five Most Costly Health Conditions	Top Five Most Prevalent Chronic Conditions
Trauma	Diabetes
Mental Disorders	Mood Disorders
Heart Disease	Heart Disease
Cancer	Hypertension
Pulmonary Disorders	Asthma

Interesting new evidence suggests that exposure to violence and abuse predispose people to ongoing physical health problems, in part by inducing a state of chronic pain that makes them more sensitive to subsequent stresses. [10] Researchers have postulated that the resulting chronic pain is due to disruption of the hypothalamic-pituitary-adrenal (HPA) axis with both endocrine and neurological consequences that contribute maintenance of chronic pain. [29, 30]

This research suggests that prolonged exposure to stress hormones released by the body in response to violence or abuse affect the regulation of the nervous system, as well as the immune, endocrine, and other organ systems. [10] Other recent research is beginning to identify the specific biochemical changes that take place along the HPA axis in response to psychosocial stress. [29, 30]

The 1999 Wisner study, which was conducted in cooperation with a large Minnesota health insurance plan, found approximately $1,776 more was spent annually on female enrollees with a history of violence and/or abuse compared to a random sample of female enrollees. [20] The study found that women who had experienced violence within their lifetime had more hospitalizations, more frequent clinic use, mental health utilization, and out-of-plan referrals.

Jones et al. compared abused and non-abused middle class women enrolled in a multisite metropolitan health maintenance organization (HMO) and found that average annual costs were $570 higher for women who reported a history of abuse. [31]

In another study (Rivara), women with a history of violence and abuse had up to 20% higher total health care costs (approximately $439 annually) and the elevation in costs continued long after the violence ended. [22] Similarly, a retrospective study by Bonomi et al. found evidence among a randomly selected sample of women that health care costs were 36% higher for women who reported experiences with childhood physical and sexual abuse. [32]

Although the study has not yet been done that identifies the full cost of violence and abuse to the health care system, based on prior studies (Koss, Felitti, CDC, and others), we can make a reasonable approximation of those costs.

As mentioned earlier, Koss and Heslet showed that those who have experienced abuse access health care 2 to 2.5 times more frequently than those without that history. [7]

Felitti, Anda and others have given us confidence that at least 20-40% of the population has experienced consequential abuse at some time in their lives. [23, 24, 25]

Using estimated 2008 health care costs of about $2 trillion [33] and a U.S. population of 300 million, [34] Tables 4 and 5 below show that the predicted incremental cost to the health care system ranges between $333 billion and $750 billion annually, or nearly 17% to 37.5% of the total health care dollar.

Table 4: Assuming Twice the Average Rate of Utilization

		2X				
Percent of Population Exposed		Annual Per Capita Cost-No Abuse	Annual Per Capita Cost-Abuse	Annual Health Expenditures in Billions - Abuse History	Incremental Cost of Abuse in Billions	Percent of Health Care Dollar Spent Due to Abuse
20%		$5,555.56	$11,111.11	$667	$333	16.7%
30%		$5,128.21	$10,256.41	$923	$462	23.0%
40%		$4,761.90	$9,523.81	$1,143	$571	28.6%

Table 5: Assuming Two and One Half Times the Average Rate of Utilization

		2.5X				
Percent of Population Exposed		Annual Per Capita Cost-No Abuse	Annual Per Capita Cost-Abuse	Annual Health Expenditures in Billions - Abuse History	Incremental Cost of Abuse in Billions	Percent of Health Care Dollar Spent Due to Abuse
20%		$5,128.21	$12,820.51	$769	$461	23.0%
30%		$4,597.70	$11,494.25	$1,034	$620	31.0%
40%		$4,166.67	$10,416.67	$1,250	$750	37.5%

CONCLUSION

The various studies cited in this paper provide convincing evidence that exposure to violence and abuse is a strong predictor of higher health care utilization and cost. The health effects of this exposure include both acute and chronic conditions. These studies also suggest that some of this comes as a result of a greater likelihood to engage in high-risk health behaviors, such as smoking, alcohol and drug use, and poor eating and exercise habits.

For the most part, health care provider organizations and individual practitioners have been slow to address violence and abuse as health issues. Most providers are not adequately trained to elicit abuse histories from their patients and are, for a variety of reasons, reluctant to do so. As a result, the contribution of violence and abuse to the patient's health status often remains unrecognized and untreated. Addressing this deficiency represents an untapped potential for significant cost savings.

The evidence presented here makes it clear that the prevention, identification and treatment of violence and abuse must be established priorities in health care delivery systems. Recognition of the serious health issues that are strongly associated with abuse would be an important step forward. Recognition must then be followed by increased research to support the adoption of evidence-based preventive measures, identification techniques and science-based treatment of the effects of violence and abuse.

The research that has been done so far clearly shows the contribution of violence and abuse to health care costs. Policy makers should be made cognizant of this information. As our health care system struggles to reduce costs, incorporating this knowledge will play a crucial role if it can be translated into better identification, management, and prevention of abuse and the health-related aftermath.

Several encouraging trends are emerging. The movement toward "the medical home" offers an opportunity. Incorporating recognition, management and treatment of violence and abuse is a natural fit with this concept of integrated care. Informed payers may wish to provide incentives to encourage this type of coordination.

But progress in this area is ultimately dependent on the selection and training of health professionals who have the history-taking skills necessary to elicit a history of exposure to abuse and a willingness to openly discuss these issues.

RECOMMENDATIONS:
Next steps should include:

- Fund further large-scale studies on cost
- Identify evidence-based practices that better address violence and abuse exposure
- Establish guidelines for treatment and management of patients
- Identify appropriate prevention components for health care providers

The Academy on Violence and Abuse invites other health education institutions, health providers, researchers, representatives from the health care industry and health administration, as well as government agencies, to join us in taking these next steps.

REFERENCES

1. Zink T, Lloyd K, Isham G, Mathews DJ, Crowson T. Applying the planned care model to intimate partner violence. *Manag Care.* 2007 Mar;16(3):54-61.

2. Tjaden P, Thoennes N. Prevalence, Incidence, and Consequences of Violence Against Women: Findings From the National Violence Against Women Survey. Atlanta: Centers for Disease Control and Prevention, National Institute of Justice; November 1998. Available at www.ncjrs.gov/pdffiles/172837.pdf. Accessed June 14, 2008.

3. Finkelhor, D., Ormrod, R.K., Turner, H.A., and Hamby, S.L. (2005). The victimization of children and youth: A comprehensive, national survey. *Child Maltreatment,* 10(1), 5-25.

4. Centers for Disease Control and Prevention (CDC). Costs of intimate partner violence against women in the United States. Atlanta, GA: CDC, National Center for Injury Prevention and Control; 2003. Available at www.cdc.gov/ncipc/pub-res/ipv_cost/ipv.htm. Accessed June 14, 2008.

5. Rhodes KV. The promise and problems with using information technology to achieve routine screening for intimate partner violence. *Family Violence Prevention and Health Practice*. 2005;3:1-14. Available at http://www.endabuse.org/health/ejournal/archive/1-3/Rhodes.pdf. Accessed June 14, 2008.

6. Middlebrooks JS, Audage NC. The Effects of Childhood Stress on Health Across the Lifespan. Atlanta: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control; 2008. Available at www.cdc.gov/ncipc/pub-res/effects_of_childhood_stress.htm. Accessed June 17, 2008.

7. Koss, M. P., Heslet, L. Somatic consequences of violence against women Arch Fam Med 1992 Sep;1(1):53-9. Archives of Family Medicine, 1, 53-59.

8. Walker EA, Unutzer J, Rutter C, Gelfand A, Saunders K, VonKorff M, Koss MP, Katon W. Costs of health care use by women HMO members with a history of childhood abuse and neglect. *Archives of General Psychiatry*. 1999 Jul;56(7):609-13.

9. Arias I, Corso P. Average cost per person victimized by an intimate partner of the opposite gender: a comparison of men and women. *Violence and Victims*. 2005;20(4):379-91.

10. Meagher M. Links between traumatic family violence and chronic pain: Biopsychosocial pathways and treatment implications. In Kendall-Tackett KA (Ed.). *Health Consequences of Abuse in the Family: A Clinical Guide for Evidence-Based Practice*. Washington DC: American Psychological Association; 2004:155-177.

11. Rivara FP, Anderson ML, Fishman P, et al. Intimate partner violence and health care costs and utilization for children living in the home. *Pediatrics*. 2007;120(6):1270-7.

12. Campbell J, Jones AS, Dienemann J, Kub J, Schollenberger J, O'Campo P, Gielen AC, Wynne C. Intimate partner violence and physical health consequences. *Archives of Internal Medicine*. 2002;162(10):1157-63.

13. Dube SR, Anda RF, Felitti VJ, Edwards VJ, Croft JB. Adverse childhood experiences and personal alcohol abuse as an adult. *Addictive Behaviors*. 2002;27(5):713-715.

14. Edwards VJ, Anda RF, Gu D, Dube SR, Felitti VJ. Adverse childhood experiences and smoking persistence in adults with smoking-related symptoms and illness. *Permanente Journal*. 2007;11:5-7.

15. Silverman JG, Raj A., Mucci LA, and Hathaway JE. Dating violence against adolescent girls and associated substance use, unhealthy weight control, sexual risk behavior, pregnancy, and suicidality. Journal of the American Medical Association. 2001;286:572-579.

16. Davis J, Combs-Lane A, and Smith D. Victimization and Health Risk Behaviors: Implications for Prevention Programs. In Kendall-Tackett KA. (Ed.). *Health Consequences of Abuse in the Family: A Clinical Guide for Evidence-Based Practice*. Washington DC: American Psychological Association; 2003:179-195.

17. Max W, Rice DP, Finkelstein E, Bardwell RA, Leadbetter S. The economic toll of intimate partner violence against women in the United States. *Violence and Victims*. 2004;19(3):259-72.

18. Campbell J, Jones AS, Dienemann J, Kub J, Schollenberger J, O'Campo P, Gielen AC, Wynne C. Intimate partner violence and physical health consequences. *Archives of Internal Medicine*. 2002;162(10):1157-63.

19. McDonald D. Violence as a Public Health Issue. Australian Institute on Criminology, 2000. Trends and Issues in Crime and Criminal Justice series. No.163, Available at http://www.aic.gov.au/publications/tandi/ti163.pdf. Accessed June 14, 2008.

20. Wisner CL, Gilmer TP, Saltzman LE, Zink TM. Intimate partner violence against women: do victims cost health plans more? *Journal of Family Practice*. 1999;48(6):439-43.

21. Hulme PA. Symptomatology and health care utilization of women primary care patients who experienced childhood sexual abuse. *Child Abuse and Neglect*. 2000;24(11):1471-1484.

22. Rivara FP, Anderson ML, Fishman P, et al. Healthcare utilization and costs for women with a history of intimate partner violence. *American Journal of Preventive Medicine*. 2007;32(2):89-96.

23. Felitti VJ, Anda RF, Nordenberg D, Williamson DF, Spitz AM, Edwards V, Koss MP, et al. JS. The relationship of adult health status to childhood abuse and household dysfunction. *American Journal of Preventive Medicine.* 1998;14:245-258.

24. Edwards V, Anda R, Felitti V, Dube S. Adverse childhood experiences and health-related quality of life as an adult. In Kendall-Tackett KA (Ed.). *Health Consequences of Abuse in the Family: A Clinical Guide for Evidence-Based Practice*. Washington DC: American Psychological Association; 2004:81-94.

25. Anda R, Felitti V. Origins and essence of the study. *ACE Reporter* 2003;1(1). Available at www.acestudy.org/files/ARV1N1.pdf. Accessed June 14, 2008.

26. Felitti VJ. The relationship between adverse childhood experiences and adult health: turning gold into lead. *The Permanente Journal*, 2002;6:44-47.

27. Anda RF, Brown DW, Felitti VJ, Bremner JD, Dube SR, Giles WH. Adverse childhood experiences and prescribed psychotropic medications in adults. *American Journal of Preventive Medicine*. 2007;32(5):389-94.

28. Stanton MW, Rutherford MK. The high concentration of U.S. health care expenditures Rockville (MD): Agency for Healthcare Research and Quality; 2005. Research in Action Issue 19. AHRQ Pub. No. 06-0060. Available at www.ahrq.gov/research/ria19/expendria.pdf. Accessed June 14, 2008.

29. Elzinga BM, Roelofs K, Tollenaar MS, et al. Diminished cortisol responses to psychosocial stress associated with lifetime adverse events a study among healthy young subjects. *Psychoneuroendocrinology*. 2008;33(2):227-37.

30. Kudielka BM, Schmidt-Reinwald AK, Hellhammer DH, Kirschbaum C: Psychological and Endocrine Responses to Psychosocial Stress and Dexamethasone/ Corticotropin-Releasing Hormone in Healthy Postmenopausal Women and Young Controls: The Impact of Age and a Two-Week Estradiol Treatment. *Neuroendocrinology*. 1999;70:422-430.

31. Jones AS, Dienemann J, Schollenberger J, Kub J, O'Campo P, Gielen AC, Campbell JC. Long-term costs of intimate partner violence in a sample of female HMO enrollees. *Women's Health Issues*. 2006;16(5):252-61.

32. Bonomi AE, Anderson ML, Rivara FP, Cannon EA, Fishman PA, Carrell D, Reid RJ, Thompson RS. Health care utilization and costs associated with childhood abuse. Journal of General Internal Medicine. 2008;23(3):294-299.

33. National Health Expenditure Projections 2007-2017, Forecast Summary, Office of the Actuary in the Centers for Medicare & Medicaid Services, 2008. Accessed March 20, 2008.

34. U.S. Interim Projections by Age, Sex, Race, and Hispanic Origin, U.S. Census Bureau, 2004. Available at http://www.census.gov/ipc/www/usinterimproj/. Accessed June 16, 2008.