

The Influence of Social and Political Violence on the Risk of Pregnancy Complications

ABSTRACT

Background. Events in Chile provided an opportunity to evaluate health effects associated with exposure to high levels of social and political violence.

Methods. Neighborhoods in Santiago, Chile, were mapped for occurrences of sociopolitical violence during 1985–86, such as bomb threats, military presence, undercover surveillance, and political demonstrations. Six health centers providing prenatal care were then chosen at random: three from “high-violence” and three from “low-violence” neighborhoods. The 161 healthy, pregnant women due to deliver between August 1 and September 7, 1986, who attended these health centers were interviewed twice about their living conditions. Pregnancy complications and labor/delivery information were subsequently obtained from clinic and hospital records.

Results. Women living in the high-violence neighborhoods were significantly more likely to experience pregnancy complications than women living in lower violence neighborhoods (OR=5.0; 95% CI=1.9–12.6; $p<0.01$). Residence in a high-violence neighborhood was the strongest risk factor observed; results persisted after controlling for several sets of potential confounders.

Conclusion. Living in areas of high social and political violence increased the risk of pregnancy complications among otherwise healthy women. (*Am J Public Health.* 1992; 82:685–690)

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Introduction

Research on the health effects of social and political violence has typically focused on individuals victimized by violent acts^{1–8} and neglected the population at large, which in a troubled time or place is often exposed to a pervasive atmosphere of fear and tension. The influence of such an atmosphere on health is now being investigated more frequently.^{9,10} The recent political unrest in Chile provided an opportunity to assess the impact of social and political violence on the risk of pregnancy complications in otherwise healthy women.

Between 1973, when President Salvador Allende was overthrown by a military coup d'état, and 1990, Chile experienced widespread social and political upheaval. The commanders-in-chief of the Army, Navy, Air Force, and National Police created a military junta, headed by General Augusto Pinochet Ugarte. The junta adjourned the National Congress, dismissed elected officials, closed the constitutional court, and banned activities of political parties and labor unions. Extrajudicial killings, disappearances, forcible exiles, and arbitrary arrests reached unprecedented levels.^{11,12} The government rationalized its activities by decreeing a “state of exception” in 1973, which permitted new legislation restricting basic human rights.¹¹ Under this decree, the military junta declared the country variously under state of siege, state of emergency, and state of alert.

During the period of this study, from December 1985 to December 1986, Chile was continually under a state of exception or state of emergency (December 1985 to August 1986) or under a state of siege (September to December 1986). The at-

mosphere in Chile, especially in greater Santiago, was one of confrontation between civilians and the police and armed forces. During this period, there were 33 665 political arrests.^{13,14} An especially active period was April 29 to May 13, 1986, when joint military and police forces raided 33 neighborhoods in greater Santiago and southern Chile. Despite the government's prohibition of strikes, Chileans went on a nationwide general strike on July 2 and 3, 1986. The government declared the strike illegal and hundreds of people were arrested. In Santiago 2 people were burned alive by the military (one died, the other survived),¹⁴ 4 opponents of the government were kidnapped and executed, and at least 132 cases of torture were openly denounced in the courts. The staff of the Human Rights Commission suffered 32 arrests, 2 kidnappings, 86 threats, and 13 cases of cruel, inhumane, or degrading treatment.¹³ The Vicariate of Solidarity of the Catholic Church had 5 of its staff arrested, received 17 threats, and experienced 1 unsuccessful assassination attempt.¹³ A physician and a lawyer employed by the Vicariate, as well as a private physician, faced charges of terrorism

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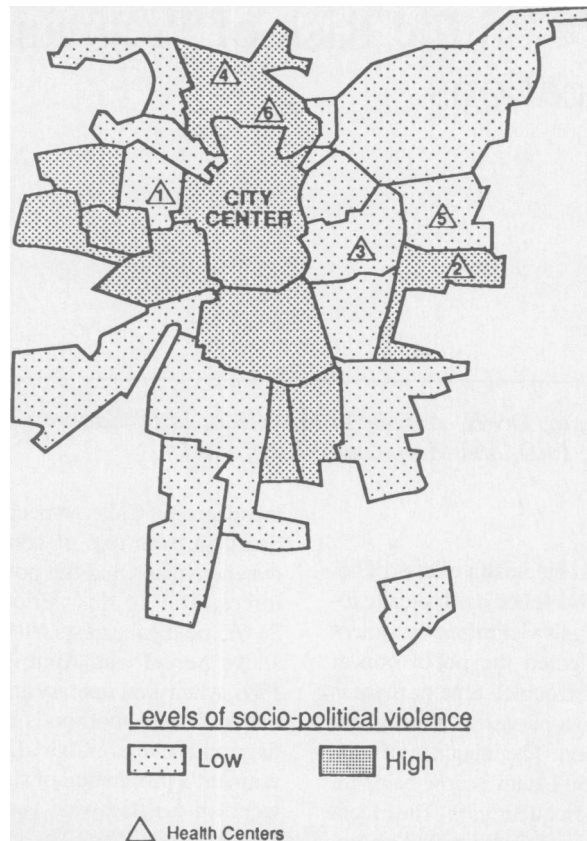


FIGURE 1—Location of six health centers in Santiago, Chile, according to levels of sociopolitical violence.

because they assisted a wounded man who sought medical assistance in a clinic under contract with the Vicariate of Solidarity.¹³

However, social and political violence, unrest, and crime were not distributed equally throughout Chile in general, or across Santiago in particular. Our goal was to study prospectively pregnancy complications among healthy Chilean women who received prenatal care at the health centers but who lived under different levels of social and political violence.

Methods

For the purpose of this study, a team of researchers from the School of Medicine of the Universidad de Chile mapped Santiago according to the frequency of occurrence of five classes of events: police and military presence, undercover police activity, bomb threats, demonstrations, and lack of reliable public transportation before the curfew hour. Neighborhoods were classified as having high or low levels of sociopolitical violence (Figure 1). From among Santiago's 58 health centers, we randomly selected 3 from high-violence

areas and 3 from low-violence areas. The director of each of these six health centers was then asked to independently rate the level of sociopolitical violence in the neighborhood of his health center. The directors' assessments were generally in agreement with our mapping designations. However, some of the directors pointed out small areas that were within generally low-violence neighborhoods, but because of special circumstances were actually at high risk of sociopolitical violence (e.g., a block containing the heavily guarded home of a member of the military junta). The 22 women who lived in such pockets were reclassified from the low-violence to the high-violence category to reflect actual exposure. Assignments to exposure were made prior to any data collection.

Our study sample comprised pregnant women between 19 and 40 years of age who were enrolled for prenatal care at the six selected health centers, lived within the clinics' target areas, had no chronic medical conditions, and (based on the date of the last menstrual period) were due to deliver between August 1 and September 7, 1986. The sample consisted of

179 women, 113 living in areas with high levels of sociopolitical violence and 66 living in areas of lower sociopolitical violence.

The first interview with each woman was conducted between March 13 and April 13, 1986, by professional interviewers from the Universidad de Chile and one of the authors (B.C.Z.). The interviews took place in the subjects' homes. The second interviews took place from June 18 through July 7, 1986. These dates correspond to the end of the first trimester or the beginning of the second trimester of pregnancy for the first interview and to the third trimester for the second interview. Between the times of the first and second interviews, 13 respondents moved out of the target area, 4 had late miscarriages, and 1 refused to continue to participate for lack of time. The final sample was therefore composed of 161 women, 106 from areas of high sociopolitical violence and 55 from areas of low sociopolitical violence. The 18 women lost to the second interview did not differ from the final cohort with respect to age, marital status, or prenatal care.

The interviews addressed potential influences on pregnancy, including length of residence in the neighborhood, the respondent's positive and negative relationships with her neighbors, family composition and relationships between the respondent and members of the household, strains within the family, violence in the home, employment and personal economic status, smoking and alcohol consumption, nutrition, health-related issues, and educational level. A series of questions allowed the construction of scales measuring social support,¹⁵ life events,¹⁶ alienation,¹⁷ depression,^{15,16,18,19} locus of control (helplessness),¹⁵⁻¹⁷ and neighborhood satisfaction. All scales were coded so that a higher score represented a potentially negative attribute, for example, more negative life events or less social support. We also asked the women a series of questions about their perceptions of sociopolitical violence in their neighborhoods (neighborhood milieu) at interviews 1 and 2.²⁰

All women received prenatal and delivery care from professional midwives. If a woman developed a health problem that might influence her pregnancy or delivery, she was referred to an obstetrician. All diagnoses of pregnancy and delivery complications were made by this team of health care providers after appropriate clinical and laboratory tests and were documented in the medical records. Medical

records were reviewed at the health centers after the second interview was completed, and hospital records were reviewed after delivery. All medical records were abstracted according to a structured abstracting form by three health professionals from the School of Medicine of the Universidad de Chile who did not know exposure status. Complications of pregnancy were defined as any of the following clinical diagnoses: gestational hypertension; pre-eclampsia, eclampsia, or toxemia; bleeding at first, second, or third trimester; threat of miscarriage; threat of premature labor; premature rupture of membranes; late miscarriage (stillbirth); painful preterm contractions requiring bed rest and sexual abstinence or hospitalization; and fetal growth retardation. A woman was considered subject to pregnancy complications if she had any two or more of these complications or one extremely severe complication. In the latter category were three women, two who developed eclampsia and one who gave birth to a stillborn fetus.

Odds ratios (ORs) and confidence intervals (CIs), as well as chi-square and *t* test statistics, were used to test associations of possible risk factors and pregnancy complications. Risk factors associated with pregnancy complications were also entered into logistic regression models to adjust for confounding effects. SAS data management and analysis programs were used throughout.²¹⁻²³

Results

All 161 women had prenatal care throughout their pregnancies. The women who fell below expected weight gain during pregnancy (19%) were assigned by the health care provider to a supplementary food program through the health center. Pregnancy complications by health center are indicated in Table 1. Forty-six women had two or more complications; 115 women had one or zero complications. These two groups did not differ (at $P < .20$) in most demographic and health-related characteristics (Table 2). Age was associated with increased risk of pregnancy complications ($\chi^2 = 6.49$, $df = 3$, $P = .09$): women younger than 25 years of age and women older than 34 years of age were at greater risk of two or more pregnancy complications.

Among psychosocial indicators, risk of pregnancy complications was marginally associated with higher levels of alienation ($P = .13$) and lower levels of social support ($P = .18$) (Table 3). Other psy-

TABLE 1—Number of Women with Pregnancy Complications by Health Center, Santiago, Chile, 1986

Complication	Health Center ^a					
	1	2	3	4	5	6
Gestational hypertension	1	6	2	3	3	1
Toxemia/pre-eclampsia/eclampsia	1	2	2	5	1	0
Hemorrhage 1st, 2nd, 3rd trimester	0	4	3	3	4	4
Threat of miscarriage	0	4	7	6	1	3
Threat of premature labor	0	3	5	3	0	2
Premature rupture of membranes	4	7	3	2	2	5
Preterm contractions	1	14	6	14	1	6
Fetal growth retardation	0	2	6	1	0	1
Late miscarriage/stillbirth	0	1	2	1	0	0
0-1 Pregnancy complications	20	17	18	24	22	14
≥ 2 Pregnancy complications	1	12	11	12	3	7
Total pregnancies	21	29	29	36	25	21

^aHealth centers numbered 1, 3, and 5 were located in low-violence neighborhoods; those numbered 2, 4, and 6 were located in high-violence neighborhoods. Numbers in subsequent tables may differ because 22 women were reclassified from low- to high-violence exposure status (see Methods section).

TABLE 2—Distribution of Correlates of Pregnancy Complications among Women with Two or More Complications (n = 46) Compared with Women with One or No Complications (n = 115), Santiago, Chile, 1986

Correlates of Complications	Complications		P Value
	≥ 2 No. (%)	0-1 No. (%)	
Maternal age			.09
19-24 years	25 (54.3)	50 (43.5)	
25-29 years	9 (19.6)	38 (33.0)	
30-34 years	7 (15.2)	23 (20.0)	
35-40 years	5 (10.9)	4 (3.5)	
Parity			.26
0	17 (36.9)	42 (36.5)	
1-2	20 (43.5)	61 (53.0)	
≥ 3	9 (19.6)	12 (10.4)	
Gravidity			.29
Primigravida	15 (32.6)	38 (33.0)	
Secundigravida	13 (28.3)	29 (25.2)	
Multigravida	18 (39.1)	48 (41.7)	
Previous spontaneous abortion	11 (23.9)	23 (20.0)	.58
Nutritional risk factors			
Underweight	10 (21.7)	20 (17.4)	.52
Any alcohol intake	14 (30.4)	27 (23.5)	.36
Any cigarette smoking	14 (30.4)	27 (23.5)	.36
Any coffee intake	13 (28.3)	33 (28.8)	.96
Any tea intake	16 (34.8)	30 (26.1)	.27
Monthly income			.33
< US\$65	28 (60.9)	59 (51.3)	
US\$65-100	14 (30.4)	36 (31.3)	
> US\$100	4 (8.7)	20 (17.4)	
Education			.99
1-3 years	22 (47.8)	53 (46.1)	
4-8 years	9 (19.6)	23 (20.0)	
9-10 years	10 (21.7)	27 (23.5)	
≥ 11 years	5 (10.9)	12 (10.4)	
Marital status			.89
Married/living with partner	38 (82.6)	96 (83.5)	
Single	8 (17.4)	19 (16.5)	
Work during pregnancy			.45
Working	13 (28.3)	26 (22.6)	
Not working	33 (71.7)	89 (77.4)	

TABLE 3—Distribution of Psychological Correlates of Pregnancy Complications among Women with Two or More Complications (n = 46) Compared with Women with One or No Complications (n = 115), Santiago, Chile, 1986

Correlates of Complications	Complications (mean ± SD)		P Value
	≥ 2	0–1	
Resources			
Social support (range: 12–24)	16.3 ± 3.5	15.4 ± 3.8	.18
Locus of control (range: 2–11)	5.6 ± 1.5	5.9 ± 1.7	.37
Neighborhood satisfaction (range: 3–14)	9.2 ± 2.6	8.7 ± 2.3	.20
Constraints			
Alienation (range: 0–7)	3.6 ± 1.7	3.1 ± 1.6	.13
Uncertainty (range: 0–7)	4.3 ± 1.5	4.1 ± 1.4	.45
Life events (interview 1) (range: 0–34)	10.6 ± 6.2	10.2 ± 7.1	.73
Life events (interview 2) (range: 0–25)	6.6 ± 4.6	4.7 ± 4.2	.25
Depression (interview 1) (range: 0–12)	5.7 ± 2.8	5.2 ± 2.7	.24
Depression (interview 2) (range: 0–13)	5.7 ± 2.8	5.2 ± 2.9	.36
Marital strain (range: 0–18)	4.8 ± 3.9	4.9 ± 3.6	.96

TABLE 4—Distribution of Sociopolitical Violence among Women with Two or More Pregnancy Complications (n = 46) Compared with Women with One or No Complications (n = 115), Santiago, Chile, 1986

Violence Level	Complications		P Value
	≥ 2 No. (%)	0–1 No. (%)	
In the neighborhood (classified by researchers)			<.01
High	40 (37.7)	66 (62.3)	
Low	6 (10.9)	49 (89.1)	
In the neighborhood (subject's perception at interview 1)			.17
High	38 (31.4)	83 (68.6)	
Low	8 (20.0)	32 (80.0)	
In the neighborhood (subject's perception at interview 2)			.09
High	29 (34.1)	56 (65.9)	
Low	17 (2.4)	59 (77.6)	
Violence in the home			.23
High	30 (32.3)	63 (67.7)	
Low	16 (23.5)	52 (76.5)	

TABLE 5—Independent Predictors of Pregnancy Complications among Women in Santiago, Chile, 1986: Final Multiple Logistic Regression Model

Risk Factor	Odds Ratio	95% Confidence Interval	P Value
Sociopolitical violence (high vs low, defined by mapping)	5.0	1.93, 12.77	<.01
Social support ^a	1.9	0.92, 4.07	.08
Neighborhood milieu at interview 1	1.9	0.78, 4.86	.15

^aScales were dichotomized, and odds ratios compare women scoring above the median to women scoring below the median (reference group).

chosocial indicators were not associated with risk of complications.

The fundamental question addressed in this study was whether living in a neighborhood of high sociopolitical violence was associated with pregnancy complications. Of the 55 women living in areas of low sociopolitical violence, 6 (11%) had at

least two pregnancy complications, whereas among the 106 women living in areas of high sociopolitical violence, 40 (38%) had at least two pregnancy complications (Table 4). Thus women living in high-violence neighborhoods, as defined a priori, were at significantly increased risk of pregnancy complications (OR = 5.0,

95% CI = 1.9, 12.6). The woman's own perception of her neighborhood milieu was also associated with an increase in risk (OR = 1.8, 95% CI = 0.8, 4.3 at interview 1 and OR = 1.8, 95% CI = 0.9, 3.6 at interview 2). The presence of violence in the home was not significantly associated with an increased risk of pregnancy complications (OR = 1.5, 95% CI = 0.8, 3.2).

Multiple logistic regression was used to assess the independent effects of age, low social support, high level of alienation, perception of neighborhood milieu, and sociopolitical violence in the neighborhood, that is, all variables for which $P < .20$ in previous analyses. Because several of the variables were not independently associated with the risk of pregnancy complications in the multivariate analysis, a second model included only the three variables that remained predictive of pregnancy complications at $P < .20$ (Table 5). A fivefold increase in the risk of pregnancy complications was associated with living in high-violence versus low-violence neighborhoods, after adjustments were made for lack of social support and perception of neighborhood milieu at interview 1.

Several variables were associated with living in high-violence neighborhoods, including income, education, marital status, underweight, cigarette smoking, dissatisfaction with neighborhood, life events (at interview 2), neighborhood milieu (at interview 1), alienation, uncertainty, and depression (at interview 1). Most of these variables were not directly associated with pregnancy complications. However, we chose to include them in a multiple logistic model as potential confounders of the association between living in a high-violence neighborhood and risk of pregnancy complications. The results of this multivariate analysis closely paralleled those shown in Table 5. The only predictive variables were sociopolitical violence of the neighborhood (OR = 5.3, $P < .01$), alienation (OR = 1.8, $P = .18$), and neighborhood milieu at interview 1 (OR = 1.9, $P = .17$). The P values for all other variables in the model were higher than .4.

To assess whether the apparent effect of neighborhood sociopolitical violence resulted from differences in diagnosis of pregnancy complications among the health centers, we tested for an association between specific health center and risk of pregnancy complications separately for high-violence neighborhoods and low-violence neighborhoods. The fact that no significant associations were ob-

served suggested that the levels of violence in the health centers' neighborhoods, rather than characteristics of the health centers themselves, influenced pregnancy complications. However, we did find an interaction between neighborhood violence and social support in these analyses. Within high-violence neighborhoods, lower levels of social support were significantly associated with risk of pregnancy complications (OR = 3.1, 95% CI = 1.3, 7.6). In other words, women exposed to high levels of violence in their neighborhoods who also had less social support were more likely to have pregnancy complications than were women in the high-violence neighborhoods whose social support was stronger.

Discussion

The purpose of this study was to determine whether there was a difference in pregnancy complications between women who live under high levels of sociopolitical violence and women who live under less violent conditions. After adjusting for potential confounders, we found that high levels of sociopolitical violence were associated with an approximately fivefold increase in risk of pregnancy complications. Two subjective measures, lack of social support and perceived sociopolitical violence (neighborhood milieu), also independently contributed approximately twofold increases in risk of pregnancy complications among otherwise healthy women. The latter results are similar to those found in other studies of pregnancy complications.²⁴⁻²⁶

One potential source of bias in this study is possible misclassification of women's exposure to violence. However, the use of objective indicators of sociopolitical violence to categorize neighborhoods, as well as the independent confirmation by the health centers' directors, gives us confidence in our mapping efforts. Moreover, the ability of the health centers' directors to identify pockets of high sociopolitical violence within areas classified as low-violence gave us the opportunity to identify more precisely the level of violence within neighborhoods and to assign women appropriately.

The prospective nature of the study precluded the possibility of assigning exposure status on the basis of outcome. Pregnancy complication information was obtained after completion of both interviews by medical record abstractors who were unaware of whether a woman resided in a high- or low-violence neighbor-

hood. Moreover, the medical care providers did not know which pregnant women were included in our study. Nevertheless, we addressed the possibility that medical care or diagnostic practices may have differed by health center and thereby influenced our findings. The fact that these analyses revealed no association between health centers and pregnancy complications after we controlled for level of sociopolitical violence suggests that differential ascertainment of pregnancy complications was not a problem.

We were initially concerned about the respondents' willingness to participate fully in our prospective study. However, our response rate was 100% of those contacted and eligible at the first interview and 99% of those still living in the target areas and still pregnant at the second interview. The sample was relatively small, but it was representative of healthy pregnant women in Santiago who received prenatal care at the health centers. This group includes the majority of lower-middle-class, working class, and unemployed pregnant women in Santiago. Our conclusions cannot be generalized to pregnant teenagers, women with chronic illness, or those not receiving prenatal care.

Public Health Implications

Violence is a public health issue and deserves the attention accorded to any other cause of morbidity and mortality in human populations. Some countries have a specialization called trauma medicine, which deals with severe body damage caused by violence. New techniques in psychiatry and psychology have contributed to the healing of invisible wounds left by political violence. Two of the best examples of efforts to address violence are the centers for the rehabilitation of victims of torture in Denmark²⁷ and Los Angeles.⁷

Medical resources for curing or rehabilitating victims of violence are scarce, but preventive measures in the medical and public health disciplines are nonexistent. Most of the work on the prevention of violence in general, and political violence in particular, is being done by non-profit groups and organizations. It is not too late for the public health field to effectively address its negligence of social and political violence and the threat such violence represents to the lives of individuals and communities.

To our knowledge, this is the first study of the effect of sociopolitical violence on pregnancy complications. Four women in our study miscarried after 20

weeks' gestation. All four resided in high-violence areas. Among the other women, complications were generally mild or moderate. The finding that healthy women were more subject to pregnancy complications if they lived in high-violence neighborhoods thus reflects unexpected health consequences of sociopolitical violence in a vulnerable population. The fact that 98% of these women carried their pregnancies to term despite the reality of violence in their neighborhoods during their pregnancies is a tribute, in our view, to their ability to cope and to the excellent care provided by their neighborhood health centers.

Research on health-related effects of social and political violence is very limited, particularly in communities that experience high levels of violence for prolonged periods of time. Clearly, this study requires confirmation with a larger sample and other populations. At the same time, data are needed on the long-term effects of sociopolitical violence on the postpartum and neonatal well-being of mothers and their infants, as well as on other sectors of the general population. As public health professionals, we can contribute to the control of social and political violence by actively engaging in the study and prevention of such violence. □

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