

# Trauma and PTSD Symptoms in Rwanda

## Implications for Attitudes Toward Justice and Reconciliation

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**F**ROM APRIL TO MID JULY 1994, AN unprecedented wave of organized violence swept across the small East African state of Rwanda. By the time the violence ended in mid July, estimates indicated as many as a million people were dead, victims of genocide, war, and reprisal attacks.<sup>1-3</sup> The impact of these horrific events included not only the loss of at least 10% of the country's 7.7 million inhabitants but the destruction of much of the country's infrastructure and the displacement of nearly 4 million people, including 2 million who fled into exile in neighboring countries. Survivors were exposed to scenes of unmitigated violence, masses of dead bodies, and the breakdown of any semblance of civility.<sup>1,2</sup>

The principal response by diplomats and the human rights community to prevent future violence and promote reconciliation in postconflict societies has been to hold perpetrators accountable by establishing legal mechanisms to try those accused of human rights violations.<sup>4</sup> In November 1994, the International Criminal Tribunal for Rwanda (ICTR) was charged with trying the organizers of the 1994 genocide. The majority of those accused of participation in the Rwandan genocide, however, will be tried by national courts. Yet the classical judicial system is incapable of handling the more than 100 000 alleged perpetrators of genocidal crimes who have been imprisoned in Rwanda. As a result, Rwanda has implemented a new judicial program, *gacaca*, that builds on a

**Context** The 1994 genocide in Rwanda led to the loss of at least 10% of the country's 7.7 million inhabitants, the destruction of much of the country's infrastructure, and the displacement of nearly 4 million people. In seeking to rebuild societies such as Rwanda, it is important to understand how traumatic experience may shape the ability of individuals and groups to respond to judicial and other reconciliation initiatives.

**Objectives** To assess the level of trauma exposure and the prevalence of posttraumatic stress disorder (PTSD) symptoms and their predictors among Rwandans and to determine how trauma exposure and PTSD symptoms are associated with Rwandans' attitudes toward justice and reconciliation.

**Design, Setting, and Participants** Multistage, stratified cluster random survey of 2091 eligible adults in selected households in 4 communes in Rwanda in February 2002.

**Main Outcome Measures** Rates of exposure to trauma and symptom criteria for PTSD using the PTSD Checklist–Civilian Version; attitudes toward judicial responses (Rwandan national and *gacaca* local trials and International Criminal Tribunal for Rwanda [ICTR]) and reconciliation (belief in community, nonviolence, social justice, and interdependence with other ethnic groups).

**Results** Of 2074 respondents with data on exposure to trauma, 1563 (75.4%) were forced to flee their homes, 1526 (73.0%) had a close member of their family killed, and 1472 (70.9%) had property destroyed or lost. Among the 2091 total participants, 518 (24.8%) met symptom criteria for PTSD. The adjusted odds ratio (OR) of meeting PTSD symptom criteria for each additional traumatic event was 1.43 (95% CI, 1.33-1.55). More respondents supported the local judicial responses (90.8% supported *gacaca* trials and 67.8% the Rwanda national trials) than the ICTR (42.1% in support). Respondents who met PTSD symptom criteria were less likely to have positive attitudes toward the Rwandan national trials (OR, 0.77; 95% CI, 0.61-0.98), belief in community (OR, 0.76; 95% CI, 0.60-0.97), and interdependence with other ethnic groups (OR, 0.71; 95% CI, 0.56-0.90). Respondents with exposure to multiple trauma events were more likely to have positive attitudes toward the ICTR (OR, 1.10; 95% CI, 1.04-1.17) and less likely to support the Rwandan national trials (OR, 0.90; 95% CI, 0.84-0.96), the local *gacaca* trials (OR, 0.80; 95% CI, 0.72-0.89), and 3 factors of openness to reconciliation: belief in nonviolence (OR, 0.92; 95% CI, 0.87-0.97), belief in community (OR, 0.92; 95% CI, 0.87-0.98), and interdependence with other ethnic groups (OR, 0.86; 95% CI, 0.81-0.92). Other variables that were associated with attitudes toward judicial processes and openness to reconciliation were educational level, ethnicity, perception of change in poverty level and access to security compared with 1994, and ethnic distance.

**Conclusions** This study demonstrates that traumatic exposure, PTSD symptoms, and other factors are associated with attitudes toward justice and reconciliation. Societal interventions following mass violence should consider the effects of trauma if reconciliation is to be realized.

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traditional local dispute mechanism. Gacaca trials, conducted by popularly elected committees of lay judges, have been organized throughout the country to try those accused of less serious crimes in open community trials, reserving more serious crimes for classical courts. Organizers have claimed that all 3 of these judicial responses contribute to reconciliation in Rwanda. However, whether any forms of justice contribute to the process of reconciliation is not known, and if they do, for whom and under what circumstances. Reconciliation is a complex process that entails difficult tasks such as the reforging of societal linkages and the rebuilding of communities. Whether judicial responses are capable of contributing substantially to this process has not been empirically tested.

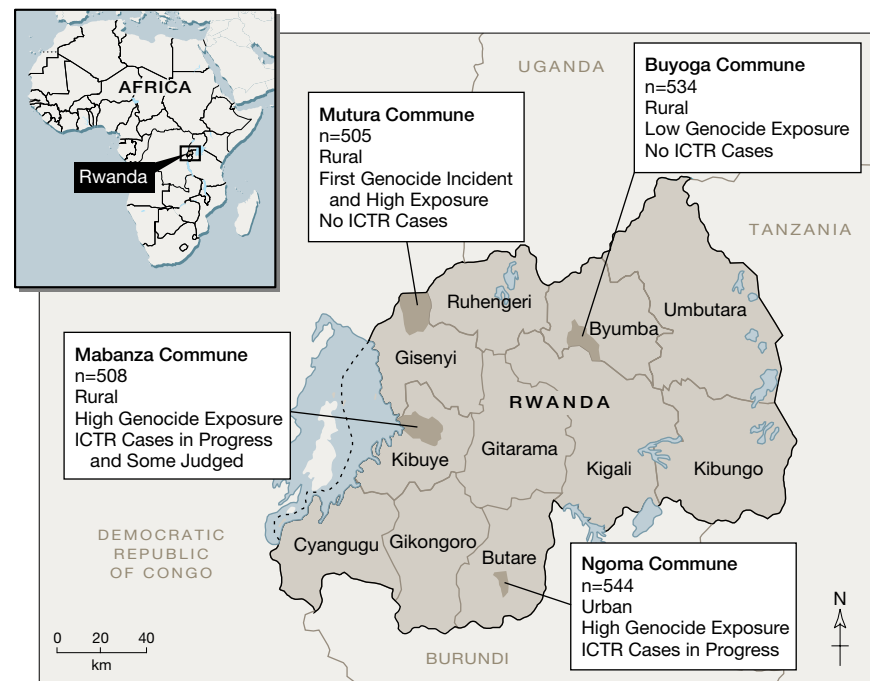
The purpose of this study was to examine attitudes toward the contribution of judicial processes and reconciliation and to explore how exposure to traumatic events, symptoms consistent with posttraumatic stress disorder (PTSD), and other factors may affect these attitudes in 4 communes of Rwanda.

## METHODS

### Survey Sites and Sampling Procedures

During February 2002, almost 8 years after the genocide, a team of 26 trained members carried out interviews with a standardized questionnaire in 4 communes, the local political unit at the time of the genocide. In 1994, Rwanda was divided into 11 prefectures, and each prefecture was divided into communes, for a total of 154 communes in the country. The communes were themselves divided into sectors and the sectors into cells. The 4 communes, Ngoma (known as Butare town), Mabanza, Buyoga, and Mutura, were selected to represent Rwanda's diversity in terms of region, level of urbanization, experience with the genocide, and relationship to the ICTR, as illustrated in FIGURE 1. These communities were all exposed to genocidal activity and/or retaliation in the war with varying degrees of exposure to and/or

**Figure 1.** Selection Criteria of Sampled Communes in Rwanda



ICTR indicates International Criminal Tribunal for Rwanda.

protection from the resulting violence and trauma. Ethnicity was a significant issue in Rwanda and, before the genocide, all individuals were required to carry an ethnic identity card. We randomly selected participants without knowing their ethnicity and asked them to provide us with their ethnic identity at the very end of the interview. The interviewer did not read the list of possible responses. We first asked the respondent, "Are you comfortable discussing your ethnic identity?" then, "If yes, what is your ethnicity?"

Study participants within each of the 4 communes were selected through a multistage cluster sampling method (FIGURE 2). Using proportionate probability sampling, 5 sectors from each of the 4 communes and half of the cells (the lowest administrative unit level in Rwanda equivalent to a neighborhood) were selected. From these cells, at least 500 households per commune were randomly selected. In each selected household, we interviewed 1 adult ( $\geq 18$  years old) chosen by the

name closest to the beginning of the alphabet.

Because of the high population illiteracy rate, we obtained consent orally with a standardized format. The Committee for the Protection of Human Subjects at the University of California, Berkeley, the National University of Rwanda, and Rwandan local government officials approved the research protocol. No incentive was provided to survey participants.

Sample size was determined using the difference in proportion formula and was adjusted for stratification and design effect due to cluster sampling. The assumed level of precision was 10%, with 80% power.

### Instrument and Scales

The questionnaire consisted of 9 sections that included scales measuring current symptoms of PTSD; attitudes toward reconciliation, the ICTR, Rwandan national trials, and gacaca; and questions on demographic factors and exposure to traumatic events. Given the centrality of ethnicity to the conflict in

Rwanda, we also included 7 questions about situations in which individuals were comfortable with members of another ethnic group. The summed responses formed an “ethnic distance” scale ( $\alpha = .94$ ).

Given the nationwide nature of the genocide and war and the density of the population, we made the assumption that all who were in Rwanda in 1994 had some exposure to horrific events and were at risk of developing symptoms of PTSD. To assess exposure to specific traumatic events, we asked respondents to answer the question, “Did you experience the following during the events of 1994 or their aftermath?” We

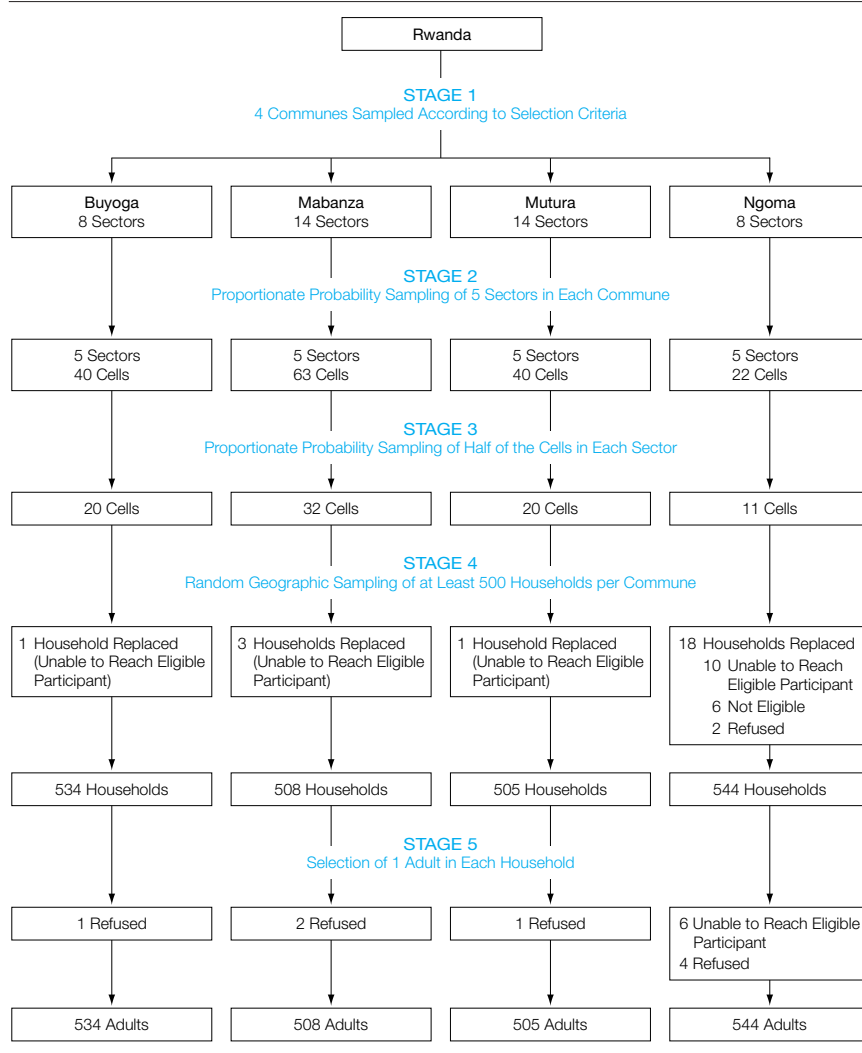
assessed 7 traumatic events: property destroyed or lost, being forced to flee, serious illness, a close family member killed, a close family member died from illness, sexual violence, and physical injury. These were summed for each individual and were used as an indicator of cumulative traumatic exposure. The list of traumatic events emerged from about 100 individual interviews and focus groups conducted among an additional 104 genocide survivors, women, youth, and older adults in Rwanda. These traumatic events do not represent all the possible traumatic events but those that were reported frequently. They were included on the survey in-

strument that was pilot-tested among individuals residing in one of the non-selected cells prior to carrying out the survey. Illnesses were described that respondents related to the events of the genocide, as well as loss of family members due to illness that could not be treated during the genocide.

To assess symptoms of PTSD, we used the PTSD Checklist–Civilian Version (PCL-C), a self-reported 17-item instrument corresponding to the symptoms associated with the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* diagnostic criteria for PTSD. The PCL-C has been correlated with the Clinician-Administered PTSD Scale (CAPS) and uses simple language that eases the process of translation and administration by non-clinicians to a population with low education. We used an overall cutoff score of 44 for meeting symptom criteria of PTSD and an item score of 3 for each symptom criterion, based on recommendations from tests of psychometric properties.<sup>5,6</sup> The checklist specifically asked about current symptoms of stress during the past month.

We defined reconciliation as the processes whereby individuals, social groups, and institutions (1) develop a shared vision and sense of collective future (“community”); (2) establish mutual ties and obligations across lines of social demarcation and ethnic groups (“interdependence”); (3) come to accept and actively promote individual rights, rule of law, tolerance of social diversity, and equality of opportunity (“social justice”); and (4) adopt non-violent alternatives to conflict management (“nonviolence”). We developed a 29-question scale about these components of the reconciliation process and entered the responses into a principal component analysis, which confirmed the 4 factors. The 4 factors comprised 14 of 29 items that accounted for 58% of the total variance. The estimated Cronbach  $\alpha$  (a measure of internal reliability) for the 4 factors was: community,  $\alpha = .69$ ; interdependence,  $\alpha = .46$ ; social justice,  $\alpha = .75$ ; and violence,  $\alpha = .88$ . For each of the 4 fac-

**Figure 2.** Sample Selection



tors, we obtained a total score and dichotomized each sample into 2 categories using the median score. Dichotomizing the factors allowed us to obtain odds ratios (ORs), making interpretation and communication of a complex concept easier without losing statistical validity.

Similarly, we developed a scale for attitudes toward the 3 judicial processes, the ICTR, Rwandan national trials, and gacaca trials. The survey included 10 statements about the ICTR, its policies, and its functioning; attitudes toward the Rwandan national courts (4 statements); and gacaca (4 statements), to which respondents were asked to express whether they strongly agreed, agreed, were uncertain, disagreed, strongly disagreed, or were not informed. Through principal component analysis, we confirmed that there were 3 factors comprising 9 items that accounted for 63% of the total variance: attitudes toward the ICTR ( $\alpha = .82$ ), attitudes toward the Rwandan national trials ( $\alpha = .61$ ), and attitudes toward gacaca ( $\alpha = .51$ ). We then dichotomized the scales on the 3 factors into categorical variables (positive and negative attitudes) by using the median score.

Prior to the launch of the survey, the survey instrument was piloted first among local experts, then among randomly selected individuals, and finally among a random sample of approximately 100 participants from a nonstudy site.

### Statistical Analysis

Means and proportional 95% confidence intervals (CIs) were calculated by Epi Info C-Sample Analysis, version 6.0 (Centers for Disease Control and Prevention, Atlanta, Ga), which adjusts for design effect. Sampling was conducted proportionate to population size; hence, no weighting was performed. We imputed the middle score of all missing data for the questions on the 2 scales measuring attitudes toward reconciliation and judicial responses. Overall, a range of 15 to 28 responses was missing on each of the items on the 2 scales. We explored the

relationship between symptoms of PTSD and their potential predictors and confounding variables in 2 stages. At the univariate stage, we analyzed the following possible predictor variables of PTSD symptoms: sex, marital status, religion, education, age, ethnicity, physical presence in Rwanda during 1994, frequency of traumatic experience, and ethnic distance. We then performed stepwise multivariate logistic regression to obtain ORs, 95% CIs, and *P* values for each significant risk factor.

To examine the relationship between exposure to specific traumatic events, symptoms of PTSD, and attitudes toward the judicial responses and openness to reconciliation, we ran 7 separate multivariate stepwise logistic regression analyses with the 3 factors of the judicial response scale (ICTR, Rwandan trials, and gacaca) and the 4 factors of openness to reconciliation scale (interdependence, community, social justice, and violence) as dependent variables. For all 7 models, the independent variables were sex, age, education, physical presence in Rwanda during 1994, cumulative traumatic exposure, ethnicity, ethnic distance, economic frustration, defined as the perception of current poverty level compared with 1994 (ie, improved, same, or worse) and belief that poverty was the root problem of the 1994 genocide (based on a 5-point Likert scale; 1 = strongly agree and 5 = strongly disagree), perception of current access to security compared with before 1994 (improved, same, or worse), and symptoms of PTSD. We also added attitudes toward the 3 judicial responses as the independent variables for the 4 models using the openness to reconciliation scales as the dependent variables. The 2 predictors of most interest were PTSD symptoms, as measured by the PCL-C, and the number of traumatic events to which respondents were exposed. We used a Bonferroni-adjusted level of significance of .007 to adjust for the multiple analyses.

### RESULTS

We interviewed a minimum of 500 individuals in each commune for a total of 2091 interviews (544 in Ngoma; 508

in Mabanza; 534 in Buyoga; and 505 in Mutura). We replaced 23 (1%) selected households with the next qualifying household after 2 failed attempts to reach an eligible participant. We were unable to interview 14 selected individuals (<1%) because of unavailability or refusal to participate and, hence, selected the next eligible household member (Figure 2).

### Sociodemographic Profile of Respondents

There were statistically significant differences among the 4 stratified communes in all sociodemographic variables as well as in attitudinal, traumatic exposure, and PTSD symptom variables ( $P < .001$  for all). For this reason, we present the results as stratified during our first stage of sampling (TABLE 1). Approximately half (51.5%) of participants were female. The age distribution ranged from 18 to 94 years, with an overall mean of 36.4 years. A high percentage (89.2%) of respondents were willing to provide their ethnic identity. Ngoma had the highest percentage of respondents who refused to reveal their ethnicity, and it was the only commune where there was a higher percentage of Tutsi than Hutu. Of those who specified their ethnicity, 70.3% were Hutu, 26.0% were Tutsi, and 3.4% identified themselves as being of another ethnicity (generally Twa or immigrants).

More than one quarter (26.7%) of respondents had never attended school, 56.2% had at least some primary education, 15.4% had at least some secondary education, and fewer than 2% had any university education. Ngoma, where the National University of Rwanda is located, had a higher percentage of respondents with some level of university education and was the only commune selected where there were respondents who had completed university education.

Prior to the events of 1994, 10.7% of respondents lived outside Rwanda, primarily as refugees, while 72.8% of respondents reported to have been displaced during 1994 (Table 1). In Ngoma, 6.8% and 10.1% of the respon-



dents previously resided in the 2 closest neighboring countries, Burundi and the Democratic Republic of Congo (then called Zaire). In Mutura, 21.6% of the respondents were in the Democratic Republic of Congo before 1994. Mabanza, which was under French control immediately after the Rwandan Patriotic Front rise to power, had the lowest percentage of respondents who were displaced during 1994 (37.6% compared with 80%-90% in the other 3 communes).

### Exposure to Trauma and Prevalence of PTSD Symptoms

Of 2074 respondents with data on exposure to trauma, 1563 (75.4%) were

forced to flee their homes, 1526 (73.0%) had a close member of their family killed, and 1473 (70.9%) had property destroyed or lost (TABLE 2). The level of traumatic exposure was significantly different across the 4 communes ( $P < .001$ ). In Ngoma and Mutura, more than 80% of the respondents had at least 1 close family member killed during the events of 1994 and their aftermath. Ngoma had the highest percentage of respondents (23.9%) who reported that they or a close family member had experienced sexual violence. The highest percentage of family members killed was among siblings, ranging from 49.6% to 77.0%, followed by cousins, ranging from 42.1% to 62.5% (Table 2).

Within the 4 communes sampled, 2091 participants responded to all items on the PCL-C. Of these, 518 (24.8%) met symptom criteria for PTSD (Table 2). The prevalence of PTSD symptoms varied from 12.2% in Buyoga to 33.8% in Ngoma and was statistically different across the communes ( $P < .001$ ). In addition, the prevalence of PTSD symptoms was higher in women than men. More than half of the sample (56.8%) had 1 or more of the 5 reexperiencing symptoms, 43.2% had 3 or more of the avoidance/numbing symptoms, and 25.7% had 2 or more of the hyperarousal symptoms.

Of the 518 respondents who met PTSD symptom criteria, complete data

**Table 1.** Sociodemographic Characteristics of Respondents, February 2002\*

Characteristics	Commune, No. (%)				Overall, No. (%) [95% CI]
	Ngoma (n = 544)	Mabanza (n = 508)	Buyoga (n = 534)	Mutura (n = 505)	
Sex, female (n = 2084)	371 (68.2)	265 (52.2)	230 (43.2)	210 (41.7)	1076 (51.5) [49.3-53.5]
Age, mean (SD), y	37.4 (14.2)	38.1 (14.4)	35.3 (13.9)	35.0 (12.8)	36.4 (13.9)
Marital status (n = 2085)					
Single	147 (27.2)	91 (17.9)	144 (27.0)	63 (12.5)	445 (21.3) [19.1-23.4]
Married	308 (56.9)	372 (73.2)	349 (65.5)	387 (76.9)	1416 (67.9) [64.6-71.2]
Divorced	6 (1.1)	9 (1.8)	7 (1.3)	6 (1.2)	28 (1.3) [0.9-1.8]
Widowed	80 (14.8)	36 (7.1)	33 (6.2)	47 (9.3)	196 (9.4) [7.2-11.5]
Education (n = 2090)					
No schooling	93 (17.1)	139 (27.4)	158 (29.6)	168 (33.3)	558 (26.7) [24.6-28.8]
Some/completed primary	299 (54.9)	298 (58.7)	330 (61.8)	249 (49.4)	1176 (56.2) [51.7-60.8]
Some/completed secondary	122 (22.5)	69 (13.5)	44 (8.2)	87 (17.3)	322 (15.4) [14.7-16.1]
Some/completed university or higher	30 (5.5)	2 (0.4)	2 (0.4)	0 (0.0)	34 (1.6) [0.9-2.4]
Monthly income, US \$ (n = 2091)					
No income	132 (24.3)	146 (28.7)	140 (26.2)	102 (20.2)	520 (24.9) [23.0-26.7]
<43.47	231 (42.5)	302 (59.4)	362 (67.8)	348 (68.9)	1243 (59.4) [57.4-61.5]
43.47-106.52	91 (16.7)	49 (9.6)	29 (5.4)	52 (10.3)	221 (10.6) [9.3-11.9]
>106.53	62 (11.4)	10 (2.0)	3 (0.6)	2 (0.4)	77 (3.7) [2.4-5.1]
No response or missing data	28 (5.1)	1 (0.2)	0 (0.0)	1 (0.2)	30 (1.4) [0.8-2.1]
Religion (n = 2084)					
Protestant	115 (21.2)	213 (42.0)	191 (35.8)	152 (30.3)	671 (32.2) [29.7-33.6]
Catholic	372 (68.6)	150 (29.6)	312 (58.4)	109 (21.8)	943 (45.2) [42.7-47.5]
Adventist	27 (5.0)	120 (23.7)	14 (2.6)	212 (42.3)	373 (17.9) [15.1-20.7]
Muslim	15 (2.8)	10 (2.0)	2 (0.4)	3 (0.6)	30 (1.4) [0.9-2.0]
Other	13 (2.4)	14 (2.8)	15 (2.8)	25 (5.0)	67 (3.2) [2.1-4.3]
Ethnicity (n = 2091)					
Hutu	203 (37.3)	358 (70.5)	427 (80.0)	324 (64.2)	1312 (62.7) [59.3-66.2]
Tutsi	261 (48.0)	68 (13.4)	32 (6.0)	122 (24.2)	484 (23.1) [20.2-26.1]
Twa/other	11 (2.0)	13 (2.6)	26 (4.9)	19 (3.8)	69 (3.3) [1.6-4.9]
No response or missing data	69 (12.7)	68 (13.4)	32 (6.0)	40 (7.9)	226 (10.8) [8.9-12.7]
Residence in Rwanda before 1994 (n = 2091)	440 (81.0)	495 (97.6)	533 (99.8)	393 (78.4)	1861 (89.3) [88.0-90.6]
Displaced during 1994 (n = 1861)†	348 (79.1)	186 (37.6)	467 (87.6)	353 (89.8)	1354 (72.8) [70.9-74.7]

Abbreviation: CI, confidence interval.

\*Denominators for each percentage vary because of item-level missing data.

†Among respondents who were residing in Rwanda before 1994.

on all trauma items were available for 475. Of these, 11 reported no exposure to the 7 listed trauma events; however, all were in Rwanda during the genocide in 1994 (TABLE 3). Thus, they may have had other exposures that were not assessed in this survey, such as witnessing an atrocity committed against nonfamily members. Among those in the sample who met PTSD symptom criteria and had complete data, 92.8% were in Rwanda at the time of the genocide; 34 (7.2%) were outside of Rwanda in 1994. Of those with PTSD symptoms who were outside of the country, all reported at least 1 exposure to

1 or more of the listed traumatic events (Table 3). Those with PTSD symptoms who were outside of Rwanda at the time of the genocide were primarily refugees living in the Democratic Republic of Congo (n = 20; 58.5%) or Burundi (n = 10; 29.3%), where extensive ethnic violence also occurred in the early 1990s.

### PTSD Symptoms

At the univariate level, we found several factors to be statistically associated with symptoms of PTSD (sex, age, marital status, religion, ethnicity, presence in Rwanda in 1994, commune of

residence, ethnic distance, and cumulative traumatic exposure). At the multivariate level, the statistically significant predictors of PTSD symptoms can be grouped into 4 major categories: sociodemographic characteristics (age and sex), cumulative traumatic exposure, proximity to conflict (in Rwanda in 1994 and commune of residence), and ethnicity and ethnic distance. TABLE 4 lists the adjusted ORs for all significant variables, adjusted for the effects of the other significant predictors in the model. The adjusted OR of having PTSD symptoms for a 1-event difference comparison was 1.43 (95% CI,

**Table 2.** Adverse Events During the 1994 Genocide and Its Aftermath, PTSD Symptoms, and Attitudes Toward Judicial Responses and Reconciliation\*

Variables	Commune, No. (%)				Overall, No. (%) [95% CI]
	Ngoma (n = 544)	Mabanza (n = 508)	Buyoga (n = 534)	Mutura (n = 505)	
Traumatic events (n = 2074)					
Property destroyed or lost	382 (71.3)	304 (60.4)	379 (71.0)	407 (81.2)	1472 (70.9) [68.5-72.3]
Forced to flee home	400 (74.6)	242 (48.1)	476 (89.1)	445 (88.8)	1563 (75.4) [73.0-76.5]
Serious illness	169 (31.5)	194 (38.6)	146 (27.3)	182 (36.3)	691 (33.0) [31.0-35.1]
Close family member killed	439 (81.9)	315 (62.6)	365 (68.3)	407 (81.2)	1526 (73.0) [71.1-74.9]
Close family member died from illness	222 (41.4)	240 (47.8)	202 (37.8)	265 (52.9)	926 (44.5) [42.3-46.5]
Sexual violence involving self or close family member	128 (23.9)	45 (8.9)	30 (5.6)	41 (8.2)	244 (11.7) [10.3-13.0]
Physical injury	130 (24.2)	96 (19.0)	63 (11.8)	90 (18.0)	379 (18.3) [16.5-19.8]
Particular relatives killed (n = 2091)					
Spouse	89 (19.5)	50 (11.1)	48 (10.1)	69 (14.6)	256 (12.2) [10.8-13.6]
Child	104 (22.5)	78 (17.1)	93 (19.7)	105 (22.6)	380 (18.2) [16.5-19.8]
Parent	190 (34.9)	130 (25.6)	138 (25.9)	192 (38.0)	650 (31.8) [28.3-32.8]
Sibling	372 (69.8)	249 (49.6)	346 (65.2)	386 (77.0)	1353 (64.7) [62.7-66.7]
In-law	144 (26.4)	109 (21.5)	87 (16.3)	164 (32.6)	452 (21.6) [19.9-23.4]
Grandparent	97 (18.5)	52 (10.4)	70 (13.2)	105 (20.9)	324 (15.5) [14.0-17.0]
Uncle/aunt	293 (56.0)	163 (32.7)	173 (32.5)	277 (55.5)	906 (43.3) [41.2-45.4]
Cousin	328 (62.5)	216 (43.4)	222 (42.1)	302 (61.0)	1068 (51.1) [49.0-53.2]
Total symptom criteria for PTSD (n = 2091)	<b>184</b> (33.8)	<b>133</b> (26.2)	<b>65</b> (12.2)	<b>136</b> (26.9)	<b>518</b> (24.8) [23.0-26.6]
Men (n = 1010)	37 (21.4)	49 (20.2)	37 (12.2)	75 (25.7)	198 (19.6) [17.2-22.1]
Women (n = 1074)	147 (39.6)	83 (31.4)	28 (12.2)	61 (29.2)	319 (29.7) [27.0-32.4]
PTSD symptom cluster (n = 2091)					
Reexperiencing	361 (66.4)	309 (60.8)	230 (43.1)	287 (56.8)	1187 (56.8) [54.7-58.9]
Avoidance/numb	276 (50.7)	249 (49.0)	159 (29.8)	220 (43.6)	907 (43.2) [41.1-45.3]
Hyperarousal	214 (39.3)	137 (27.0)	80 (15.0)	107 (21.2)	538 (25.7) [23.9-27.6]
Positive attitudes toward (n = 2091)					
ICTR	176 (32.4)	265 (52.2)	248 (46.4)	191 (37.8)	880 (42.1) [41.1-43.1]
Rwandan trials	338 (62.1)	365 (71.9)	371 (69.5)	343 (67.9)	1417 (67.8) [66.9-68.7]
Gacaca	460 (84.6)	459 (90.4)	509 (95.3)	471 (93.3)	1899 (90.8) [90.2-91.4]
Openness to reconciliation (n = 2091)					
Support community	209 (38.4)	226 (44.5)	323 (60.5)	250 (49.5)	1008 (48.2) [47.2-49.2]
Support social justice	391 (71.9)	327 (64.4)	275 (51.5)	336 (66.5)	1329 (63.6) [62.7-64.5]
Demonstrate interdependence	268 (51.9)	333 (68.5)	377 (73.1)	375 (77.0)	1353 (67.5) [66.6-68.4]
Support nonviolence	225 (42.5)	264 (54.2)	226 (43.3)	216 (44.1)	931 (45.9) [44.9-46.9]

Abbreviations: CI, confidence interval; ICTR, International Criminal Tribunal for Rwanda; PTSD, posttraumatic stress disorder.

\*Denominators for each percentage vary because of item-level missing data.

1.33-1.55), with similar increments for each additional event. The more the individual was exposed to these traumatic events, the greater the likelihood of reporting PTSD symptoms.

Women were more likely to have symptoms of PTSD than men (OR, 1.43; 95% CI, 1.19-1.90). The OR for a 10-year increase in age was 1.19 (95% CI, 1.10-1.29). Those who were in Rwanda

before 1994 were more likely to have PTSD symptoms than those who were not (OR, 3.10; 95% CI, 1.95-4.94). Also, those who described themselves as Tutsi were more likely to meet symptom criteria for PTSD than those self-identified as Hutu (OR, 2.02; 95% CI, 1.49-2.75). The OR for each increment of the ethnic distance scale was 1.17 (95% CI, 1.05-1.29).

**Table 3.** Trauma Exposure Among Respondents With PTSD Symptoms (n = 475)\*

Cumulative Trauma Exposures	No. With PTSD Residing in Rwanda During 1994	No. With PTSD Residing Outside of Rwanda During 1994	Total
0	11	0	11
1	23	1	24
2	41	5	46
3	81	4	85
4	107	6	113
5	99	11	110
6	62	2	64
7	17	5	22
<b>Total</b>	<b>441</b>	<b>34</b>	<b>475</b>

Abbreviation: PTSD, posttraumatic stress disorder.

\*For 106 respondents, complete data on exposure for all 7 trauma items (property destroyed or lost, forced to flee home, serious illness, close family member killed, close family member died from illness, sexual violence involving self or close family member, or physical injury) were missing.

**Table 4.** Demographic and Trauma Exposure Variables Associated With PTSD Symptoms (n = 1950)\*

Independent Variables	Unadjusted Odds Ratio (95% CI)	P Value	Adjusted Odds Ratio (95% CI)	P Value
Marital status				
Widowed/single	2.57 (1.76-3.76)	.001	NA	NA
Married/single	1.60 (1.22-2.10)	.001	NA	NA
Divorced/single	1.00 (0.37-2.73)	.99	NA	NA
Widowed/divorced	2.56 (0.93-7.01)	.07	NA	NA
Married/divorced	1.59 (0.60-4.22)	.35	NA	NA
Cumulative traumatic exposure				
1-Event difference comparison	1.47 (1.38-1.59)	.001	1.43 (1.33-1.55)	<.001
2-Event difference comparison	2.19 (1.90-2.52)	.001	2.06 (1.76-2.40)	<.001
3-Event difference comparison	3.23 (2.62-4.00)	.001	2.95 (2.34-3.71)	<.001
Commune				
Ngoma/Buyoga	3.69 (2.69-5.05)	.001	2.21 (1.53-3.18)	<.001
Mutura/Buyoga	2.55 (1.85-3.54)	.001	2.43 (1.70-3.47)	<.001
Mabanza/Buyoga	2.66 (1.92-3.68)	.001	2.30 (1.69-3.40)	<.001
Ngoma/Mutura	1.38 (1.06-1.81)	.02	1.10 (0.79-1.52)	.57
Ngoma/Mabanza	1.44 (1.10-1.88)	.007	1.09 (0.73-1.40)	.62
Mutura/Mabanza	1.04 (0.79-1.37)	.79	1.01 (0.73-1.40)	.93
Sex (female to male)	1.73 (1.41-2.12)	.001	1.43 (1.19-1.90)	<.001
Age				
1-y increase	1.02 (1.01-1.02)	.001	1.02 (1.01-1.03)	<.001
10-y increase	1.16 (1.08-1.24)	.001	1.19 (1.10-1.29)	<.001
In Rwanda in 1994	1.59 (1.12-2.26)	.01	3.10 (1.95-4.94)	<.001
Ethnicity				
Tutsi/Hutu	2.11 (1.19-2.27)	.001	2.02 (1.49-2.75)	<.001
Hutu/other	0.78 (0.58-1.05)	.10	1.12 (0.79-1.59)	.53
Tutsi/other	1.65 (1.19-2.27)	.002	1.81 (1.21-2.69)	<.001
Ethnic distance (per 1 unit on scale)	1.17 (1.08-1.27)	.001	1.17 (1.05-1.29)	.003

Abbreviations: CI, confidence interval; NA, not applicable because variable was not retained in the final model; PTSD, posttraumatic stress disorder.

\*One hundred forty-one records with missing data were excluded from multivariate logistic regression analyses. Adjusted odds ratios were adjusted for the effect of other statistically significant variables in the model. Religion and educational level were also examined but were not statistically significantly associated with PTSD symptoms.

### Trauma, PTSD, Justice, and Reconciliation

Table 2 shows the attitudes of the respondents toward the 3 judicial responses. More respondents were positive toward the 2 Rwandan-based judicial systems (90.8% supported the gacaca trials and 67.8% supported the Rwanda national trials) than the ICTR (which had support from 42.1%). With respect to openness to reconciliation, 64.7% reported their ability to be interdependent with the other ethnic group, 63.6% of the respondents supported the process of achieving social justice, 48.2% supported the idea of community, and 44.6% opposed the use of violence for conflict management. About 1.9% of respondents were not open to reconciliation on any of the 4 factors, 15.3% supported 1 factor, 38.4% supported 2 factors, 34.0% supported 3 factors, and 10.3% supported all 4 factors of reconciliation. As illustrated in TABLE 5 and TABLE 6, after controlling for other significant variables, respondents who met the symptom criteria for PTSD were less likely to have positive attitudes toward the Rwandan national trials (OR, 0.77; 95% CI, 0.61-0.98) and were less likely to believe in community (OR, 0.76; 95% CI, 0.60-0.97) and less likely to support interdependence (OR, 0.71; 95% CI, 0.56-0.90) than those who did not meet the PTSD symptom criteria.

As Table 5 illustrates, after controlling for other significant variables, cumulative traumatic exposure was associated with positive attitudes toward the ICTR (OR, 1.10; 95% CI, 1.04-1.17) and negative attitudes toward Rwandan national trials (OR, 0.90; 95% CI, 0.84-0.96) and gacaca (OR, 0.80;

**Table 5.** Variables Associated With Positive Attitudes Toward Judicial Responses\*

Independent Variables	Judicial Responses					
	ICTR		Rwandan Trials		Gacaca	
	Adjusted OR (95% CI)	P Value	Adjusted OR (95% CI)	P Value	Adjusted OR (95% CI)	P Value
Increasing educational level	0.91 (0.84-0.98)	.007	0.72 (0.66-0.79)	<.001	0.82 (0.72-0.93)	<.001
Ethnicity						
Tutsi/Hutu	0.58 (0.45-0.74)	<.001	NA	NA	NA	NA
Tutsi/other	0.55 (0.40-0.77)	<.001	NA	NA	NA	NA
Other/Hutu	0.96 (0.74-1.26)	.77	NA	NA	NA	NA
Increasing ethnic distance	NA	NA	NA	NA	0.86 (0.77-0.96)	<.001
In Rwanda in 1994	NA	NA	1.63 (1.15-1.30)	.007	0.55 (0.33-0.90)	.01
Cumulative traumatic exposure (increasing)	1.10 (1.04-1.17)	.002	0.90 (0.84-0.96)	.004	0.80 (0.72-0.89)	<.001
PTSD symptoms	NA	NA	0.77 (0.61-0.98)	.007	NA	NA
Perceived poverty level in 2002 compared with 1994						
Improved/worse	1.25 (1.01-1.52)	.03	2.21 (1.76-2.79)	<.001	1.95 (1.29-2.91)	.002
Improved/same	1.42 (1.07-1.90)	.002	1.74 (1.26-2.41)	<.001	1.45 (0.83-2.55)	.20
Same/worse	0.83 (0.68-1.02)	.07	1.30 (0.97-1.74)	.08	1.33 (0.82-2.17)	.25
Perceived security in 2002 compared with 1994						
Improved/worse	NA	NA	1.56 (1.22-2.00)	.004	1.53 (1.04-2.25)	<.001
Improved/same	NA	NA	1.44 (0.98-2.12)	.07	1.35 (0.73-2.43)	.07
Same/worse	NA	NA	1.00 (0.65-1.55)	.98	0.74 (0.41-1.37)	.35

Abbreviations: CI, confidence interval; ICTR, International Criminal Tribunal for Rwanda; NA, not applicable because variable was not retained in the final model; OR, odds ratio; PTSD, posttraumatic stress disorder.

\*Adjusted ORs were calculated from multivariate logistic regression models adjusting for other significant variables in the model. Statistical significance was determined by a Bonferroni-adjusted significance level of .007 or less. One hundred twenty-eight records with missing data were excluded from multivariate logistic regression analyses.

**Table 6.** Variables Associated With Attitudes Toward Openness to Reconciliation Factors\*

Independent Variables	Reconciliation Factors							
	Community		Interdependence		Nonviolence		Social Justice	
	Adjusted OR (95% CI)	P Value	Adjusted OR (95% CI)	P Value	Adjusted OR (95% CI)	P Value	Adjusted OR (95% CI)	P Value
Increasing educational level	0.85 (0.78-0.92)	<.001	0.73 (0.68-0.80)	<.001	NA	NA	0.91 (0.84-0.98)	.02
Ethnicity								
Tutsi/Hutu	NA	NA	NA	NA	NA	NA	1.67 (2.13-1.28)	<.001
Tutsi/other	NA	NA	NA	NA	NA	NA	1.07 (0.74-1.54)	.87
Other/Hutu	NA	NA	NA	NA	NA	NA	1.73 (1.31-2.30)	<.001
In Rwanda in 1994	1.54 (1.11-2.15)	<.001	NA	NA	NA	NA	NA	NA
Cumulative traumatic exposure (increasing)	0.92 (0.87-0.98)	.006	0.86 (0.81-0.92)	<.001	0.92 (0.87-0.97)	.006	NA	NA
PTSD symptoms	0.76 (0.60-0.97)	.005	0.71 (0.56-0.90)	.005	NA	NA	NA	NA
Perceived poverty level in 2002 compared with 1994								
Improved/worse	2.42 (1.95-3.00)	<.001	NA	NA	1.13 (0.92-1.39)	.22	NA	NA
Improved/same	1.16 (0.86-1.57)	.33	NA	NA	1.44 (1.08-1.92)	.003	NA	NA
Same/worse	2.11 (1.59-2.82)	<.001	NA	NA	1.27 (0.97-1.66)	.09	NA	NA
Perceived security in 2002 compared with 1994								
Improved/worse	2.89 (2.17-3.84)	<.001	NA	NA	1.43 (1.13-1.81)	.003	NA	NA
Improved/same	1.26 (0.86-1.85)	.23	NA	NA	1.74 (1.20-2.52)	.30	NA	NA
Same/worse	2.24 (1.43-3.50)	<.001	NA	NA	1.22 (0.81-1.84)	.34	NA	NA

Abbreviations: CI, confidence interval; NA, not applicable because variable was not retained in the final model; OR, odds ratio; PTSD, posttraumatic stress disorder.

\*Adjusted ORs were calculated from multivariate logistic regression models adjusting for other significant variables in the model. Statistical significance was determined by a Bonferroni-adjusted significance level of .007. One hundred twenty-eight records with missing data were excluded from multivariate logistic regression analyses.



95% CI, 0.72-0.89). Cumulative trauma exposure was also associated with negative attitudes toward nonviolence (OR, 0.92; 95% CI, 0.87-0.98), community (OR, 0.92; 95% CI, 0.87-0.97), and interdependence (OR, 0.86; 95% CI, 0.81-0.92) (Table 6).

Other variables that were associated with attitudes toward judicial processes and openness to reconciliation were education level, ethnicity, perception of change in poverty level and access to security compared with 1994, and ethnic distance (Table 5 and Table 6). As shown in Table 5 and Table 6, a higher level of education was associated with less support for all 3 judicial responses (ICTR [OR, 0.91; 95% CI, 0.84-0.98], Rwandan national trials [OR, 0.72; 95% CI, 0.66-0.79], and gacaca [OR, 0.82; 95% CI, 0.72-0.93]) and less openness to reconciliation (interdependence [OR, 0.73; 95% CI, 0.68-0.80], community [OR, 0.85; 95% CI, 0.78-0.92], and social justice [OR, 0.91; 95% CI, 0.84-0.98]). Those with more education were less likely to have positive attitudes toward any of the 3 judicial responses and less likely to support community and interdependence. In addition, those who perceived that the economic situation had improved since 1994 were more likely to support the Rwandan national trials (OR, 2.21; 95% CI, 1.76-2.79) and the gacaca trials (OR, 1.95; 95% CI, 1.29-2.91) than those who perceived their economic situation to have worsened.

## COMMENT

Among this sample of 2091 Rwandans surveyed 8 years after the 1994 genocide, rates of cumulative traumatic exposure (94.1% reported having at least 1 traumatic event) and prevalence of those meeting PTSD symptom criteria (24.8%) are consonant with what we would expect to see for the country and representative of the areas sampled. Furthermore, the number of traumatic events and the prevalence of those meeting the PTSD symptom criteria were high, with some geographic differences that reflect the level and type of exposure in various areas.

Symptom clusters raise questions as to how culture may play into the experience or reporting of traumatic effects. According to Breslau,<sup>7</sup> avoidance/numbing is the criterion that is critical for the diagnosis of PTSD and is least frequently met. In our sample, 43.2% of those meeting PTSD symptom criteria experienced at least 3 avoidance/numbing symptoms. Rwandan culture discourages open displays of emotion, suggesting that some of these symptoms may be mediated by cultural expectations. In addition, our study suggests that mass violence likely has long-term psychological effects, given that the genocide had occurred more than 8 years before.

Risk factors associated with symptoms of PTSD found in the study are consistent with the literature. We found that all those with symptoms of PTSD either were in the country during the genocide and/or had been exposed to 1 or more of the specific traumatic events assessed. Those who were in Rwanda in 1994 were more likely to meet the PTSD symptom criteria. Not surprisingly, a significant predictor of symptoms of PTSD was exposure to trauma. Several studies have shown that the level and type of traumatic events are associated with more symptoms of PTSD.<sup>8-10</sup> Also, we found that after controlling for all other effects, the only significant difference in PTSD among the communes sampled was in Buyoga, where the prevalence was significantly less. Buyoga was the only commune where the genocide directly occurred in only part of the commune.

Moreover, we found that personal factors (sex, age, ethnicity) were also associated with PTSD symptom criteria. The relationship between female sex and PTSD symptoms and older age and PTSD symptoms are consistent with findings in Western populations.<sup>7,11</sup> In Rwanda, women were particularly targeted for violence, and there may be greater vulnerability or less resilience in older populations.<sup>1(p215)</sup> With regard to ethnicity, the Tutsi, who were the targeted ethnic group during the 1994 events, were more likely to re-

port PTSD symptoms than other ethnicities. In addition, ethnic distance was associated with symptoms of PTSD, suggesting that the effects of traumatic exposure are perhaps associated with fear of "the other."

An important finding was the significantly greater support for gacaca trials compared with other judicial responses. There are 2 possible interrelated explanations for this finding. People may have a more positive attitude toward gacaca because they may feel more informed and involved with the process. Social learning theorists such as Bandura<sup>12</sup> have proposed that self-efficacy is a critical dimension of well-being and behavior change. When people feel as though they have more control of the outcome, they are more likely to support the process. Since gacaca is community-based and trials are held publicly within the community, people may be more involved and committed. In another article, we note that a substantial portion of Rwandans (87.2%) do not have enough information about the ICTR. We concluded that a lack of reliable information is the key factor undermining the capacity of the tribunal to contribute to reconciliation in Rwanda (T.L., P.N.P., and H.M.W., unpublished data, February 2002).

There was more support for interdependence and social justice (Table 2). However, there was less support for community and nonviolence. Interdependence was measured by such questions as whether respondents had shared a drink with a member of another group or attended a funeral. It may be that respondents are willing to develop relationships at an individual level but that these relationships do not yet constitute a shared sense of community.

As shown in Tables 5 and 6, higher level of education was associated with less support for trials and less openness to reconciliation. This challenges the commonly held belief that education contributes to greater understanding while ignorance contributes to conflict and division.<sup>13</sup> A perception of

improved economic conditions was associated with positive attitudes toward Rwandan trials and gacaca and toward support for community and opposition to violence. Also ethnicity was associated with PTSD symptom criteria and attitudes toward the ICTR and social justice. This suggests that ethnicity remains important in Rwanda and continues to shape people's perceptions.

To our knowledge, this is the first study to examine associations between exposure to trauma and symptoms of PTSD and attitudes toward justice and reconciliation. Increased exposure to traumatic events was associated with less support for gacaca, or desire to reconcile, as evidenced by a decreased support for interdependence. After controlling for the effects of other significant variables such as exposure to violence, we found that those with PTSD symptoms as measured by the PCL-C were less likely to support the Rwandan trials and 2 critical components of reconciliation, community and interdependence. However, some of the associations observed among PTSD symptoms, trauma exposure, and attitudes toward judicial responses and reconciliation had ORs with 95% CI close to or including 1. Further explanation of these associations with more refined measures is needed.

There are several limitations to this study. Our data may not be nationally representative since we selected only 4 communes in Rwanda. We chose 4 communes because we knew that they had unique experiences with genocide exposure and experience with the ICTR. As well, they differed in their level of urbanization and geographic location. Furthermore, given the geography and demography of Rwanda and the history of the genocide and war, we have made the assumption that exposure to the genocide and its aftermath was inevitable and that this basic exposure produced PTSD symptoms in a significant proportion of the population. We do not know the prevalence of PTSD symptoms prior to 1994. Another possible limitation to this study is the assessment of exposure to

specific traumatic events. We had asked respondents to state "yes" or "no" as to whether they experienced any of the listed traumatic events of 1994 and their aftermath. The survey took place almost 8 years after the 1994 genocide. Inaccurate recall may have affected the validity of the responses. Also, they may have experienced other kinds of traumatic events. Furthermore, we used a self-reporting measure for PTSD symptoms that could affect the validity of the assessment. However, several studies have shown that the PTSD Checklist is highly correlated with the CAPS.<sup>5,6</sup> Also, we assessed only 1 of several possible psychological effects of exposure to trauma, PTSD symptoms. Another potential limitation to the study is the political climate in which the survey was conducted. Rwanda's violent recent history, the fact that the national government was not democratically elected, and that genocide trials were currently under way in Rwanda might have constrained people in their ability to respond openly, particularly to highly sensitive questions. Nevertheless, we have a high degree of confidence in the responses because they show wide variation and because people demonstrated a willingness to express opinions divergent with the positions articulated by the government (T.L., P.N.P., and H.M.W., unpublished data, February 2002). Although performing 7 logistic regression analyses increased type I error, our sample size was large and the significance level was high enough that, even with Bonferroni adjustment, the *P* values obtained were still significant. The lack of association found in some of the analyses could have resulted from the dilution effect of imputing the middle score for missing item data in the 2 scales. However, this is unlikely, as this was performed for only 1% of the data. Finally, our 2 scales—openness to reconciliation and attitude toward judicial responses—are newly developed. Several subscales in these scales have a Cronbach reliability  $\alpha$  less than the desired .80. More work needs to be done to improve the scales and validate them for other populations.

Our study provides a first glimpse at how traumatic exposure, symptoms of PTSD, and other factors—such as education, perceptions of economic stability and security, ethnicity, and ethnic distance—are associated with a person's attitude toward justice and reconciliation. We encourage further work to explore how other psychological effects of trauma may influence individual and national reconciliation and how interventions can assist those with PTSD symptoms and the process of reconciliation. We urge that this method be tested in other cultures and conflicts so as to enhance our understanding of ways to promote reconciliation. Other than in our Balkan study,<sup>14</sup> we have found no empirical research that links personal traumatic exposure to openness to reconciliation. In that study, there was no direct link unless there was a negative prior relationship with members of the opposing side.

## CONCLUSION

In summary, we developed measures to assess the prevalence of traumatic exposure, PTSD symptoms, attitudes toward judicial responses, and openness to reconciliation. We found that symptoms of PTSD affect about one quarter of respondents and that these symptoms were associated with traumatic exposure, proximity to trauma, and some sociodemographic factors. We also found associations between symptoms of PTSD, judicial attitudes, and 2 factors of openness to reconciliation. Those who met the PTSD symptom criteria were less likely to support the Rwandan national trials, to believe in community, and to demonstrate interdependence with other ethnic groups. These findings suggest that the relationship of judicial trials to reconciliation cannot be assumed, nor can we assume that all trauma survivors necessarily see justice in the same way. Furthermore, the data from Rwanda indicate that openness to reconciliation is related to multiple other personal and environmental factors that must be considered in developing policies for peacebuilding in societies that are emerging

from mass violence. We recommend that further exploration and research be undertaken to improve the measures to further investigate the impact of conflict on trauma and to examine how trauma may affect the road to reconciliation. If countries are to rebuild after genocide or ethnic cleansing, it is important to understand the factors that may facilitate or inhibit that process.

**Author Contributions:** Drs Pham, Weinstein, and Longman had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

**Study concept and design:** Pham, Longman, Weinstein.

**Acquisition of data:** Pham, Longman.

**Analysis and interpretation of data:** Pham, Weinstein, Longman.

**Drafting of the manuscript:** Pham, Weinstein, Longman.

**Critical revision of the manuscript for important intellectual content:** Pham, Weinstein, Longman.

**Statistical expertise:** Pham.

**Obtained funding:** Weinstein.

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I intend to leave after my death a large fund for the promotion of the peace idea, but I am skeptical as to its results. The savants will write excellent volumes. There will be laureates. But wars will continue just the same until the force of circumstances renders them impossible.

—Alfred Nobel (1833-1896)