B. Operational Aspects

The successful completion of the Armero project led to the identification of five basic principles that were fundamental for its outcome. These principles are:

1. A previous relationship needs to exist between the local mental health officials and clinical staff, and the outsider disaster researcher.

It seems to be both difficult and easy to develop a project on the interface of disaster, mental health and primary care. If no previous relationshp existed with the health officials of the disaster area, it may be extremely difficult, if not impossible, to develop a successful collaborative research in the aftermath of a disaster. If a relationship pre-existed the disaster, however, it can evolve very rapidly into an effective research effort. Communications with the health sector and other sectors of the disaster relief system are facilitated by the special disaster-related context, promoting intra- and intersectorial collaboration. To increase the likelihood of having a successful entry into the disaster system, an on-going relationship between a disaster research center and health officials of disaster-prone areas should be proactively established as an avenue for subsequent collaborative work. In the Armero project, one of us (BRL) had provided mental health consultation to the Colombian Division of Mental Health prior to the tragedy to design a Primary Mental Health Care Plan, and following the disaster, on mental health services to victims at the primary level of care. This joint work

established the necessary background for the development of the project.

2. The research project must have both a service and a research component, the latter being conceptually, immediately and concretely related to the former.

The research questions addressed in the Armero project were clearly related to pressing service needs at three levels. Firstly, the consultation provided before and after the disaster highlighted the relationship between the assessment of mental health needs of disaster victims and the development of effective treatment interventions through the utilization of the PCW for the detection and management of emotional problems. Secondly, the disaster experience was subsequently incorporated in the Colombian Primary Mental Health Care Plan. Thirdly, the research data have supported the various initiatives undertaken locally for training the health providers of the disaster area in disaster mental health (Lima et al in press)

3. The data collection has to be carried out by health workers local to the disaster area.

The data collection in the Armero project was carried out by a team of mental health professionals who had worked very closely with the affected community in delivering routine mental health care. They were accepted members of the community with a clearly perceived commitment to its welfare. This special strategy circumvented the frequent problems of victims' uncooperativeness which are known to hinder disaster research projects. None of the

200 subjects approached for recruitment into the study refused to participate and, of the 90 subjects who scored positively on the screening instrument, were not available for a psychiatric interview because they had moved out of the area; only one subject refused the interview.

4. A fairly well developed general and primary health care system needs to be in place in the disaster area, with a good relationship with the national or state mental health authorities, whose previous work at the local level has made them accepted and respected, paving the way for the successful introduction of a disaster mental health research project.

Armero had the only psychiatric hospital in the State of Tolima, with 87% of its psychiatric beds. It had a large outpatient department with approximately 5,000 yearly visits, and a close involvement with primary care clinics and other community agencies in the region, such as schools. The local general health practitioners were aware of the importance of mental health issues and initiatives. The relationship of the mental health officials and clinical staff with the general health sector, particularly with the primary care providers, was active and productive.

5. At all stages of the project there needs to be a joint effort between the outsider research team and the local research team.

Partnership is the key concept, and it needs to be reflected from the design of the project to the development of instruments, to data collection, analysis and interpretation, and to publication

of the findings. The Armero project was conceived during the initial consultation provided by one of us (BRL) following the tragedy, and it was refined in subsequent meetings of all the investigators involved. Communications by mail and telephone have been extensive, and all opportunities available for personal contacts have been utilized for following up the research progress and the analysis of the data. The data base has been copied for independent analytical work at both centers, all results have been shared and extensively discussed, and papers have always been written, or presented jointly.

C. Mental Health/Primary Care Interaction

Our findings indicate that a major disaster in a developing country is likely to produce very high levels of emotional distress, essentially affecting every other adult victim. These problems moreover are present as late as half a year after the impact, and our clinical observations lend no support to the expectation that this situation may improve. Therefore, it can be stated with certainty that, for the underprivileged population in developing countries which become victims of a major disaster, a very high level of mental morbidity can be expected which will require adequate management. In developing countries, specialized mental health resources are already inadequate for the management of emotional problems in routine clinical settings, and in a

disaster situation, when the mental morbidity may increase manyfold, they will become totally insufficient. Hence, the mental health actions of the PCW in developing countries need to be further explored an adequate strategy for meeting these important needs.

The role of the specialized mental health sector in the comprehensive care of disaster victims needs to be reexamined as well. Certainly it should not be of routine and direct service delivery, not only because the damands are likely to be much greater than the resources available, but also because mental health services delivered though the primary level of care may be more appropriate to the victim's health needs. The role of the specialized mental health sector, therefore, should be related to program design, implementation and evaluation; to the training and education of the primary care worker; and to providing him continuing support through consultation and supervision. Particularly in disasterprone countries, a small national disaster mental health team should develop and master a simple and well-structured educational and training package adjusted to the particular country (Figure 2). Once a disaster strikes, this national/regional team becomes responsible for training the mental health team local to the affected community. The local mental health team will then provide training and continuing support to the general health sector and to the front-line primary care workers, other sectors of the disaster-relief operation, and to the community. The trained primary care worker will in turn provide routine mental health care to victims, families and

affected communities. The specialized mental health worker will continue to be available for evaluation and/or treatment of referred patients whose psychiatric problems are too complex to be handled at the primary care level.

The next investigative step is to evaluate the focused training of the PCW local to the disaster area in the management of the most relevant psychiatric disorders seen among victims, for which this study provides initial guidelines.

The successful completion of the proposed project should promote the role of the PCW in the delivery of mental health care to victims of disasters. On the basis of the Armero project, some concrete evidence of this process has already been produced in the areas of research, health care delivery, training, education and planning. A course for the training of the PCW in disaster mental health was given to general doctors and nurses of the Armero area utilizing a training manual written by one of us (Lima 1987). The Division of Mental Health of the Ministry of Health in Ecuador has implement a similar course to health workers following the earthquakes in March 1987, utlizing an abridged version of the same manual. Additional courses to ancialliary health staff are planned. The Colombian Primary Mental Health Care Plan (Colombia 1986) contains a special section on primary mental health care to disaster victims.

Our experience also shows that international research on disaster primary mental health care is feasible, yields good quality data, promotes the local development of initiatives to

address the long-term mental health needs of victims, and shapes national policy in mental health issues. It is expected our efforts will be replicated elsewhere and that the data generated by these related projects will further support the provision of primary mental health to disaster victims indeveloping countries.

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FIGURE 1

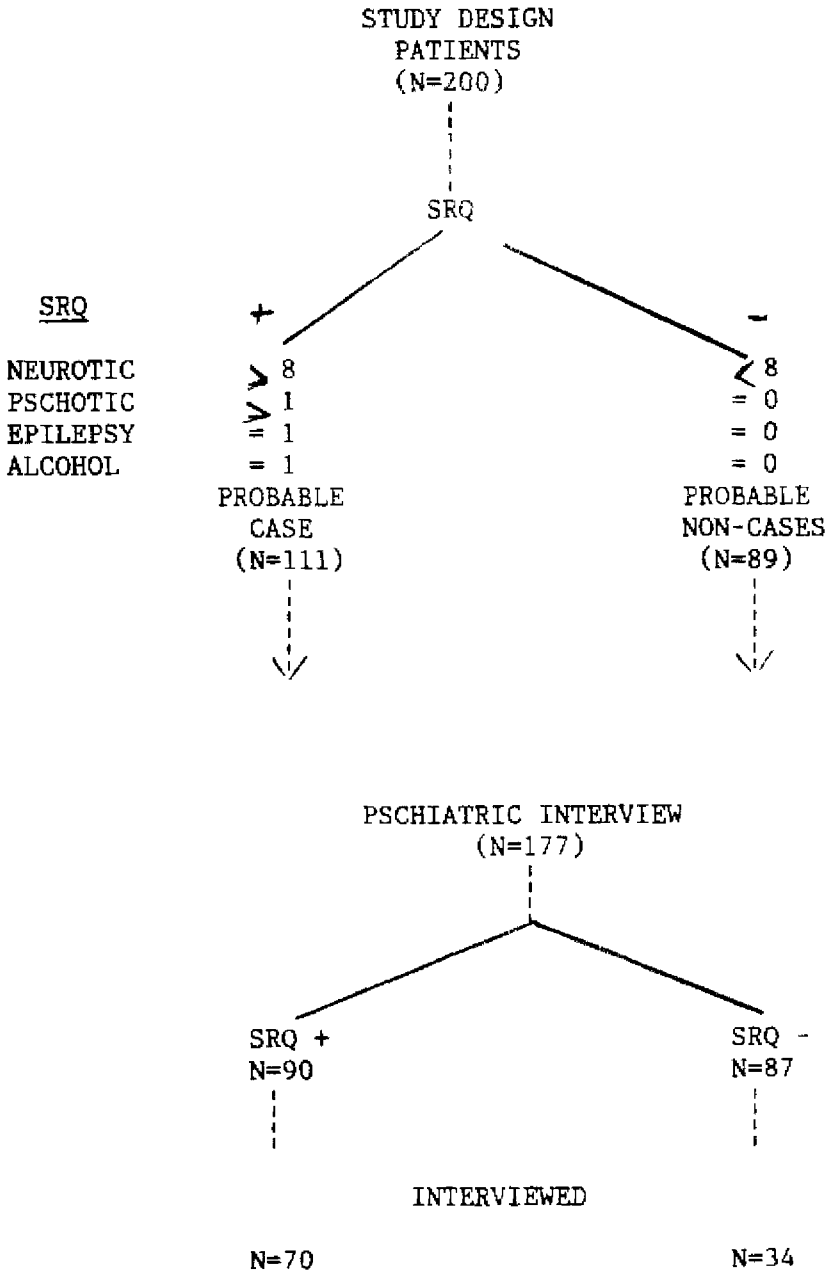
STUDY DESIGN
PATIENTS
(N=200)
SRQ
SRQ
+
-
NEUROTIC
PSCHOTIC
EPILEPSY
ALCOHOL
≥ 8
≥ 1
= 1
= 1
< 8
= 0
= 0
= 0
PROBABLE
CASE
(N=111)
PROBABLE
NON-CASES
(N=89)
PSCHIATRIC INTERVIEW
(N=177)
SRQ +
N=90
SRQ -
N=87
INTERVIEWED
N=70
N=34

FIGURE 2

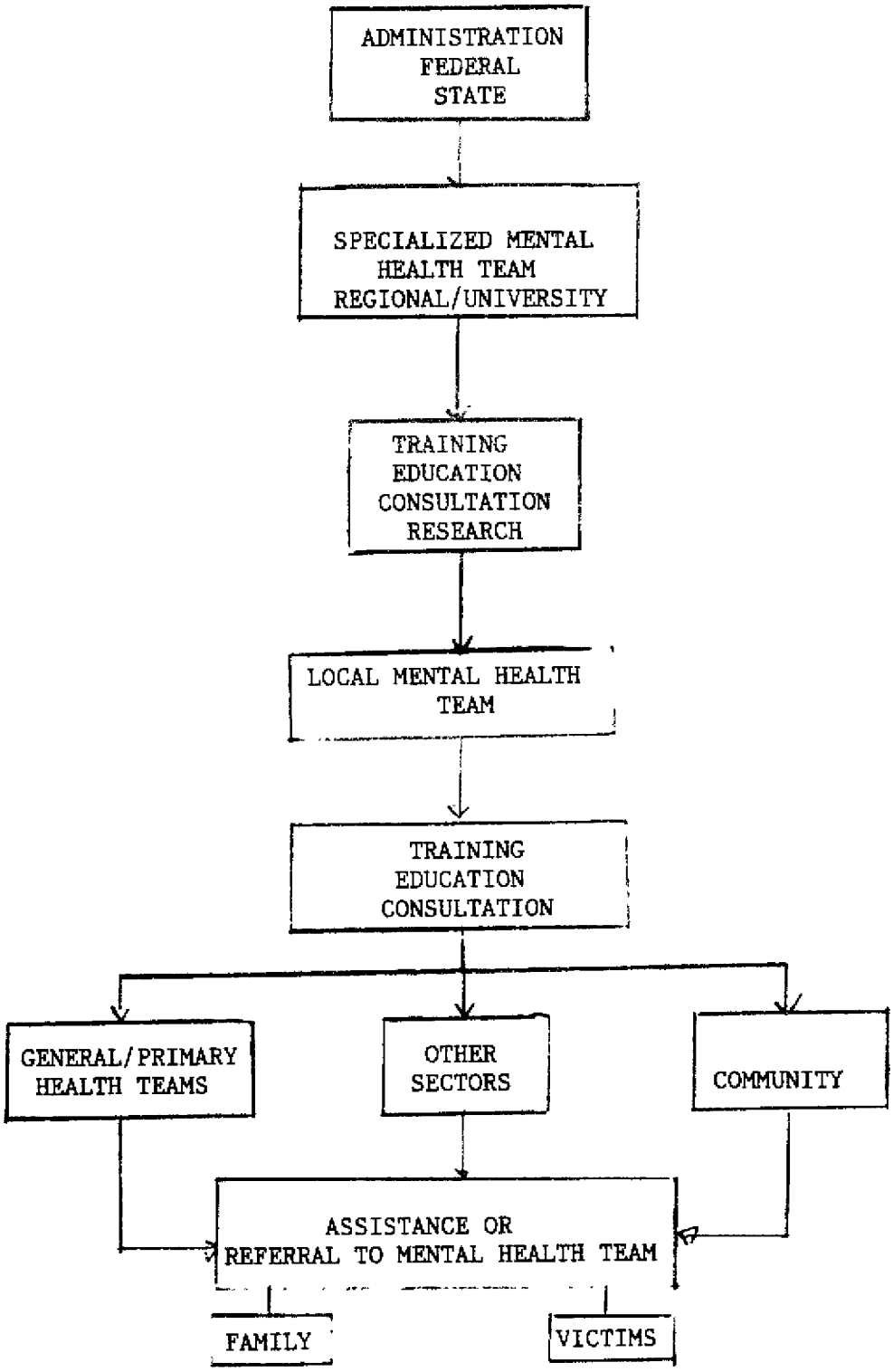
ADMINISTRATION
FEDERAL
STATE
SPECIALIZED MENTAL
HEALTH TEAM
REGIONAL/UNIVERSITY
TRAINING
EDUCATION
CONSULTATION
RESEARCH
LOCAL MENTAL HEALTH
TEAM
TRAINING
EDUCATION
CONSULTATION
GENERAL/PRIMARY
HEALTH TEAMS
OTHER
SECTORS
COMMUNITY
ASSISTANCE OR
REFERRAL TO MENTAL HEALTH TEAM
FAMILY
VICTIMS

TABLE 2

DISTRIBUTION (%) OF SELECTED SOCIO-DEMOGRAPHIC CHARACTERISTICS AND MEAN SRQ* SCORES OF THE ARMERO VICTIMS

	SCREENED (N=200)	AVAILABLE FOR INTERVIEWED (N=177)
SEX		
MALES	53	48
FEMALES	47	52
AGE		
18-44	70	68
45-64	22	23
65+	8	9
MARITAL STATUS		
SINGLE	20	20
MARRIED	13	14
COMMON-LAW	45	43
SEPARATED	8	9
WIDOW	14	14
EDUCATION		
NONE	31	31
1-5	54	54
6+	15	15

=SELF-REPORTING QUESTIONNAIRE

TABLE 3

PREVALENCE (%) OF EMOTIONAL DISTRESS DEFINED BY SRQ# BY NEUROTIC SYMPTOMS INCLUDED IN THE SRQ

NEUROTIC SYMPTOMS	SYMPTOMS PRESENT				
	NEGATIVE		POSITIVE		
	N	% WITH EMOTIONAL DISTRESS	N	% WITH EMOTIONAL DISTRESS	
1. DO YOU OFTEN HAVE HEADACHES?	112	68.8	88	38.6	<.001
2. IS YOUR APPETITE POOR?	85	76.5	115	40.0	<.001
3. DO YOU SLEEP BADLY?	84	70.2.	116	44.8	<.001
4. ARE YOU EASILY FRIGHTENED?	117	66.7	83	39.8	<.001
5. DO YOU HANDS SHAKE?	72	84.7.	128	39.1	<.001
6. DO YOU FEEL NERVOUS, TENSE OR WORRIED?	163	62.6	37	24.3	<.001
7. IS YOUR DIGESTION POOR?	43	81.4	157	48.4	<.001
8. DO YOU HAVE TROUBLE THINKING CLEARLY?	34	91.2	164	47.6	<.001
9. DO YOU FEEL UNHAPPY?	68	83.8	131	40.5	<.001
10. DO YOU CRY MORE THAN USUAL?	45	82.2	153	47.1	<.001
11. DO YOU FIND IT DIFFICULT TO ENJOY YOUR DAILY ACTIVITIES?	73	89.0	126	35.7	<.001
12. DO YOU FIND IT DIFFICULT TO MAKE DECISIONS?	68	76.5	131	45.0	<.001
13. IS YOUR DAILY WORK SUFFERING?	63	87.3	137	40.9	<.001
14. ARE YOU UNABLE TO PLAY A USEFUL PART IN LIFE?	31	100.0	169	47.3	<.001
15. HAVE YOU LOST INTEREST IN THINGS?	70	82.9	130	40.8	<.001
16. DO YOU FEEL THAT YOU ARE A WORTHLESS PERSON?	44	86.4	156	46.8	<.001
17. HAS THE THOUGHT OF ENDING YOUR LIFE BEEN IN YOUR MIND?	34	85.3	166	49.4	<.001
18. DO YOU FEEL TIRED ALL THE TIME?	42	95.2	155	43.9	<.001
19. DO YOU HAVE UNCOMFORTABLE FEELINGS IN YOUR STOMACH?	47	87.2	150	46.0	<.001
20. ARE YOU EASILY TIRED?	93	80.6	104	32.7	<.001

*SELF-REPORTING QUESTIONNAIRE

TABLE 4

PREVALENCE (%) OF EMOTIONAL DISTRESS DEFINED BY SRQ* BY THE MOST FREQUENT NEUROTIC SYMPTOMS INCLUDED IN THE SRQ

	SYMPTOM PRESENT?				
	YES		NO		
MOST FREQUENT SYMPTOMS:	% WITH EMOTIONAL DISTRESS	N	% WITH EMOTIONAL DISTRESS	P
DO YOU FEEL NERVOUS OR WORRIED?	62.6	163	24.3	37	<.001
ARE YOU EASILY FRIGHTENED?	66.6	117	39.8	83	<.001
DO YOU OFTEN HAVE HEADACHES?	68.6	112	38.6	88	<.001

*SELF-REPORTING QUESTIONNAIRE

TABLE 5

PREVALENCE (%) OF EMOTIONAL DISTRESS DEFINED BY SRQ* BY THE STRONGEST PREDICTORS OF SRQ POSITIVITY

	SYMPTOM PRESENT?				
	YES		NO		
	N	% WITH EMOTIONAL DISTRESS	N	% WITH EMOTIONAL DISTRESS	P
STRONGEST PREDICTORS:					
1. DO YOU FEEL TIRED ALL THE TIME?	42	95.2	155	43.9	<.001
2. DO YOU HAVE TROUBLE THINKING CLEARLY?	34	91.2	164	47.6	<.001
3. ARE YOU UNABLE TO PLAY A USEFUL PART IN LIFE?	31	100.0	169	47.3	<.001

*SRQ = SELF-REPORTING QUESTIONNAIRE

TABLE 6

PREVALENCE (%) OF EMOTIONAL DISTRESS DEFINED BY SRQ* BY SELECTED VARIABLES

		VARIABLE PRESENT?				
		YES		NO		
		N	% WITH EMOTIONAL DISTRESS		% WITH EMOTIONAL DISTRESS	
I. PERSONAL VARIABLES						
LIVING ALONE		18	83.3	162	51.9	<.03
AGE (YEARS)	18-44	140	51.4	NA		~.06
	45-64	43	62.8	NA		
	65+	17	70.6	NA		
EDUCATION (YEARS)	NONE	61	62.8	NA		~.07
	1-5	109	55.0	NA		
	6+	30	43.3	NA		
II. ENVIRONMENTAL						
HAVING LOST PREVIOUS JOB		52	75.4	76	50.0	<.003
BEING HELPED NOW		114	46.5	85	67.1	<.004
KNOWING DATE FOR LEAVING		83	45.8	105	62.9	<.02
SATISFIED WITH LIVING ARRANGEMENT		48	39.6	151	60.3	<.02

*SRQ = SELF-REPORTING QUESTIONNAIRE

TABLE 6 (CONT'D)

PREVALENCE (%) OF EMOTIONAL DISTRESS DEFINED BY SRQ* BY SELECTED VARIABLES

	VARIABLE PRESENT?				
	YES		NO		
	N	% WITH EMOTIONAL DISTRESS		% WITH EMOTIONAL DISTRESS	P
III. REPORTED PHYSICAL PROBLEMS					
EPIGASTRIC PAIN	13	92.3	187	52.9	<.02
NON-SPECIFIC SYMPTOMS	29	72.4	171	52.6	<.05
NUMBER OF PHYSICAL COMPLAINTS					
NONE	84	45.2	NA		
1	72	59.7	NA		<.02
2	39	60.0	NA		
3	14	86.7	NA		
IV. DISASTER EXPERIENCE					
SEEN HORRIBLE THINGS	184	54.9	14	57.1	NS
LOSING ANY FAMILY MEMBER	157	56.1	42	52.4	NS
UNAWARE OF IMPENDING DANGER	70	51.4	130	57.7	NS
CONTINGENCY PLANS	24	54.2	175	55.4	NS
BEEN INJURED	62	62.9	133	50.4	NS
RECOVERED FROM INJURIES	40	57.5	25	76.0	NS
BEEN OF HELP TO OTHERS	63	60.3	134	53.7	NS

* SRQ = SELF-REPORTING QUESTIONNAIRE

Table 7

SELECTED CHARACTERISTIC OF ARMERO VICTIMS (N=177)
BY SRQ* AND INTERVIEW STATUS

		SELF REPORTING QUESTIONNAIRE					
		NEGATIVE (N=87)			POSITIVE (N=90)		
		INTERVIEWED (N=34)	NOT-INTERVIEWED (N=53)		INTERVIEWED (N=70)	NOT-INTERVIEWED (N=20)	
MEAN SRQ SCORE							
Neurotic Subscale		4.03 ± 2.01	2.85 ± 1.98	.008	11.41 ± 3.57	10.40 ± 3.20	N.S
Psychotic Subscale		—	—		.77 ± .95	.65 ± .67	N.S
AGE (YEARS)	18-44	70.6	79.2		58.6	70.0	
	45-64	20.6	17.0	N.S.	27.1	25.0	N.S.
	65+	8.8	3.8		14.3	5.0	
SEX	MALE	32.4	64.2	.004	38.6	60.0	N.S.
	FEMALE	67.6	35.8		61.4	40.0	
EDUCATION (YEARS)	NONE	32.4	22.6		40.0	20.0	
	1-5	52.9	54.7	N.S.	48.6	70.0	N.S
	6+	14.7	22.6		11.4	10.0	
MARITAL STATE	SINGLE	8.8	20.8		20.0	35.0	
	MARRIED	8.8	17.0		15.7	10.0	
	COMMON-LAW	50.0	45.3	N.S.	40.0	35.0	N.S
	DIVORCED	11.8	3.8		11.4	5.0	
	WIDOW	20.6	13.2		12.9	15.0	
CURRENT OCCUPATION	NONE	73.5	34.0	.001	75.7	70.0	N.S.
	SOME	26.5	64.2		24.3	30.0	
PHYSICAL PROBLEMS	YES	55.9	41.5	N.S.	73.9	60.0	N.S
	NO	44.1	58.5		26.1	40.0	
PEOPLE HELPING	YES	64.7	69.8	N.S.	52.9	52.6	N.S
	NO	35.3	30.2		47.1	47.4	
DATE FOR LEAVING	YES	52.9	56.6	N.S.	58.6	60.0	N.S
	NO	47.1	43.4		41.4	40.0	

*Self Reporting Questionnaire

TABLE 8

DISTRIBUTION OF PSYCHIATRIC DIAGNOSES OF THE ARMERO DISASTER VICTIMS BY RESULTS OF THE SRQ* AND BY DIFFERENT CRITERIA FOR CASENESS

DIAGNOSIS	CRITERIA FOR CASENESS**		
	BOTH	CLINICIAN	DSM-III
SRQ POSITIVES			
POST-TRAUMATIC STRESS DISORDER	33	51	35
MAJOR DEPRESSION	24	25	33
GENERALIZED ANXIETY DISORDER	2	15	2
ALCOHOL ABUSE OR DEPENDENCE	4	8	4
PHOBIAS	8	8	14
PSYCHOLOGICAL FACTORS COMPLICATING PHYSICAL ILLNESS	2	2	2
ATYPICAL BIPOLAR DISORDER	1		
SOMATIZATION DISORDERS		4	1
PANIC DISORDER	1	2	1
ADJUSTMENT DISORDER		1	
CONVERSION DISORDER		1	
DISSOCIATIVE DISORDER		1	
SENILE DEMENTIA		1	
PERSONALITY DISORDER			
PARANOID		1	
SCHIZOID		1	
INADEQUATE		1	
MENTAL RETARDATION, BORDERLINE		1	
TOBACCO DEPENDENCE		1	
SRQ NEGATIVES			
POST-TRAUMATIC STRESS DISORDERS	5	12	5
ADJUSTMENT DISORDERS	1	1	1
MAJOR DEPRESSION	3	3	3
GENERALIZED ANXIETY DISORDER	1	1	1
DISSOCIATIVE DISORDER	1	1	1
ALCOHOL ABUSE	1	1	1
PHOBIA		1	

*Self-Reporting Questionnaire

**Both - the diagnosis given by the clinician was confirmed by DSM-III criteria (Criterion 1).

Clinician - the diagnosis by the clinician may or may not have been confirmed by DSM-III (Criterion 2).

DSM-III - the diagnosis met DSM-III criteria, but may or may not have been made by the clinician (Criterion 3).

TABLE 9

VALIDITY OF THE SRQ* COMPARED TO DIFFERENT CRITERIA

FOR CASENESS OF THE ARMERO VICTIMS INTERVIEWED (N=104)

CRITERIA FOR CASENESS	SRQ+ (n=70)	SRQ- (N=34)	CHARACTERISTICS OF THE SRQ: SENSITIVITY	SPECIFICITY	POSITIVE PREDICTIVE VALUE
CRITERION 1: CLINICIAN'S DIAGNOSIS AND DSM-III DIAGNOSIS					
YES	53	8	.87		
NO	17	26		.60	.75
CRITERION 2: CLINICIAN'S DIAGNOSIS					
YES	64	14	.82	.77	
NO	6	20			.91
CRITERION 3: DSM-III DIAGNOSIS					
YES	57	8	.87		
NO	13	26		.67	.81

*Self-Reporting Questionnaire

APPENDIX 1

ITEMS OF THE SELF REPORTING QUESTIONNAIRE (SRQ)

Neurotic Subscale

1. Do you often have headaches?
2. Is your appetite poor?
3. Do you sleep badly?
4. Are you easily frightened?
5. Do your hands shake?
6. Do you feel nervous, tense or worried?
7. Is your digestion poor?
8. Do you have trouble thinking clearly?
9. Do you feel unhappy?
10. Do you cry more than usual?
11. Do you find it difficult to enjoy your daily activities?
12. Do you find it difficult to make decision?
13. Is your daily work suffering?
14. Are you unable to play a useful part in life?
15. Have you lost interest in things?
16. Do you feel that you are a worthless person?
17. Has the thought of ending yourlife been in your mind?
18. Do you feel tired all the time?
19. Do you have uncomfortable feelings in your stomach?
20. Are you easily tired?

Psychotic Subscale

1. Do you feel that somebody has been trying to harm you in some way?
2. Are you a much more important person than most people think?
3. Have you noticed any interference or anything else unusual with your thinking?
4. Do you ever hear voices without knowing where they come from or which other people cannot hear?