

# National Disasters in Iran and Blood Donation: Bam Earthquake Experience

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## Abstract

**Background:** Understanding the characteristics of blood donors donating in disasters may help predicting the blood safety and adequacy. We investigated the blood supply and safety during Bam earthquake in east of Iran.

**Methods:** Both pre and post studies were performed on the donors without considering any control group in Shiraz blood donors after the earthquake and one month before it. We compared the demographic characteristics and prevalence of hepatitis B (HBV), hepatitis C (HCV) and HIV among them. Then, they were followed for 24 months to find out their return rate.

**Results:** The number of donors, especially first-time donors, was significantly increased after the earthquake. The prevalence rates of HBS Ag, HCV Ab, and HIV Ab were not significantly different. The return rate of the first-time blood donors after the earthquake was lower than that of the first-time donors before it ( $P < 0.05$ ).

**Conclusion:** The number of blood donors after the earthquake increased. In spite of the increased rate of the first-time donations, the prevalence of HBS antigen, HCV antibody and HIV antibody did not change. It seems that disaster has only a short-term effect on the desire of donors for donation.

**Keywords:** Earthquake; Blood safety; Blood donation; Bam; Iran

## Introduction

Preparation of adequate supplies of safe blood for disaster victims is essential.<sup>1</sup> A strong public response is often observed after disasters<sup>3-6</sup> by donating food, clothes, cash and blood.<sup>2,7</sup> So, the number of donors (especially first-time donors) increases.<sup>3,8-11</sup> Therefore, due to the greater prevalence of blood borne diseases among the first time donors than that of repeat donors, blood safety might be endangered.<sup>11-13</sup> The number of blood donors increases but its long-term impact on blood supply is unclear. A survey by Gimble *et al.* showed that a disaster has only a short-term effect on the desire of donors to donate blood.<sup>13</sup> Some donors may think blood is necessary only in critical situations, so they insist on donating, leading to blood

collection more than needed, and consequently it leads to wastage of unused blood.<sup>2</sup>

Iran has suffered many natural disasters. The last severe earthquake registering 6.5 on Richter scale occurred in Bam located in Kerman Province in December 2003.<sup>14,15</sup> We investigated the impact of the Bam earthquake on blood donation and safety in Shiraz Blood Transfusion Organization (BTO) in Shiraz, southern Iran.

## Materials and Methods

Both pre and post studies were conducted in Shiraz after the earthquake and one month before it on the donors' characteristics without considering a control group. Data on the number, demographic characteristics (age, sex, marital status, education level, donation status) and the seroprevalence of HBS antigen (Ag), HCV antibody (Ab) and HIVAb in donors after the earthquake, from the first day till the two following

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days were collected. Similar data were collected for two days in the previous month. All donors were selected by physicians. Screening tests for HBS Ag (ELISA, Behring, Germany), HCV Ab (ELISA, Avenina, Russia) and HIV Ab (ELISA, Biotest, Germany) were used. All positive tests were confirmed by neutralization tests for HBS Ag (Behring), RIBA for HCV Ab (Genelab, Singapore) and western blot for HIV (Genelab, Singapore). We compared the demographic characteristics and prevalence of HBS Ag, HCV Ab, and HIV Ab in the two groups. We evaluated the 24 month return rate of donors in the two groups. Chi Square and t tests were used for data analysis using SPSS software (version 15, Chicago, IL, USA).

### Results

All donors were volunteer. The number of donors significantly increased to 7 folds after the earthquake (1694 versus 239). The number of young (under 25 years), female, single, low-educated and first-time blood donors was significantly higher after the disaster ( $p < 0.05$ ) (Table 1).

The prevalence rates of HBS Ag, HCV Ab, and HIV Ab were not significantly different between the two groups (Table 2). The return rates of the first-time donors after the earthquake were lower than those before it (14.8% versus 32.1%) ( $p < 0.05$ ). The return rate of repeat-donors after and before the event

was not significantly different (41.8% versus 43.2%) ( $p > 0.05$ ).

### Discussion

The number of blood donors (especially first-time donors) after the earthquake increased significantly, as in other studies.<sup>2,3,8-10,14-15</sup> These donations were volunteer, not due to recruitment efforts. In this study, the number of female donors increased after the disaster as in other studies.<sup>4,15</sup> However, in Turkey the ratio of male to female did not change.<sup>2</sup> The education level of blood donors after the disaster was lower in contrast to the previous study.<sup>2</sup> The number of younger blood donors increased; however, in a study in Turkey, the donor age distribution did not change.<sup>2</sup>

The donors (especially first-time donors) had a lower return rate; a finding which needs further consideration to increase the motivation of the first-time donors for regular donation.<sup>4,11,15</sup> After disasters, people donate more because they know that blood donation is essential for victims. These donors may not know that blood is essential in normal situations, too. This highlights the importance of educating people about the importance of regular donation in saving lives in any situation not only in crisis.

The sudden increase in the donation during the crisis leads to long waits and inconvenience to donate. So these donors may assume that blood donation is a pro-

**Table 1:** The demographic characteristics of blood donors after the Bam earthquake.

Blood donors	Donation status		Sex		Education level		Age (years)
	First-time No. (%)	Repeat blood donors No. (%)	Women No. (%)	Men No. (%)	Lower than diploma No. (%)	Higher than diploma No. (%)	Mean±SD
26, 27 November	35 (14.7)	204 (85.3)	41 (17.4)	198 (82.6)	77 (32.6)	162 (68.4)	23.7±4.5
26, 27 December	484 (28.6)	1210 (71.4)	494 (29.2)	1200 (70.8)	748 (44.2)	946 (55.8)	32.8±5.6

**Table 2:** The prevalence of HBS antigen, HCV antibody and HIV antibody in donors on 26 - 28 December 2003 and 26 -28November 2003

Prevalence of diseases Date of blood donation	HIV Antibody	HBS Antigen	HCV Antibody
26-28 November	0	2/239=0.8%	2/239=0.8%
26-28 December	0	10/1694=0.6%	8/1694=0.5%

longed process, affecting their desire to donate again. Collecting large amounts of blood in a short period may cause wastage of units if it exceeds the need.

In spite of the increased rate of the first-time donations, the prevalence of HBS Ag, HCV Ab and HIV Ab did not change and it was similar to the figures reported in previous studies,<sup>2,15</sup> reflecting the altruistic motivation of many first-time donors who referred for donation after a disaster.<sup>1,8,10,15</sup>

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**Conflict of interest:** None declared.