### Table 1 World Health Organization Eastern Mediterranean Region survey on availability and safety of blood transfusion during humanitarian emergencies 2006–2016

<table>
<thead>
<tr>
<th>Type of emergency</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural: earthquake (n = 2), flooding (n = 4), drought (n = 1), landslide (n = 1), avalanche (n = 1), fire (n = 1)</td>
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<tr>
<td>Human-made: terrorism (n = 10), war (including war in neighbouring countries) (n = 9), insurgency (n = 2), blockade (n = 2)</td>
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These emergencies affect 20–100% of the community with estimated 10–85% of the injured requiring blood transfusion.

Need for blood transfusion has increased in all countries due to the humanitarian emergencies.

Type of emergencies has also changed over the years – increasing conflicts and wars, explosions, acts of terrorism, refugees and population movements.

Emergencies affect both military personnel and civilians – women, men, children and old people.

Main reasons for transfusion were:
- Trauma (armed conflict) (n = 11)
- Trauma (civil accident) (n = 9)
- Trauma (natural disaster) (n = 1)
- Obstetric (n = 6)
- Surgical (regular) (n = 6)
- Paediatric anaemia (e.g., malaria, thalassaemia and haemophilia) (n = 4)
- Other (oncology) (n = 3)

### Current strategies

Seven countries have a national emergency plan and strategy.

Potential blood donors are mobilized through:
- Public media (n = 11)
- Calling known donors (n = 5)
- Calling family/replacement donors (n = 3)
- Supply from neighbouring blood centres (n = 7)
- Other (n = 1) – inter country collaboration

Only in 7 countries does the plan include emergency stocks in the blood centres and hospitals.
- Coordinated by ministries of health, provincial health departments, and NGOs
- All countries process blood and test for ABO antigens, Rhesus D antigen, HBV, HCV, HIV and syphilis before issuing except:
  - One country where syphilis testing is not done
  - Two countries issued blood with incomplete crossmatch

Operational cold chain in place for transportation of blood and blood products in 9 countries.

Power supply during emergencies has variable reliability.

### Coordination and collaboration

Central coordinating organization is in place in 10 countries.

Collaboration between different blood supply organizations and between the different medical and emergency providers is limited.

In 8 countries, NGOs are involved in humanitarian emergency responses.

Only in 5 countries are NGOs involved in blood supply and transfusion (including donor mobilization) – covering 20–30% of the total supply.

### Gaps and challenges

Most common weak points in the blood supply during emergencies are:
- Fragmented organization (n = 9)
- Shortcomings in numbers and competence of human resources (n = 9)
- Shortages in supply of consumables (n = 8)
- Shortcomings in infrastructure (n = 7)
- Transport and cold chain deficits (n = 7)
- Financial shortage (n = 7)
- Ineffective coordination (n = 6)

*HBV = hepatitis B virus; HCV = hepatitis C virus; HIV = human immunodeficiency virus; NGO = nongovernmental organization.*