HEALTH CARE FACILITIES PREPAREDNESS FOR RESPONDING TO INDUSTRIAL HAZARDS - CASE STUDY OF HEALTH FACILITY IN OBRENOVAC, SERBIA


* Javno komunalno preduzeće „Obrenovac“
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Resilience and social infrastructure

- Resilience: ability to absorb, adapt and respond to changes in an urban system
- Social infrastructure: schools and health care facilities extremely important
- Hazards: natural or man-made, with a high probability of causing the socioeconomic consequences
- Possible consequences: human losses, damage to property and economy including the destruction of infrastructure
Resilience and social infrastructure

• Sendai Framework for Disaster Risk Reduction 2015-2030 was adopted in 2015

• Reducing human losses due to disasters and creating common forms of action amongst the member countries (168 signatories, including Serbia)

• four priority fields:
  • understanding disaster risk;
  • strengthening disaster risk governance to manage disaster risk;
  • investing in disaster risk reduction for resilience;
  • enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction.
Health care facilities

• Health care facilities must continue to work during emergencies and disasters
• People immediately go to the nearest hospital for medical assistance when emergencies occur, without considering whether the facilities might not be functional
• Vital to identify the level of safety and functionality a hospital will have if an emergency or disaster occurs
Aim

• Identify elements that need improvement in a specific health care facility or network of health care facilities

• To prioritize interventions in them that are essential for reducing the mortality, morbidity, disability and other social and economic costs associated with emergencies and disasters
Methods – Hospital Safety Index

- World Health Organization (WHO) developed a method
- Hospital Safety Index represents a methodology for fast and relatively economical evaluation of functional capacity of a hospital
  - not only the functional capacity of a hospital during and after an emergency
  - provides ranges that help authorities determine which hospitals most urgently need actions to improve their safety and functionality
- 2 forms:
  - general information on a hospital
  - safe hospital checklist, divided into 4 modules
Hospital Safety Index - Modules

• Hazards affecting the safety of the hospital and the role of the hospital in emergency and disaster management
• Structural safety
• Nonstructural safety
• Emergency and disaster management
## Hospital Safety Index - Modules

### Module 1: Hazards affecting the safety of the hospital

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Hazard Level</th>
<th>Should the hospital be prepared to respond to this</th>
<th>Observations (evaluator’s comments)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No hazard</strong></td>
<td>LOW</td>
<td>HIGH</td>
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<tr>
<td><strong>1.1 Hazards</strong></td>
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<td><strong>1.1.1 Geological hazards</strong></td>
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<tr>
<td>Earthquakes</td>
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<td>Dry mass movement – landslides</td>
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<td><strong>1.1.2 Hydro-meteorological hazards</strong></td>
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<td><strong>1.1.2.1 Meteorological hazards</strong></td>
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<td>Local storms</td>
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<td><strong>1.1.2.2 Hydrological hazards</strong></td>
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<td>Wet mass movements – landslides</td>
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<td><strong>1.1.2.3 Climatological hazards</strong></td>
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<td>Extreme temperature (e.g., heat wave, cold wave, drought)</td>
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<td><strong>1.1.3 Biological hazards</strong></td>
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<td>Epidemics, pandemics and emerging diseases</td>
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<td>Human-made hazards</td>
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<td><strong>1.1.4 Technological hazards</strong></td>
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<tr>
<td>Industrial hazards (e.g., chemical, radiological)</td>
<td>X</td>
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<td>Fire (e.g., building)</td>
<td>X</td>
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<tr>
<td>Hazardous materials (chemical, biological, radiological)</td>
<td>Chemical</td>
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<tr>
<td></td>
<td>Biological</td>
<td>X</td>
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<td></td>
<td>Radiological</td>
<td>X</td>
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<tr>
<td>Power outages</td>
<td>X</td>
<td>floods in 2014.</td>
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<tr>
<td>Water supply disruption</td>
<td>X</td>
<td>floods in 2014.</td>
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<tr>
<td>Transportation incidents (e.g., air, road, rail, water)</td>
<td>X</td>
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<td>Other technological hazards (e.g., air pollution, structural)</td>
<td>X</td>
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<td><strong>1.1.5 Societal hazards</strong></td>
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<td>Security threat to hospital building and staff</td>
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<td>Displaced populations</td>
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<td><strong>1.2 Geotechnical properties of soils</strong></td>
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<td>Liquefaction</td>
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<td>Clay soils</td>
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<td>Unstable slopes</td>
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</table>
Case Study: Obrenovac Health Care Facility

• First module is about different accidents or hazards
• Specific hazards are divided to 7 main types:
  • Industrial hazards

The health care facility should be prepared to respond to an emergency or disaster due to industrial hazards (based on exposure of the affected population or the specialized role of this facility for the treatment of patients exposed to industrial hazards).

• Other technological hazards (e.g. air pollution, structural collapses, food/water contamination, nuclear)
Case Study: Obrenovac Health Care Facility

• Evaluation process consisted of giving one of three marks to each of the above named hazards

• Marks represent hazard levels: low, average and high, or it can be stated that there are no some specific hazards.

• Hazards regarding power outrages and water disruption were given marks of high hazard level regarding recent floods near health care facility which was in area of massive floods in Obrenovac, in 2014
Case Study: Obrenovac Health Care Facility

• Main type of hazards from which can this health care facility can be at risk are industrial hazards
• Risk of them is evaluated considering mainly the positions of SEVESO facilities in its near surroundings
• The document Preliminary list of SEVESO facilities on the territory of Republic of Serbia was used for evaluation
• In that document there are two main categories of SEVESO facilities: secondary (less hazardous) and primary (highly hazardous)
Case Study: Obrenovac Health Care Facility

• Secondary SEVESO facilities in nearby location of the health care facility:
  • Eko – Dunav DOO Beograd
  • Skladište ND „Prva Iskra Barič“ (fuel storage)
  • Tent DOO Obrenovac ogranak TE „KOLUBARA“ (thermal power plant)
  • „Prva iskra namenska proizvodnja“ AD Barič (explosives production facility)

• Primary SEVESO facility in nearby location of health care facility:
  • Tent DOO Obrenovac Tent – A (thermal power plant)
Case Study: Obrenovac Health Care Facility

- Regarding the position and number of SEVESO facilities near the health care facility and also danger of influences of floods, earthquakes and other natural hazards in their protection zones (1000 m), the evaluation of these specific types of hazards is marked as high level hazard.

- The health care facility is first and nearest government health institution which can be in danger from this kind of hazards.

- On the other hand it is the first that can help in triage, transporting and treatment of the injured patients and can be of great importance in the first minutes of immediate danger.
Discussion and Conclusions

• Resilience of the Municipality of Obrenovac has to be evaluated also through the ability of their Primary Health Care Facility to respond to potential disasters

• Hospital Safety Index, developed by the World Health Organization, represents a good tool which can be used to evaluate this readiness to respond to disasters

• Four secondary and one primary SEVESO facility in close vicinity to the Primary Health Care Facility in Obrenovac have been identified
Discussion and Conclusions

• Taking into account the fact that the Primary Health Care Facility in Obrenovac is the nearest public health care facility to the victims of potential industrial disaster in Obrenovac, its importance for triage, transport and treatment of injured patients is very high. Detailed results of the evaluation of this hospital using the Health Safety Index should be seriously considered when planning investments into the hospital infrastructure.
Acknowledgments

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