Surge Capacity Planning Issues

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# Surge Capacity Planning Issues

**Abstract**

Surge capacity planning is a critical aspect of healthcare management during emergencies. This study explores the conceptual framework and methodologies for surge capacity planning in healthcare systems. The research emphasizes the importance of anticipatory planning, dynamic resource allocation, and cross-disciplinary collaboration to effectively manage unexpected increases in demand for medical services.

**Keywords**

- Healthcare management
- Surge capacity planning
- Emergency response
- Resource allocation
- Cross-disciplinary collaboration

**Security Classification**

- Unclassified

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**References**


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**Notes**

- This study was supported by the National Institutes of Health under grant number 5K12HL133059-10.
- Data collection was conducted over a 2-year period in collaboration with local healthcare providers.

Establish a response system that allows the immediate deployment of 250 or more additional patient care personnel per 1,000,000 population in urban population areas. (125 rural)

Off site options for increasing bed capacity such as mobile facilities, temporary facilities appropriate to austere environments, large convention halls, armories, and state fair grounds.
Ambulatory Care Centers (ACC)

- Inpatient medical services-hospital locked down, or simply overwhelmed.
- Definitive care-IVs, Antibiotics, hydration, pain meds, respiratory care.
- 250 Bed Pods, five 50 bed nursing units.
- Medical personnel- 1 MD, 1 PA, 6 RNs or LPNs, 4 nursing assistants plus 14 support personnel.
Neighborhood Health Center (NEHC)

- High volume point of distribution, prophylaxis medicines and self-help information.
- Coordinating center with private MDs, community outreach, area hospitals, ACCs, fatality management.
- Stabilization, worried well, medicines, public health, patient registration and information.
- Medical Staffing - 80 Total staff including 6 physicians and seven nurses.
- (2) twelve hour shifts - 1,000 patients.
- Expandable facility, coordinate with EMS, community resources.
**Clinic Models**

- Small Pox Clinics - 6,000 pts 24hr.
- NYC Anthrax Postal Mission total: 7,076 patients/68 hr period.
  - 2,452 pts 1st 24 hr.
  - 3,875 pts 2nd 24 hr.
  - 749 last 24 hr.
- Non-medical model NYC 1500 pts/hr.
- Technological improvements are needed.
NEHC vs. Small Pox Clinic

Staffing levels for NEHC converted to VC (two 8-hr shifts):

<table>
<thead>
<tr>
<th>Position</th>
<th>NEHC</th>
<th>Addition</th>
<th>VC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Dir/Administrator</td>
<td>4</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Logistician/Transport Manager</td>
<td>4</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Medical Clerk</td>
<td>32</td>
<td>(12)</td>
<td>20</td>
</tr>
<tr>
<td>Physician/Physician Extender</td>
<td>8</td>
<td>(4)</td>
<td>4</td>
</tr>
<tr>
<td>Nurse/Nurse Assist</td>
<td>16</td>
<td>25</td>
<td>41</td>
</tr>
<tr>
<td>Paramed/EMT</td>
<td>18</td>
<td>-</td>
<td>18</td>
</tr>
<tr>
<td>Social Worker</td>
<td>-</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Volunteers (Non affiliated)</td>
<td>70</td>
<td>24</td>
<td>94</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>152</td>
<td>41</td>
<td>193</td>
</tr>
</tbody>
</table>
Commitment to help staff non-hospital field medical units by Incident and Profession

<table>
<thead>
<tr>
<th>Incident</th>
<th>Physician*</th>
<th>Nurse*</th>
</tr>
</thead>
<tbody>
<tr>
<td>NATURAL DISASTER</td>
<td>83% (461)</td>
<td>90% (2499)</td>
</tr>
<tr>
<td>EXPLOSION INCIDENT</td>
<td>67% (372)</td>
<td>70% (1941)</td>
</tr>
<tr>
<td>CHEMICAL INCIDENT</td>
<td>59% (329)</td>
<td>59% (1644)</td>
</tr>
<tr>
<td>BIOLOGICAL INCIDENT</td>
<td>56% (315)</td>
<td>53% (1474)</td>
</tr>
<tr>
<td>CONTAGIOUS EPIDEMIC</td>
<td>56% (312)</td>
<td>49% (1352)</td>
</tr>
<tr>
<td>RADIOLOGICAL INCIDENT</td>
<td>52% (290)</td>
<td>45% (1254)</td>
</tr>
</tbody>
</table>

* number of physicians, n = 559 and nurses, n = 2775 responding
What's wrong with this picture?
Essential Support Functions

- All ESFs may be needed to safely and efficiently provide medical care.
- Significant logistical support is necessary to support the most basic free standing health center.
- When calculating pt flow consider all potential bottlenecks i.e. parking, translation, complicated medical patients etc.
- Smooth interface with mutual aid, state, regional and federal resources is critical.
- Don’t underestimate the need for adequate security.
Regional Hospitals

- Regional Hospitals- Specialized care not easily available, maintenance of normal day to day activity is essential.
- Significantly increased role during a mass casualty event.
- Increased planning role likely involving several state area.
- Obligation to collaborate with other area regional hospitals for back-up, shared resources, regional exercises, and education.
Regionalization

- Unable to provide adequate resources at all times at all locations.
- Balance resources based on population, geography, budget priorities, risk assessment.
- Regional response will be incident specific and possibly limited.
  - Chemical, radiological, and conventional: likely self limited.
  - Biological: especially contagious, potentially unlimited.
- Support local response.
29 sites throughout New Hampshire serving 240 towns.

Essential component of public health response.

Geographical & population distribution, then modified according to usual catchment area.

Broad based leadership-politicians, EMS, law enforcement, Health, hospital, Emergency Management.
Security Resources

- CDC plan would utilize 10% of security resources within the state of NH.
- Including licensed police officers, correctional officers, private security & crossing guards, supervisory officers, etc.
- 7,840 total versus 740 needed.
- Strategies to be developed i.e. train in advance volunteers from community support agencies, limit #s personnel needed to carry weapons.
- Riots in China & Algeria.
Atropine Availability

- Must be available in local community.
- EMS Providers-pre-filled syringes.
- EDs-Pre-filled syringes.
- Bulk stock- hospitals & regional capacity.
- Key partners: Hospitals, EMS, Law Enforcement.
BT Response Requirements

Local Medical Response

Resources Required

Pre-Incident Planning and Preparation

Operational Response Level

Federal Medical Support

Crisis Management

Consequence Management

Hours - Post Incident
Final Points

- The first line of response = local community’s healthcare and EMS system.
- Identify and work with key partners early on.
- Anticipate secondary attacks against healthcare facilities and first responders.
- Family support and community mental health services should be key components of response.
- Economic impact of not planning and exercising can be enormous.
- Planning for an unlikely event, or an event affecting thousands to hundreds of thousands of patients is extremely difficult.
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