Pandemic Influenza in Children: Hard Choices

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Pandemic Influenza in Children

- Critical care needs
- Critical care resources
- If resources fail to meet needs…
- Rationing?

Typical region

- Total population 1,800,000
- 0-19 years 500,000
- 0-14 years 360,000
- 0-<1 year 25,000

Needs - H1N1 2009, so far

	Australia ICU[1] Per population	Typical Region ICU[1] Estimated total number	Typical Region All Inpatients[2] Estimated total number
All Ages	29/million	52	260
0-<1 yr	75/million	2	10
1-19 yr	15/million	7	35

1) ANZIC
2) Jain, et al
Both NEJM
Online Oct 2009

Needs- DHHS Pessimistic Pandemic Influenza Scenario

www.hhs.gov/pandemicflu/plan/pdf/HHSPandemicInfluenzaPlan.pdf

	Typical region ICU admissions Weekly average*	Typical region All admissions Weekly average*
All ages	171	1313
0-19 yr *assume pandemic lasts 1 yr	29	146

Resources- All hospital beds (ICU + non-ICU combined)

Daily count of hospital occupancy NYS 1996-2002
Peak capacity= sum of 95%ile occupancy each hospital
Average daily vacancy = Peak - Average occupancy
Kanter; Ann Emerg Med 2007;50:314

	Typical region Peak Capacity	Typical region Average Vacancies
All ages	4685	900
Pediatric	257	103

Resources- PICU beds

Randolph; J Pediatr 2004;144:792

- Typical region 27 beds
- If daily occupancy = 60%
- Average vacancies = 11 beds

Needs vs resources summary

Typical region severe pandemic

- All pediatric hospital beds
  - Normal daily vacancies 103
  - Weekly admissions due to pandemic 146
- PICU only
  - Normal daily vacancies 11
  - Weekly admissions due to pandemic 29
- It is easy to imagine getting overloaded

Ordinary surge

- Accommodate 10-20% above peak capacity by
  - Canceling elective procedures
  - Early discharges
  - Mobilize usual ICU staff
  - Adapt additional space (double or triple patients per ICU space, ED, PACU)

Mass Critical Care

- Normal goals- optimize individual outcomes
- Mass critical care goals- maximize population survival
- Extend resources by providing only lifesaving interventions, delay or forgo other interventions

- Task Force on Mass Critical Care; Chest 2008;133:1S-66S
- Kanter, Cooper; Disaster Med Public Health Preparedness online October 2009

Mass Critical Care

- Approach
  - Substitute
  - Adapt
  - Conserve
  - Reuse
- Interventions
  - Mechanical ventilation
  - Fluid resuscitation
  - Vasopressors
  - Antibiotics & antidotes
  - Sedation & analgesia

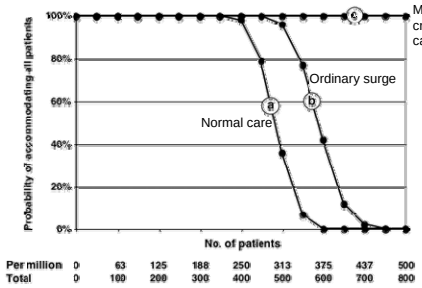
•Task Force on Mass Critical Care; Chest 2008;133:1S-66S
•Kanter, Cooper; Disaster Med Public Health Preparedness online October 2009

Critical Care Responses to Public Health Emergencies

Task Force on Mass Critical Care; Chest 2008;133:1S-66S
Kanter, Cooper; Disaster Med Public Health Preparedness online October 2009

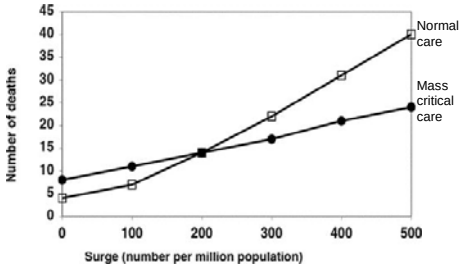
Number of patients	Response	Authority to implement
10-20% above peak capacity	"Ordinary surge" Normal care	Usual clinical leaders
Up to 3X usual peak capacity	Temporary reactive mass critical care	Hospital incident commander
Up to 3X usual peak capacity	Sustained mass critical care	State public health official Phillips; AHRQ No 07-0001
> 3X usual peak capacity	Mass critical care & Rationing	Authority for rationing-ambiguous Hoffman; DMPHP 2009;3:117

Impact of ordinary surge & MCC



Quantitative model for sudden impact event. Kanter; Pediatrics 2007;119:94

Impact of MCC



Quantitative model for sudden impact event. Kanter Crit Care Med;2007;35:2837

But if needs >> resources despite MCC… Rationing?

- Propose that patients unlikely to benefit from critical care receive palliative care only.
- Proposed criteria for palliative care
  - Certain chronic diseases
  - High mortility risk despite critical care
  - Fail to improve after a trial of critical care
- NYS Task Force for Life and the Law; DMPHP 2008;2:20

Rationing?

- Which chronic patients excluded from MCC?
- How identify high mortality risk?
  - Validated methods exist, but they assume normal ICU care. These tools are not validated in mass critical care for children or adults.
  - A better tool would predict survival with brief MCC- no such tool exists
- How to handle disagreements, appeals?

Rationing?

- Even if criteria validated, what if needs still exceed resources?
- Special priority groups?
  - Child (life-years vs lives saved; peoples' beliefs about care of children)?
  - Parents?
  - Important/productive people?

Rationing?

- Special priority groups?
  - How to achieve a national consensus on priority groups?
  - How identify authentic members of a hypothetical priority group?
  - What if priority group is too large to accommodate?
  - How avoid unfair influences?
- Versus first-come first-served?

Rationing?

- Does the public understand the idea of population based goals & rationing in a public health emergency?
  - How to begin the public discussion of rationing in a constructive way?
  - " 'there will be rioting in the streets' if hospitals begin disconnecting ventilators. 'There won't be enough public relations spin or appropriate media coverage in the world' to calm the family of a patient 'terminally weaned' from a ventilator…"
    - NY Times October 25, 2009

Rationing?

- Legal basis, procedures
  - State by state public health laws, authority for rationing is very ambiguous
- Liability protection
  - Very ambiguous
    - Hoffman;DMPHP 2009;3:117

Rationing?

- In October 2009, we are not prepared for rationing in public health emergencies
- Prepare to use existing resources as well as we can in order to avoid the need for rationing
  - Local preparedness including mass critical care
- Selectively expand resources to provide mass critical care?
- Begin a constructive public discussion of rationing and other disturbing choices?

Reissman; J Homeland Sec Emerg Management 2006;3:1