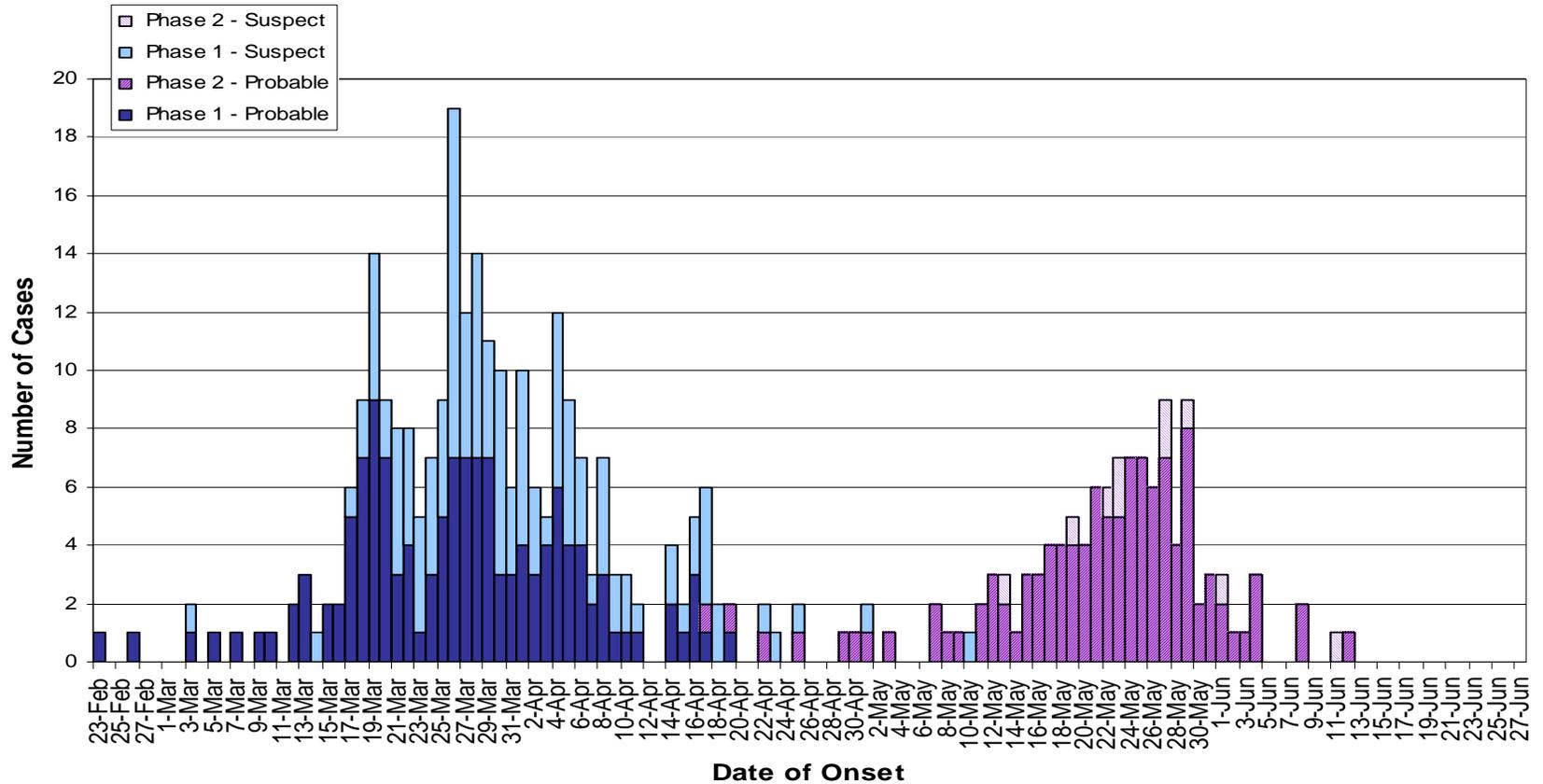


# Hospital Issues: Infection Control

# Pneumonia in Adults

- **CDC: Guideline for Isolation Precautions in Hospitals: Hospital Infection Control Practices Advisory Committee:**
  - Pneumonia: Standard precautions
- **Health Canada: Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care**
  - Pneumonia: Routine precautions

# SARS Toronto: Phase I & 2



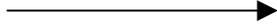
# SARS Toronto: Phase I & 2

Exposure	Phase	
	I	II
	No. (%)	No. (%)
Hospital - worker	91 (33%)	52 (42%)
- patient/visitor	49 (18%)	64 (51%)
Other healthcare (clinic, EMS)	8 (2.9%)	2 (1.6%)
Household contact	76 (28%)	9 (7.2%)
“Community”	16 (5.9%)	-
Travel	12 (4.4%)	-
Under investigation	21 (7.7%)	-

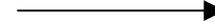
**Friday, March 7<sup>th</sup>**



**Index Case  
(Mother)**



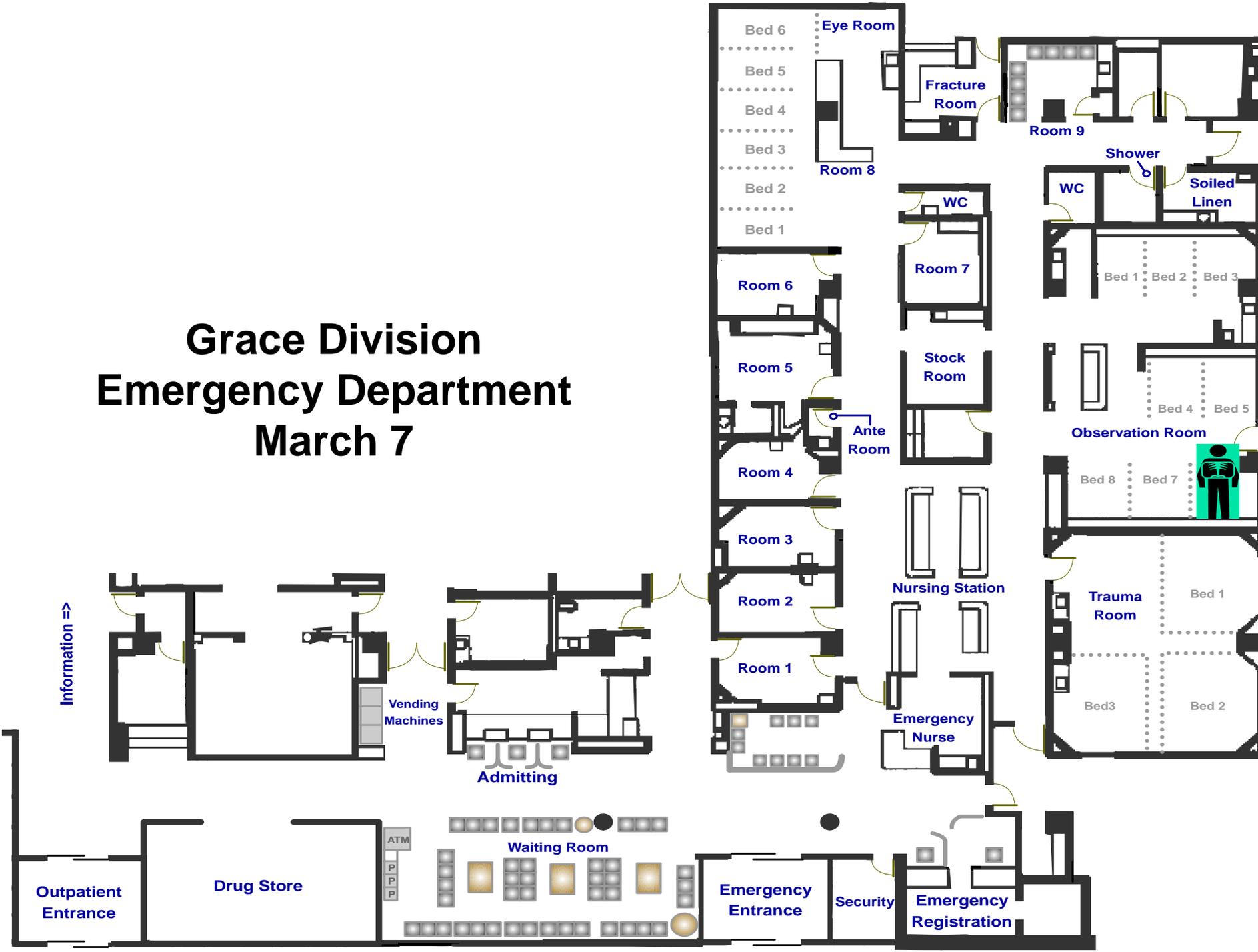
**Mr. T  
(Son)**



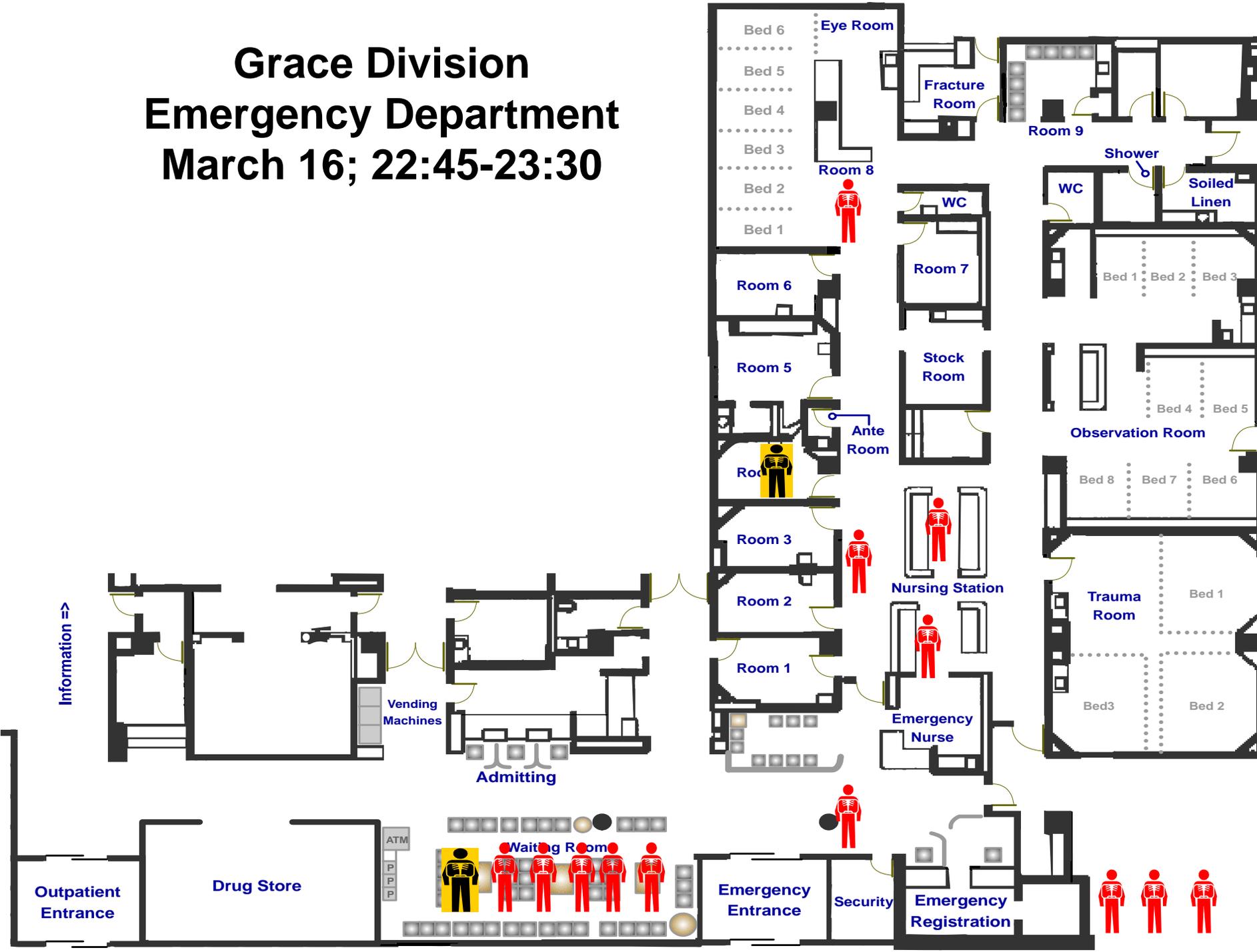
**Admitted to SGH**

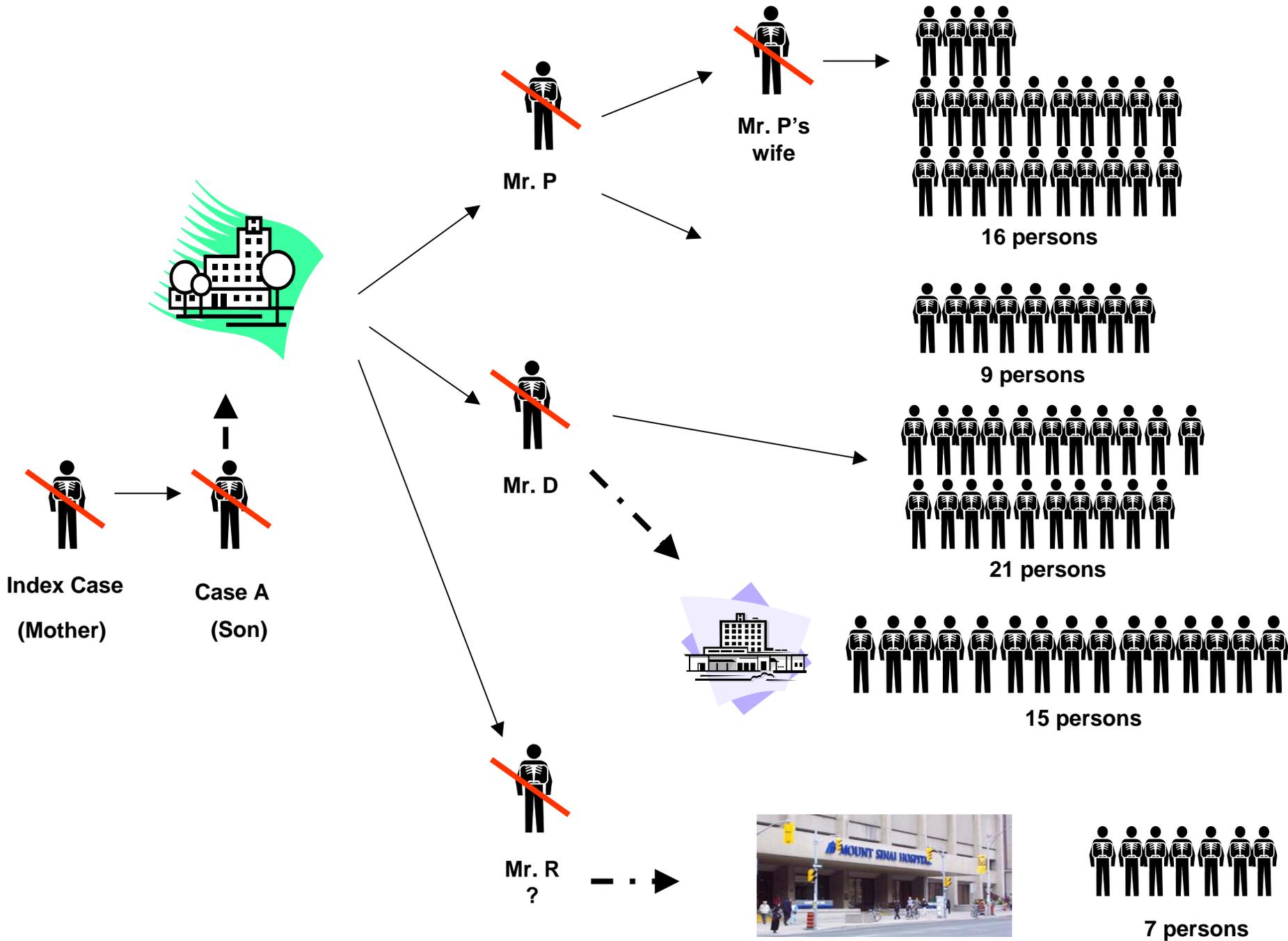
# Grace Division Emergency Department March 7

Information =>



# Grace Division Emergency Department March 16; 22:45-23:30





## Wednesday evening, March 26

- Stopped transfer of patients and staff between health care centers
- Created SARS units in all hospitals
- Restricted access to hospitals including visitors
- Screening of all persons accessing hospitals
- Institution of precautions

# Communicability

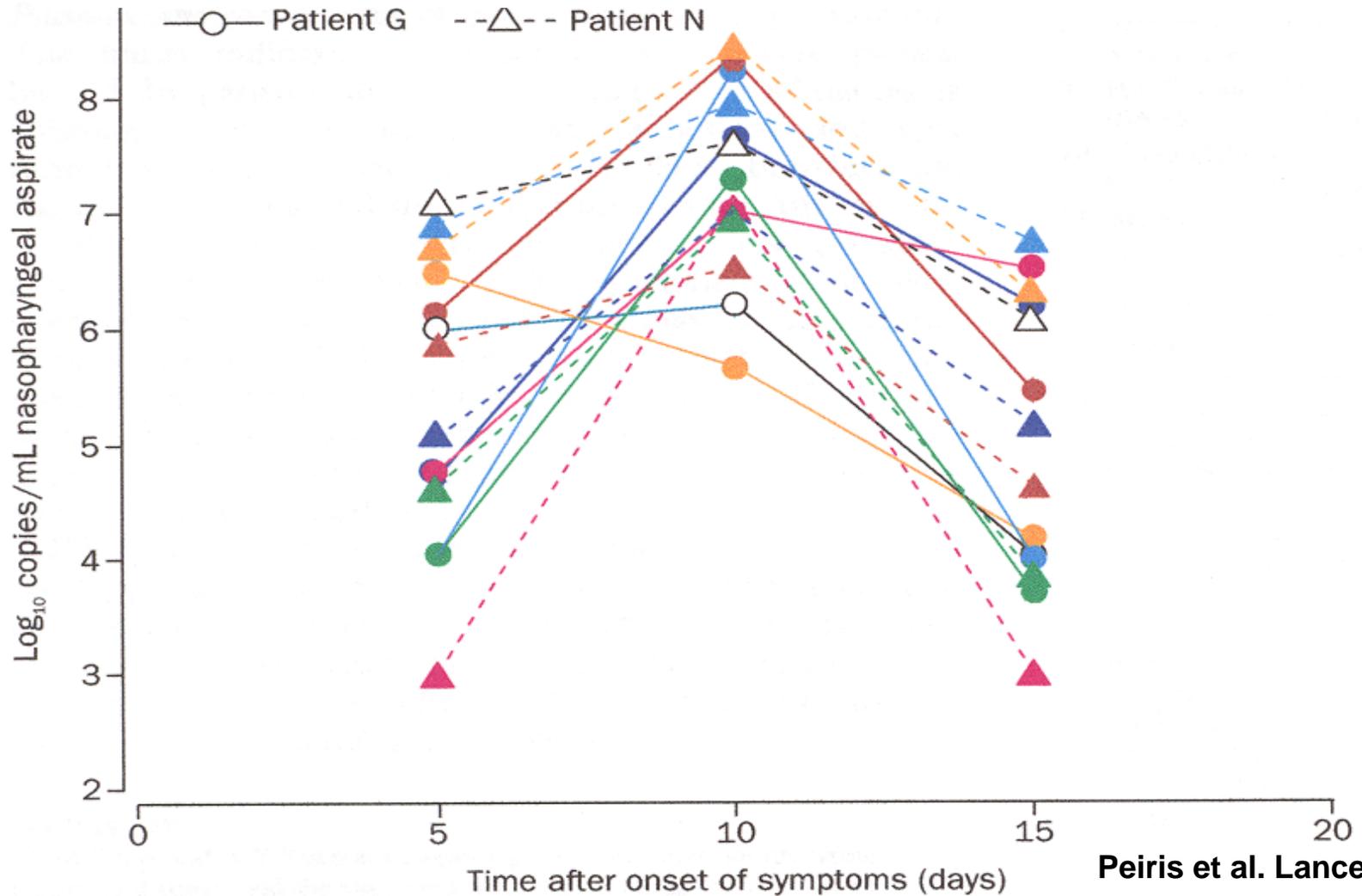
## ■ Patient factors

- Not infectious prior to symptoms
- Increases with increased severity of disease
- Increases post-onset symptoms (peak at day 7-10)
- Not infectious after recover
- No evidence of prolonged carriage or relapse

## ■ Setting

- Duration, degree of contact
- Contact with airway (?contact with stool)

# Communicability is heterogeneous: time in disease course



# PCR: Time to positive

Onset (days)	NPA / TNS N=392	Stools N=50
	% positive	%positive
0 – 2	31	0
3 – 5	43	57
6 – 8	60	86
9 – 11	57	90
12 – 14	59	100
15 – 17	35	33
18 – 20	18	60
21 – 23	13	43

# Communicability

## ■ Patient factors

- Not infectious prior to symptoms
- Increases with increased severity of disease
- Increases post-onset symptoms (peak at day 7-10)
- Not infectious after recover
- No evidence of prolonged carriage or relapse

## ■ Setting

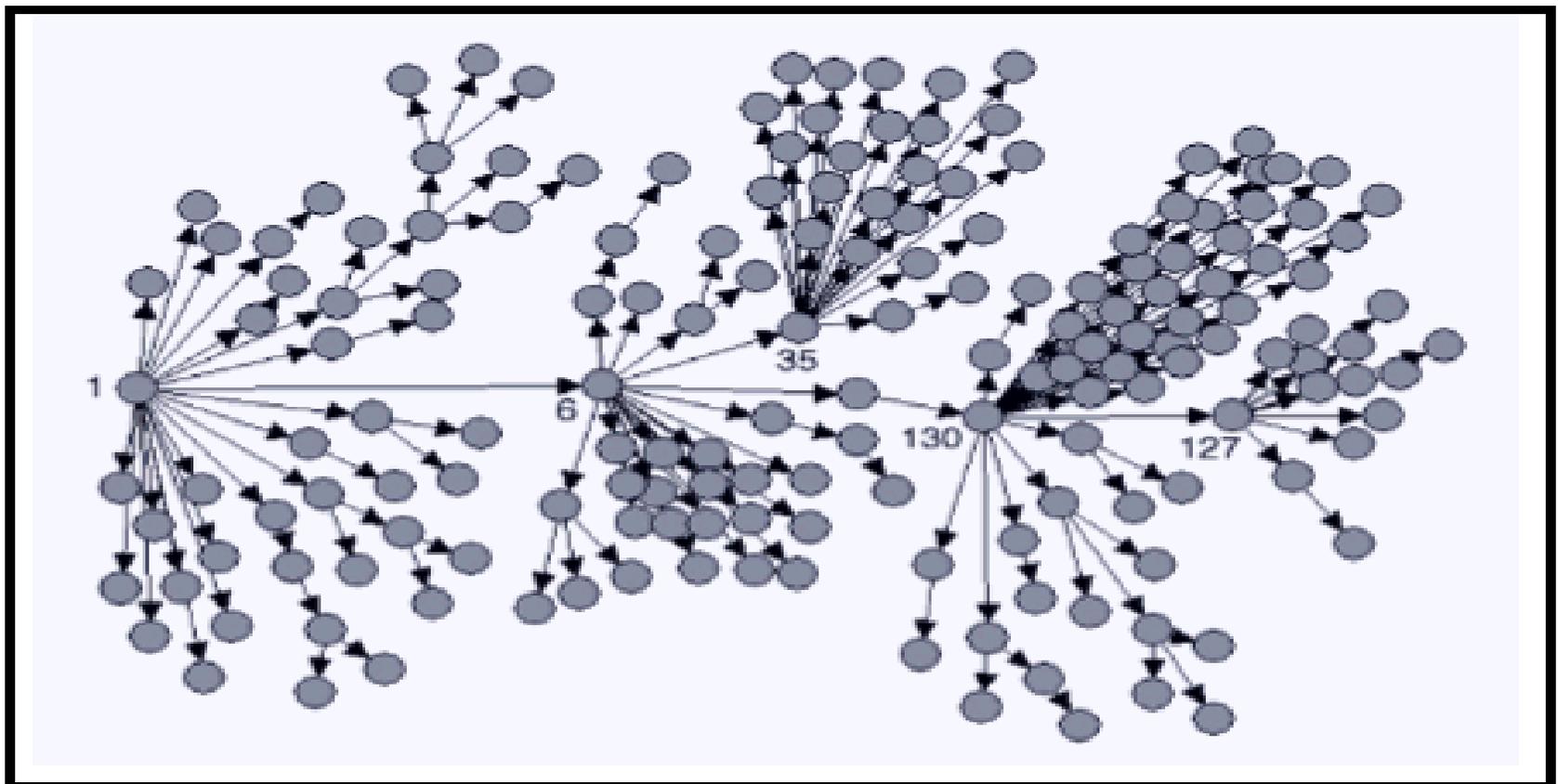
- Duration, degree of contact
- Contact with airway (?contact with stool)

# Exposure Risk in ICU

- Loeb et al. (ICAAC 2003)
  - 8/32 entering room vs 0/11 others (P=0.09)
  - Risks: assisting with intubation RR=4.2 (1.6, 11)
  - suctioning prior to intubation RR=4.2 (1.6,11)
  - manipulation O<sub>2</sub> mask RR=9.0 (1.3,65)
- Scales et al. (ICAAC 2003)
  - 6/31 entering room vs. 1/38 others RR=8.8 (1,420)
  - Risks: in room for >4 hrs RR=24 (1.2,311)
  - present >30min with NIV RR=105 (3,3000)

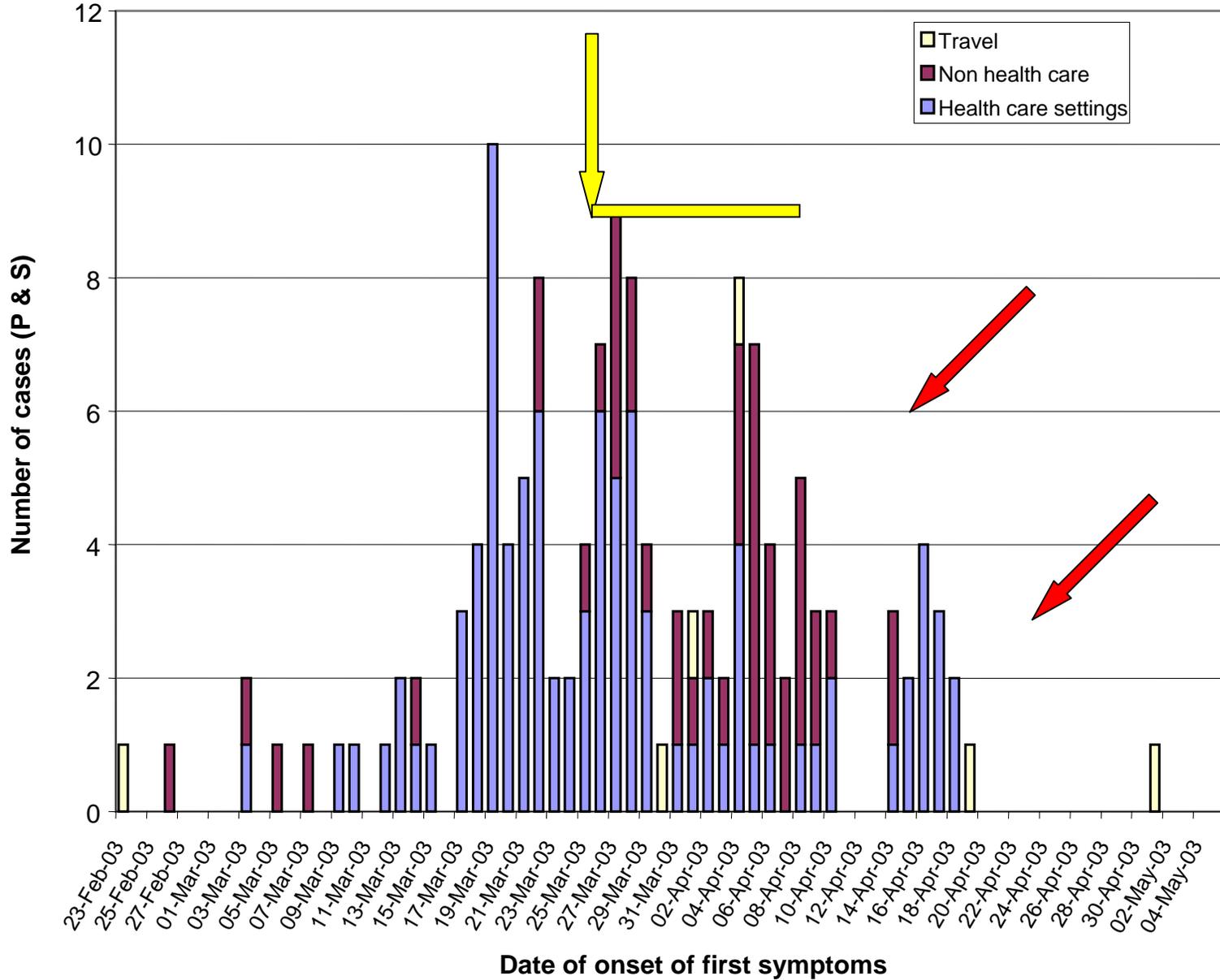
# Communicability is heterogeneous: the patient

**FIGURE 2. Probable cases of severe acute respiratory syndrome, by reported source of infection\* — Singapore, February 25–April 30, 2003**



# SARS Control

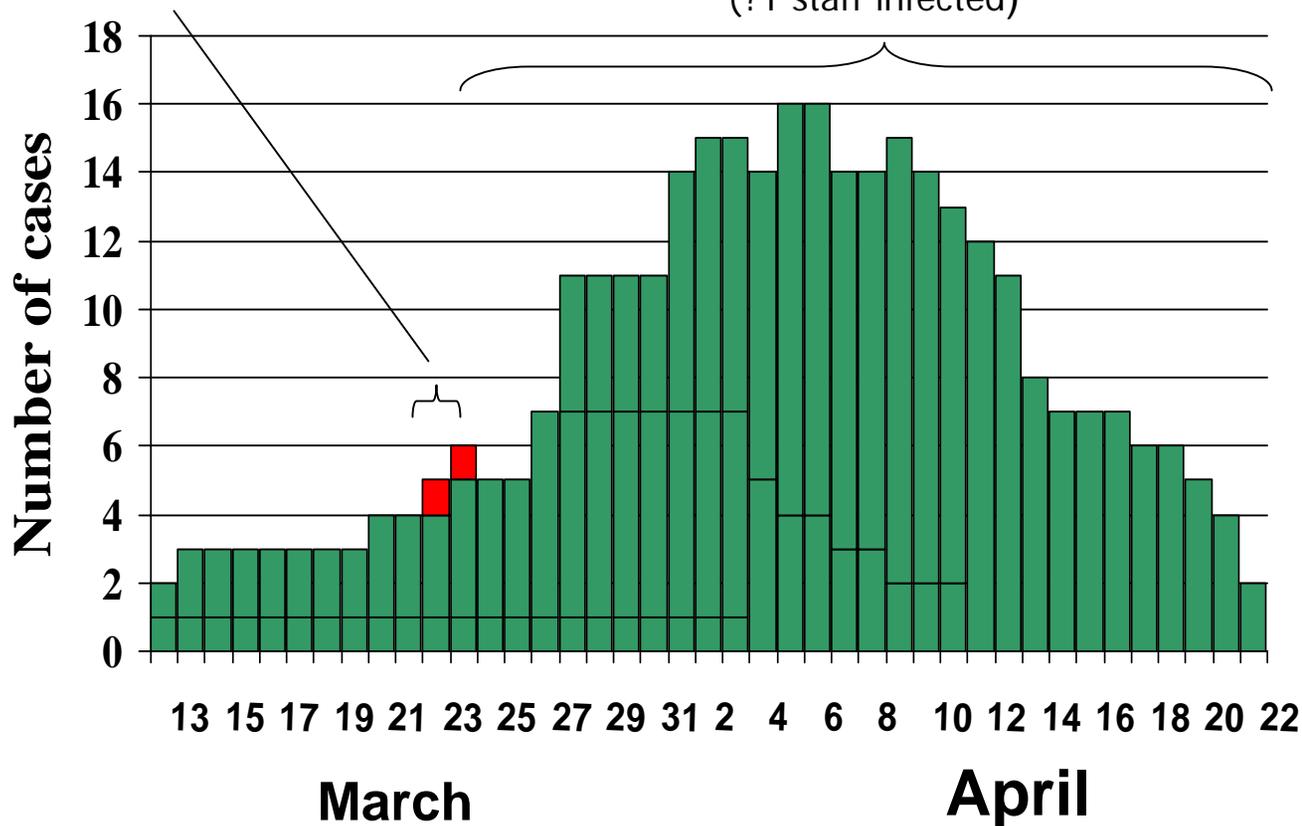
- Identification of cases
- Isolation/quarantine

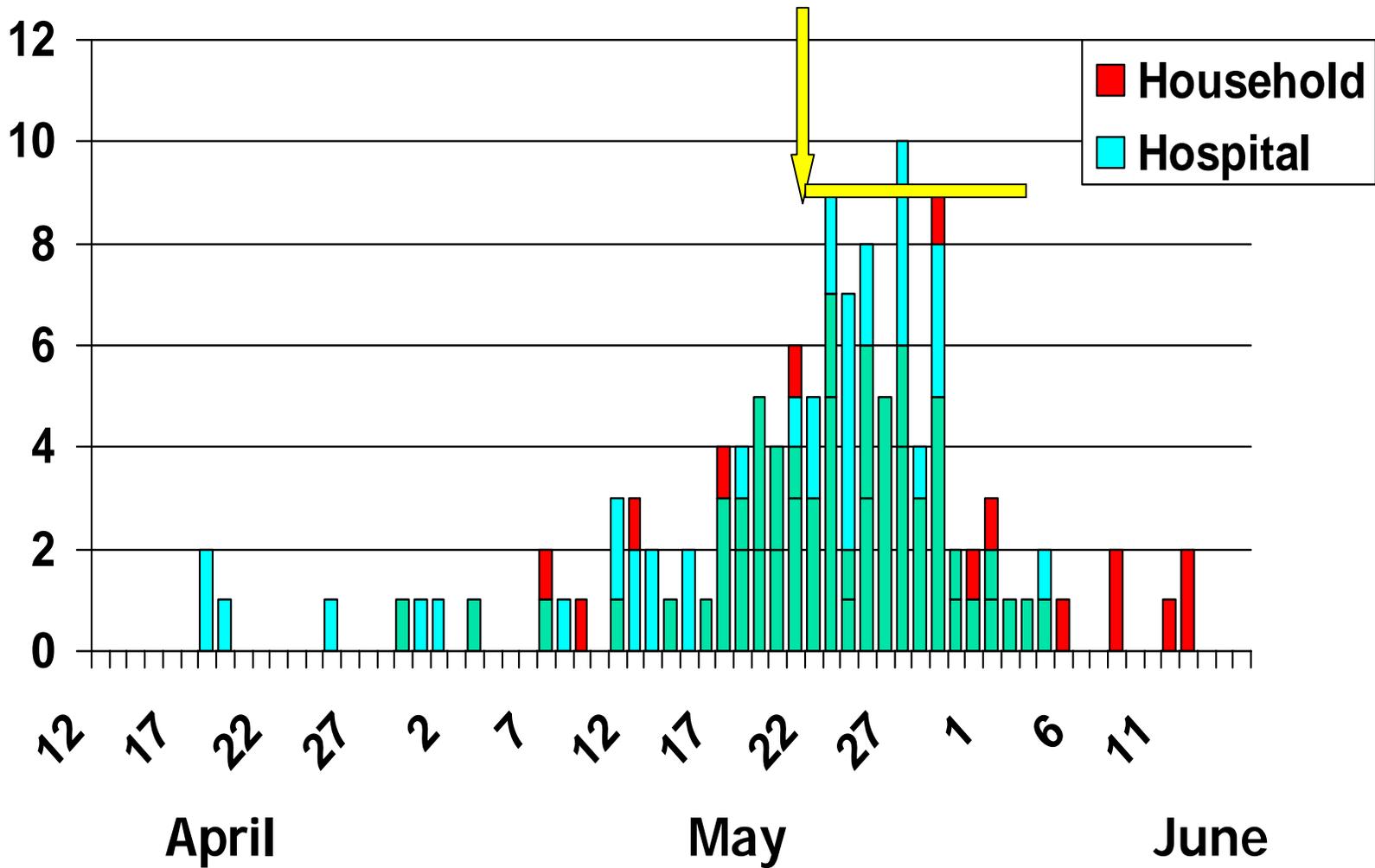


# Number of SARs hospitalization days Mount Sinai Hospital

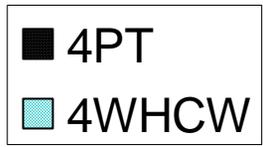
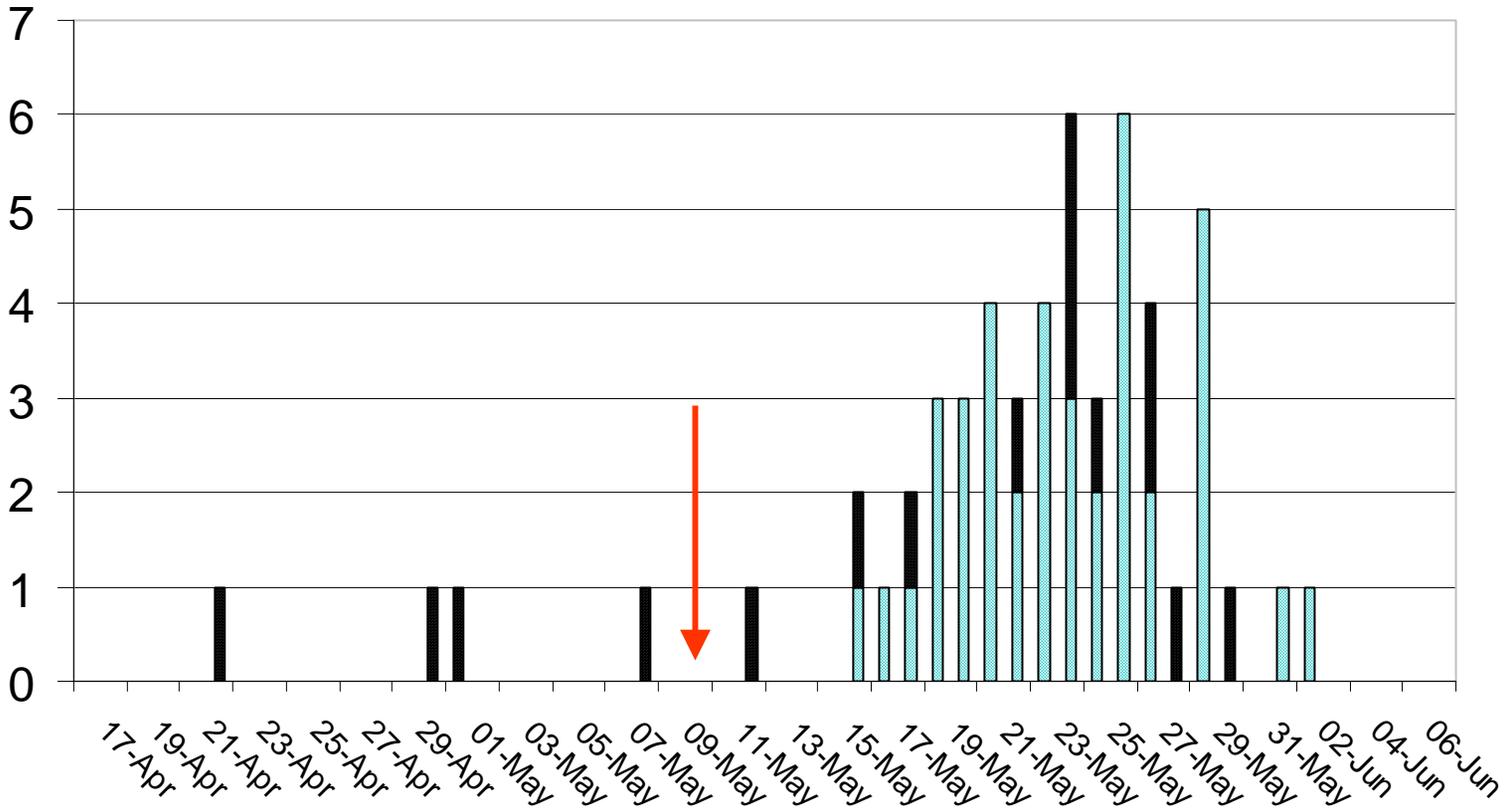
31 hours of unprotected exposure  
(7 staff infected)

338 days of protected exposure  
(?1 staff infected)





# NYGH-4W- June 6



# Impact on NYGH

- HCWs 39
- Patients 30
- Visitors 18

# Effectiveness of Precautions

- Seto *et al.* Lancet 2003: Case (n=13)/Control (241)
  - Lower risk with handwashing OR 0.2 (.07,1)
  - Lower risk with gloves OR 0.5 (.14,1.6)
  - Lower risk with gown OR undef (P=.006)
  - Lower with masks OR 0.08 (.02,.33)
- Loeb et al. ICAAC 2003: Cohort (43 nurses, 8 infected)
  - Lower risk with gloves OR 0.45 (.44, 4.5)
  - Lower risk with gown OR 0.36 (.10,1.2)
  - Lower risk with masks OR 0.23 (.07,.78)

# Transmission in the setting of any precautions, Toronto

- Phase 1 - 260 patients
  - 22 HCW infected
  - intubation, cardiac arrest, “pre-intubation” care
- Phase 2 – 129 patients
  - 3 HCW infected
  - cardiac arrest, bronchoscopy, “pre-intubation” care

# Differences between Phase 1 and Phase 2

- HCW training and awareness
- “Enhancements”
  - Double gloves, hair & foot covering, greens
- Practice issues
  - Minimize time in room
  - Minimize contact with patient
  - Medical therapy to reduce cough/vomiting
  - Minimize procedures that increase risk of droplets

# Protective Barriers: N95 masks, face shields, gown and gloves



# Conclusions

- Disease driven by exposure
- Transmission
  - Primarily in health care settings
  - Droplet/contact
  - Heterogeneous between patients
- Control
  - Unrecognized patients are the most important problem
  - Precautions include not only barriers, but also practice
  - Compliance with precautions is critical

# Acknowledgements

**Allison McGeer and Karen Green  
The staff and patients of greater  
Toronto area hospitals and public  
health departments**