NYU Langone Health

Infection Prevention in the Covid-19 Era: What to Focus on for the Future

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APIC Greater NY and Long Island Chapter Fall Conference

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Disclosures

- No financial and non-financial disclosures
- These ideas are mine alone, not official policy

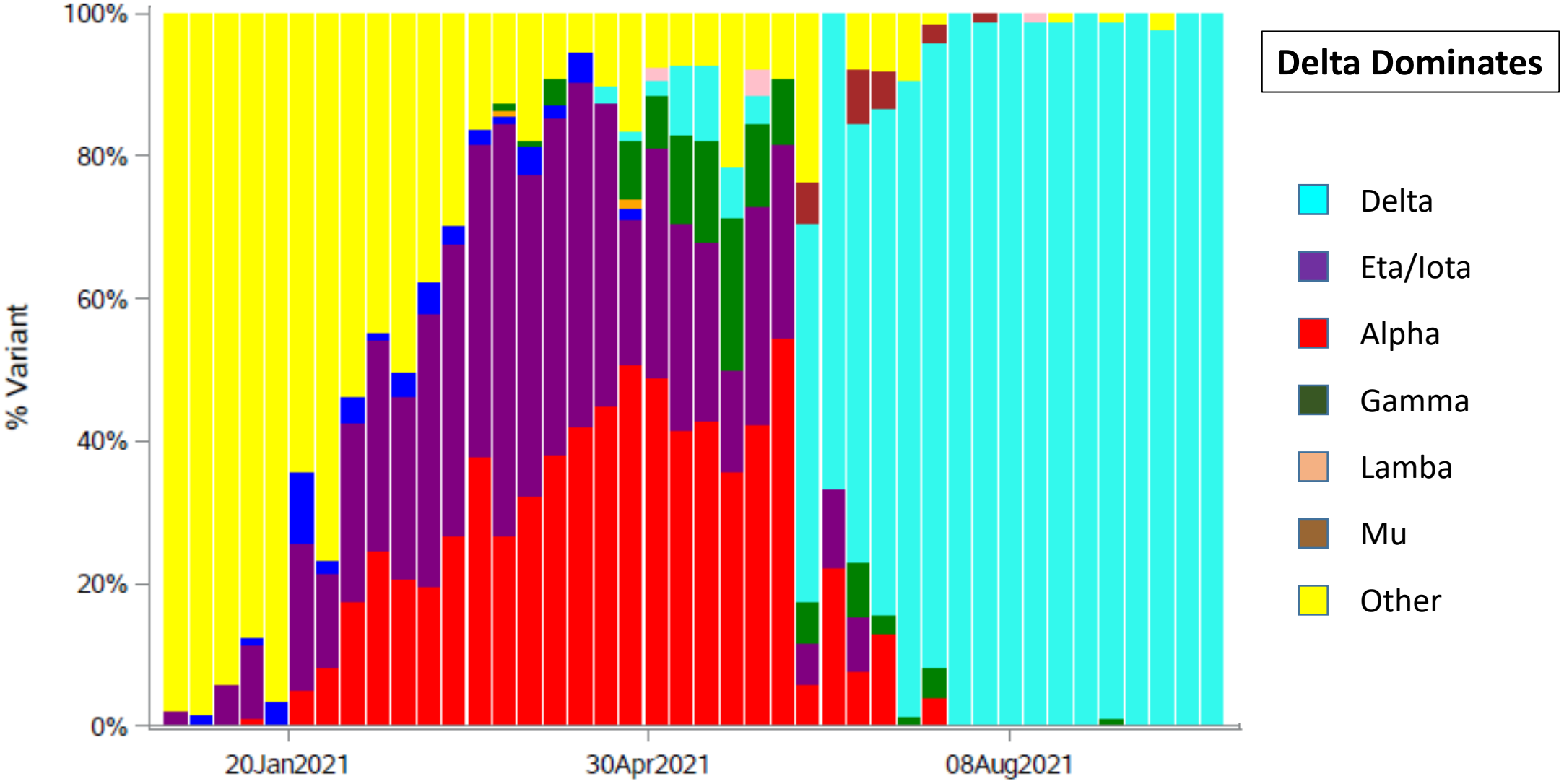
Three Areas of Focus

1. Surveillance
2. Respiratory protection
3. Teamwork

Surveillance

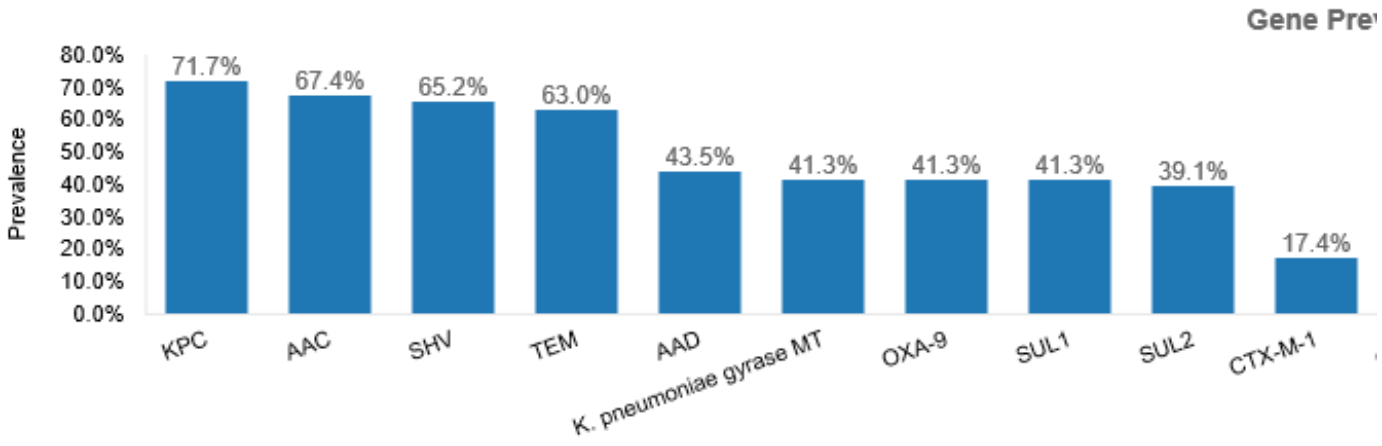
1. Incorporate molecular diagnostics
2. Build electronic data systems and communicate widely
3. Embrace predictive analytics

NYULH Covid-19 Variant Surveillance



But regional surveillance is a critical need!

NYSDOH Pilot Project: Technology and Genomic Microbiology Platform for State-Wide Surveillance and Control of Antimicrobial Resistance



CSV Excel Show entries Note: D = Detected

Plate ID	Sample ID	Run Date/Time	Facility Name	Sample Type	E. coli
H9H0397F	S679693	2020-10-07 14:44:22 EDT	NYU Langone Hospitals Center	Isolate	-
H9H0397F	T283829	2020-10-07 14:44:22 EDT	NYU Langone Hospitals Center	Isolate	-
H9H0397F	X501870	2020-10-07 14:44:22 EDT	NYU Langone Hospital - Brooklyn	Isolate	-
H9H0397F	T301469	2020-10-07 14:44:22 EDT	NYU Langone Hospitals Center	Isolate	-

Molecular testing identifies pathogens of interest

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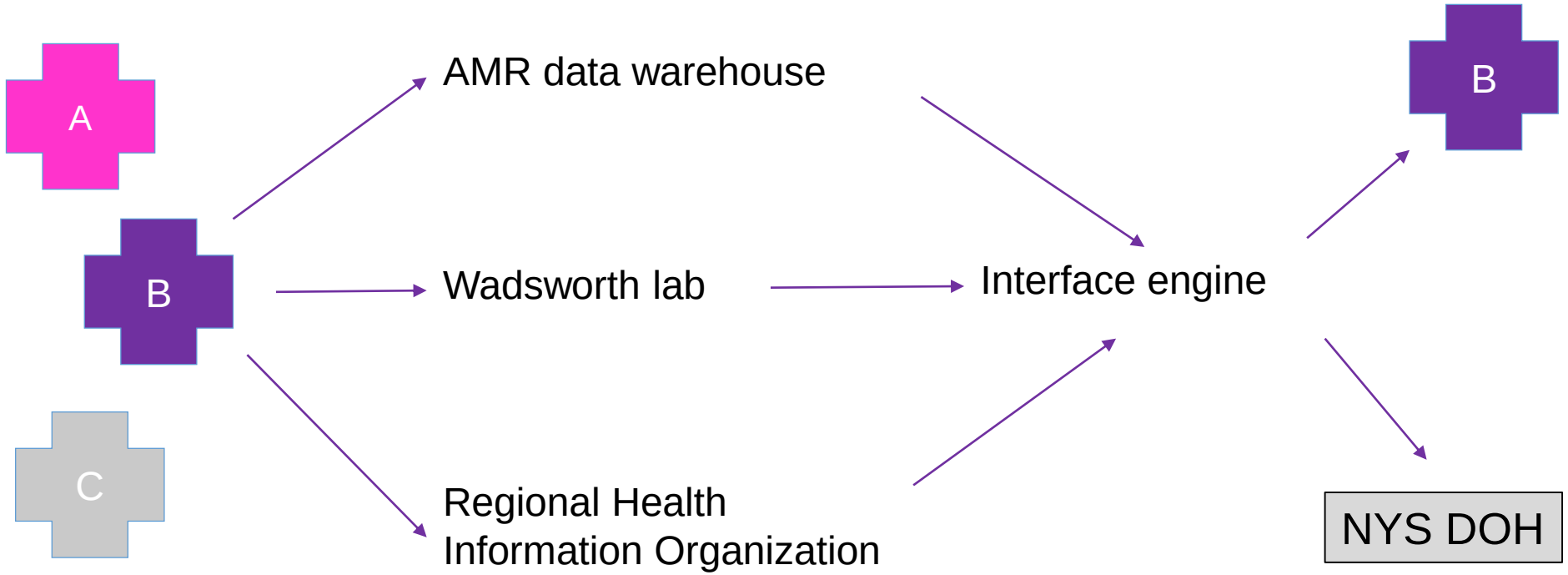
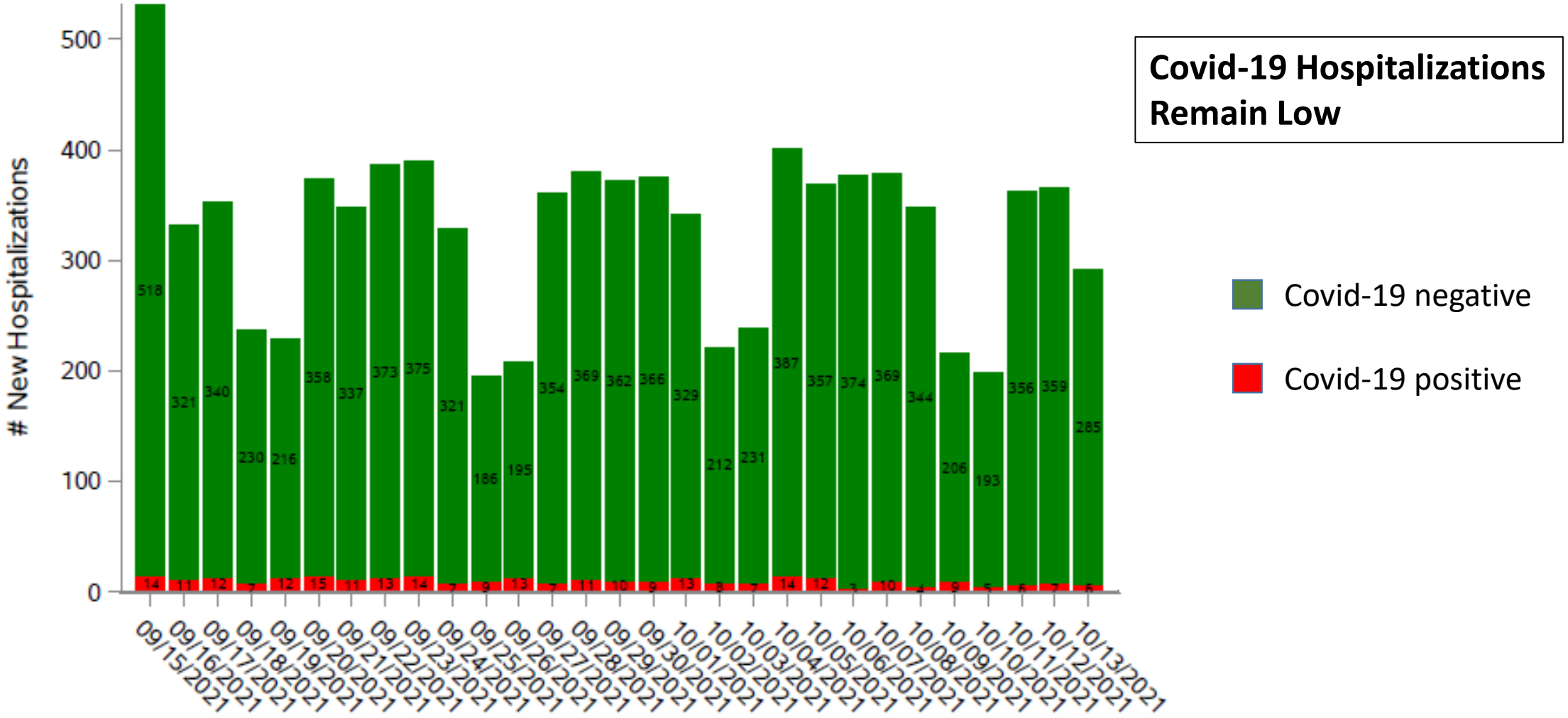


DOH identifies clusters and trends

Facility B notified when patient admitted with pathogen of interest isolated at Facility A or C

NYULH Hospital Admissions



Covid-19 Hospitalizations Remain Low

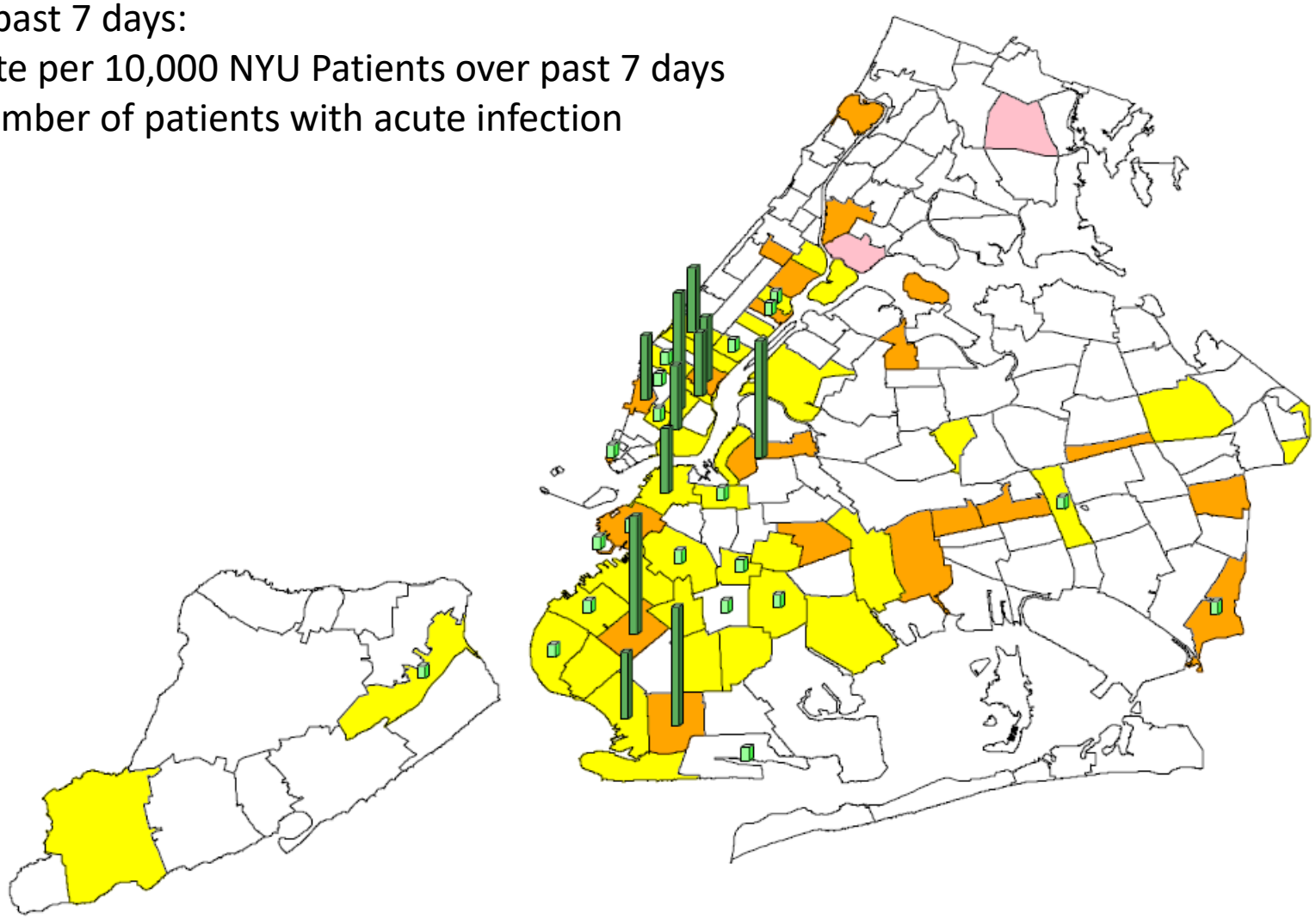
Covid-19 negative

Covid-19 positive

Covid-19 Rate by Patient Zip Code

Over past 7 days:

- Rate per 10,000 NYU Patients over past 7 days
- Number of patients with acute infection



# of patients with low Covid-19 PCR cycle threshold

1 2-3

Covid-19 rate/10,000 patients

0 1 2-3 4-6

As of October 14, 2021

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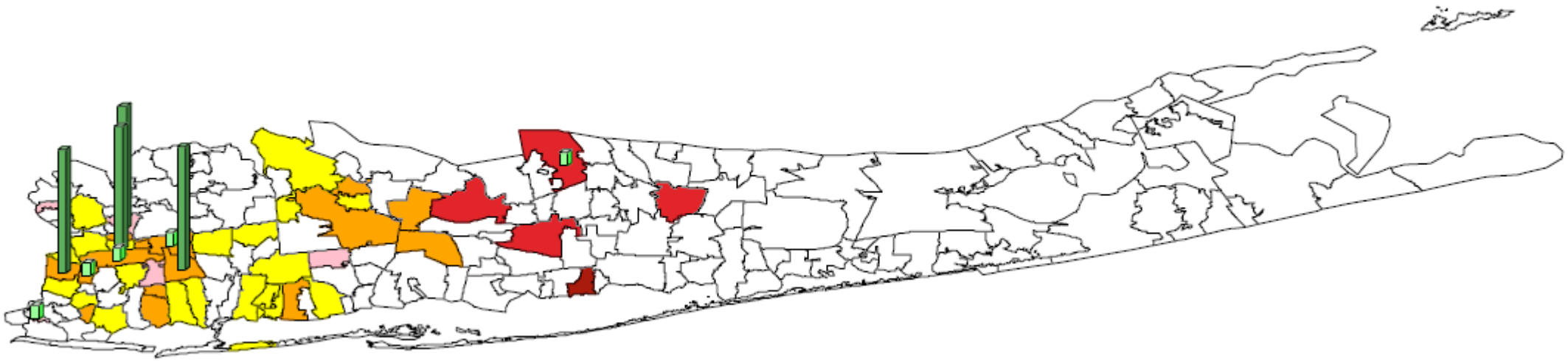

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Covid-19 rate/10,000 patients

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As of October 14, 2021

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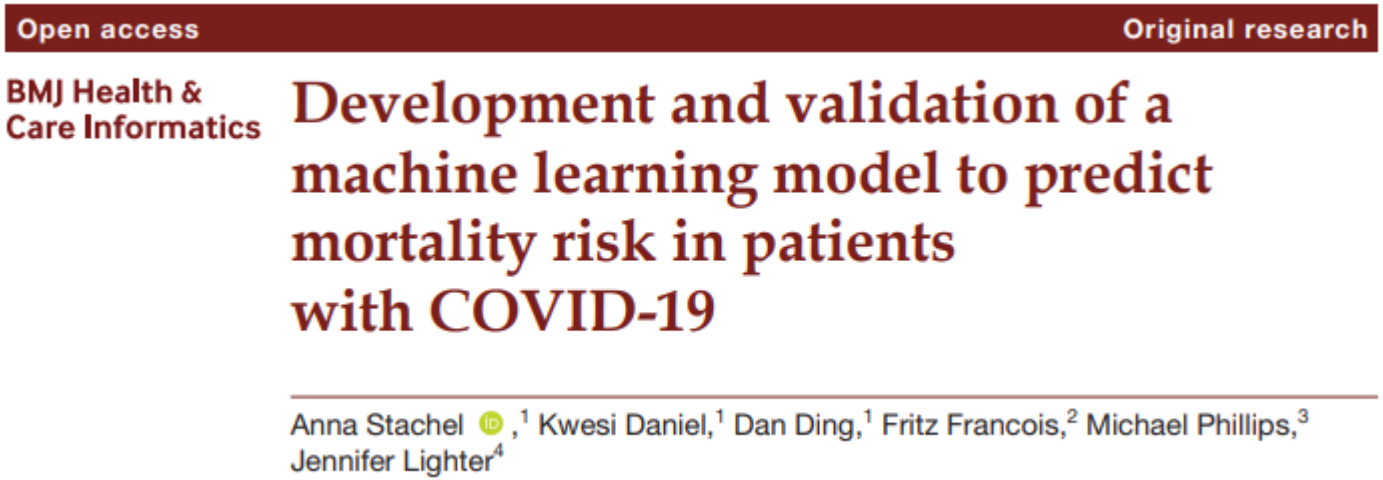

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Open Forum Infectious Diseases

MAJOR ARTICLE

IDSA Infectious Diseases Society of America hivma hiv medicine association OXFORD

Using Machine Learning and the Electronic Health Record to Predict Complicated *Clostridium difficile* Infection

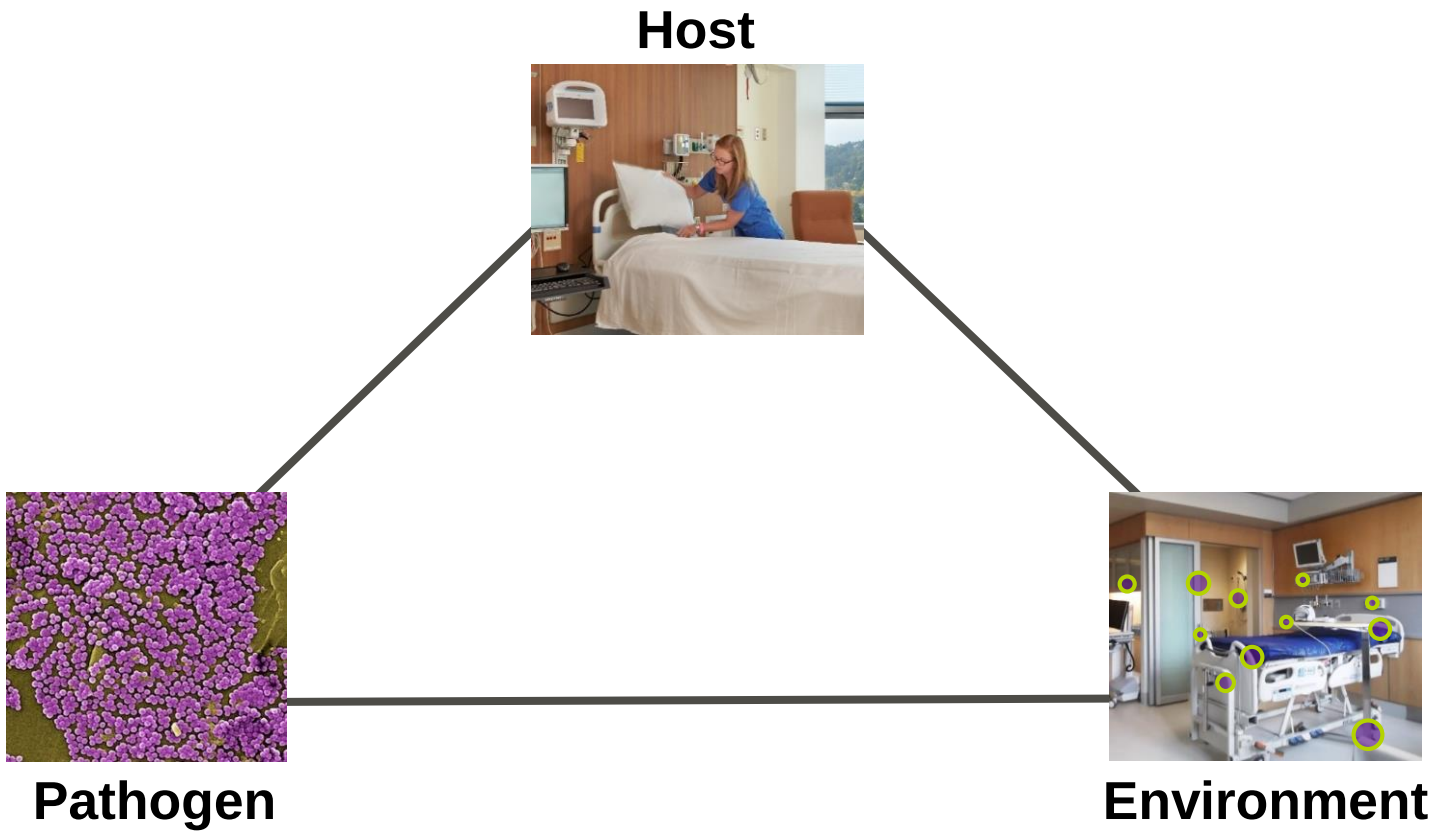
Benjamin Y. Li,[1] Jeeheh Oh,[1] Vincent B. Young,[2,3] Krishna Rao,[2,a] and Jenna Wiens[1,a]

[1]Department of Electrical Engineering and Computer Science, [2]Department of Internal Medicine/Division of Infectious Diseases, and [3]Department of Microbiology and Immunology, University of Michigan, Ann Arbor, Michigan

Respiratory Protection

1. Question the dogma: airborne vs droplet
2. Can we get to a simple and safe approach?
3. Personal Protective Equipment training: our new annual health assessment

Epidemiologic triangle



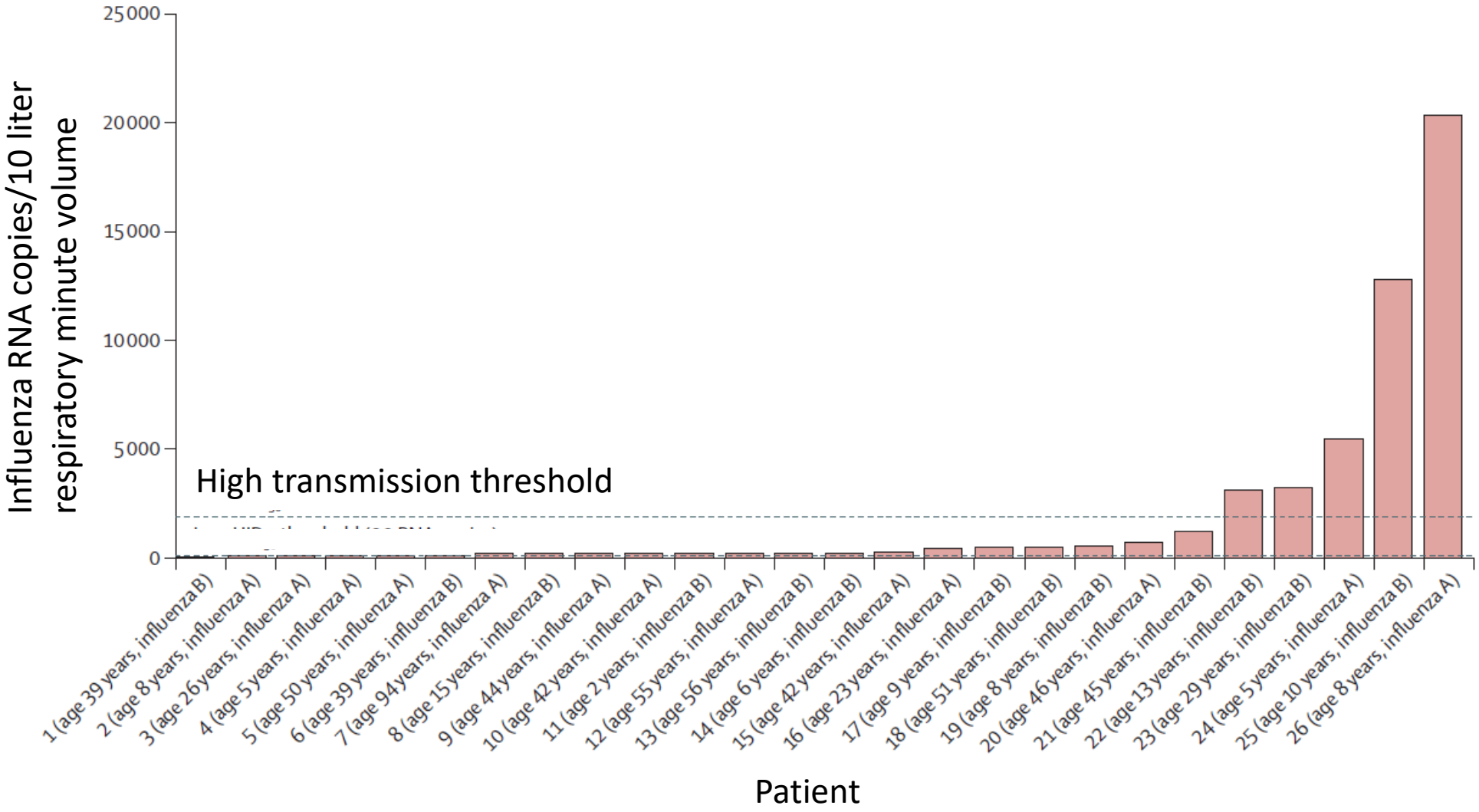
Type and Duration of Precautions Recommended for Selected Infections and Conditions[1]

Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings (2007)

Appendix A: updates in September 2018

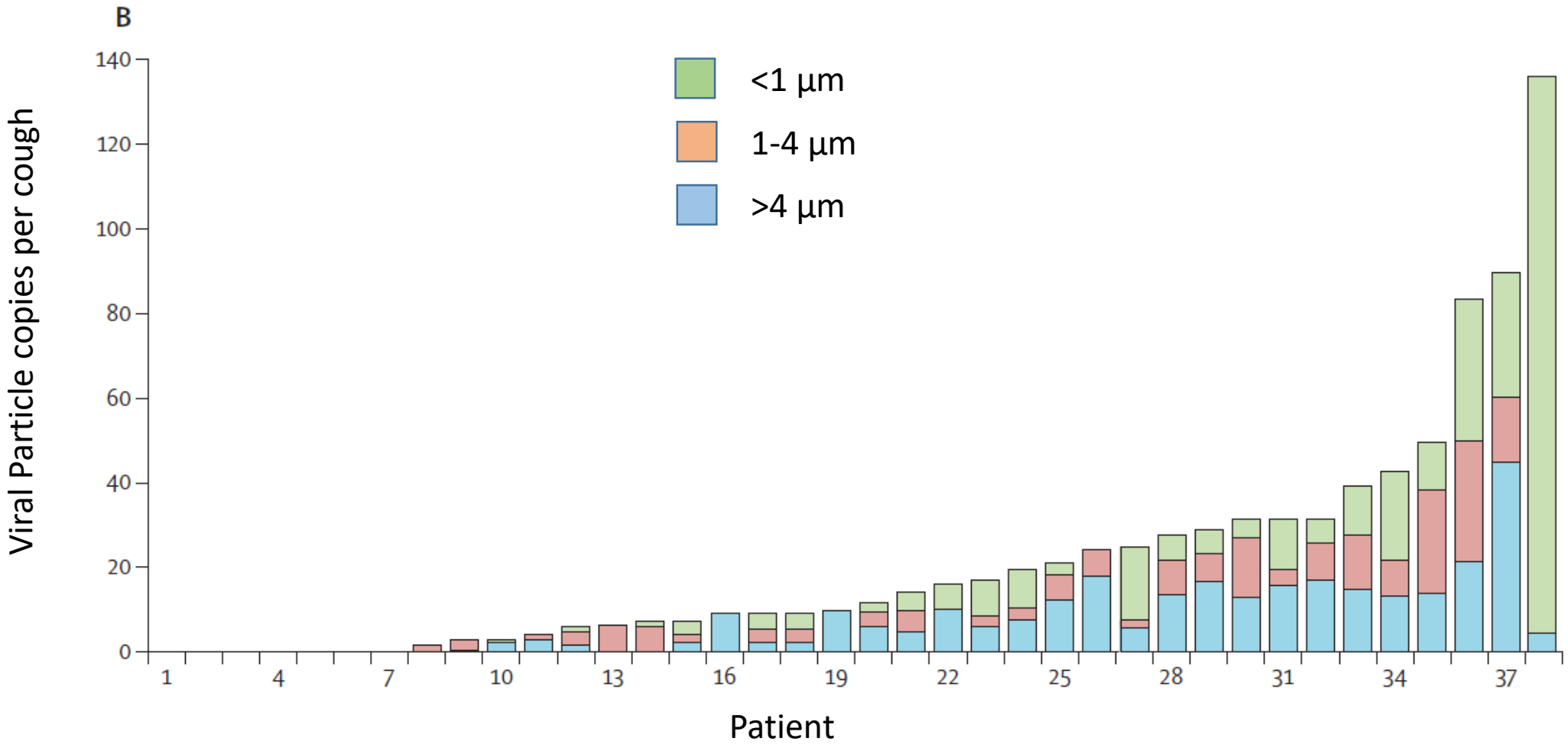
Respiratory virus	Isolation Precautions
Adenovirus	Droplet+Contact
Coronavirus (not Covid-19, SARS, MERS)	Standard
Covid-19, SARS, MERS	Airborne+Contact
Enterovirus	Standard
Human metapneumovirus	Contact
Parainfluenza	Contact (kids)
Pathogenic or novel influenza	Airborne
Rhinovirus	Droplet
RSV	Contact (kids, immunocompromised adults)
Seasonal influenza	Droplet
Pneumonia, viral, adults, not covered elsewhere	Standard

Exposure to Influenza Virus Aerosols During Routine Patient Care



Bischoff et al, JID, 2013

Measurements of Airborne Influenza Virus in Aerosol Particles from Human Coughs

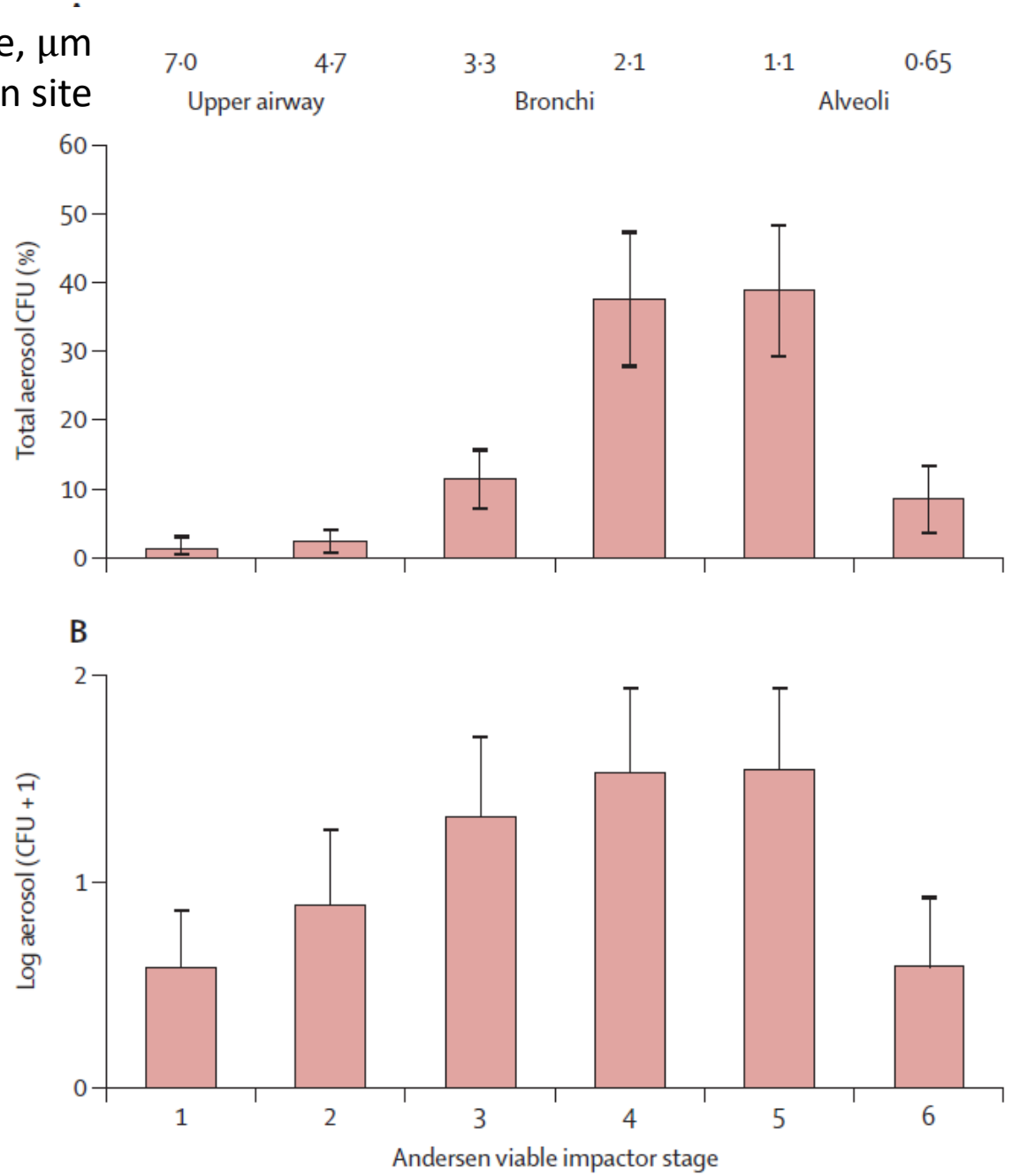


Lindsley et al, PLOSone, 2010

Particle size, µm
Anatomical deposition site

M. tuberculosis

Cystic fibrosis, *P. aeruginosa*



Fennelly, Lancet Resp Med, 2020

What is an aerosol generating procedure?

VII. Aerosol Generating Procedures and Environmental Controls

1. Aerosol generating procedures.
    a. The CDC definition of an aerosol generating procedures is:
        i. Endotracheal intubation or extubation
        ii. Non-invasive and manual ventilation such as BiPAP, CPAP or bag valve mask ventilation
        iii. CPR
        iv. Bronchoscopy
        v. Sputum induction
        vi. Open suctioning of airways
    b. The NYULH definition of an aerosol generating procedure includes those defined by the CDC plus the following:
        i. Administration of nebulized medication not in closed respiratory circuits
        ii. High flow oxygen delivery
        iii. Tracheostomy collar oxygen delivery
        iv. Oral, airway and sinus surgery
        v. Dental cleaning
        vi. Pulmonary function testing or spirometry
        vii. Nasopharyngeal and upper GI endoscopy
        viii. Activities when a patient not consistently wearing a face mask is breathing heavily or coughing, such as:
            1. Exercise stress testing
            2. Cardiac rehabilitation therapy
            3. Metabolic testing
            4. Swallow studies

Can we get to a simple and safe approach to respiratory protection?

Assumptions:

- Aerosol generation by patients is variable, but “superspreading” occurs and may include particles <5 µm in size
- The full spectrum of aerosol generating procedures is unknown
- The epidemiologic triangle can help us determine risk:
  - Is the microbe pathogenic?
  - Is the host at risk?
  - Is the environment promoting transmission?

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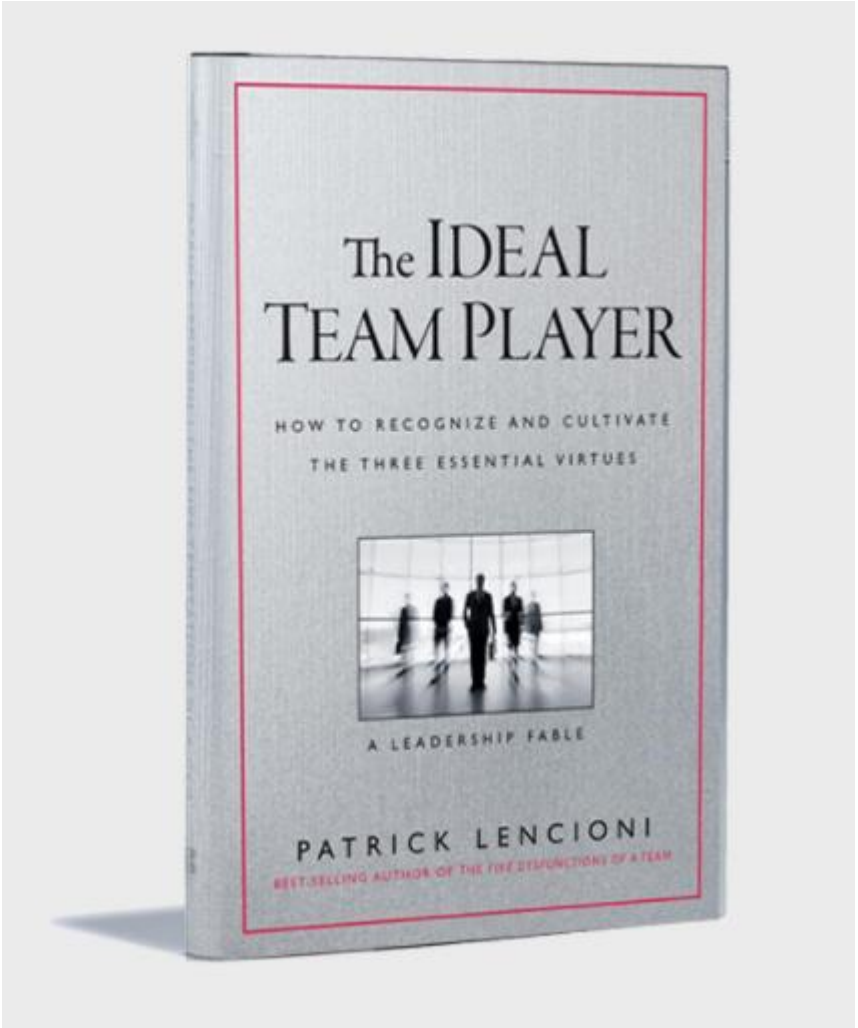
If the answer is yes:

- Perhaps the simplest and safest approach is respirators (not masks) for PPE
- Respirator (and PPE) training should be a key annual health assessment

Teamwork



Patrick Lencioni

Teamwork

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    - Be confident of our abilities and expertise
    - Define success collectively
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    - Think about the next step
3. Smart
    - Have good “common sense” about people
    - Understand group dynamics
    - Listen and ask good questions

Thank you!