Access speaker bios here: https://files.asprtracie.hhs.gov/documents/special-pathogens-webinar-speaker-bios.pdf

Access the recording here: https://attendee.gotowebinar.com/recording/3960632069915707011

Access the transcript here: https://files.asprtracie.hhs.gov/documents/special-pathogens-webinar-transcript-final.pdf

TRACIE

HEALTHCARE EMERGENCY PREPAREDNESS INFORMATION GATEWAY

Infection Prevention and Control: Incorporating Lessons Learned in Managing Special Pathogens

November 7, 2022

NETEC

ASPR
Administration for Strategic Preparedness and Response

The opinions expressed in this presentation and on the following slides by non-federal government employees are solely those of the presenter and not necessarily those of the U.S. Government. The accuracy or reliability of the information provided is the opinion of the individual organization or presenter represented.

TRACIE

HEALTHCARE EMERGENCY PREPAREDNESS
INFORMATION GATEWAY

Rachel Lehman
Acting Program Director, ASPR TRACIE

ASPR
ADMINISTRATION FOR STRATEGIC PREPAREDNESS AND RESPONSE

ASPR Key Priorities

To meet the nation's health/medical needs, ASPR is focused on three key priorities:

1. Extend capabilities to respond well and emerge from the COVID-19 pandemic better
2. Restore resources and capabilities diminished during the pandemic
3. Prepare for future emergencies whether natural or man-made

ASPR TRACIE: Three Domains

TECHNICAL RESOURCES

- Self-service collection of audience-tailored materials
- Subject-specific, SME-reviewed "Topic Collections"
- Unpublished and SME peer-reviewed materials highlighting real-life tools and experiences

asprtracie.hhs.gov

ASSISTANCE CENTER

- Personalized support and responses to requests for information and technical assistance
- Accessible by toll-free number (1844-5-TRACIE), email (askasprtracie@hhs.gov), or web form (ASPRtracie.hhs.gov)

1-844-5-TRACIE

INFORMATION EXCHANGE

- Area for password-protected discussion among vetted users in near real-time
- Ability to support chats and the peer-to-peer exchange of user-developed templates, plans, and other materials

askasprtracie@hhs.gov

TRACIE
HEALTHCARE EMERGENCY PREPAREDNESS
INFORMATION GATEWAY

John Hick, MD
Hennepin Healthcare & ASPR TRACIE
Moderator

ASPR
ADMINISTRATION FOR STRATEGIC PREPAREDNESS AND RESPONSE

Speakers and Topics

- **COVID-19 Pandemic: Lessons Learned for** Special **Pathogens Patient Management:** Alexander Isakov
- **Lessons About Respiratory Virus Transmission:** Justin Chan
- **Lessons from COVID-19 Infection Prevention and Control:** James Lawler
- **Adopting COVID-19 Lessons Learned and Best Practices:** Syra Madad

COVID-19 Pandemic: Lessons Learned for Special Pathogens Patient Management

TRACIE
HEALTHCARE EMERGENCY PREPAREDNESS
INFORMATION GATEWAY

Alexander Isakov, MD, MPH
Professor of Emergency Medicine and Executive Director, Emory CEPAR

ASPR
Administration for Strategic Preparedness and Response

COVID-19 Pandemic: Lessons Learned for Special Pathogens Patient Management

- Recognizing the threat and implementing a response
  - **Identify**
    - EMS partnership
    - Signage
    - Just-in-time education + training
  - **Isolate**
    - Hierarchy of controls
      - Isolation space
      - Work practices
        - Bifurcated flow, AGPs, cleaning and disinfection
      - PPE
  - **Inform**
    - Infection prevention, public health

Identify, Isolate, Inform: Assessment, management, and placement of PUI

Self-paced

Enroll Now

NETEC

Health Care Facility Special Pathogen Preparedness Checklist

COVID-19 Pandemic: Lessons Learned for Special Pathogens Patient Management

- Personal protective equipment (PPE)
  - Appropriate PPE identified and available
  - Staff educated and trained on its use
  - Supply chain
  - Donning and doffing practices
  - Complacency and burn-out

NETEC

Personal Protective Equipment Resources

DASH

DISASTER AVAILABLE SUPPLIES IN HOSPITALS

COVID-19 Pandemic: Lessons Learned for Special Pathogens Patient Management

NETEC

- Availability of testing
- Assay performance
- Testing procedures

Test results:

- *Inform infection prevention procedures*
- *Drive PPE consumption*
- *May yield an alternate diagnosis*

Lab Resources

COVID-19 Pandemic: Lessons Learned for Special Pathogens Patient Management

- Health of personnel
  - Health monitoring
  - Quarantine, isolation, return to work guidelines
  - Universal masking
  - Vaccines and vaccine hesitancy

Photo: CDC

COVID-19 Pandemic: Lessons Learned for Special Pathogens Patient Management

- Behavioral and mental health consequences
  - Anxiety
  - Depression
  - Substance abuse
  - Burn-out
  - Workforce turnover

NETEC

Behavioral Health Considerations for Patients and Healthcare Workers

Self-paced

Enroll Now

COVID-19 Pandemic: Lessons Learned for Special Pathogens Patient Management

- What have we learned about operationalizing crisis standards of care?
  - Do we have good thresholds for implementation of crisis standards?
  - Who is at risk? Patients, personnel, both?
  - Do we have a robust evidence base for recommended procedures?
  - How do we prevent erosion of trust and mistrust?
  - What are the mental health consequences?

Original Research | September 2021

Association Between Caseload Surge and COVID-19 Survival in 558 U.S. Hospitals, March to August 2020

Sameer S. Kadri, MD, MS, Junfeng Sun, PhD, Alexander Lawandi, MDCM, MSc, ... See More +

1 in 4 COVID-19 deaths may be related to surge conditions at the hospital rather than to the disease itself

COVID-19 Pandemic: Lessons Learned for Special Pathogens Patient Management

Planning and Coordinated Responses to Avoid Crisis Standards of Care

- Regional structures
- Training and education
- Plans
- Staff
- Space
- Supplies

Maintaining Standards of Care in the Era of Special Pathogens

Radu Postelnicu, Vikramjit Mukherjee, Amit Uppal, and John L. Hick

Published Online: 31 May 2022 | https://doi.org/10.1089/hs.2021.0186

COVID-19 Pandemic: Lessons Learned for Special Pathogens Patient Management

What effect has the focus on COVID-19 had on the nationwide system of care for special pathogens?

The Evolution of the National Special Pathogen System of Care

Vikramjit Mukherjee, Lauren M. Sauer, Aneesh K. Mehta, Sophia Y. Shea, Paul D. Biddinger, Brendan G. Carr, Laura E. Evans, Shelly Schwedhelm, and John J. Lowe

Published Online: 31 May 2022 | https://doi.org/10.1089/hs.2022.0026

COVID-19 Pandemic: Lessons Learned for Special Pathogens Patient Management

One health system – a continuum of care

- Call taking/screening/triage
- Hierarchy of controls
  - Engineering controls
  - Work practices
  - PPE
- Appropriate destination
  - Frontline vs assessment vs treatment center
  - Interfacility
- Alternate care models

EMS Agenda 2050 Meets the COVID-19 Pandemic

Alexander Isakov, Michael Carr, Kevin G. Munjal, Lekshmi Kumar, and Marianne Gausche-Hill

Published Online: 31 May 2022 | https://doi.org/10.1089/hs.2021.0179

Lessons About Respiratory Virus Transmission

TRACIE
HEALTHCARE EMERGENCY PREPAREDNESS
INFORMATION GATEWAY

Justin Chan, MD MPH
Director, Infection Prevention & Control, NYC Health + Hospitals/Bellevue
Assistant Professor of Medicine, NYU Grossman School of Medicine

ASPR
ADMINISTRATION FOR STRATEGIC PREPAREDNESS AND RESPONSE

Case Study #1

Morbidity and Mortality Weekly Report

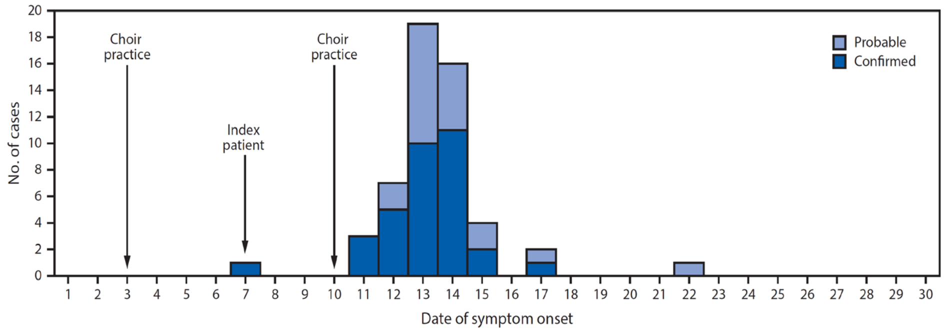
High SARS-CoV-2 Attack Rate Following Exposure at a Choir Practice — Skagit County, Washington, March 2020

Lea Hamner, MPH[1]; Polly Dubbel, MPH[1]; Ian Capron[1]; Andy Ross, MPH[1]; Amber Jordan, MPH[1]; Jaxon Lee, MPH[1]; Joanne Lynn[1]; Amelia Ball[1]; Simranjit Narwal, MSc[1]; Sam Russell[1]; Dale Patrick[1]; Howard Leibrand, MD[1]

March 2020

- 122 choir members met for 2.5-hour indoor practice once weekly through March 10
- 61 members attended March 10 practice; 1 index case known to be symptomatic
- 53 cases **(87% secondary attack rate)**
- 3 (5.7%) hospitalized, 2 (3.8%) died

FIGURE. Confirmed* and probable† cases of COVID-19 associated with two choir practices, by date of symptom onset (N = 53) — Skagit County, Washington, March 2020



Source: Hamner L et al, MMWR Morb Mortal Wkly Rep 2020;69(19):606-610.

Case Study #2

March 1977

- 53 passengers in Homer, AK
- During takeoff, engine failed
- Most waited on the airplane for 4.5 hours with doors closed and ventilation system off
- 1 index case became ill 15 minutes after boarding
- 38 cases **(72% secondary attack rate)**, 4 (11%) required hospitalization

AMERICAN
Journal of Epidemiology
Formerly AMERICAN JOURNAL OF HYGIENE

VOL. 110 JULY, 1979 NO. 1

Original Contributions

AN OUTBREAK OF INFLUENZA ABOARD A COMMERCIAL AIRLINER

MICHAEL R. MOSER,[1] THOMAS R. BENDER,[1] HAROLD S. MARGOLIS,[1] GARY R. NOBLE,[2] ALAN P. KENDAL[2] AND DONALD G. RITTER[3]

TABLE 2

*Association of clinical influenza with time spent on delayed airliner, Homer, Alaska, March, 1977**

Time (hours)	No.† (ill/at risk)	Attack rate (%)
<1	8/15	53
1–3	5/9	56
>3	25/29	86

* $\chi^2 = 6.657$ ($p < 0.05$).

Source: Moser MR et al, Am J Epidemiol 1979;110(1):1-6.

Lessons from Case Studies

- High attack rate from aerosol transmission of a respiratory virus:
  - Crowded indoor venue
  - Poor ventilation
  - Long duration
  - Loud vocalization (in case # 1)

Wells-Riley infection model

$$P = 1 - e^{-Iqpt/Q}$$

P = probability of airborne infection

I = number of infectors

q = quanta (infectious dose) generation rate (quanta per hour)

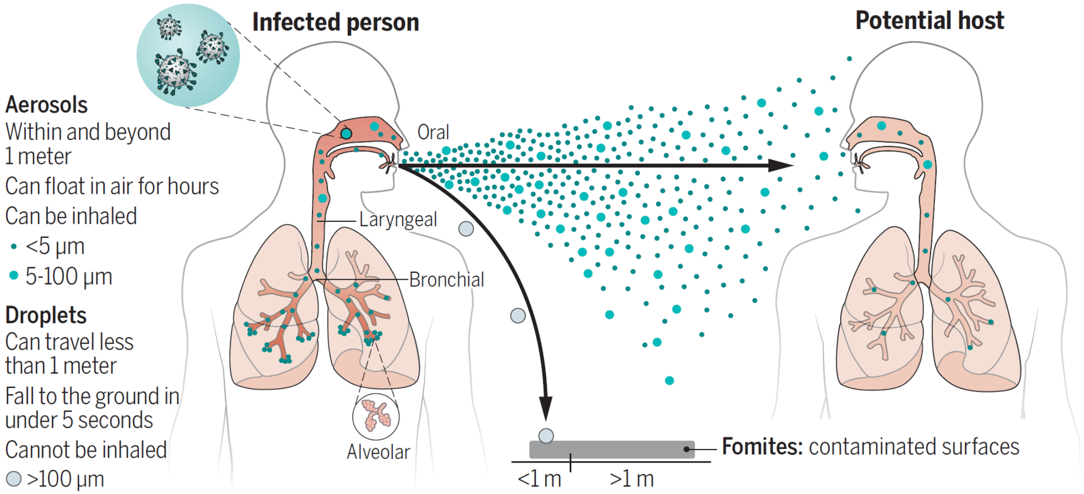
p = pulmonary ventilation rate of susceptible individual (cubic meters per second)

t = exposure time (hours)

Q = room ventilation rate (cubic meters per second)

Source: Riley EC et al, Am J Epidemiol 1978;107:421-432.

Droplets vs. Aerosols



Phases involved in airborne transmission of respiratory viruses. Virus-laden aerosols (<100 µm) are first generated by an infected individual through expiratory activities, through which they are exhaled and transported in the environment. They may be inhaled by a potential host to initiate a new infection, provided that they remain infectious. In contrast to droplets (>100 µm), aerosols can linger in air for hours and travel beyond 1 to 2 m from the infected individual who exhales them, causing new infections at both short and long ranges.

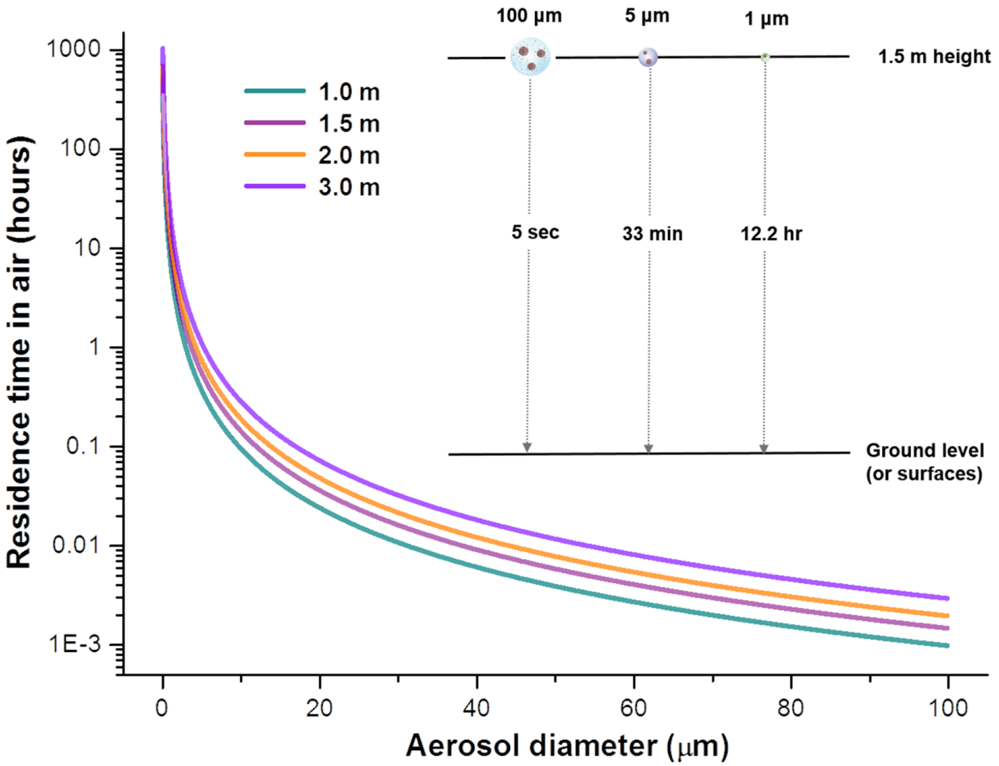


Fig. 3. How long can aerosols linger in air? Residence time of aerosols of varying size in still air can be estimated from Stokes' law for spherical particles (*116*). For example, the time required for an aerosol of 100, 5, or 1 µm to fall to the ground (or surfaces) from a height of 1.5 m is 5 s, 33 min, or 12.2 hours, respectively.

Source: Wang CC et al, Science 2021;373:981.

Breathing Is Enough:
For the Spread of Influenza Virus
and SARS-CoV-2 by Breathing Only

Gerhard Scheuch, PhD*

- Respiratory aerosols are produced during all expiratory activities
- Compared to quiet breathing, fold increase in aerosol production:
  - Talking → 35-fold
  - Exercise → 60-fold
  - Coughing → 400-fold
- These activities can generate more aerosols than traditional “aerosol-generating procedures,” such as high-flow nasal cannula, non-invasive positive pressure ventilation

Source: Scheuch G. J Aerosol Med Pulm Drug Deliv 2020;33(4):230-234;
Wilson NM et al, Anaesthesia 2021;76:174-181.

Airborne Transmission of Respiratory Viruses

	Scope of Studies and/or Approaches						
Virus	**Air sampling and PCR**	**Air sampling and cell culture**	**Animal models**	**Laboratory or clinical studies**	**Epidemiological analysis**	**Simulation and modeling**	**Size-resolved information**
SARS-CoV	X	X		X	X	X	
MERS-CoV	X	X	X	X			
SARS-CoV-2	X	X	X	X	X	X	X
Influenza	X	X	X	X	X	X	X
Rhinovirus	X	X		X		X	X
Measles	X	X			X	X	X
Respiratory syncytial virus (RSV)	X	X		X			X

Source: Wang CC et al, Science 2021;373:981.

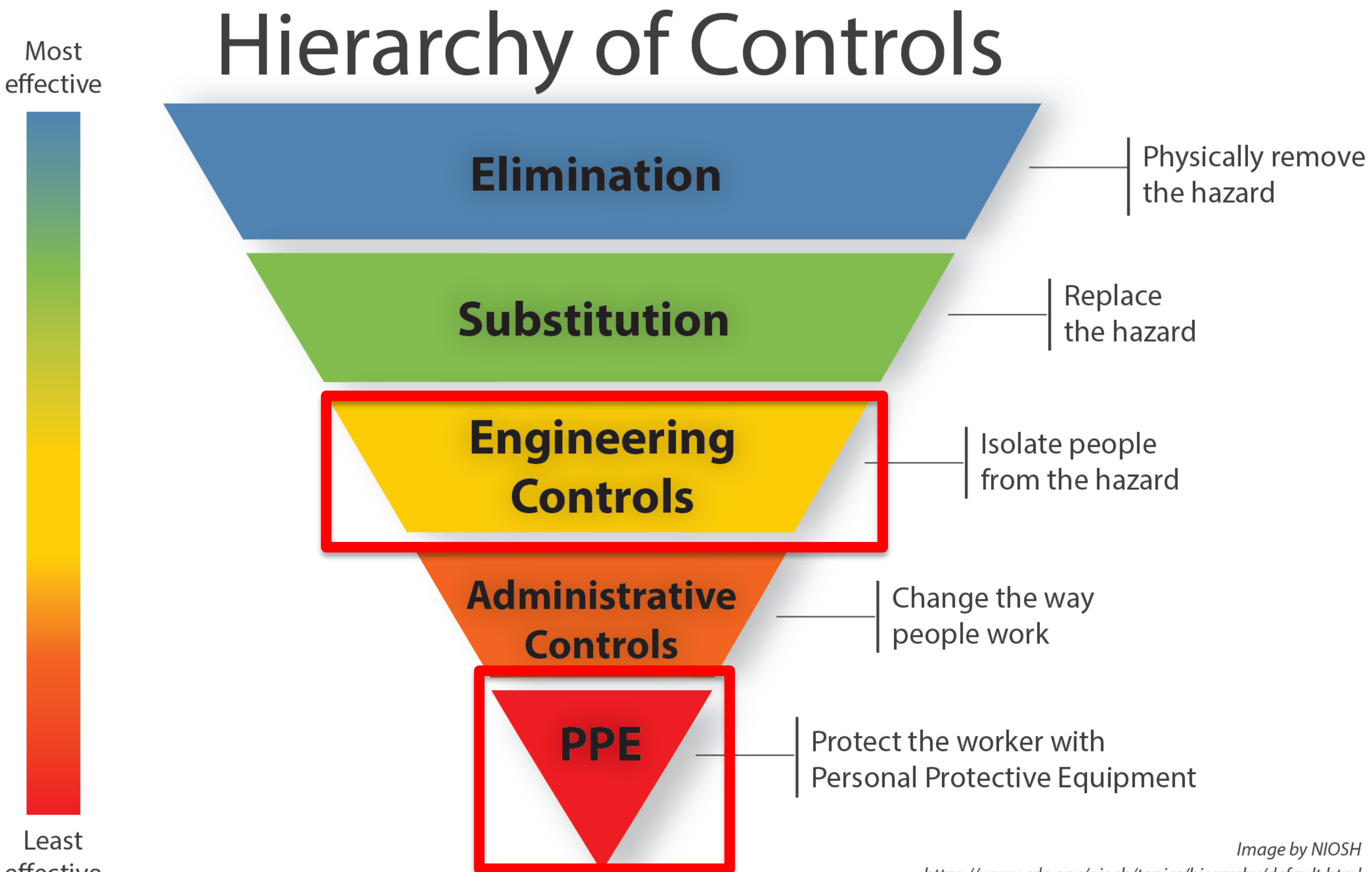


Image by NIOSH
https://www.cdc.gov/niosh/topics/hierarchy/default.html

Surgical Mask or Respirator Use in Indoor Settings Protects Against SARS-CoV-2 Transmission

California, February – December 2021

TABLE 3. Types of face mask or respirator worn in indoor public settings among persons with positive or negative SARS-CoV-2 test results — California, September–December 2021

	SARS-CoV-2 infection status, no. (%)		Odds ratio (95% CI)	
Mask type*	Positive (case-participant) N = 259	Negative (control-participant) N = 275	Unadjusted† [p-value]	Adjusted§ [p-value]
None (Ref)	24 (9.3)	11 (4.0)	—	—
Cloth mask	112 (43.2)	104 (37.8)	0.50 (0.23–1.06) [0.07]	0.44 (0.17–1.17) [0.10]
Surgical mask	113 (43.6)	139 (50.5)	0.38 (0.18–0.81) [0.01]	0.34 (0.13–0.90) [0.03]
N95/KN95 respirator	10 (3.9)	21 (7.6)	0.22 (0.08–0.62) [<0.01]	0.17 (0.05–0.64) [<0.01]

Abbreviation: Ref = referent group.

Source: Andrejko KL et al, MMWR Morb Mortal Wkly Rep 2022;71(6):212-216.

Surgical Mask or Respirator Use in Indoor Settings Protects Against SARS-CoV-2 Transmission

Califo

TABLE 3. Ty… RS-CoV-2 test results — California, …

Mask type*	… 5% CI) Adjusted§ [p-value]
None (Ref)	—
Cloth mask	0.44 (0.17–1.17) [0.10]
Surgical mas…	0.34 (0.13–0.90) [0.03]
N95/KN95 re…	…0.17 (0.05–0.64) [<0.01]

Abbreviatio…

Source: Andrejko KL et al, MMWR Morb Mortal Wkly Rep 2022;71(6):212-216.

Aerosol transmission can occur despite use of surgical mask and eye protection

Open Forum Infectious Diseases

BRIEF REPORT

SARS-CoV-2 Infection Among Health Care Workers Despite the Use of Surgical Masks and Physical Distancing—the Role of Airborne Transmission

Lotem Goldberg,[1,2] Yoel Levinsky,[1,2] Nufar Marcus,[1,2] Vered Hoffer,[1,2] Michal Gafner,[1,2] Shai Hadas,[1,2] Sraya Kraus,[1] Meirav Mor,[2,3] and Oded Scheuerman[1,2,3]

[1]Department of Pediatrics B, Schneider Children's Medical Center of Israel, Petah Tiqva, Israel, [2]Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel, and [3]Infectious Diseases Unit, Schneider Children's Medical Center of Israel, Petah Tiqva, Israel

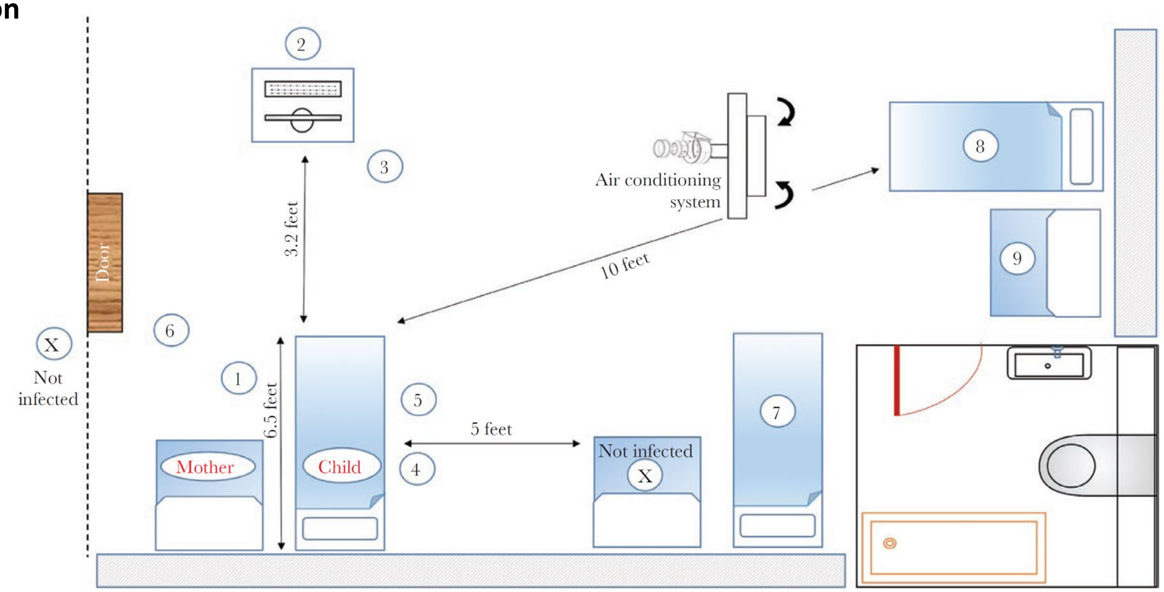


Figure 1. Room illustration. Index cases 1–9 are drawn according to their location in the room. The distances and airflow directions are detailed above. There is a special air conditioning system that diverts air only outside the room. The ventilation characteristics are 3–4 air changes per hour. The average temperature in the room is 23–24°C (73–75°F), and the humidity is 40%–55%.

Clinical Infectious Diseases

BRIEF REPORT

Transmission of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) From Asymptomatic and Presymptomatic Individuals in Healthcare Settings Despite Medical Masks and Eye Protection

Michael Klompas[1,2] Meghan A. Baker,[1,2] Diane Griesbach,[2] Robert Tucker,[2] Glen R. Gallagher,[3] Andrew S. Lang,[3] Timelia Fink,[3] Melissa Cumming,[3] Sandra Smole,[3] Lawrence C. Madoff,[3] and Chanu Rhee[1,2]; for the CDC

Health Care Institute, Boston, Massachusetts, USA; [2]Brigham and Women's Hospital, Boston, Massachusetts, USA; and [3]Massachusetts Department of Public Health, Boston, Massachusetts, USA

Source: Klompas M et al, Clin Infect Dis 2021;73:1693-5;
Goldberg L et al. Open Forum Infect Dis 2021;8:ofab036.

Engineering Controls to Mitigate Risk from Aerosols

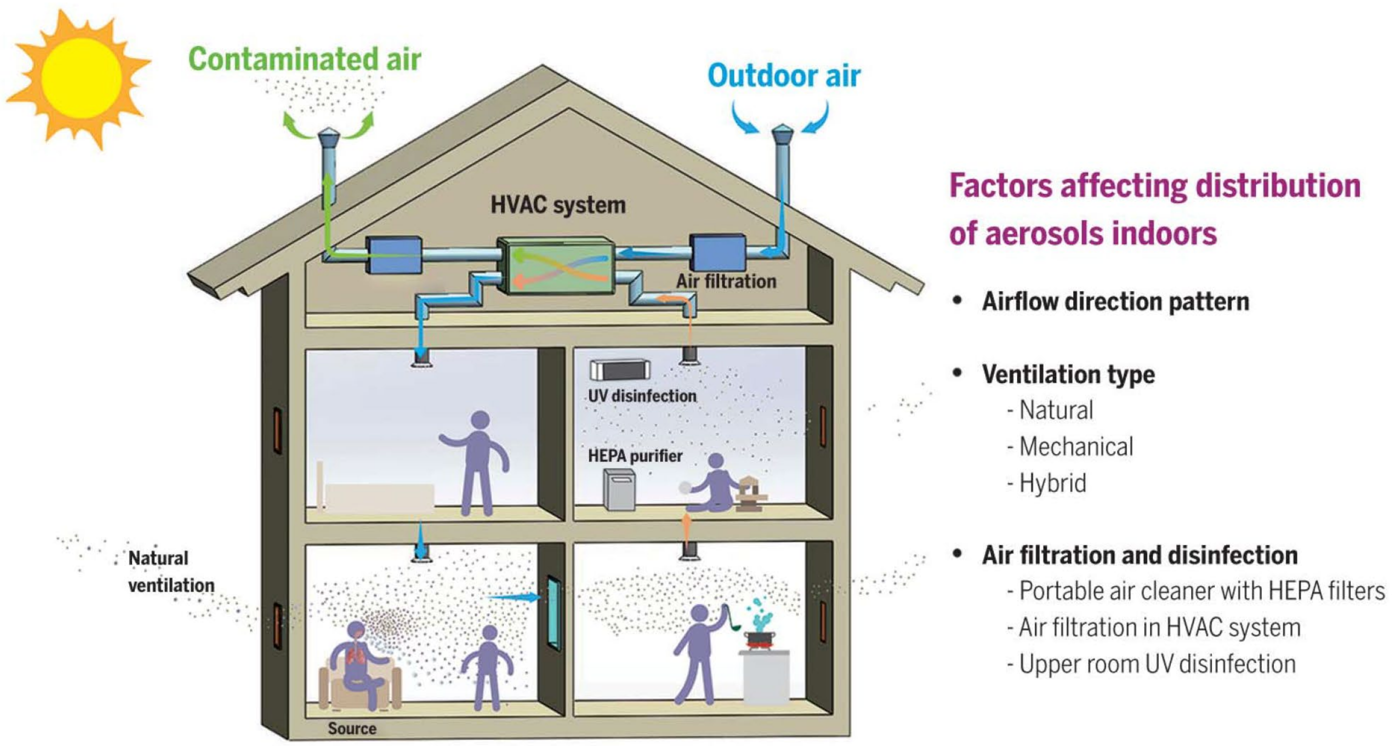
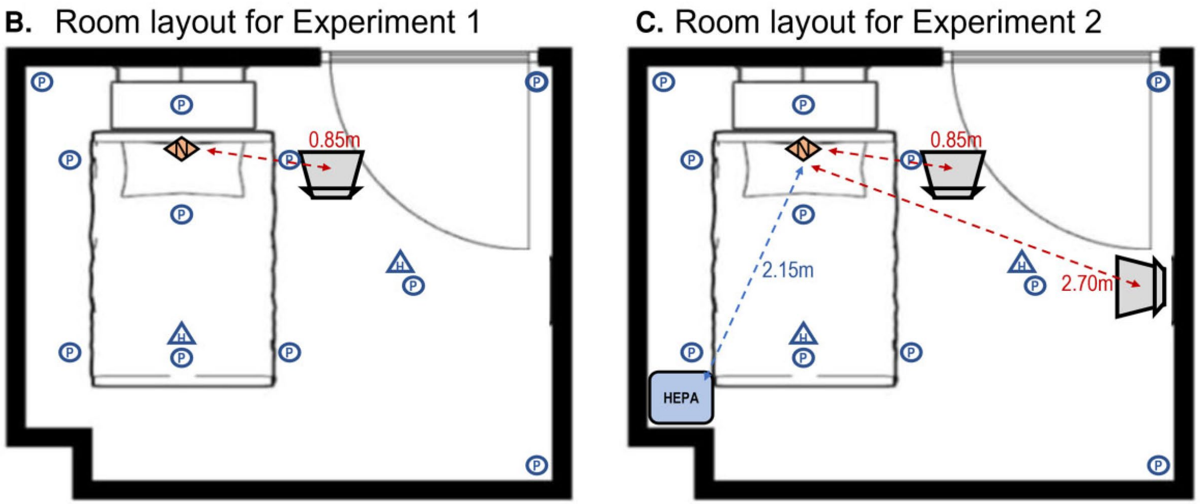


Fig. 4. Factors affecting indoor airborne transmission. Whereas the motion of large droplets is predominantly governed by gravity, the movement of aerosols is more strongly influenced by airflow direction and pattern, type of ventilation, and air filtration and disinfection.

Source: Wang CC et al, Science 2021;373:981.

Fit-Tested N95 Respirator + Ventilation Provides Best Protection Against an Aerosolized Pathogen



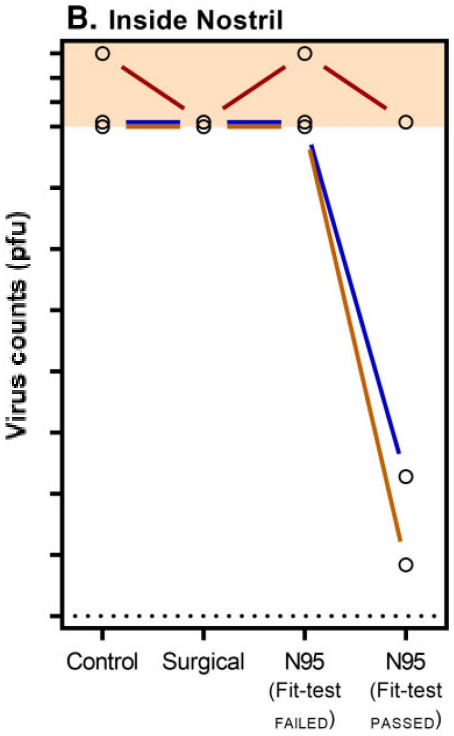
D. Experiment 1 conditions

1) No PPE control
2) Surgical mask
3) Fit-test$_{FAILED}$ N95 mask
4) Fit-test$_{PASSED}$ N95 mask

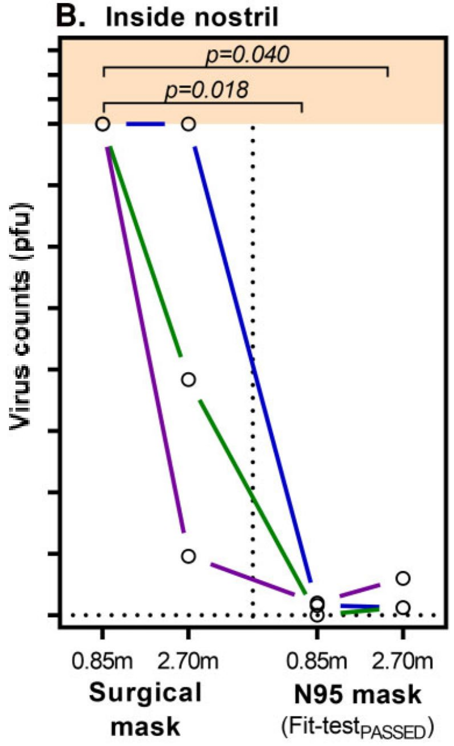
E. Experiment 2 conditions

1) HEPA + Surgical mask, bedside (0.85m)
2) HEPA + Surgical mask, distant (2.70m)
3) HEPA + Fit-test$_{PASSED}$ N95 mask, bedside
4) HEPA + Fit-test$_{PASSED}$ N95 mask, distant

No ventilation



With ventilation 13 air changes / hour



Source: Landry SA et al, J Infect Dis 2022;226(2):199-207.

Take Home Points

- Dichotomous categories of droplet vs. airborne pathogen is incomplete
  - Develop uniform respiratory precautions for all respiratory pathogens
- N95 respirators provide better protection against aerosols than surgical masks
  - During times of high community transmission of SARS-CoV-2 or other respiratory viruses, consider use of N95 respirators for all face-to-face patient encounters
- Prolonged exposure in poorly ventilated spaces increases risk of short- and long-range transmission
  - Reinforce minimum ventilation standards for clinical and non-clinical spaces
  - For poorly ventilated spaces, consider UV air disinfection or HEPA filters
- Need to think beyond "aerosol-generating procedures" for the risk of exposure to aerosolized pathogens
  - Risk is a function of viral load, severity of illness, duration of exposure, and proximity to the source of aerosols

Source: Klompas M et al, Ann Intern Med 2021;174(12):1710-1718; Klompas M et al, JAMA Surgery 2021;156(2):113.

Lessons from COVID-19 Infection Prevention and Control

TRACIE
HEALTHCARE EMERGENCY PREPAREDNESS
INFORMATION GATEWAY

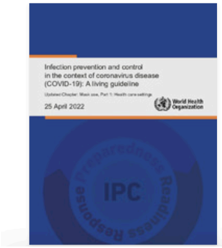
James Lawler, MD, MPH, FIDSA
Executive Director for International Programs and Innovation
Global Center for Health Security, UNMC

ASPR
Administration for Strategic Preparedness and Response

Lessons from COVID-19 Infection Prevention and Control

- Don’t fight the last war
- Remember the basics
- Anticipate problems
- Innovate
- Research early and often

Don’t Fight the Last War…


World Health Organization

Health Topics ⌄ Countries ⌄ Newsroom ⌄ Emergencies ⌄ Data ⌄ About WHO ⌄

Home / Publications / Overview /
Infection prevention and control in the context of coronavirus disease (COVID-19): a living guideline, 25 April 2022: updated chapter: mask use, part 1: health care settings

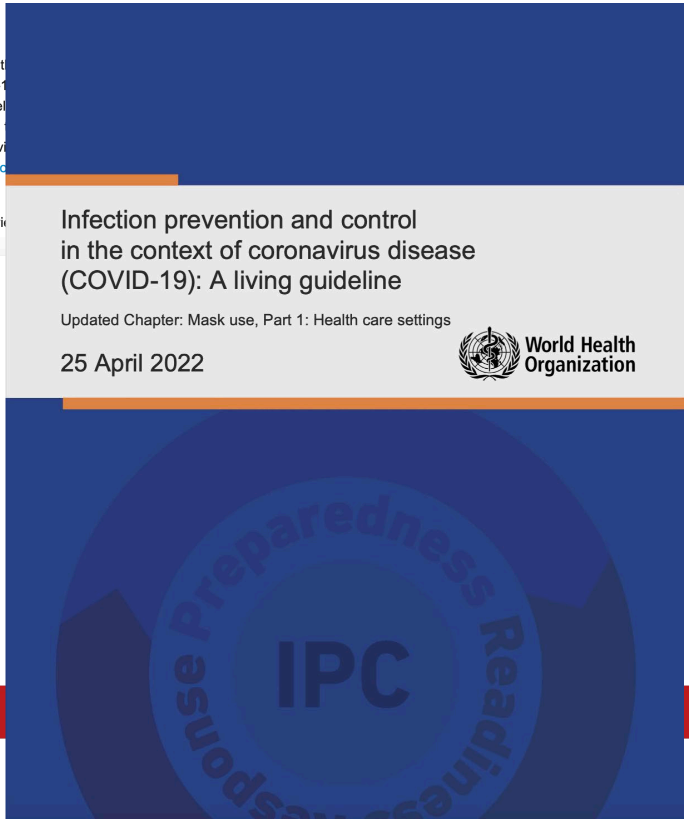
Infection prevention and control in the context of coronavirus disease (COVID-19): a living guideline, 25 April 2022: updated chapter: mask use, part 1: health care settings

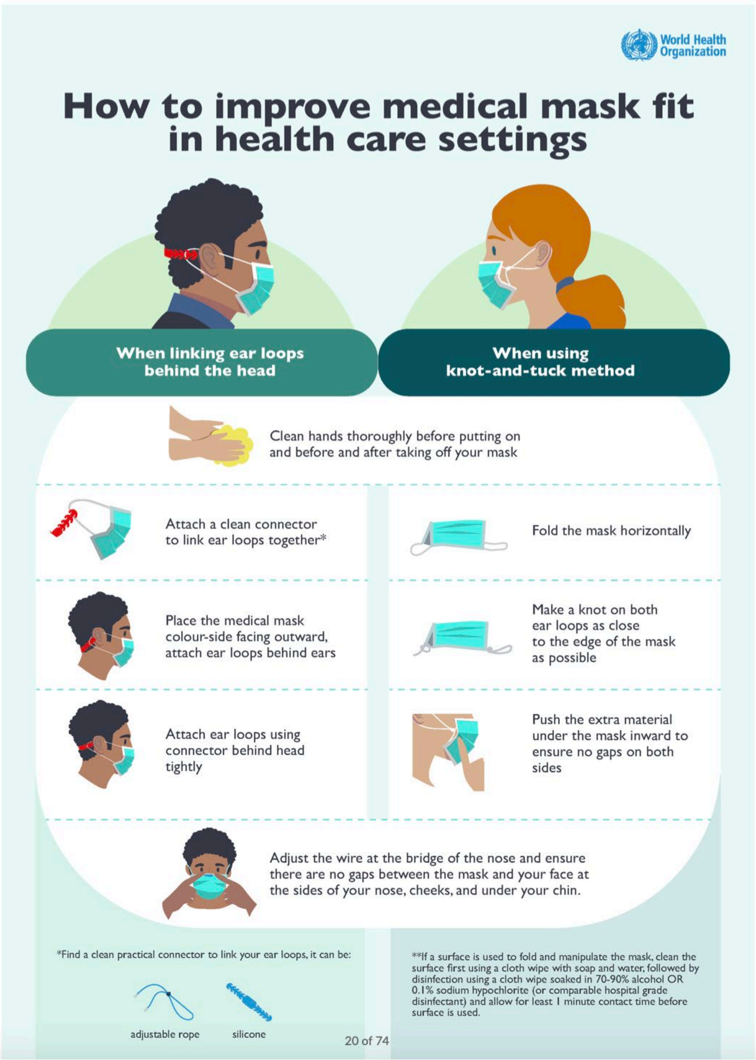
25 April 2022 | COVID-19: Infection prevention and control / WASH

Overview

This document provides updated interim recommendations on t
providing care to patients with suspected or confirmed COVID-1
evidence around mask use and COVID-19 transmission, as wel
concern including Omicron. Masks continue to be a critical tool f
These interim guidelines supersede the recommendations provi
on mask use by health workers, in light of the Omicron variant c
2022.

WHO continually evaluates the emerging evidence and will revi
within two months and issue new guidance as needed.





Don’t Fight the Last War…

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Search

EMERGING INFECTIOUS DISEASES®

ISSN: 1080-6059

EID Journal > Volume 28 > Early Release > Main Article

Disclaimer: Early release articles are not considered as final versions. Any changes will be reflected in the online version in the month the article is officially released.

Volume 28, Number 12—December 2022

Dispatch

Possible Occupational Infection of Healthcare Workers with Monkeypox Virus, Brazil

Richard Steiner Salvato✉ , Maria Leticia Rodrigues Ikeda, Regina Bones Barcellos, Fernanda Marques Godinho, Patrícia Sesterheim, Leticia Camiza Bulcão Bitencourt, Tatiana Schäffer Gregianini, Ana Beatriz Gorini da Veiga, Fernando Rosado Spilki, and Gabriel Luz Wallau✉
Author affiliations: Secretaria Estadual da Saúde do Rio Grande do Sul, Porto Alegre, Rio Grande do Sul, Brazil (R. Steiner Salvato, M.L. Rodrigues Ikeda, R. Bones Barcellos, F. Marques Godinho, P. Sesterheim, T. Schäffer Gregianini); Universidade do Vale do Rio dos Sinos Programa de Pós-Graduação em Saúde Coleti São Leopoldo, Rio Grande do Sul (M.L. Rodrigues Ikeda, L.C. Bulcão Bitencourt); Universidade Federal de Ciências da Saúde de Porto Alegre, Porto Alegre, Rio Grande do Sull (A.B. Gorini da Veiga); Universidade Feevale Laboratório de Microbiologia Molecular, Novo Hamburgo, Rio Grande do Sul (F. Rosado Spilki); Instituto Aggeu Magalhães (IAM), FIOCRUZ-PE, Recife, Brazil (G.L. Wallau); National Reference Center for Tropical Infectious Diseases, Hamburg, Germany (G.L. Wallau)
Suggested citation for this article

Figure 1

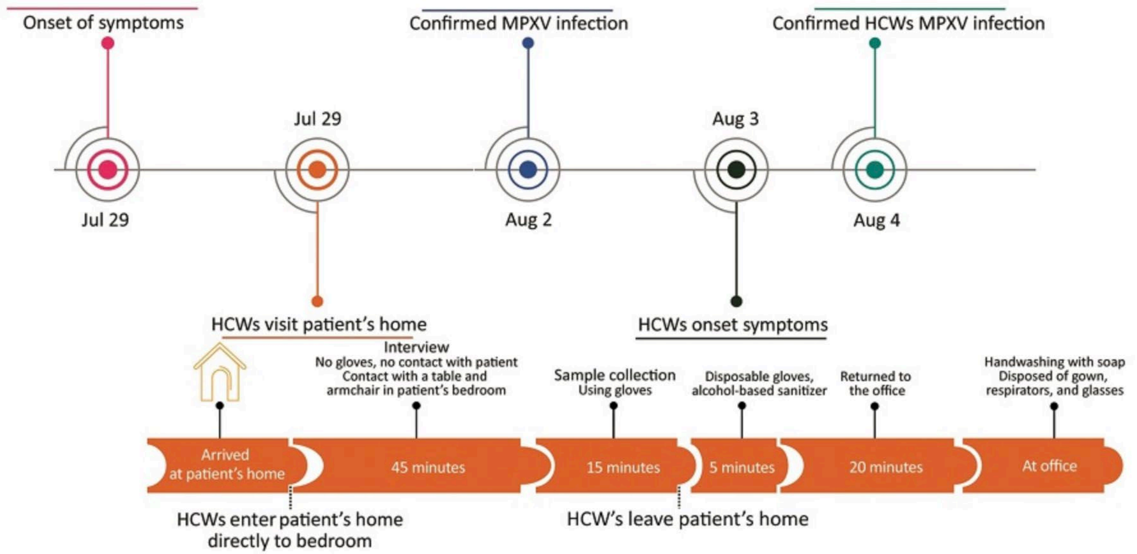
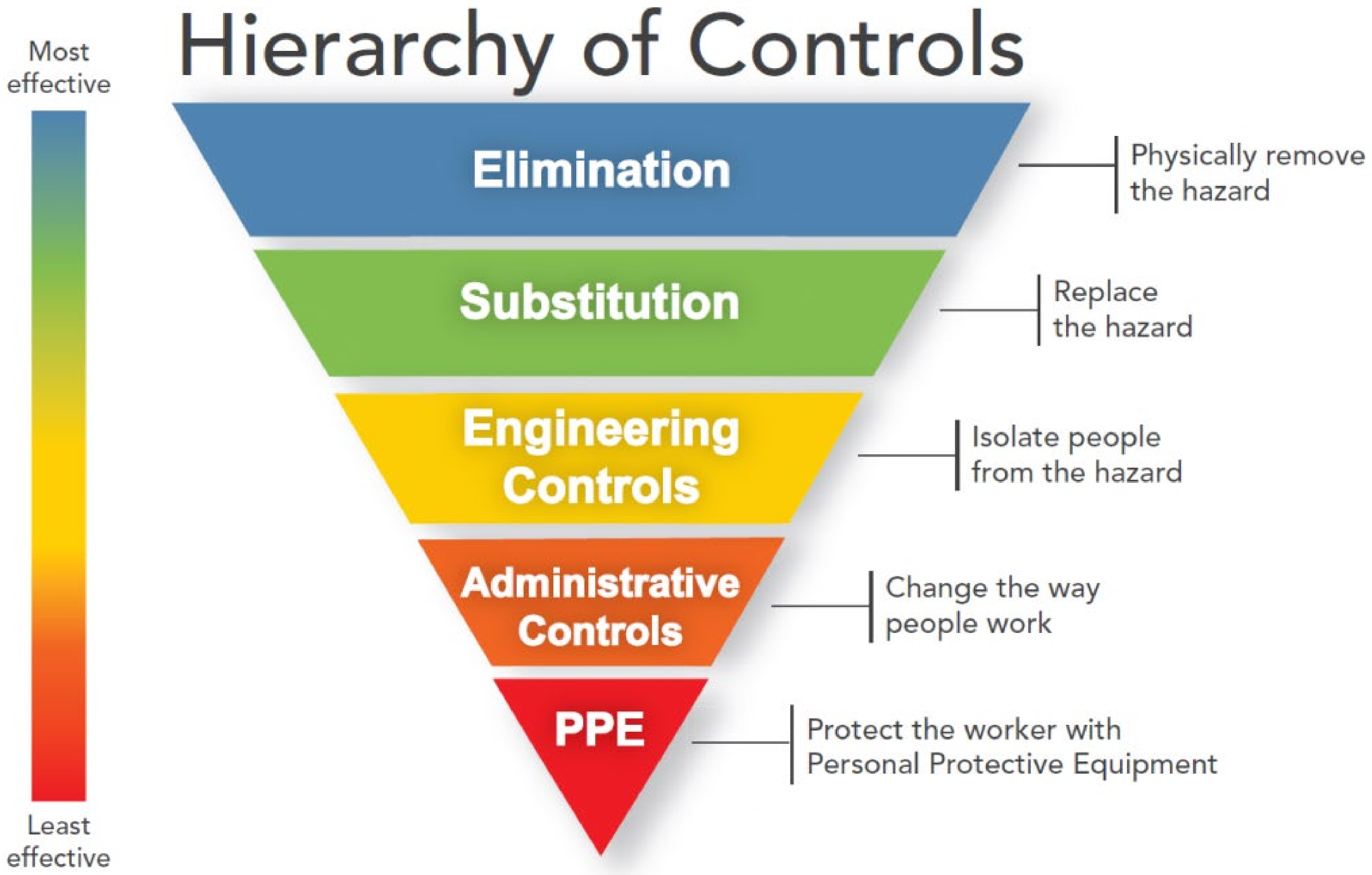


Figure 1. Timeline of monkeypox patient illness, HCW visit to the patient’s home, and subsequent HCW illness, Brazil, 2022. HCW, healthcare worker; MPXV, monkeypox virus.

Remember the Basics



Anticipate Problems

The NEW ENGLAND JOURNAL of MEDICINE

Perspective

APRIL 30, 2020

Critical Supply Shortages — The Need for Ventilators and Personal Protective Equipment during the Covid-19 Pandemic

Megan L. Ranney, M.D., M.P.H., Valerie Griffeth, M.D., Ph.D., and Ashish K. Jha, M.D., M.P.H.

On March 11, 2020, the World Health Organization designated "coronavirus disease 2019" (Covid-19) a global pandemic. As the number of cases in the United States continues to grow, political leaders are encouraging physical (or "social") distancing to slow the rate of transmission. The goal of this practice is to flatten the curve of new infection, thereby avoiding a surge of demand on the health care system, but the effects of physical distancing may take weeks to appear. U.S. hospitals are already reporting shortages of key equipment needed to care for critically ill patients, including ventilators and personal protective equipment (PPE) for medical staff. Adequate production and distribution of both types of equipment are crucial to caring for patients during the pandemic.

There is a broad range of estimates of the number of ventilators we will need to care for U.S. patients with Covid-19, from several hundred thousand to as many as a million.[1] The estimates vary depending on the number, speed, and severity of infections, of course, but even the availability of testing affects the number of ventilators needed: without adequate testing, the number increases because patients who are traditionally treated with noninvasive positive-pressure ventilation (NIPPV) for conditions such as chronic obstructive pulmonary disease exacerbations may need to instead be presumptively intubated while awaiting Covid-19 testing results (using NIPPV is contraindicated for patients with Covid-19 because of aerosolization of the virus under positive pressure). Current estimates of the number of ventilators in the United States range from 60,000 to 160,000, depending on whether those that have only partial functionality are included.[2] The national strategic reserve of ventilators is small and far from sufficient for the projected gap.[2] No matter which estimate we use, there are not enough ventilators for patients with Covid-19 in the upcoming months.

Equally worrisome is the lack of adequate PPE for frontline health care workers, including respirators, gloves, face shields, gowns, and hand sanitizer. In Italy, health care workers experienced high rates of infection and death[3] partly because of inadequate access to PPE. And recent estimates here in the United States suggest that we will need far more respirators and surgical masks than are currently available.[4]

The U.S. shortage has multiple causes, including problems with the global supply chain. Before this pandemic, for instance, China produced approximately half the world's face masks.[5] As the infec-

N ENGL J MED 382;18 NEJM.ORG APRIL 30, 2020 e41(1)

The New York Times

Health Care Workers Still Face Daunting Shortages of Masks and Other P.P.E.

Frontline medical personnel in hospitals and nursing homes are urging the incoming Biden administration to use the Defense Production Act to increase manufacturing of personal protective equipment.

By Andrew Jacobs

Dec. 20, 2020

Health Affairs | COVID-19 | Topics | Journal | Forefront | Podcasts

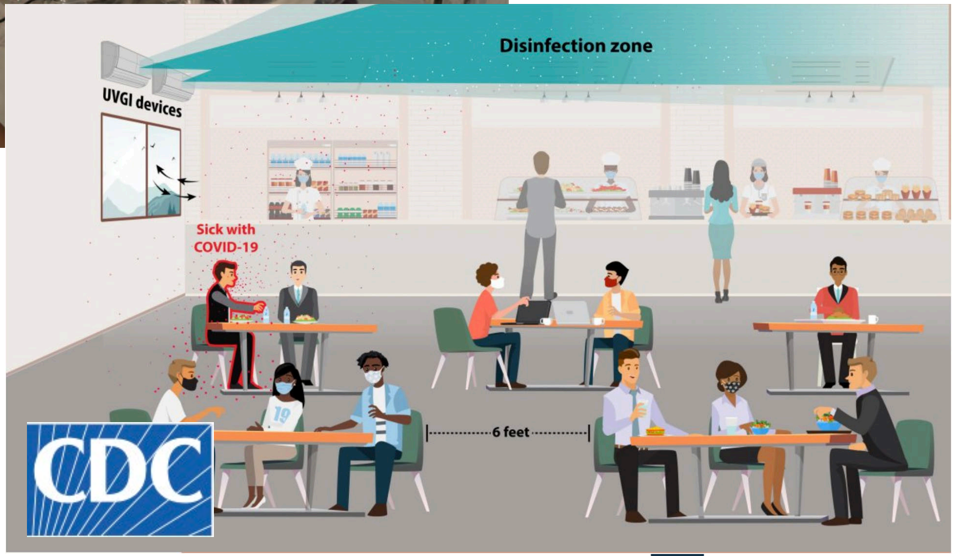
Severe Staffing And Personal Protective Equipment Shortages Faced By Nursing Homes During The COVID-19 Pandemic

Brian E. McGarry, David C. Grabowski, and Michael L. Barnett

AFFILIATIONS

PUBLISHED: AUGUST 20, 2020 Free Access https://doi.org/10.1377/hlthaff.2020.01269

Innovate


Disinfection zone
UVGI devices
Sick with COVID-19
6 feet
CDC

Research Early and Often

www.nature.com/jes
Journal of Exposure Science & Environmental Epidemiology

ARTICLE OPEN

Check for updates

The size and culturability of patient-generated SARS-CoV-2 aerosol

Joshua L. Santarpia[1,2,3,11], Vicki L. Herrera[1,2], Danielle N. Rivera[3], Shanna Ratnesar-Shumate[1,2], St. Patrick Reid[1,2,11], Daniel N. Ackerman[3], Paul W. Denton[4], Jacob W. S. Martens[4], Ying Fang[5], Nicholas Conoan[6], Michael V. Callahan[7], James V. Lawler[2,8], David M. Brett-Major[2,9] and John J. Lowe[2,10,11]

BACKGROUND: Aerosol transmission of COVID-19 is the subject of ongoing policy debate. Characterizing aerosol produced by people with COVID-19 is critical to understanding the role of aerosols in transmission.
OBJECTIVE: We investigated the presence of virus in size-fractioned aerosols from six COVID-19 patients admitted into mixed acuity wards in April of 2020.
METHODS: Size-fractionated aerosol samples and aerosol size distributions were collected from COVID-19 positive patients. Aerosol samples were analyzed for viral RNA, positive samples were cultured in Vero E6 cells. Serial RT-PCR of cells indicated samples where viral replication was likely occurring. Viral presence was also investigated by western blot and transmission electron microscopy (TEM).
RESULTS: SARS-CoV-2 RNA was detected by rRT-PCR in all samples. Three samples confidently indicated the presence of viral replication, all of which were from collected sub-micron aerosol. Western blot indicated the presence of viral proteins in all but one of these samples, and intact virions were observed by TEM in one sample.
SIGNIFICANCE: Observations of viral replication in the culture of submicron aerosol samples provides additional evidence that airborne transmission of COVID-19 is possible. These results support the use of efficient respiratory protection in both healthcare and by the public to limit transmission.

Keywords: SARS-CoV-2; aerosol transmission; viral aerosol; human-generated aerosol

Journal of Exposure Science & Environmental Epidemiology (2022) 32:706–711; https://doi.org/10.1038/s41370-021-00376-8

Curr Treat Options Infect Dis (2021) 13:35–46
DOI 10.1007/s40506-021-00247-8

New Technologies and Advances in Infections Prevention (A Marra, Section Editor)

Check for updates

A Practical Approach to Filtering Facepiece Respirator Decontamination and Reuse: Ultraviolet Germicidal Irradiation

Mark P. Ridder, MD[1]
Katie D. Paladino, RT (R)[2]
John J. Lowe, PhD[3]
Mark E. Rupp, MD[1,*]

Address
[*,1]Division of Infectious Disease, University of Nebraska Medical Center, 985400 Nebraska Medical Center, Omaha, NE, 68198-5400, USA
Email: merupp@unmc.edu
[2]Department of Enterprise Quality and Outcomes, Nebraska Medicine, Omaha, NE, 68198, USA
[3]Global Center for Health Security, University of Nebraska Medical Center, Omaha, NE, 68198, USA

Published online: 6 April 2021

www.nature.com/scientificreports

SCIENTIFIC REPORTS
natureresearch

Check for updates

OPEN

Aerosol and surface contamination of SARS-CoV-2 observed in quarantine and isolation care

Joshua L. Santarpia, Danielle N. Rivera, Vicki L. Herrera, M. Jane Morwitzer, Hannah M. Creager, George W. Santarpia, Kevin K. Crown, David M. Brett-Major, Elizabeth R. Schnaubelt, M. Jana Broadhurst, James V. Lawler, St. Patrick Reid & John J. Lowe

The novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) originated in Wuhan, China in late 2019, and its resulting coronavirus disease, COVID-19, was declared a pandemic by the World Health Organization on March 11, 2020. The rapid global spread of COVID-19 represents perhaps the most significant public health emergency in a century. As the pandemic progressed, a continued paucity of evidence on routes of SARS-CoV-2 transmission has resulted in shifting infection prevention and control guidelines between classically defined airborne and droplet precautions. During the initial isolation of 13 individuals with COVID-19 at the University of Nebraska Medical Center, we collected air and surface samples to examine viral shedding from isolated individuals. We detected viral contamination among all samples, supporting the use of airborne isolation precautions when caring for COVID-19 patients.

Adopting COVID-19 Lessons Learned and Best Practices

TRACIE
HEALTHCARE EMERGENCY PREPAREDNESS INFORMATION GATEWAY

Syra Madad, DHSc, MSc, MCP
Senior Director, System-wide Special Pathogens Program
NYC Health + Hospitals

ASPR
ADMINISTRATION FOR STRATEGIC PREPAREDNESS AND RESPONSE

Maintaining an Ongoing State of Preparedness

Special Pathogen Outbreaks reported to WHO as of September 2022

1. Ebola, Uganda
2. Multiple-country outbreak of Monkeypox in non-endemic countries
3. Ebola, Democratic Republic of the Congo
4. Marburg, Ghana
5. Crimean Congo Hemorrhagic Fever, Iraq
6. Middle East Respiratory Syndrome, Oman
7. Lassa Fever, Guinea
8. Middle East Respiratory Syndrome, Qatar
9. Ebola, Democratic Republic of the Congo
10. Avian Influenza A(H3N8), China
11. Middle East Respiratory Syndrome, Saudia Arabia
12. Lassa Fever, Togo
13. Lassa Fever, U.K.
14. Lassa Fever, Nigeria

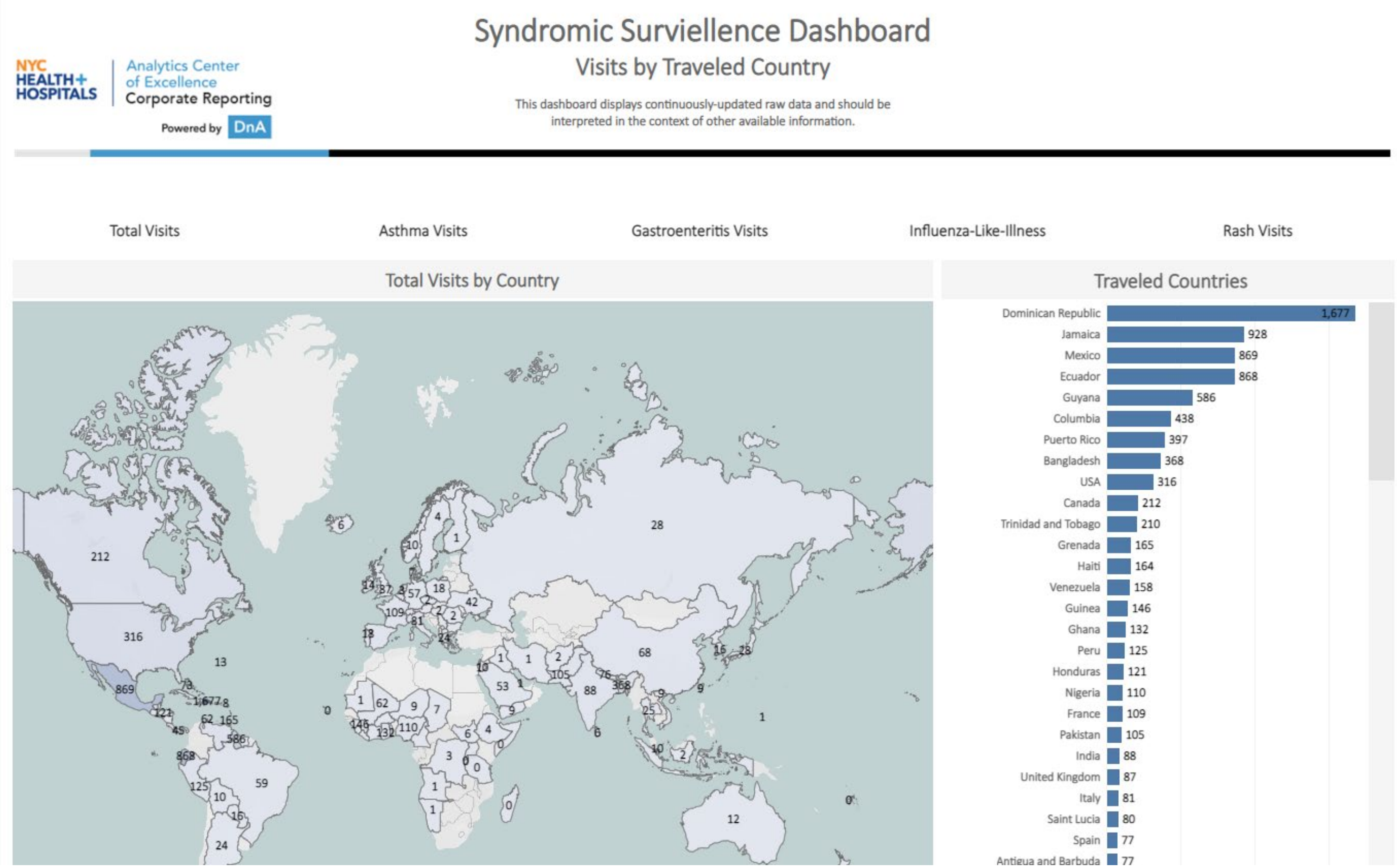
Special pathogens *are those that:*

- *are associated with high morbidity and/or mortality;*
- *have a high likelihood of secondary cases (person-to-person spread);*
- *lack an effective vaccine, prophylaxis, or treatment and*
- *might prompt the use of a biocontainment unit due to clinical or public health concerns.*

Special pathogens *pose a significant risk to healthcare personnel and require specific healthcare facility processes to ensure early identification and isolation of infected patients and the use of effective infection control practices to prevent disease transmission while the patient is further evaluated.*

Healthcare System Syndromic Surveillance

- Relying on an astute clinician to find a needle in a haystack is not a strategy.
- Piggy-backing off of analytic platforms used for COVID-19 situational awareness with EMR data to now broaden to other infectious disease threats



Healthcare System Wastewater Surveillance

- New Biosurveillance Program launched in February 2022 at NYC Health+Hospitals/Elmhurst tests wastewater for infectious diseases.
- The program has successfully predicted changes in COVID-19 and flu rates 10 to 14 days before those results are seen clinically at the hospital. Program has expanded to include testing for polio and monkeypox.

NYC Health + Hospitals Announces Wastewater Surveillance Program at its 11 Hospitals

Wastewater data signals Covid and flu 10 to 14 days before those results are seen clinically at the hospital.

Next week, the health system will begin testing wastewater for monkeypox and polio

Aug 17, 2022

Queens College Research Assistant Justin Silbiger collects a wastewater sample from a sewage pipe in the basement of NYC Health + Hospitals/Elmhurst. (Credit: NYC Health + Hospitals)

Tying COVID-19 Healthcare Guidance to Community Transmission Levels

- Embedding trigger points for infection prevention measures (i.e., N95 respirator + eye protection, inpatient routine testing) based on community transmission levels.

PERSONAL PROTECTIVE EQUIPMENT GUIDANCE FOR COVID-19			NYC HEALTH+ HOSPITALS
DOC ID HHCMPA42020 v19	Effective Date: April 5, 2022	Page 1 of 5	

SUMMARY OF UPDATES

The following sections have been updated as of 4/5/2022:

1. Due to increasing levels of community transmission of COVID-19, universal eye protection and N95 respirator use for all clinical care encounters is required.

Purpose	To provide guidance for PPE use for all healthcare personnel working at NYC H+H. This guidance applies to all NYC H+H sites that are regulated by New York State Department of Health (includes hospitals, post-acutes, clinics and all NYC Health + Hospitals locations where healthcare delivery services are provided). **Please note, all guidance is subject to change as additional information becomes available.**
Scope	NYC Health + Hospitals Health System Clinical Care/Health Care Sites

Vaccine Champions for Other Vaccination Efforts

- Leveraging the expertise of COVID-19 vaccine champions and ambassadors who have been trained in effective communication strategies and addressing vaccine hesitancy to now help build confidence and increase vaccination rates for other vaccines (e.g., seasonal flu)

Question & Answer

Contact ASPR TRACIE

asprtracie.hhs.gov

1-844-5-TRACIE

askasprtracie@hhs.gov