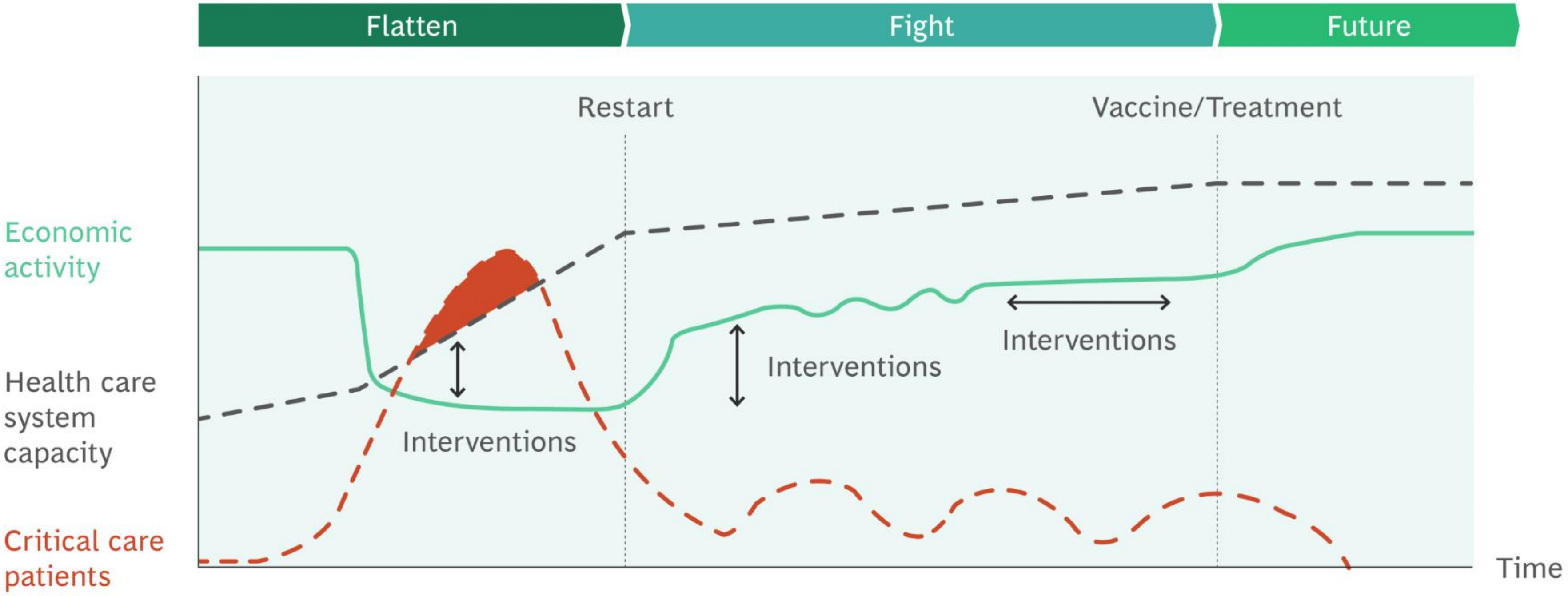
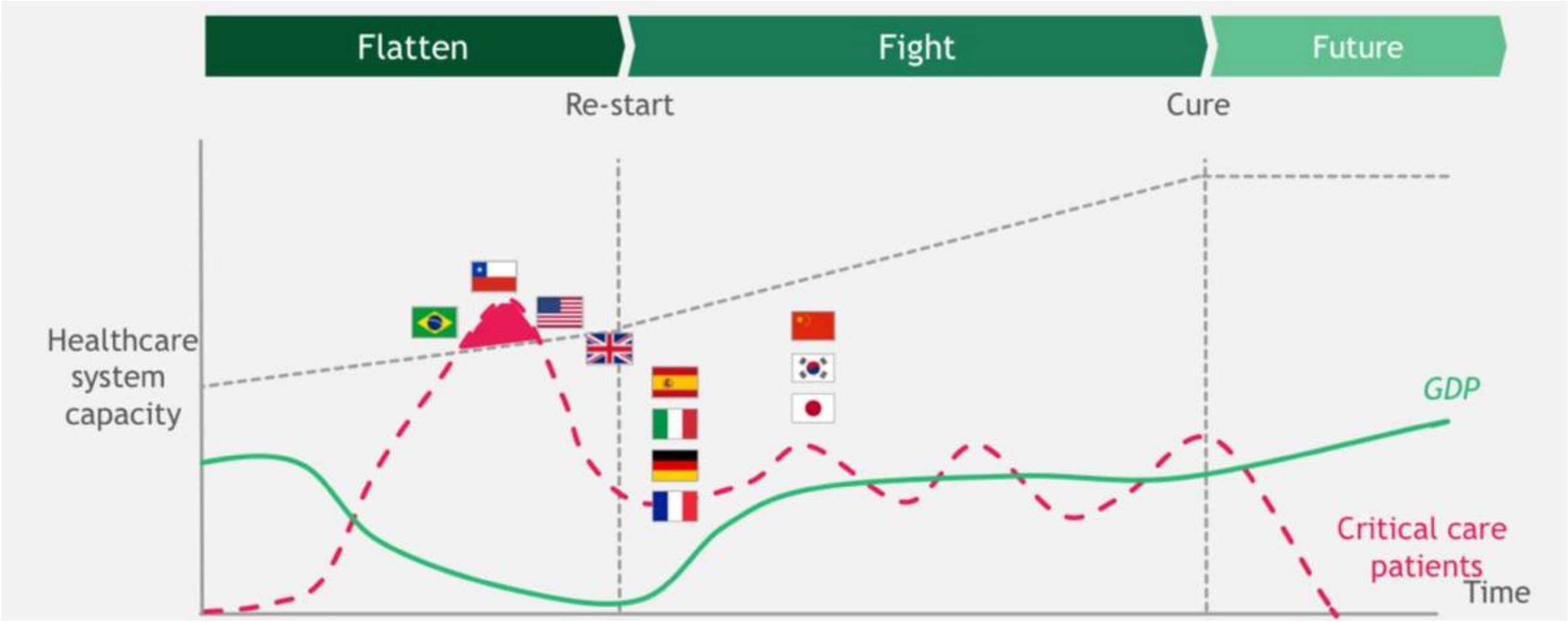
Desafios do uso de EPIs na COVID-19

Mirian de Freitas Dal Ben Corradi



Flatten
Fight
Future
Restart
Vaccine/Treatment
Economic activity
Health care system capacity
Critical care patients
Interventions
Interventions
Interventions
Time



Flatten
Fight
Future
Re-start
Cure
Healthcare system capacity
GDP
Critical care patients
Time

Transmission of SARS-CoV-2: implications for infection prevention precautions

Scientific Brief

9 July 2020

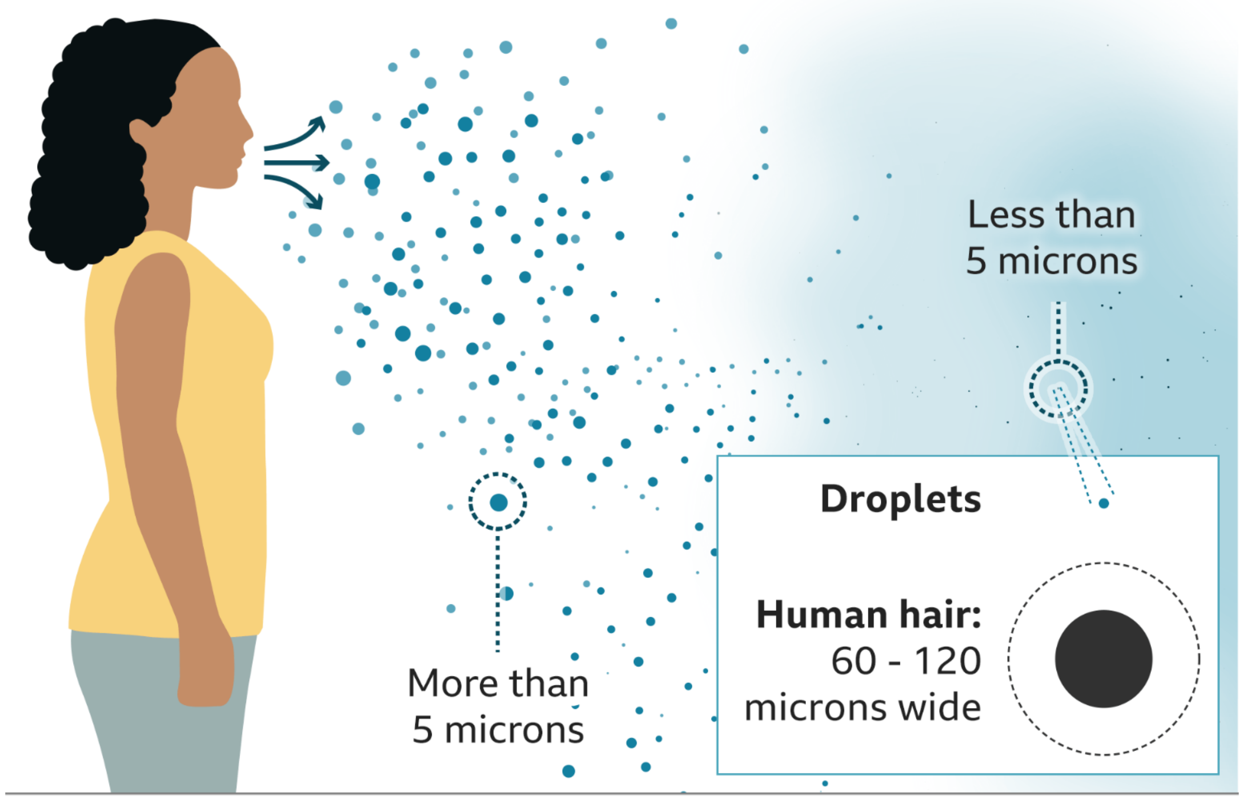
The difference between droplet and airborne transmission

Droplet transmission

Coughs and sneezes can spread droplets of saliva and mucus

Airborne transmission

Tiny particles, possibly produced by talking, are suspended in the air for longer and travel further

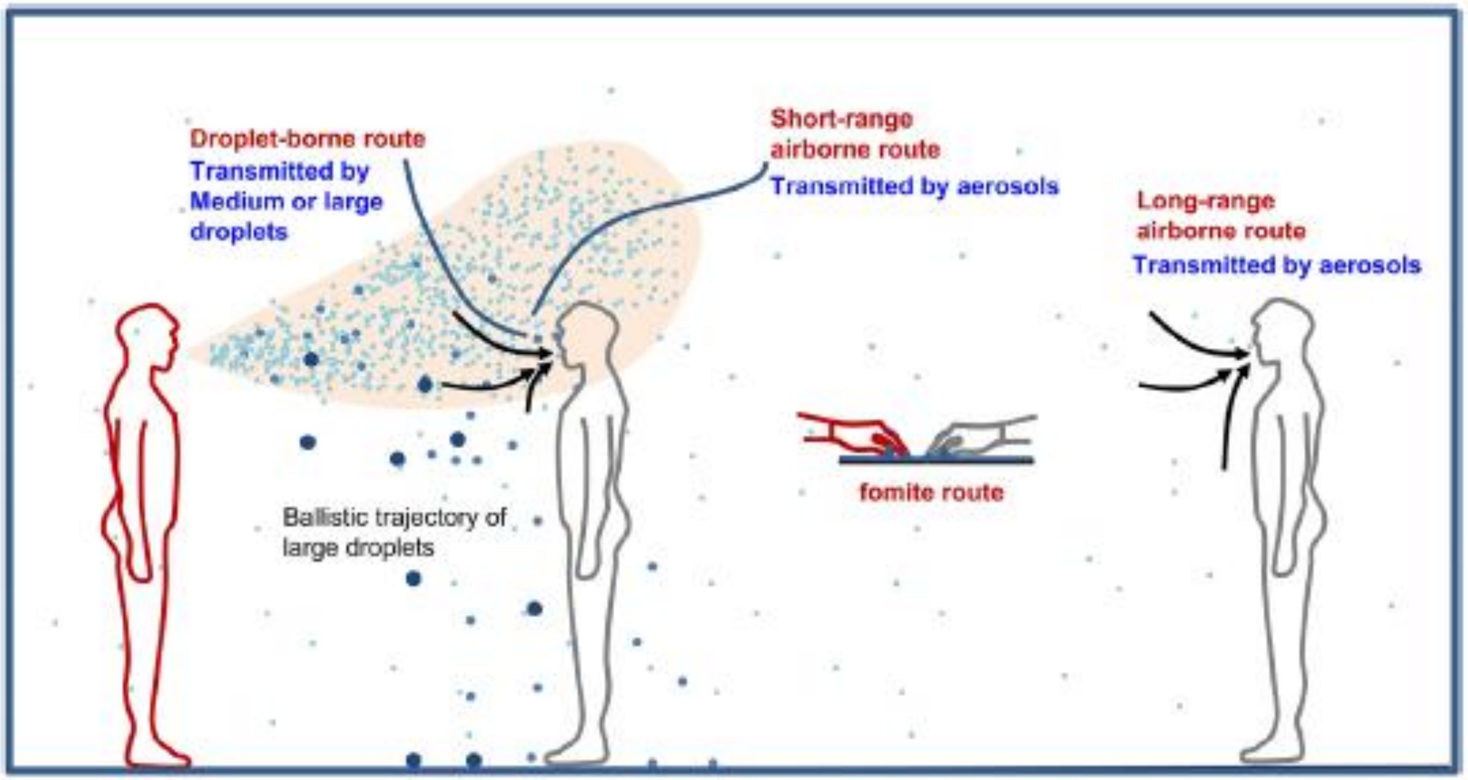


Source: WHO

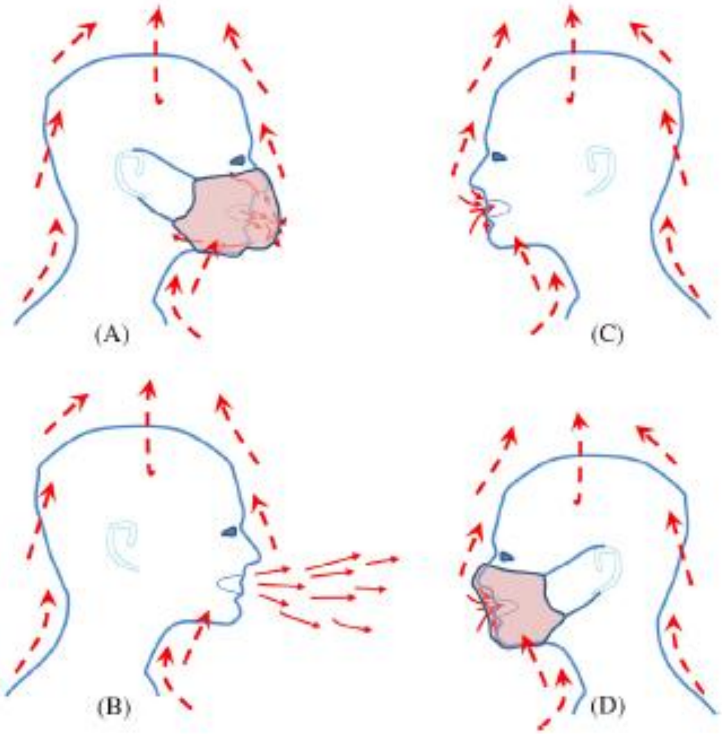
BBC

Airborne spread of infectious agents in the indoor environment

American Journal of Infection Control 44 (2016) S102-S108



- Large droplets (>100 µm) : Fast deposition due to the domination of gravitational force
- Medium droplets between 5 and 100 µm
- Small droplets or droplet nuclei, or aerosols (< 5 µm): Responsible for airborne transmission



Clinical Infectious Diseases
MAJOR ARTICLE
Clinical Infectious Diseases® 2017;65(8):1342–8

Characterization of Aerosols Generated During Patient Care Activities

Caroline A. O'Neil,[1] Jiayu Li,[2] Anna Leavey,[2] Yang Wang,[2] Matthew Hink,[1] Meghan Wallace,[3] Pratim Biswas,[2] Carey-Ann D. Burnham,[3] and Hilary M. Babcock[1]; for the Centers for Disease Control and Prevention Epicenters Program

[1]School of Medicine, Infectious Diseases Division, [2]School of Engineering and Applied Science, Department of Energy, Environmental, and Chemical Engineering, Aerosol and Air Quality Research Laboratory, and [3]School of Medicine, Department of Pathology and Immunology, Washington University, St Louis, Missouri

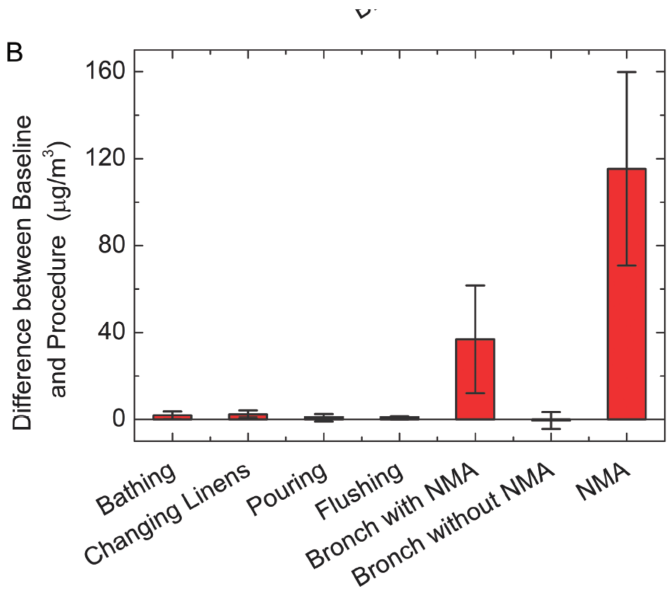
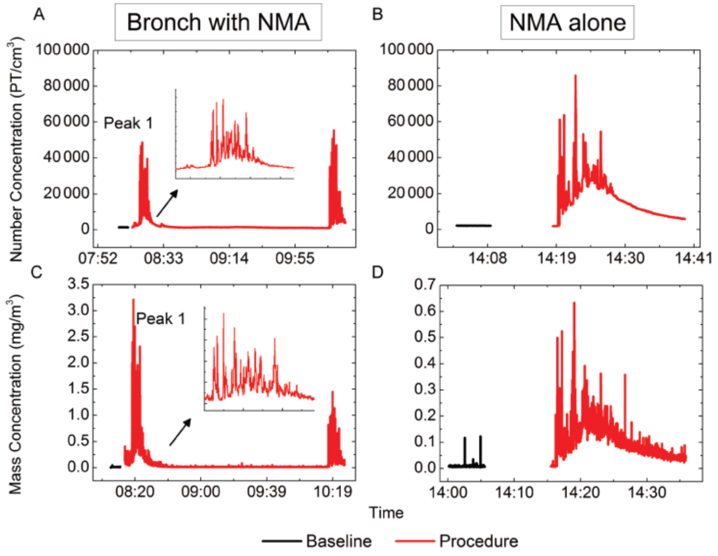


Figure 1. Change from preprocedure baseline in particle number (*A*) and mass (*B*) concentrations during the sampled procedures. Mechanical ventilation and noninvasive ventilation are not included in this figure because no baseline samples could be collected for these procedures. Error bars = standard deviation. Abbreviations: Bronch, bronchoscopy; NMA, nebulized medication administration; PT, particle.



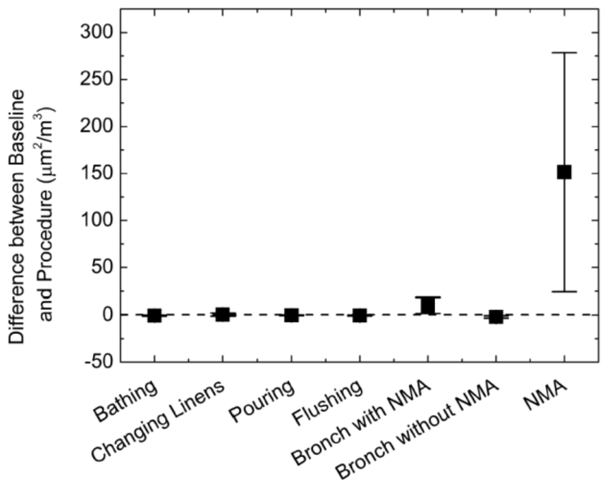
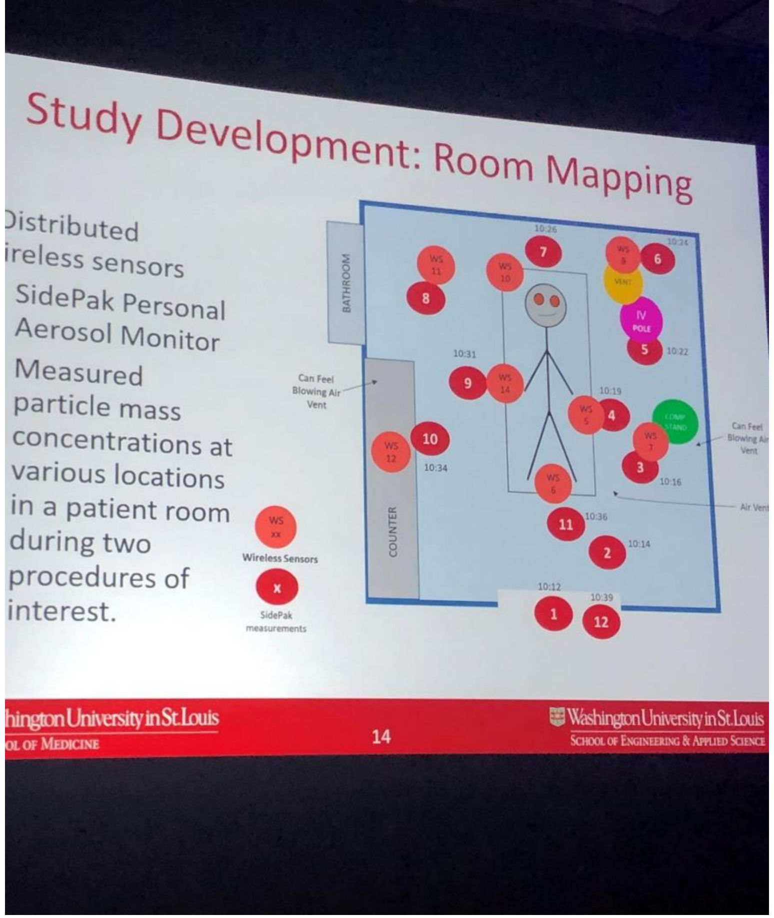
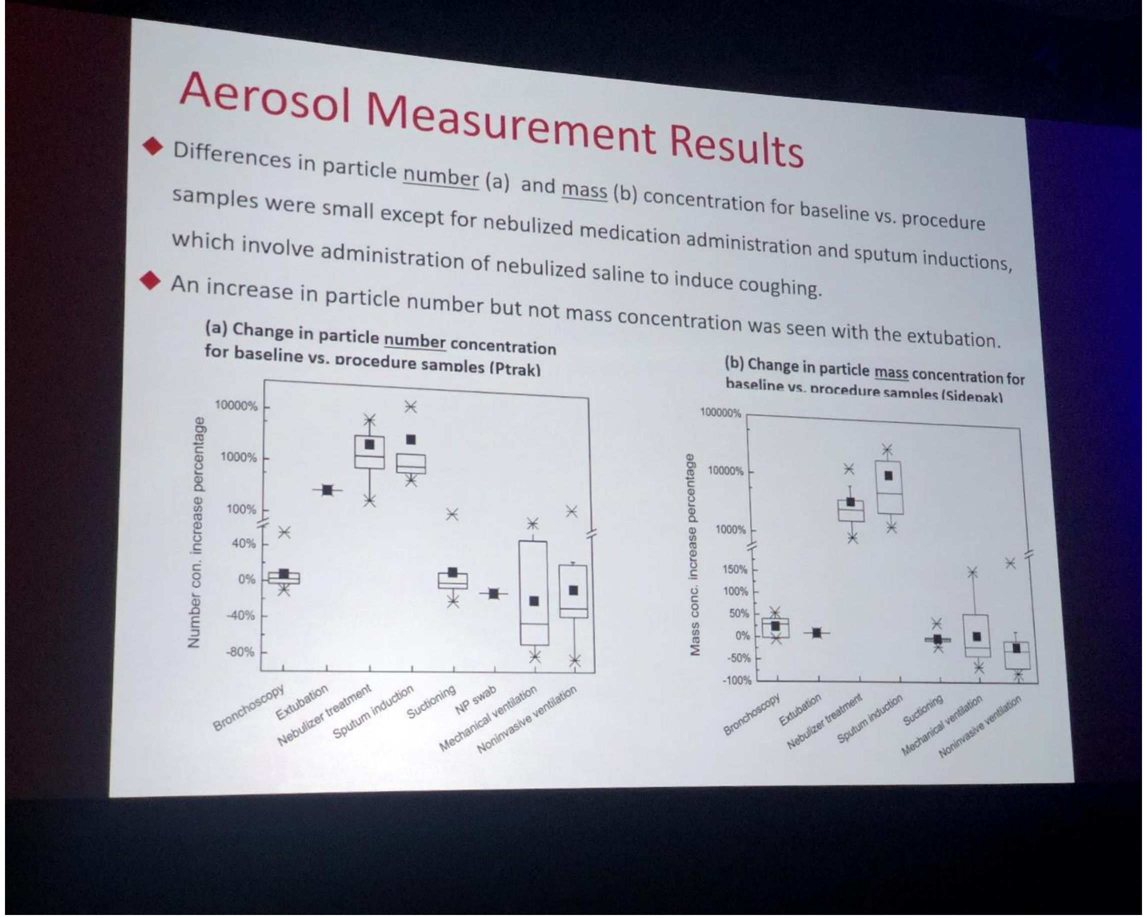
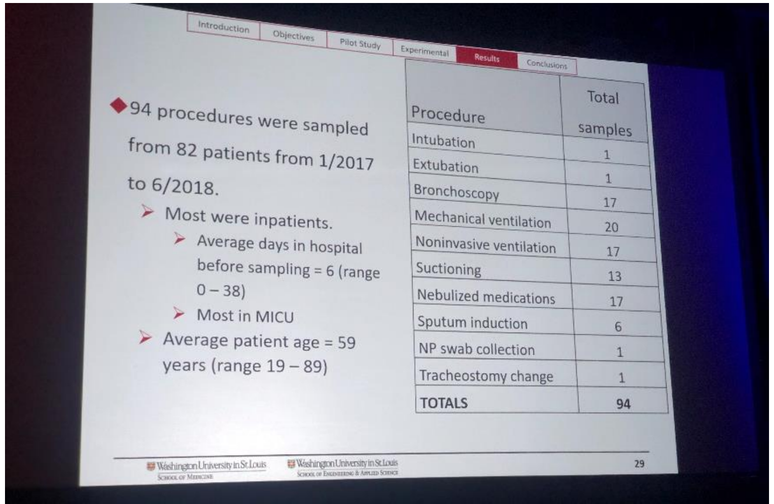


Figure 4. Change from preprocedure baseline in lung-deposited surface area concentrations (alveolar region) during the sampled procedures. Mechanical ventilation and noninvasive ventilation are not included in this figure because no baseline samples could be collected for these procedures. Error bars = standard deviation. Abbreviations: Bronch, bronchoscopy; NMA, nebulized medication administration.







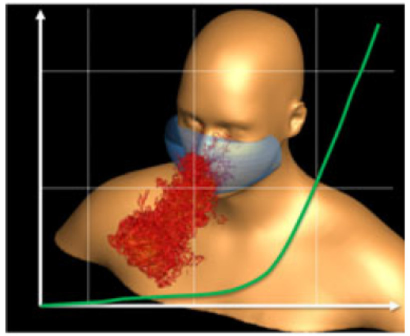
Outros procedimentos
Hilary Babcock
SHEA Spring Conference 2019

The flow physics of COVID-19

Rajat Mittal[1,2,†], **Rui Ni**[1,†] and **Jung-Hee Seo**[1,†]

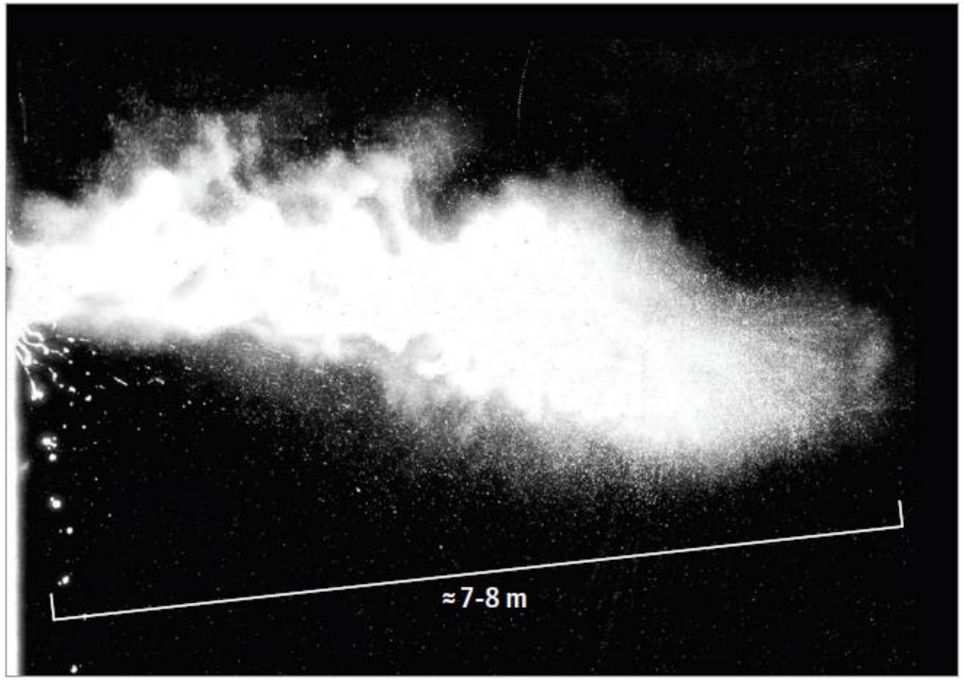
[1]Department of Mechanical Engineering, Johns Hopkins University, Baltimore, MD 21218, USA

[2]School of Medicine, Johns Hopkins University, Baltimore, MD 21205, USA



The graphical abstract displays the growth of COVID-19 infections worldwide as of April 20, 2020, superimposed on the result from a direct-numerical simulation by Jung-Hee Seo (Johns Hopkins University) and Kourosh Shoele (Florida State University), showing the vortices generated by a cough through a face mask.

Figure. Multiphase Turbulent Gas Cloud From a Human Sneeze



JAMA Insights

Turbulent Gas Clouds and Respiratory Pathogen Emissions

Potential Implications for Reducing Transmission of COVID-19

JAMA May 12, 2020 Volume 323, Number 18

The airborne lifetime of small speech droplets and their potential importance in SARS-CoV-2 transmission

Valentyn Stadnytskyi[a], Christina E. Bax[b], Adriaan Bax[a,1], and Philip Anfinrud[a,1]

PNAS | June 2, 2020 | vol. 117 | no. 22 | 11875–11877

Fala pode emitir aerossóis que ficam suspensos no ar por até 10 minutos em ambientes confinados.

Small droplet aerosols in poorly ventilated spaces and SARS-CoV-2 transmission

www.thelancet.com/respiratory Vol 8 July 2020

Transmission of SARS-CoV-2: implications for infection prevention precautions

Scientific Brief

9 July 2020

Opinion

VIEWPOINT

Airborne Transmission of SARS-CoV-2
Theoretical Considerations and Available Evidence

JAMA Published online July 13, 2020

Michael Klompas, MD, MPH

The coronavirus disease 2019 (COVID-19) pandemic has reawakened the long-standing debate about the ex- SARS-CoV-2, but what is less clear is the extent to which these characteristics lead to infections. Demonstrating

https://doi.org/10.1038/s41467-020-16670-2 OPEN

Detection of air and surface contamination by SARS-CoV-2 in hospital rooms of infected patients

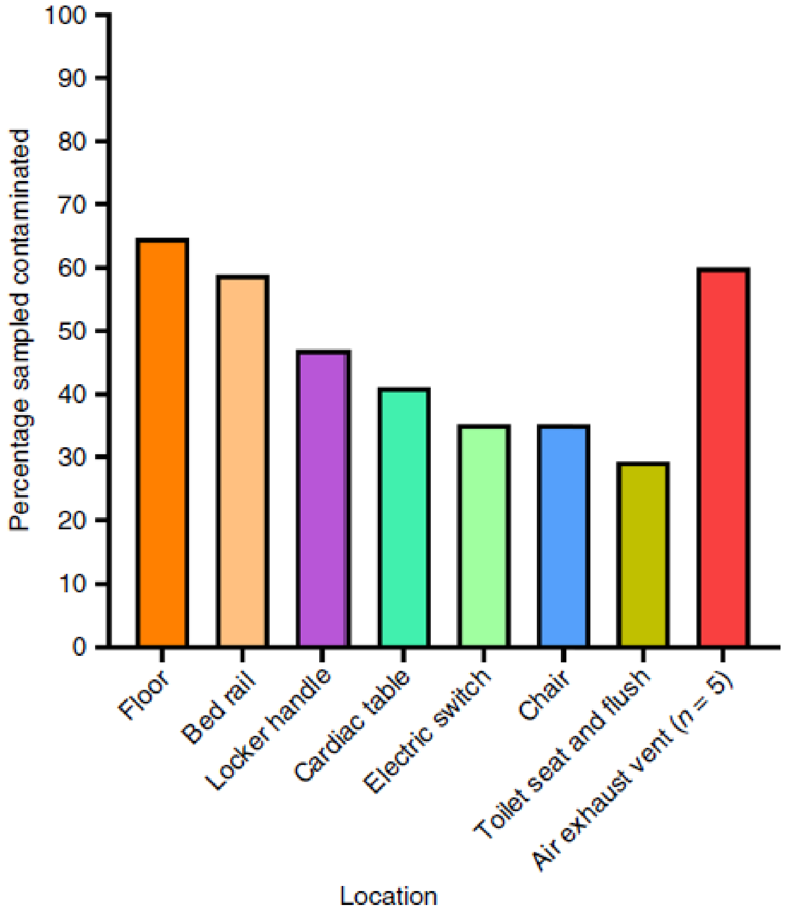
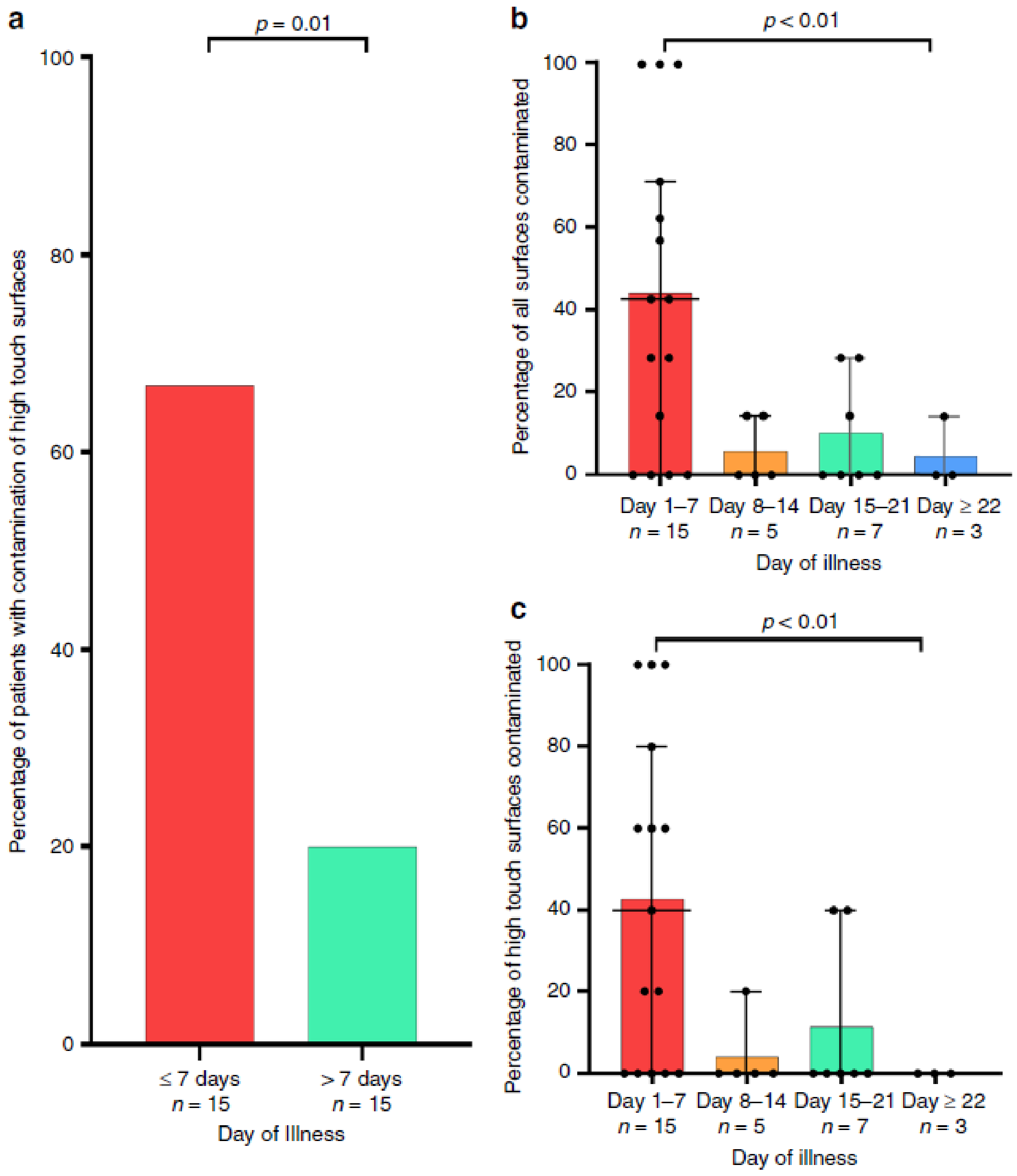
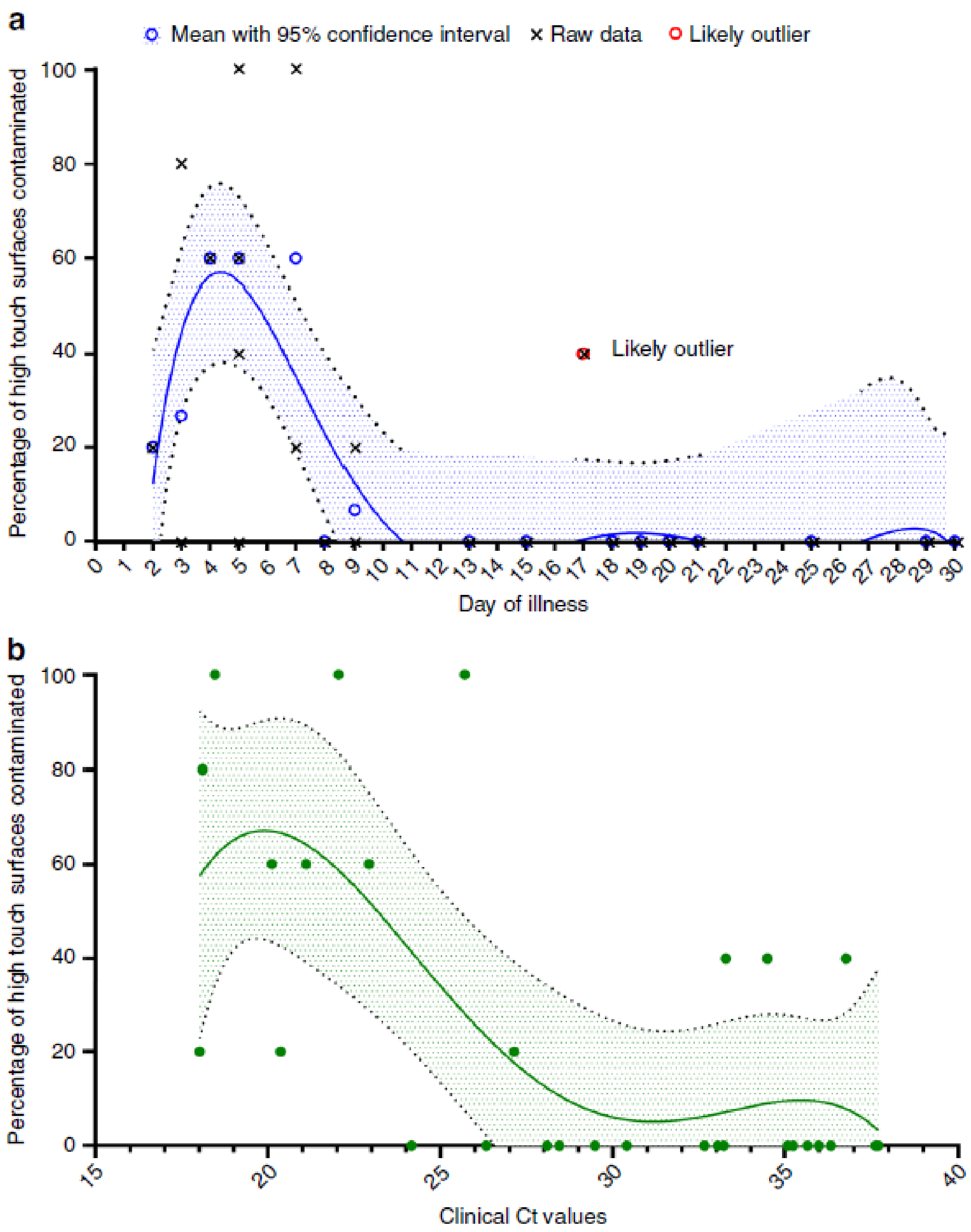


Fig. 1 Percentage of contaminated swabs from surface samples, in rooms with any contamination. All sites were $n = 17$, except for air exhaust vents where $n = 5$.





a
Mean with 95% confidence interval
Raw data
Likely outlier
Percentage of high touch surfaces contaminated
Likely outlier
Day of illness
b
Percentage of high touch surfaces contaminated
Clinical Ct values

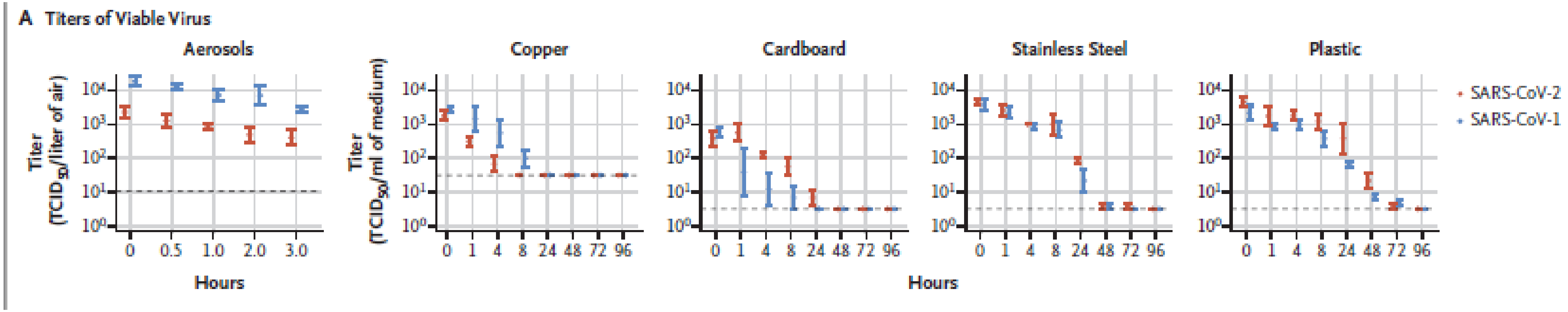
Stability of SARS-CoV-2 in different environmental conditions

www.thelancet.com/microbe Vol 1 May 2020

Papel toalha : 3 horas
Madeira e pano: 2 dias
Vidro e cédula: 4 dias
Superfície metalica e plastic: 7 dias
Face externa da mascara cirurgica: 7 dias.

Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1

N ENGL J MED 382;16 NEJM.ORG APRIL 16, 2020



Review

Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents

Journal of Hospital Infection 104 (2020) 246–251

Table I
Persistence of coronaviruses on different types of inanimate surfaces

Type of surface	Virus	Strain / isolate	Inoculum (viral titer)	Temperature	Persistence	Reference
Steel	MERS-CoV	Isolate HCoV-EMC/2012	10^5	20°C	48 h	[21]
				30°C	8–24 h	
	TGEV	Unknown	10^6	4°C	≥ 28 d	[22]
				20°C	3–28 d	
				40°C	4–96 h	
	MHV	Unknown	10^6	4°C	≥ 28 d	[22]
				20°C	4–28 d	
				40°C	4–96 h	
	HCoV	Strain 229E	10^3	21°C	5 d	[23]
Aluminium	HCoV	Strains 229E and OC43	5 x 10^3	21°C	2–8 h	[24]
Metal	SARS-CoV	Strain P9	10^5	RT	5 d	[25]
Wood	SARS-CoV	Strain P9	10^5	RT	4 d	[25]
Paper	SARS-CoV	Strain P9	10^5	RT	4–5 d	[25]
	SARS-CoV	Strain GVU6109	10^6	RT	24 h	[26]
			10^5		3 h	
			10^4		< 5 min	
Glass	SARS-CoV	Strain P9	10^5	RT	4 d	[25]
	HCoV	Strain 229E	10^3	21°C	5 d	[23]
Plastic	SARS-CoV	Strain HKU39849	10^5	22°-25°C	≤ 5 d	[27]
	MERS-CoV	Isolate HCoV-EMC/2012	10^5	20°C	48 h	[21]
				30°C	8–24 h	
	SARS-CoV	Strain P9	10^5	RT	4 d	[25]
	SARS-CoV	Strain FFM1	10^7	RT	6–9 d	[28]
	HCoV	Strain 229E	10^7	RT	2–6 d	[28]
PVC	HCoV	Strain 229E	10^3	21°C	5 d	[23]
Silicon rubber	HCoV	Strain 229E	10^3	21°C	5 d	[23]
Surgical glove (latex)	HCoV	Strains 229E and OC43	5 x 10^3	21°C	≤ 8 h	[24]
Disposable gown	SARS-CoV	Strain GVU6109	10^6	RT	2 d	[26]
			10^5		24 h	
			10^4		1 h	
Ceramic	HCoV	Strain 229E	10^3	21°C	5 d	[23]
Teflon	HCoV	Strain 229E	10^3	21°C	5 d	[23]

MERS = Middle East Respiratory Syndrome; HCoV = human coronavirus; TGEV = transmissible gastroenteritis virus; MHV = mouse hepatitis virus; SARS = Severe Acute Respiratory Syndrome; RT = room temperature.

Inactivation of coronaviruses by different types of biocidal agents in suspension tests

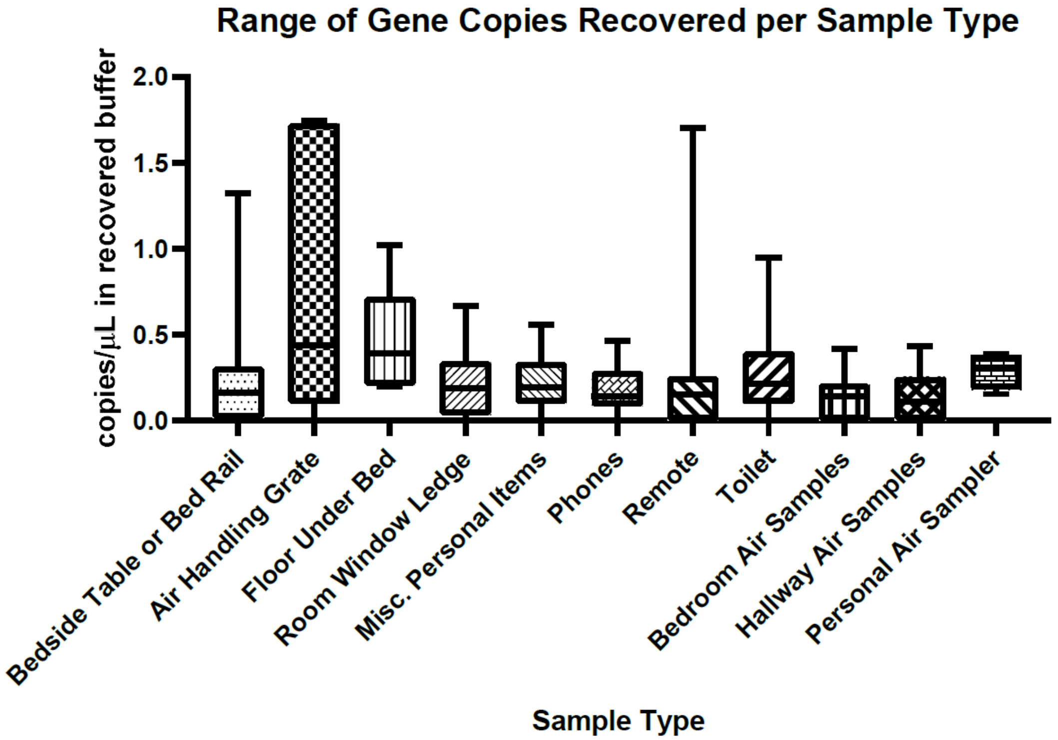
Biocidal agent	Concentration	Virus	Strain / isolate	Exposure time	Reduction of viral infectivity (log_{10})	Reference
Ethanol	95%	SARS-CoV	Isolate FFM-1	30 s	≥ 5.5	[29]
	85%	SARS-CoV	Isolate FFM-1	30 s	≥ 5.5	[29]
	80%	SARS-CoV	Isolate FFM-1	30 s	≥ 4.3	[29]
	80%	MERS-CoV	Strain EMC	30 s	> 4.0	[14]
	78%	SARS-CoV	Isolate FFM-1	30 s	≥ 5.0	[28]
	70%	MHV	Strains MHV-2 and MHV-N	10 min	> 3.9	[30]
	70%	CCV	Strain I-71	10 min	> 3.3	[30]
2-Propanol	100%	SARS-CoV	Isolate FFM-1	30 s	≥ 3.3	[28]
	75%	SARS-CoV	Isolate FFM-1	30 s	≥ 4.0	[14]
	75%	MERS-CoV	Strain EMC	30 s	≥ 4.0	[14]
	70%	SARS-CoV	Isolate FFM-1	30 s	≥ 3.3	[28]
	50%	MHV	Strains MHV-2 and MHV-N	10 min	> 3.7	[30]
	50%	CCV	Strain I-71	10 min	> 3.7	[30]
2-Propanol and 1-propanol	45% and 30%	SARS-CoV	Isolate FFM-1	30 s	≥ 4.3	[29]
		SARS-CoV	Isolate FFM-1	30 s	≥ 2.8	[28]
Benzalkonium chloride	0.2%	HCoV	ATCC VR-759 (strain OC43)	10 min	0.0	[31]
	0.05%	MHV	Strains MHV-2 and MHV-N	10 min	> 3.7	[30]
	0.05%	CCV	Strain I-71	10 min	> 3.7	[30]
	0.00175%	CCV	Strain S378	3 d	3.0	[32]
Didecyldimethyl ammonium chloride	0.0025%	CCV	Strain S378	3 d	> 4.0	[32]
Chlorhexidine digluconate	0.02%	MHV	Strains MHV-2 and MHV-N	10 min	0.7–0.8	[30]
	0.02%	CCV	Strain I-71	10 min	0.3	[30]
Sodium hypochlorite	0.21%	MHV	Strain MHV-1	30 s	≥ 4.0	[33]
	0.01%	MHV	Strains MHV-2 and MHV-N	10 min	2.3–2.8	[30]
	0.01%	CCV	Strain I-71	10 min	1.1	[30]
	0.001%	MHV	Strains MHV-2 and MHV-N	10 min	0.3–0.6	[30]
	0.001%	CCV	Strain I-71	10 min	0.9	[30]
Hydrogen peroxide	0.5%	HCoV	Strain 229E	1 min	> 4.0	[34]
Formaldehyde	1%	SARS-CoV	Isolate FFM-1	2 min	> 3.0	[28]
	0.7%	SARS-CoV	Isolate FFM-1	2 min	> 3.0	[28]
	0.7%	MHV		10 min	> 3.5	[30]
	0.7%	CCV	Strain I-71	10 min	> 3.7	[30]
	0.009%	CCV		24 h	> 4.0	[35]
Glutardialdehyde	2.5%	SARS-CoV	Hanoi strain	5 min	> 4.0	[36]
	0.5%	SARS-CoV	Isolate FFM-1	2 min	> 4.0	[28]
Povidone iodine	7.5%	MERS-CoV	Isolate HCoV-EMC/2012	15 s	4.6	[37]
	4%	MERS-CoV	Isolate HCoV-EMC/2012	15 s	5.0	[37]
	1%	SARS-CoV	Hanoi strain	1 min	> 4.0	[36]
	1%	MERS-CoV	Isolate HCoV-EMC/2012	15 s	4.3	[37]
	0.47%	SARS-CoV	Hanoi strain	1 min	3.8	[36]
	0.25%	SARS-CoV	Hanoi strain	1 min	> 4.0	[36]
	0.23%	SARS-CoV	Hanoi strain	1 min	> 4.0	[36]
	0.23%	SARS-CoV	Isolate FFM-1	15 s	≥ 4.4	[38]
	0.23%	MERS-CoV	Isolate HCoV-EMC/2012	15 s	≥ 4.4	[38]

SARS = Severe Acute Respiratory Syndrome; MERS = Middle East Respiratory Syndrome; MHV = mouse hepatitis virus; CCV = canine coronavirus; HCoV = human coronavirus.

Transmission Potential of SARS-CoV-2 in Viral Shedding Observed at the University of Nebraska Medical Center

Authors: Joshua L. Santarpia[1,2*], Danielle N. Rivera[2], Vicki Herrera[1], M. Jane Morwitzer[1], Hannah Creager [1], George W. Santarpia[1], Kevin K. Crown[2], David M. Brett-Major[1], Elizabeth Schnaubelt[1,3], M. Jana Broadhurst[1], James V. Lawler[1], St. Patrick Reid[1], and John J. Lowe[1]

medRxiv preprint doi: https://doi.org/10.1101/2020.03.23.20039446.

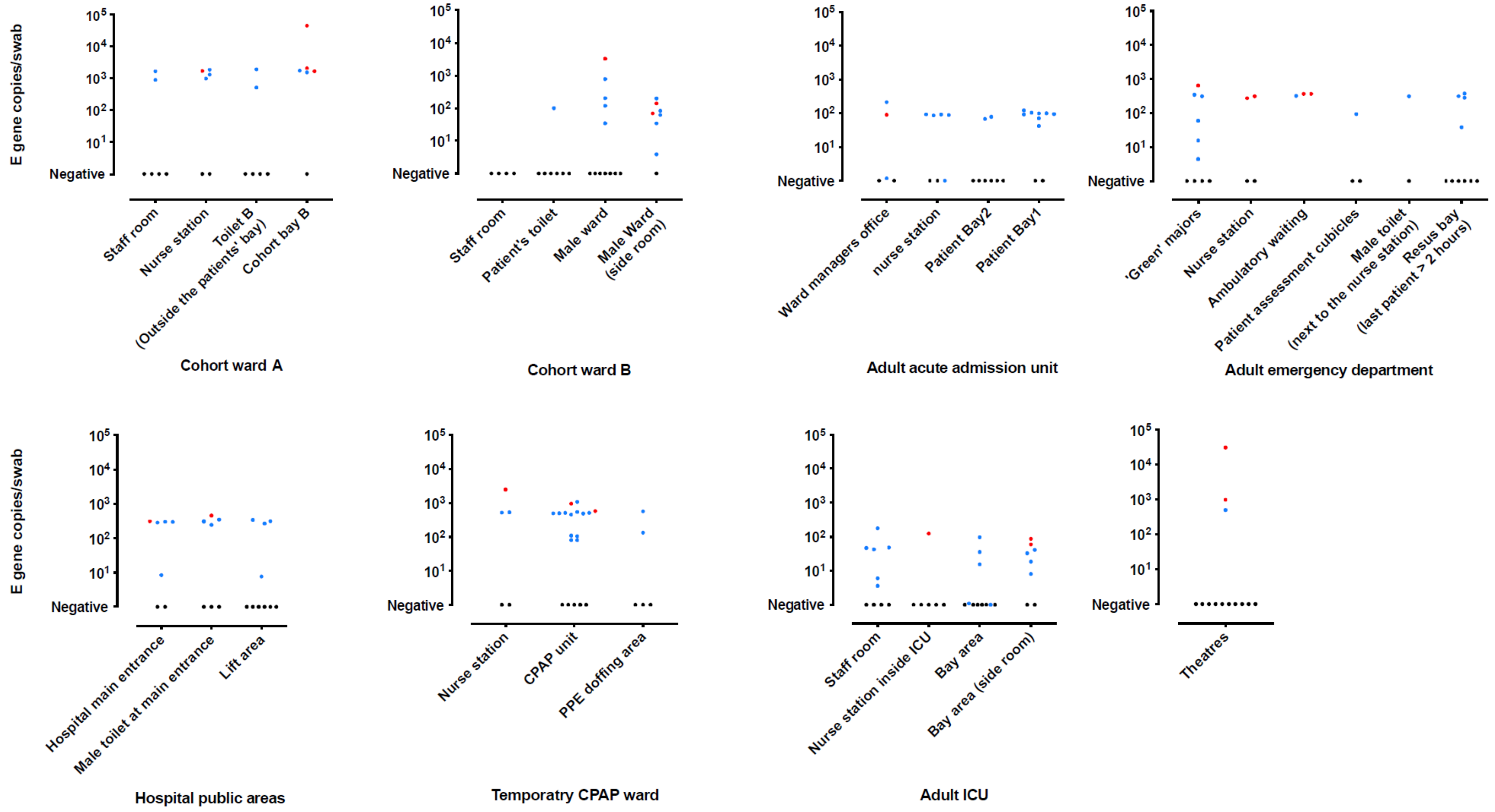


Sem efeito citopático em cultura de células

Title: Investigating SARS-CoV-2 surface and air contamination in an acute healthcare setting during the peak of the COVID-19 pandemic in London

medRxiv preprint doi: https://doi.org/10.1101/2020.05.24.20110346.

Mais encontrado em áreas COVID+(67/105 (63.8%) que áreas COVID-. 29/64 (45.3%) (OR 0.5, IC 0.2-0.9, p=0.025)



Exposures	No. (%) HCP with COVID-19	HCP without COVID-19	p-value
Total HCP	3	34	N/A
Non-AGP activities*			
Taking vital signs	2 (67)	7 (21)	0.14
Taking medical history	1 (33)	7 (21)	0.53
Performing physical exam	3 (100)	8 (24)	0.02
Providing medication	1 (33)	10 (29)	1.00
Bathing or cleaning patient	0 (0)	4 (12)	1.00
Lifting or positioning patient	1 (33)	12 (35)	1.00
Emptying bedpan	1 (33)	2 (6)	0.23
Changing linens	0 (0)	5 (14)	1.00
Cleaning patient room	0 (0)	4 (12)	1.00
Peripheral line insertion	0 (0)	1 (3)	1.00
Central line insertion	0 (0)	1 (3)	1.00
Drawing arterial blood gas	1 (33)	1 (3)	0.16
Drawing blood	0 (0)	5 (15)	1.00
Manipulation of oxygen mask or tubing	2 (67)	5 (15)	0.09
Manipulation of ventilator or tubing	0 (0)	7 (21)	1.00
In room while high-flow oxygen being delivered	1 (33)	9 (26)	1.00
Collecting respiratory specimen	0 (0)	3 (9)	1.00
AGPs*,†			
Airway suctioning	0 (0)	7 (21)	1.00
Noninvasive ventilation (BiPAP, CPAP)	2 (67)	4 (12)	0.06
Manual (bag) ventilation	1 (33)	2 (6)	0.23
Nebulizer treatments	2 (67)	3 (9)	0.04
Breaking ventilation circuit	0 (0)	5 (15)	1.00
Sputum induction	0 (0)	1 (3)	1.00
Intubation	1 (33)	2 (6)	0.23
Performed or assisted	1 (33)	1 (3)	0.16
Present in room	0 (0)	1 (3)	1.00
Bronchoscopy	0 (0)	3 (9)	1.00
Performed or assisted	0 (0)	1 (3)	1.00
Present in room	0 (0)	3 (9)	1.00
Any AGP	**2 (67)**	**15 (44)**	**0.58**

Morbidity and Mortality Weekly Report

Transmission of COVID-19 to Health Care Personnel During Exposures to a Hospitalized Patient — Solano County, California, February 2020

Amy Heinzerling, MD[1,2]; Matthew J. Stuckey, PhD[3]; Tara Scheuer, MPH[4]; Kerui Xu, PhD[2,3]; Kiran M. Perkins, MD[3]; Heather Resseger, MSN[5]; Shelley Magill, MD, PhD[3]; Jennifer R. Verani, MD[3]; Seema Jain, MD[1]; Meileen Acosta, MPH[4]; Erin Epson, MD[1]

Exposures	No./Total no. (%) HCP with COVID-19	HCP without COVID-19	p-value
Reported always* using specified PPE during AGPs†,§ with index patient			
Gloves	2/2 (100)	10/16 (63)	0.53
Facemask	0/2 (0)	3/16 (19)	1.00
Reported always* using specified PPE during non-AGP activities† with index patient			
Gloves	3/3 (100)	21/34 (62)	0.54
Facemask	0/3 (0)	3/34 (9)	1.00
Duration of exposure to index patient			
Longest single duration of time in room (mins)			
<2	0/3 (0)	2/34 (6)	0.70
2–30	2/3 (67)	23/34 (68)	
31–60	0/3 (0)	4/34 (12)	
>60	1/3 (33)	3/34 (9)	
Median (IQR) total estimated time in patient room, mins	120 (120–420)	25 (10–50)	0.06
Median (IQR) total estimated time in patient room during AGPs, mins¶	95 (0–160)	0 (0–3)	0.13
Came within 6 ft of index patient	3/3 (100)	30/34 (91)	1.00
Reported direct skin-to-skin contact with index patient	0/3 (0)	8/34 (24)	1.00
Index patient either masked or on closed-system ventilator when contact occurred			
Always	0/3 (0)	7/34 (23)	0.58
Sometimes	2/3 (67)	10/34 (32)	
Never	1/3 (33)	14/34 (45)	

Medical masks vs N95 respirators for preventing COVID-19 in healthcare workers: A systematic review and meta-analysis of randomized trials

Influenza Other Respi Viruses. 2020;14:365–373.

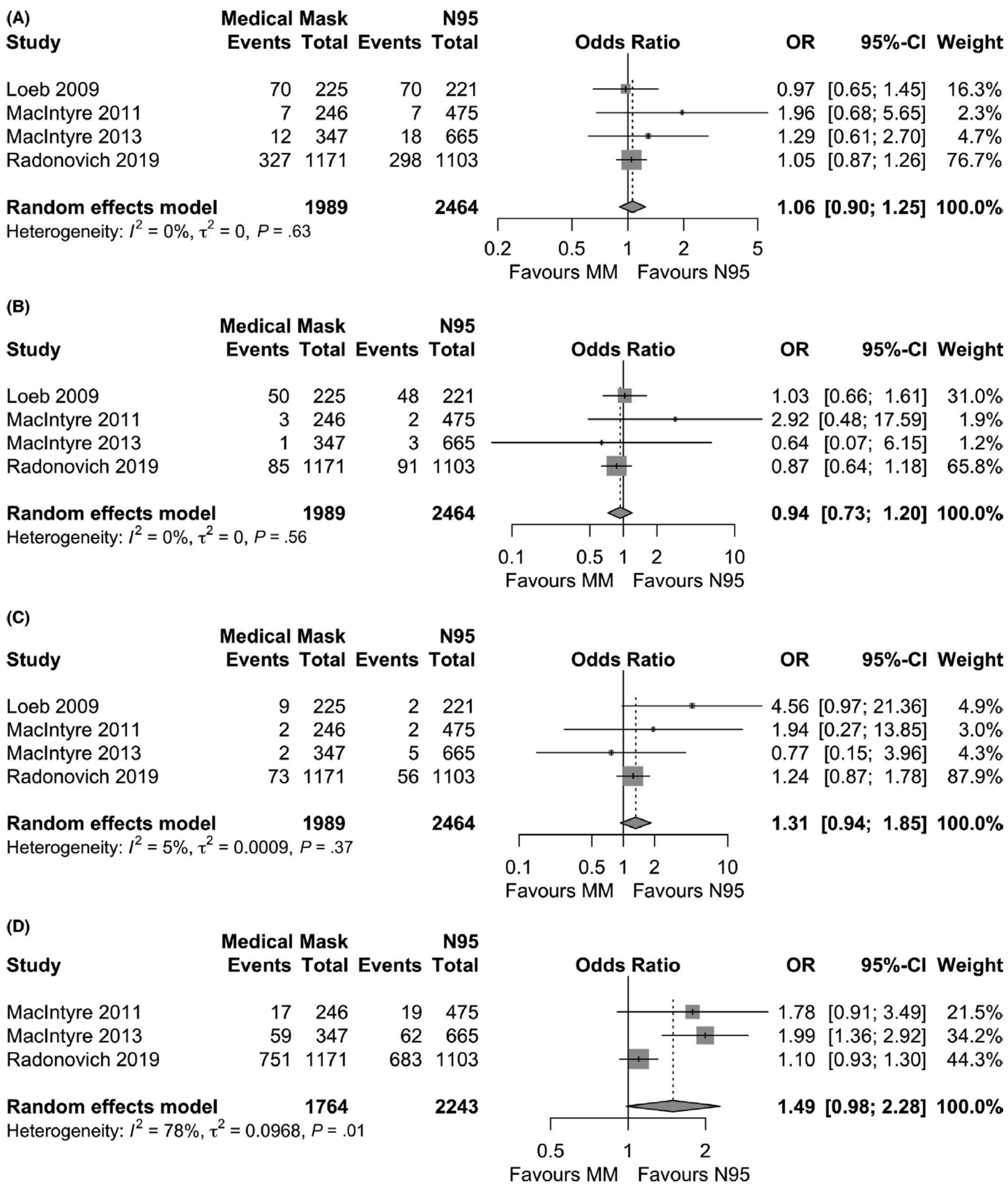


FIGURE 2 Meta-analyses of 4 randomized controlled trials comparing medical masks to N95 respirators in preventing A, Laboratoryconfirmed viral respiratory infection; B, Laboratory-confirmed influenza infection; C, Influenza-like illness; and D, Clinical respiratory illness

Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and COVID-19: a systematic review and meta-analysis

Derek K Chu, Elie A Akl, Stephanie Duda, Karla Solo, Sally Yaacoub, Holger J Schünemann, on behalf of the COVID-19 Systematic Urgent Review Group Effort (SURGE) study authors*

Lancet 2020; 395: 1973–87

Published Online
June 1, 2020

	Country	Respirator (0=no)	Infection	Events, face mask (n/N)	Events, no face mask (n/N)	RR (95% CI)	% weight (random)
Health-care setting							
Scales et al (2003)[66]	Canada	0	SARS	3/16	4/15	0·70 (0·19–2·63)	3·2
Liu et al (2009)[51]	China	0	SARS	8/123	43/354	0·54 (0·26–1·11)	6·7
Pei et al (2006)[61]	China	0	SARS	11/98	61/115	0·21 (0·12–0·38)	7·9
Yin et al (2004)[75]	China	0	SARS	46/202	31/55	0·40 (0·29–0·57)	10·3
Park et al (2016)[59]	South Korea	0	MERS	3/24	2/4	0·25 (0·06–1·06)	2·8
Kim et al (2016)[48]	South Korea	0	MERS	0/7	1/2	0·13 (0·01–2·30)	0·8
Heinzerling et al (2020)[44]	USA	0	COVID-19	0/31	3/6	0·03 (0·002–0·54)	0·9
Nishiura et al (2005)[55]	Vietnam	0	SARS	8/43	17/72	0·79 (0·37–1·67)	6·5
Nishiyama et al (2008)[56]	Vietnam	0	SARS	17/61	14/18	0·36 (0·22–0·58)	9·0
Reynolds et al (2006)[64]	Vietnam	0	SARS	8/42	14/25	0·34 (0·17–0·69)	6·7
Loeb et al (2004)[53]	Canada	1	SARS	3/23	5/9	0·23 (0·07–0·78)	3·6
Wang et al (2020)[41]	China	1	COVID-19	0/278	10/215	0·04 (0·002–0·63)	0·9
Seto et al (2003)[67]	China	1	SARS	0/51	13/203	0·15 (0·01–2·40)	0·9
Wang et al (2020)[70]	China	1	COVID-19	1/1286	119/4036	0·03 (0·004–0·19)	1·7
Alraddadi et al (2016)[34]	Saudi Arabia	1	MERS	6/116	12/101	0·44 (0·17–1·12)	5·0
Ho et al (2004)[45]	Singapore	1	SARS	2/62	2/10	0·16 (0·03–1·02)	1·9
Teleman et al (2004)[68]	Singapore	1	SARS	3/26	33/60	0·21 (0·07–0·62)	4·2
Wilder-Smith et al (2005)[72]	Singapore	1	SARS	6/27	39/71	0·40 (0·19–0·84)	6·5
Ki et al (2019)[47]	South Korea	1	MERS	0/218	6/230	0·08 (0·005–1·43)	0·8
Kim et al (2016)[49]	South Korea	1	MERS	1/444	16/308	0·04 (0·01–0·33)	1·6
Hall et al (2014)[43]	Saudi Arabia	1	MERS	0/42	0/6	(Not calculable)	0
Ryu et al (2019)[65]	South Korea	1	MERS	0/24	0/10	(Not calculable)	0
Park et al (2004)[58]	USA	1	SARS	0/60	0/45	(Not calculable)	0
Peck et al (2004)[60]	USA	1	SARS	0/13	0/19	(Not calculable)	0
Burke et al (2020)[37]	USA	1	COVID-19	0/64	0/13	(Not calculable)	0
Ha et al (2004)[42]	Vietnam	1	SARS	0/61	0/1	(Not calculable)	0
Random subtotal (I^2=50%)				**126/3442**	**445/6003**	**0·30 (0·22–0·41)**	**81·9**
Non-health-care setting							
Lau et al (2004)[50]	China	0	SARS	12/89	25/98	0·53 (0·28–0·99)	7·5
Wu et al (2004)[74]	China	0	SARS	25/146	69/229	0·57 (0·38–0·85)	9·7
Tuan et al (2007)[69]	Vietnam	0	SARS	0/9	7/154	1·03 (0·06–16·83)	0·9
Random subtotal (I^2=0%)				**37/244**	**101/481**	**0·56 (0·40–0·79)**	**18·1**
Unadjusted estimates, overall (I^2=48%)				**163/3686**	**546/6484**	**0·34 (0·26–0·45)**	**100·0**
Adjusted estimates, overall (1 COVID-19, 1 MERS, 8 SARS)						**aOR 0·15 (0·07–0·34)**	
						aRR 0·18 (0·08–0·38)	

Interaction by setting, p=0·049; adjusted for N95 and distance, p=0·11

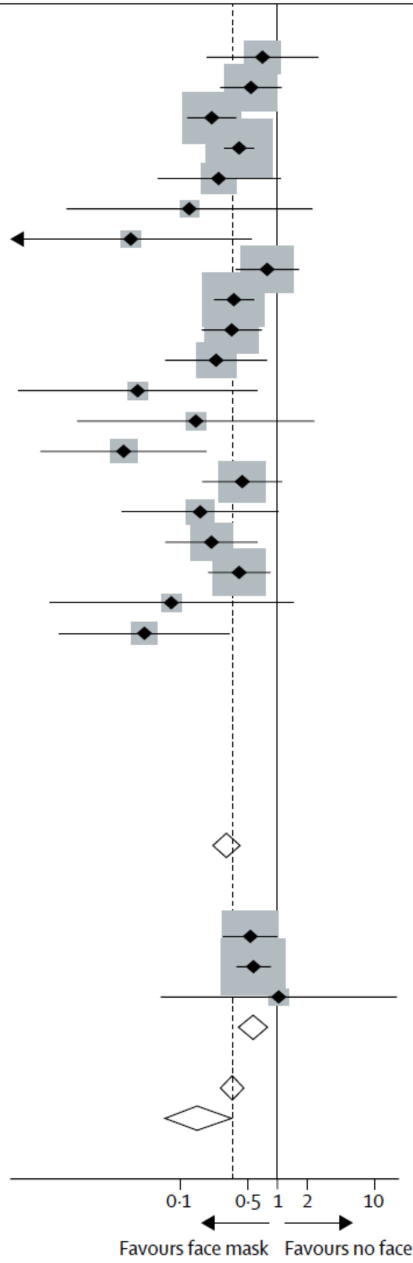


Figure 4: Forest plot showing unadjusted estimates for the association of face mask use with viral infection causing COVID-19, SARS, or MERS

	Country	Virus	Setting	aOR (95% CI)	% weight (random)
N95 respirator or similar *vs* no face mask					
Seto et al (2003)[67]	China	SARS	Health care	0·08 (0·02–0·34)	9·0
Ma et al* (2004)[54]	China	SARS	Health care	0·01 (0·003–0·06)	8·9
Wang et al (2020)[41]	China	COVID-19	Health care	0·002 (0·000–0·02)	6·2
Alraddadi et al* (2016)[34]	Saudi Arabia	MERS	Health care	0·41 (0·13–1·26)	10·4
Random subtotal (I^2=87%)				**0·04 (0·004–0·30)**	**34·5**
Surgical face mask or similar (eg, 12–16-layer cotton) *vs* no face mask					
Wu et al (2004)[74]	China	SARS	Non-health care	0·30 (0·12–0·73)	11·2
Lau et al (2004)[50]	China	SARS	Non-health care	0·32 (0·17–0·61)	12·0
Yin et al (2004)[75]	China	SARS	Health care	0·78 (0·61–1·00)	12·8
Liu et al* (2009)[51]	China	SARS	Health care	0·22 (0·08–0·62)	10·8
Nishiura et al (2005)[55]	Vietnam	SARS	Health care	0·29 (0·11–0·75)	11·0
Nishiyama et al (2008)[56]	Vietnam	SARS	Health care	0·08 (0·01–0·50)	7·7
Random subtotal (I^2=76%)				**0·33 (0·17–0·61)**	**65·5**
Random overall (I^2=88%)				**0·15 (0·07–0·34)**	**100·0**
Bayesian overall (Jefferson[31] seasonal viruses)				**0·40 (0·16–0·97)**	

Interaction p=0·090; adjusted for setting, p=0·17; adjusted for AGP, p=0·048

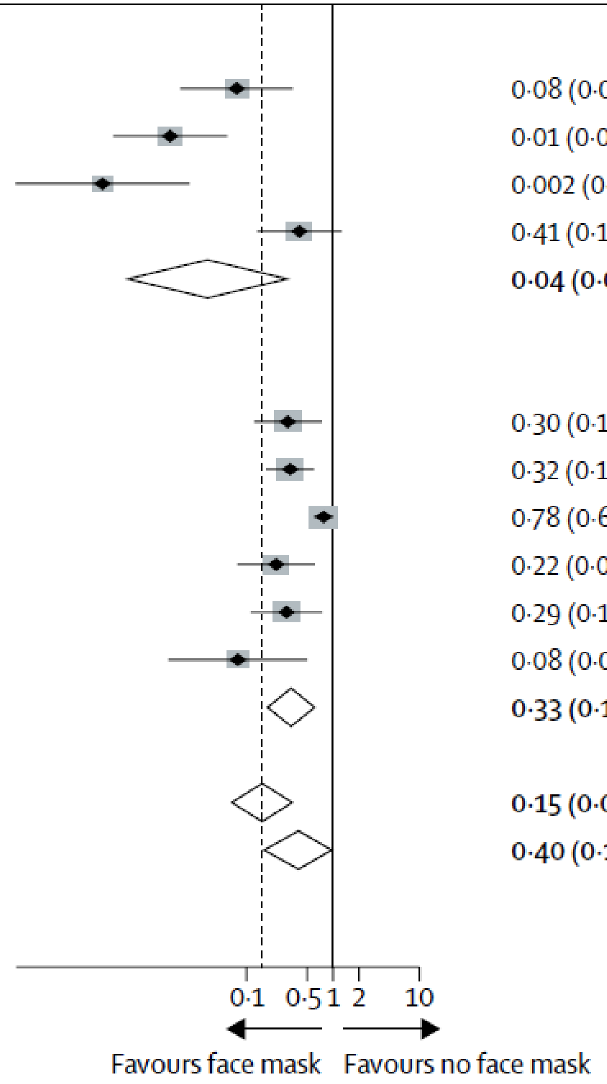
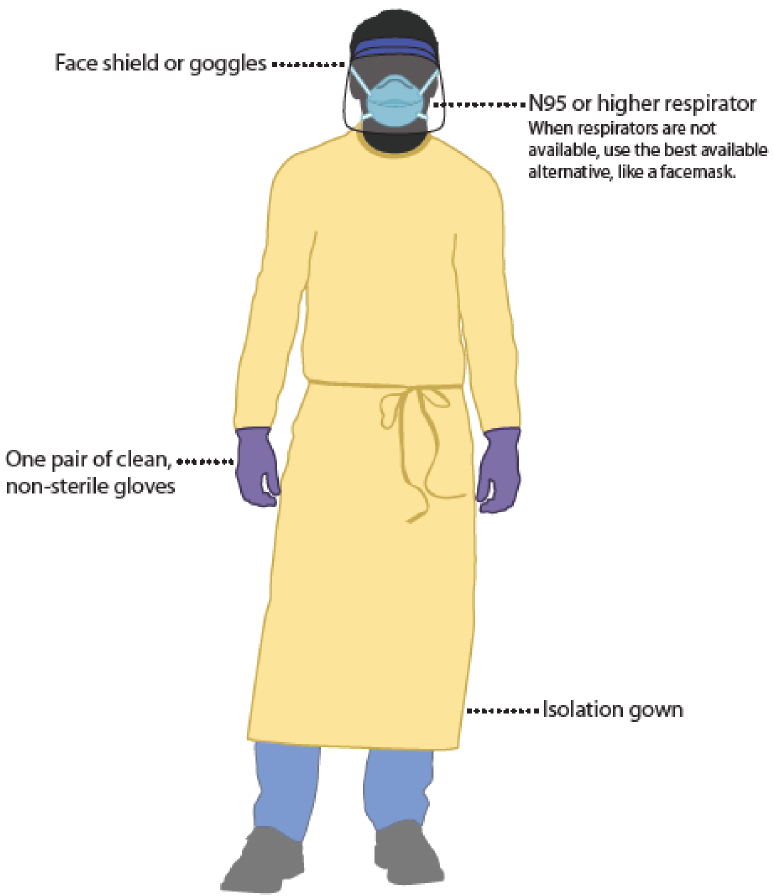


Figure 5: **Forest plot showing adjusted estimates for the association of face mask use with viral infection causing COVID-19, SARS, or MERS**
SARS=severe acute respiratory syndrome. MERS=Middle East respiratory syndrome. RR=relative risk. aOR=adjusted odds ratio. AGP=aerosol-generating procedures.
*Studies clearly reporting AGP.

Preferred PPE – Use N95 or Higher Respirator



Acceptable Alternative PPE – Use Facemask

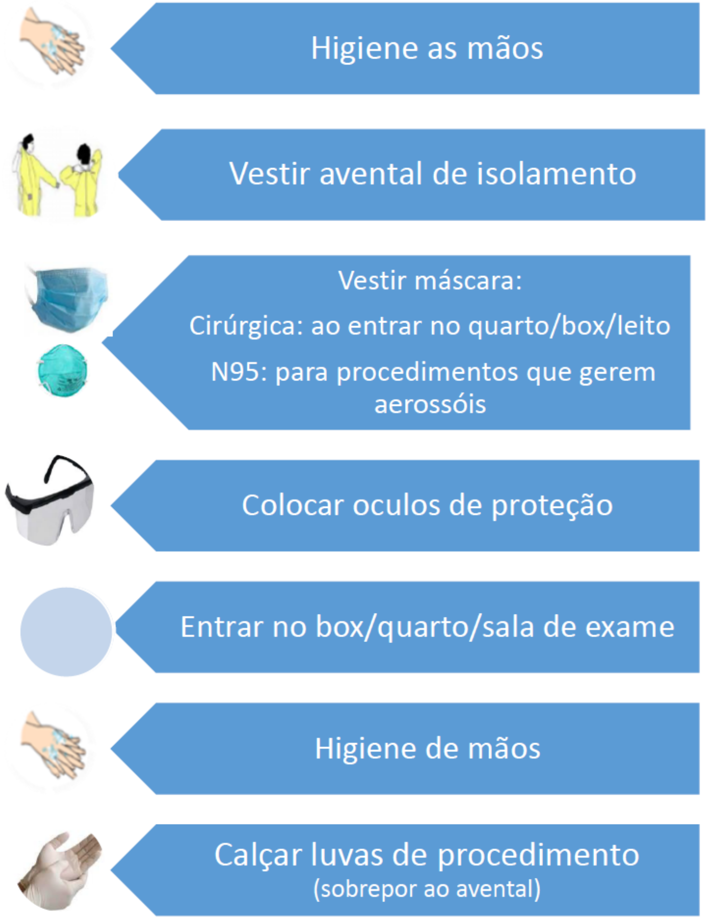
Remember:

- PPE must be donned correctly before entering the patient area (e.g., isolation room, unit if cohorting).
- PPE must remain in place and be worn correctly for the duration of work in potentially contaminated areas. PPE should not be adjusted (e.g., retying gown, adjusting respirator/facemask) during patient care.
- PPE must be removed slowly and deliberately in a sequence that prevents self-contamination. A step-by-step process should be developed and used during training and patient care.

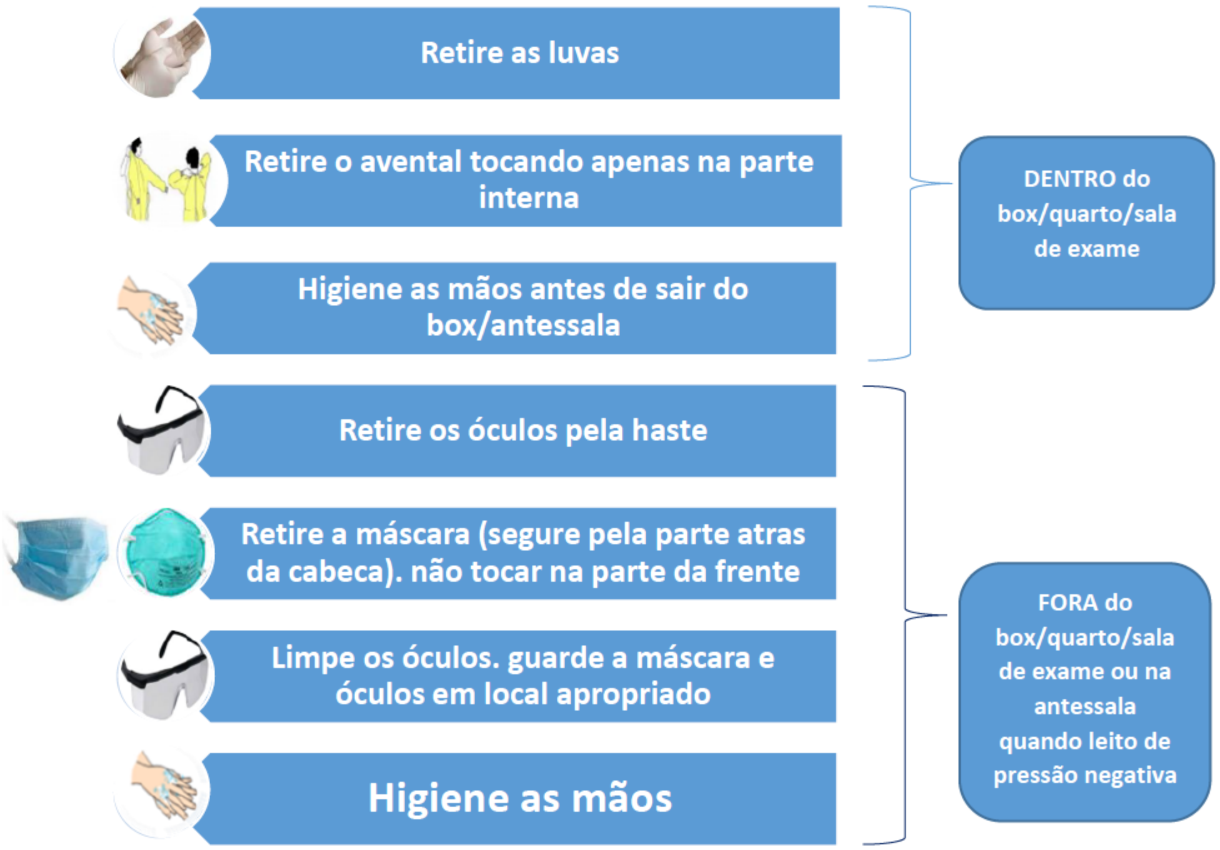
www.cdc.gov/coronavirus

CS 316124-A 03/30/2020

PASSO A PASSO DE **COLOCAÇÃO** DE EQUIPAMENTO DE PROTEÇÃO INDIVIDUAL



PASSO A PASSO DE **RETIRADA** DO EQUIPAMENTO DE PROTEÇÃO INDIVIDUAL



Common breaches in biosafety during donning and doffing of protective personal equipment used in the care of COVID-19 patients

Can J Anesth/J Can Anesth
https://doi.org/10.1007/s12630-020-01648-x

Published online: 14 April 2020

Paramentação:

- Ajuste N95
- Colocação da luva
- Tempo

Desparamentação:

- Retirada das luvas
- Retirada do avental
- Retirada da máscara

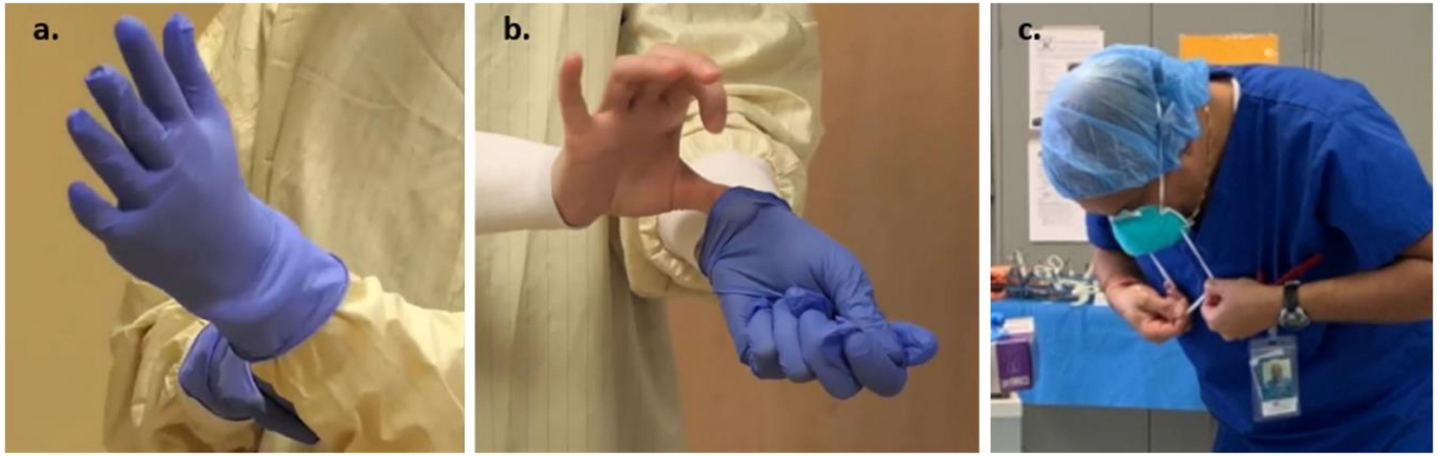


Figure Doffing of personal protective equipment. A) The sleeve fits snugly below the extended cuff of the glove. B) Minimal contact possible between the un-gloved hand/ fingers with the sleeve of the gloved hand when removing the second glove. C) Maintaining tension in the inferior strap is useful for preventing snapping of the face mask while removing. Hand hygiene with an alcohol-based hand sanitizer between each of the doffing steps is recommended

DESAFIOS

- Estetoscópio
- Limpeza óculos e faceshield
- Tamanho dos aventais e punho
- Luva dentro ou fora do quarto
- Reutilização máscaras -> saquinhos
- Machucados
- Momento 2 de higiene de mãos
- Fornecedores

Indisponibilidade

Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-Care Facilities, 1994

October 28, 1994 / Vol. 43 / No. RR-13

Reuso quando não há preocupação com transmissão pelo contato.

Considerations for Recommending Extended Use and Limited Reuse of Filtering Facepiece Respirators in Health Care Settings

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National Personal Protective Technology Laboratory, National Institute for Occupational Safety and Health, Pittsburgh, Pennsylvania

Journal of Occupational and Environmental Hygiene, 11: D115–D128
ISSN: 1545-9624 print / 1545-9632 online
DOI: 10.1080/15459624.2014.902954

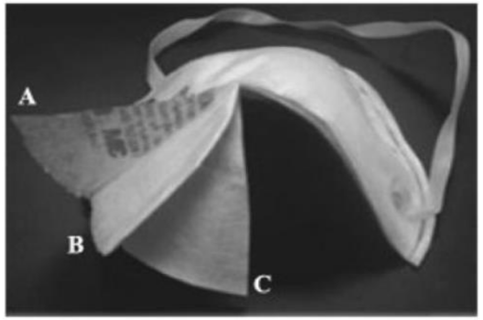


FIGURE 1. Photograph of a NIOSH certified N95 FFR cut open to show the different layers. A, polypropylene material (outermost layer); B, electret filtering medium (typically made from melt-blown or electrospun polypropylene); and C, polypropylene material (innermost layer).

Risco com procedimentos que geram aerossóis

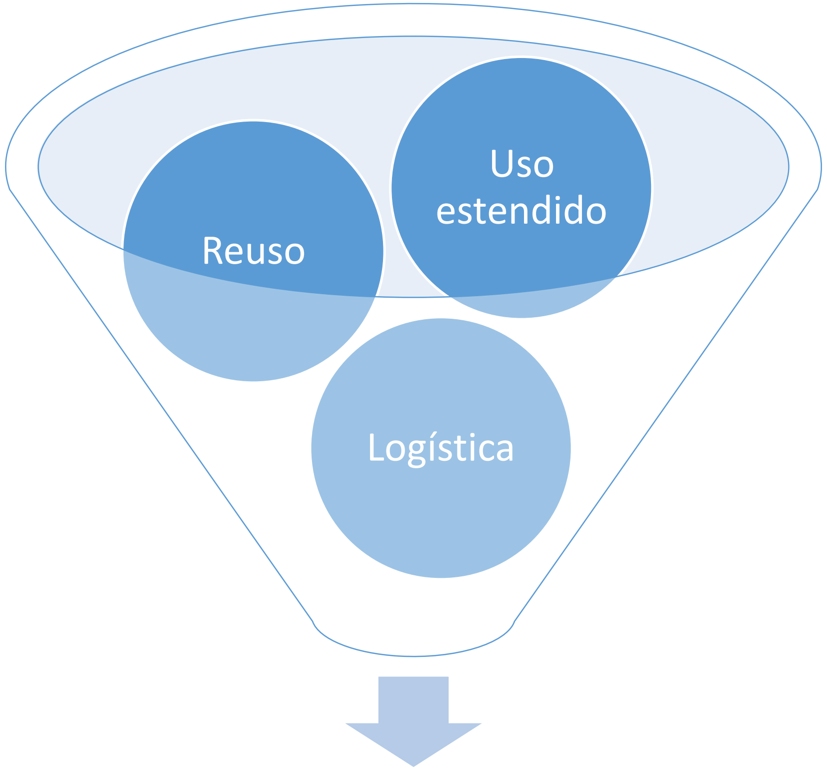
Major article

Physiologic and other effects and compliance with long-term respirator use among medical intensive care unit nurses

Terri Rebmann PhD, RN, CIC[a,*], Ruth Carrico PhD, RN, CIC[b], Jing Wang PhD[c]

American Journal of Infection Control 41 (2013) 1218-23

- 90% das enfermeiras toleram usar a N95 por dois turnos consecutivos de plantão de 12 horas.
- Tocaram a face e porção anterior da máscara em média 25 vezes/plantão



Disponibilidade

- Transmissão por gotículas/aerossóis e pelas superfícies
- Uso universal de máscaras, N95 quando indicado, avental, gorro, luvas, óculos
- Treinamentos em paramentação e desparamentação
- Reusos – logística