COVID 19 e os riscos para os profissionais de saúde durante a pandemia

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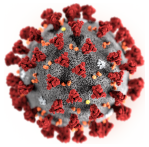
www.webbertraining.com

23 de julho de 2020

Agenda

- SARS-CoV-2
- Profissionais de saúde e vulnerabilidade
- Fatores de risco
- Medidas de prevenção e redução de risco do profissional adquirir e transmitir o vírus.



SARS-CoV-2

2019-nCoV

09/01/20
Novo coronavírus

31/12/2019
Notificaçao à OMS – casos pneumonia cidade de Wuhan (China)

13/01/20
Tailândia relatou um caso importado confirmado laboratorialmente

16/01/20
Japão reportou segundo caso fora da China

21/01/20
Primeiro caso importado nos EUA

24/01/20
Primeiro caso importado na França

29/01/20
Emirados Árabes Unidos relataram os primeiros casos

30/01/20
Emergência Saúde Pública Internacional
98 casos em 18 países fora da China

Alemanha, Japão, EUA e Vietnã tinham evidências transmissão pessoa-a-pessoa fora da China

16/02/20
República Islâmica do Irã, Itália e Espanha com níveis relativamente altos de transmissão comunitária

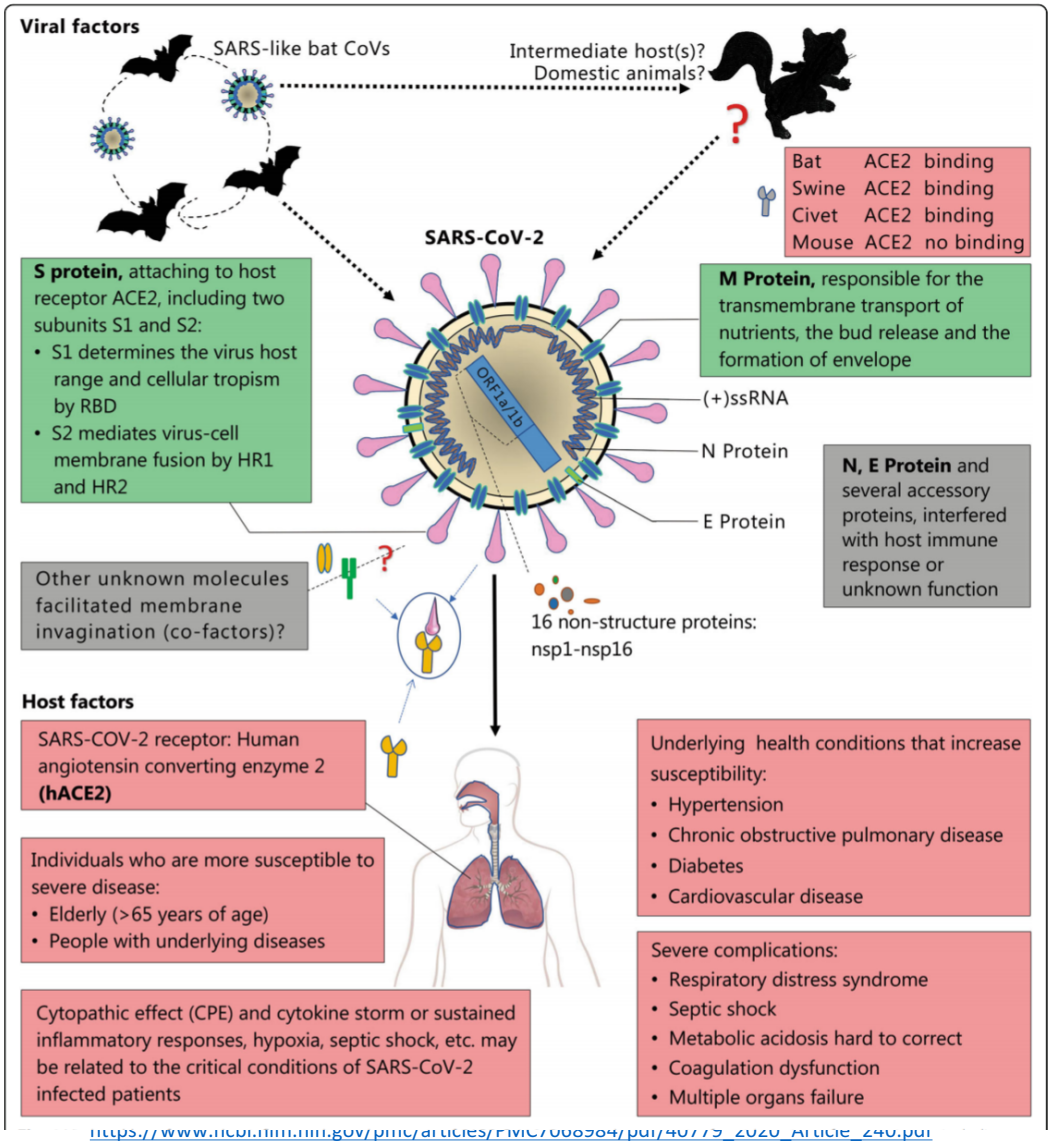
11/03/20

Declaração de Pandemia

https://www.who.int/news-room/detail/29-06-2020-covidtimeline

Situação COVID-19 em 22 de julho de 2020

- Foram confirmados no mundo 14.765.256 casos de COVID-19;
- 202.726 novos em relação ao dia anterior;
- 612.054 mortes; 4.286 novas em relação ao dia anterior.



https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7068984/pdf/40779_2020_Article_240.pdf

REVIEW

The origin, transmission and clinical therapies on coronavirus disease 2019 (COVID-19) outbreak – an update on the status

Patogênese:

- ✓ Interação vírus-hospedeiro: facilita entrada e replicação viral;
- ✓ A glicoproteína S da espícula do SARS-CoV-2 se liga aos receptores das células - enzima de conversão da angiotensina 2 (ACE2), uma etapa crítica para a entrada do vírus;
- ✓ Fatores hospedeiro: suscetibilidade à infecção e à progressão da doença.

Guo et al. Military Medical Research (2020) 7:11 https://doi.org/10.1186/s40779-020-00240-0

TO THE EDITOR: Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) preferentially infects cells in the respiratory tract,[1,2] but its domains poorly defined. Here, we present data from an autopsy series of 27 patients (see the clinical data in Table S1 in the Supplementary Appendix,

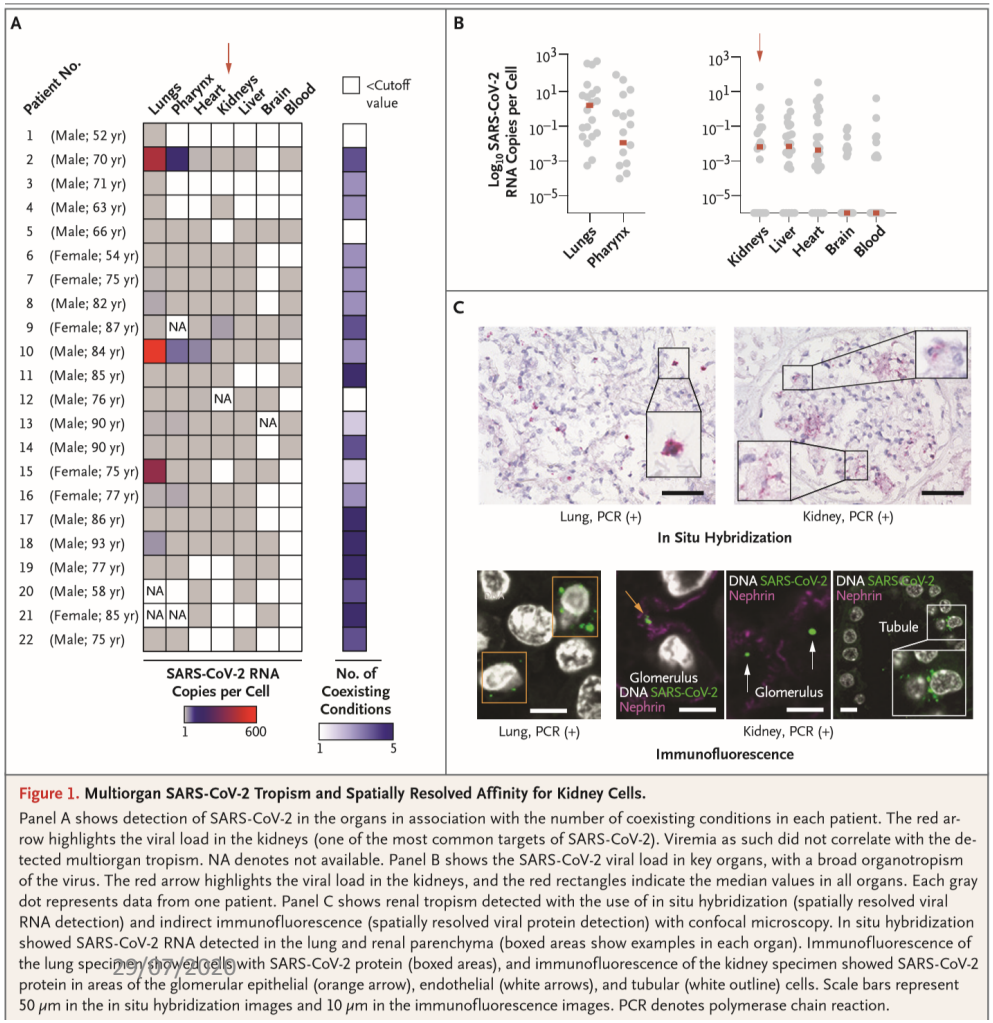


Figure 1. Multiorgan SARS-CoV-2 Tropism and Spatially Resolved Affinity for Kidney Cells.

Panel A shows detection of SARS-CoV-2 in the organs in association with the number of coexisting conditions in each patient. The red arrow highlights the viral load in the kidneys (one of the most common targets of SARS-CoV-2). Viremia as such did not correlate with the detected multiorgan tropism. NA denotes not available. Panel B shows the SARS-CoV-2 viral load in key organs, with a broad organotropism of the virus. The red arrow highlights the viral load in the kidneys, and the red rectangles indicate the median values in all organs. Each gray dot represents data from one patient. Panel C shows renal tropism detected with the use of in situ hybridization (spatially resolved viral RNA detection) and indirect immunofluorescence (spatially resolved viral protein detection) with confocal microscopy. In situ hybridization showed SARS-CoV-2 RNA detected in the lung and renal parenchyma (boxed areas show examples in each organ). Immunofluorescence of the lung specimen showed cells with SARS-CoV-2 protein (boxed areas), and immunofluorescence of the kidney specimen showed SARS-CoV-2 protein in areas of the glomerular epithelial (orange arrow), endothelial (white arrows), and tubular (white outline) cells. Scale bars represent 50 μm in the in situ hybridization images and 10 μm in the immunofluorescence images. PCR denotes polymerase chain reaction.

Tropismo de SARS-CoV-2 por vários órgãos: pulmão, faringe, rins, fígado, coração....

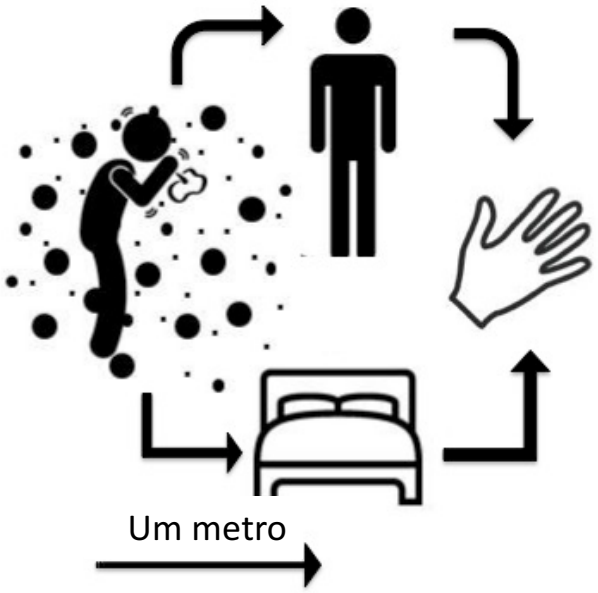
https://www.nejm.org/doi/full/10.1056/NEJMc2011400?query=featured_coronavirus

Como ocorre a transmissão de SARS-CoV-2?

- **Exposição às gotículas respiratórias**
  - Boca, olhos, nariz
  - Requer contato próximo (um metro)

- **Contato com as secreções respiratórias**
  - Mãos
  - Superfícies contaminadas
  - Transferência do vírus ao tocar boca, olhos, nariz com mãos contaminadas

- **Procedimentos que geram aerossóis**
  - Entubação, extubação, aspiração traqueal, broncoscopia
  - Geram partículas que podem ser carreadas pelo ar.



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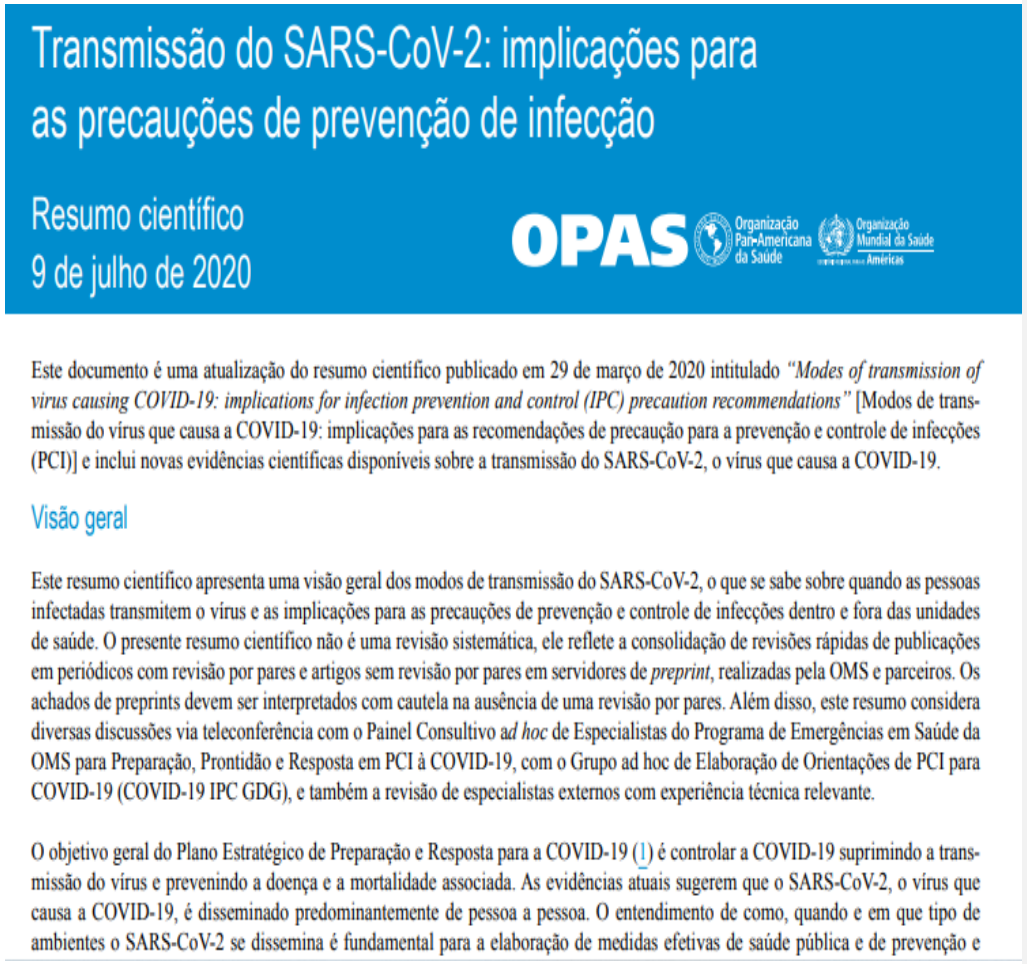


Transmissão do SARS-CoV-2: implicações para as precauções de prevenção de infecção

Resumo científico
9 de julho de 2020

OPAS Organização Pan-Americana da Saúde | Organização Mundial da Saúde Américas

Este documento é uma atualização do resumo científico publicado em 29 de março de 2020 intitulado *"Modes of transmission of virus causing COVID-19: implications for infection prevention and control (IPC) precaution recommendations"* [Modos de transmissão do vírus que causa a COVID-19: implicações para as recomendações de precaução para a prevenção e controle de infecções (PCI)] e inclui novas evidências científicas disponíveis sobre a transmissão do SARS-CoV-2, o vírus que causa a COVID-19.

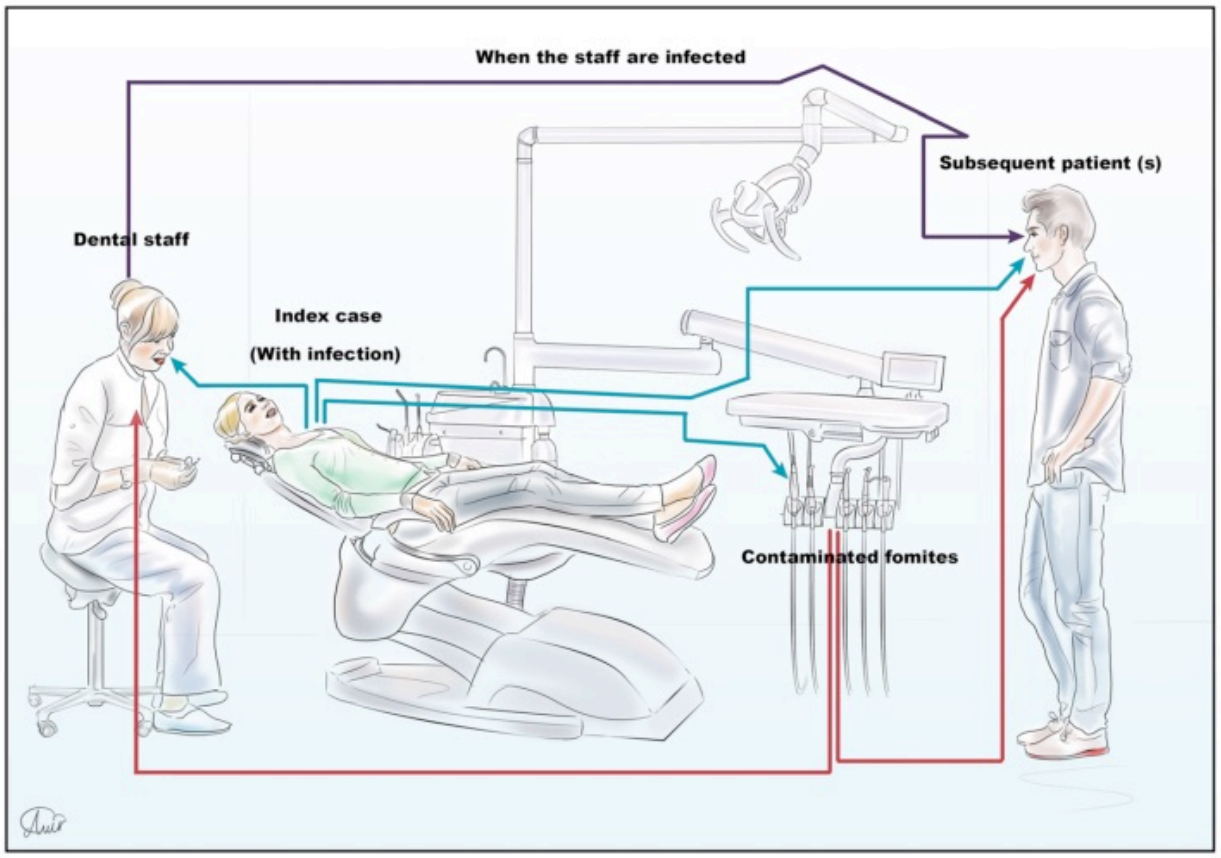
Visão geral

Este resumo científico apresenta uma visão geral dos modos de transmissão do SARS-CoV-2, o que se sabe sobre quando as pessoas infectadas transmitem o vírus e as implicações para as precauções de prevenção e controle de infecções dentro e fora das unidades de saúde. O presente resumo científico não é uma revisão sistemática, ele reflete a consolidação de revisões rápidas de publicações em periódicos com revisão por pares e artigos sem revisão por pares em servidores de *preprint*, realizadas pela OMS e parceiros. Os achados de preprints devem ser interpretados com cautela na ausência de uma revisão por pares. Além disso, este resumo considera diversas discussões via teleconferência com o Painel Consultivo *ad hoc* de Especialistas do Programa de Emergências em Saúde da OMS para Preparação, Prontidão e Resposta em PCI à COVID-19, com o Grupo ad hoc de Elaboração de Orientações de PCI para COVID-19 (COVID-19 IPC GDG), e também a revisão de especialistas externos com experiência técnica relevante.

O objetivo geral do Plano Estratégico de Preparação e Resposta para a COVID-19 (1) é controlar a COVID-19 suprimindo a transmissão do vírus e prevenindo a doença e a mortalidade associada. As evidências atuais sugerem que o SARS-CoV-2, o vírus que causa a COVID-19, é disseminado predominantemente de pessoa a pessoa. O entendimento de como, quando e em que tipo de ambientes o SARS-CoV-2 se dissemina é fundamental para a elaboração de medidas efetivas de saúde pública e de prevenção e

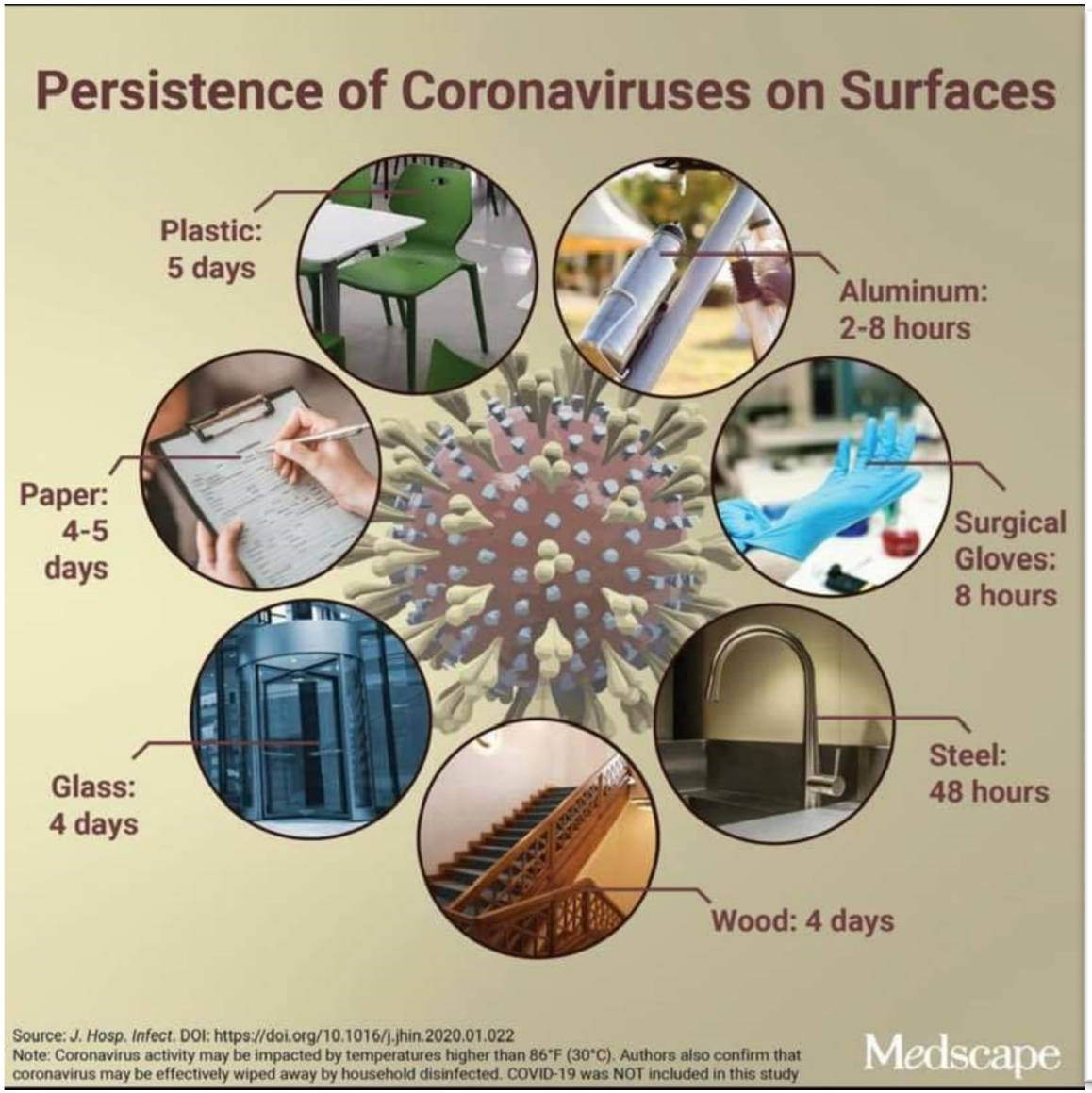
- ✓ Evidências atuais sugerem que o SARS-CoV-2 é transmitido principalmente entre pessoas pelas gotículas respiratórias e pelo contato
- ✓ A aerossolização em serviços de saúde onde procedimentos que geram aerossóis são realizados é outro modo de transmissão possível.
- ✓ Transmissão ocorre a partir de pessoas que são pré-sintomáticas ou sintomáticas para outras com quem estão em contato próximo (contato físico direto ou presencial com um caso provável ou confirmado em uma distância de um metro e por períodos prolongados) quando não estiver usando o EPI adequado.
- ✓ Também pode ocorrer a partir de pessoas infectadas e que continuam assintomáticas. Até que ponto isso ocorre ainda não é totalmente compreendido e mais pesquisas precisam ser feitas em caráter de urgência.
- ✓ O papel e a extensão da **transmissão por aerossóis fora das unidades de saúde, especialmente em ambientes fechados e mal ventilados, também precisam de mais estudos.**

https://iris.paho.org/bitstream/handle/10665.2/52472/OPASWBRACOVID-1920089_por.pdf?sequence=1&isAllowed=y



Os riscos da infecção por SARS-CoV-2 podem ser maiores entre profissionais que trabalham em estreita proximidade física com pacientes, como oftalmologistas e dentistas.

Fallahi HR, Keyhan SO, Zandian D, Kim SG, Cheshmi B. Being a front-line dentist during the Covid-19 pandemic: a literature review. *Maxillofac Plast Reconstr Surg*. 2020;42(1):12. Published 2020 Apr 24. doi:10.1186/s40902-020-00256-5



Coronavirus That Causes COVID-19 Stays on Undisinfected Surfaces for 17 Days

By **Frank Diamond (/authors/frank-diamond)**

March 24, 2020

COVID-19 (/covid-19-0), Environmental Services (/healthcare-departments/environmental-services)

Clean the rooms thoroughly.

That's 1 of the takeaways from a study (https://www.cdc.gov/mmwr/volumes/69/wr/mm6912e3.htm?s_cid=mm6912e3_w) in *Morbidity and Mortality Weekly Report* (*MMWR*) that shows that the RNA of the coronavirus that causes COVID-19, SARS-CoV-2, was detected on surfaces of cabins of the Diamond Princess cruise ship for more than 2 weeks. The coronavirus's RNA "was identified on a variety of surfaces in cabins of both symptomatic and asymptomatic infected passengers up to 17 days after cabins were vacated on the Diamond Princess but before disinfection procedures had been conducted," the study states. "Although these data cannot be used to determine whether transmission occurred from contaminated surfaces, further study of fomite transmission of SARS-CoV-2 aboard cruise ships is warranted."

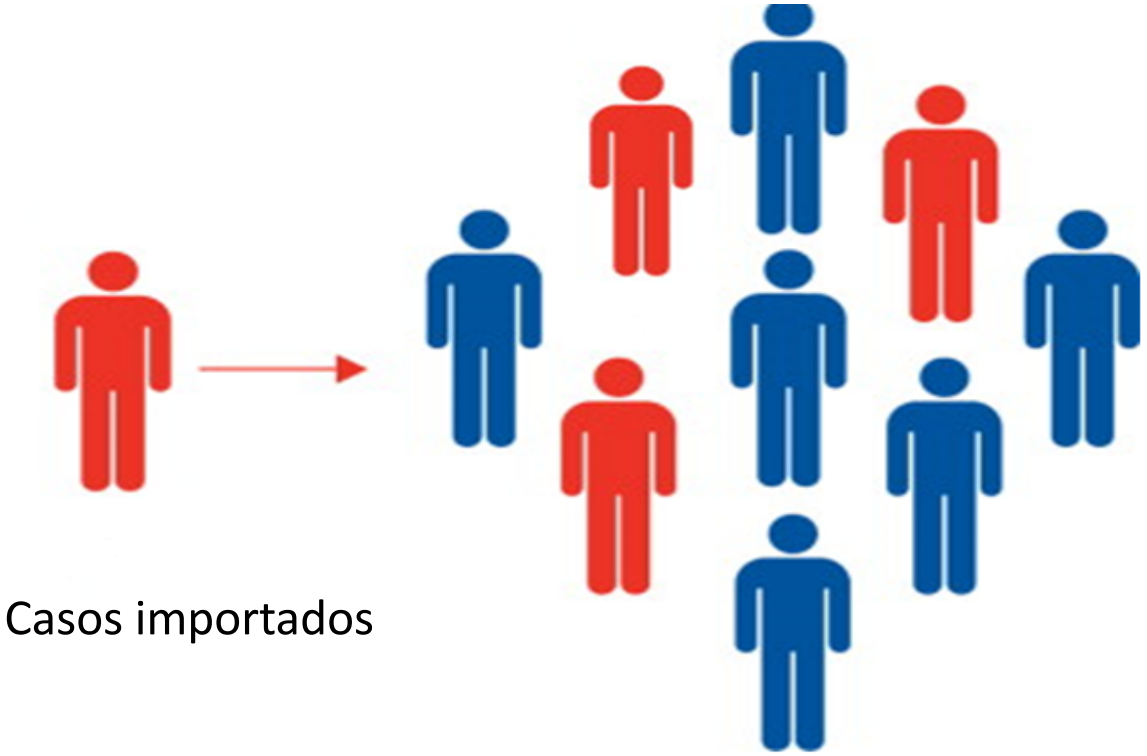
Cleaning and disinfecting (/covid-19/focus-surface-disinfection-when-fighting-covid-19) rooms has been shown to be highly effective in containing COVID-19, according to the US Centers for Disease Control and Infection (https://www.cdc.gov/coronavirus/2019-ncov/prepare/cleaning-disinfection.html), which publishes *MMWR*. (United Kingdom health officials also encourage (https://www.gov.uk/government/publications/covid-19-decontamination-in-non-healthcare-settings/covid-19-decontamination-in-non-healthcare-settings) such disinfection.)

The Diamond Princess had more than 700 coronavirus cases. It was quarantined for a time off of Yokohama, Japan, and at one point contained the largest outbreak of COVID-19 outside of mainland China. From February 16 to 23, nearly 1,000 persons who'd been on the cruise ship were repatriated by air to their home countries. The 329 people who returned to the United States entered quarantine or isolation.

The data collected about the Diamond Princess experience brought to light the danger asymptomatic carriers (/covid-19/asymptomatic-carriers-covid-19-make-it-tough-target) of COVID-19 present.

"The results of testing of passengers and crew on board the Diamond Princess demonstrated a high proportion (46.5%) of asymptomatic infections at the time of testing," the study states. "Available statistical models of the Diamond Princess outbreak suggest that 17.9% of infected persons never developed symptoms."

Quem tem risco em adquirir o SARS-CoV-2?



Casos importados

Qualquer pessoa!

R_0 – número básico de transmissão do virus: 1 – 2,5

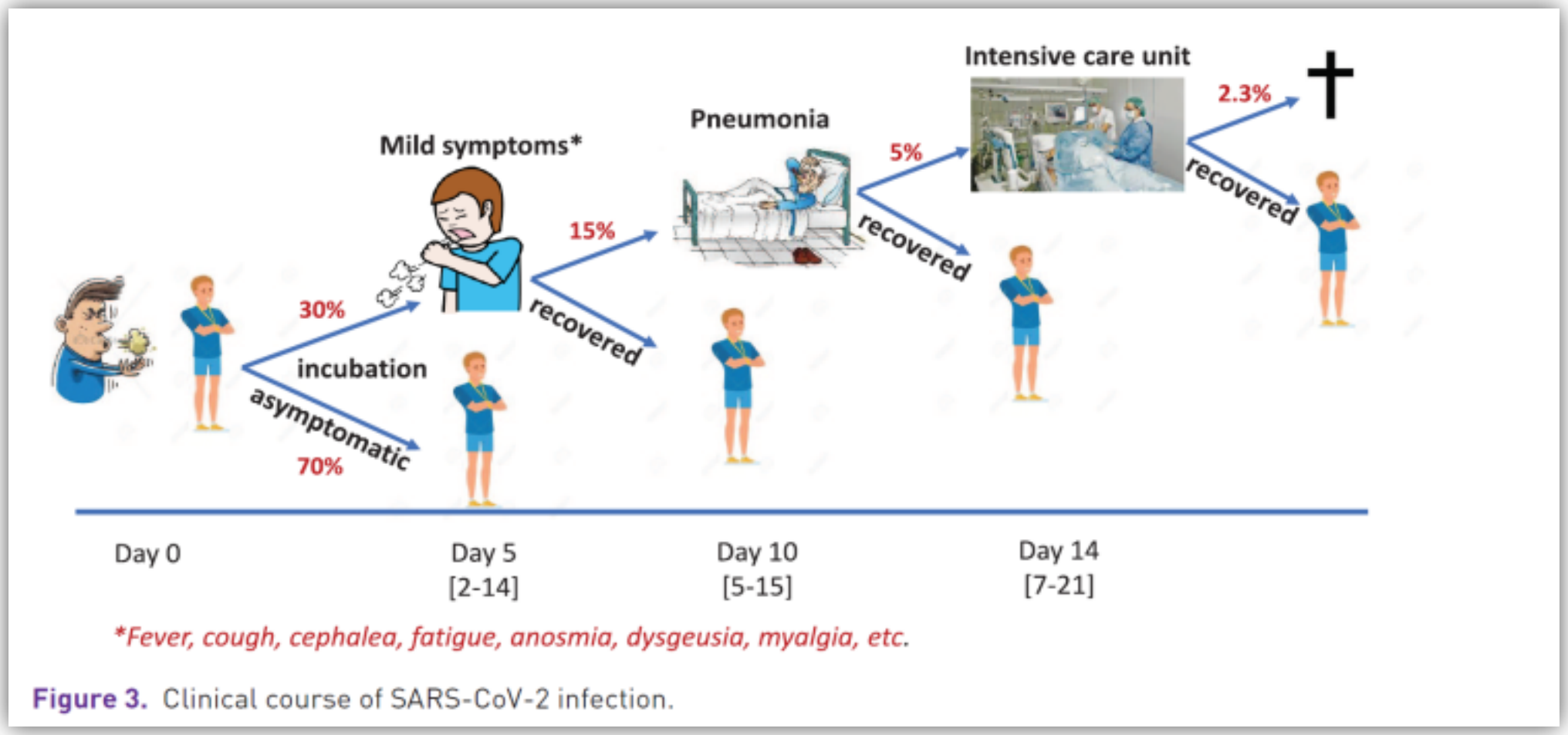
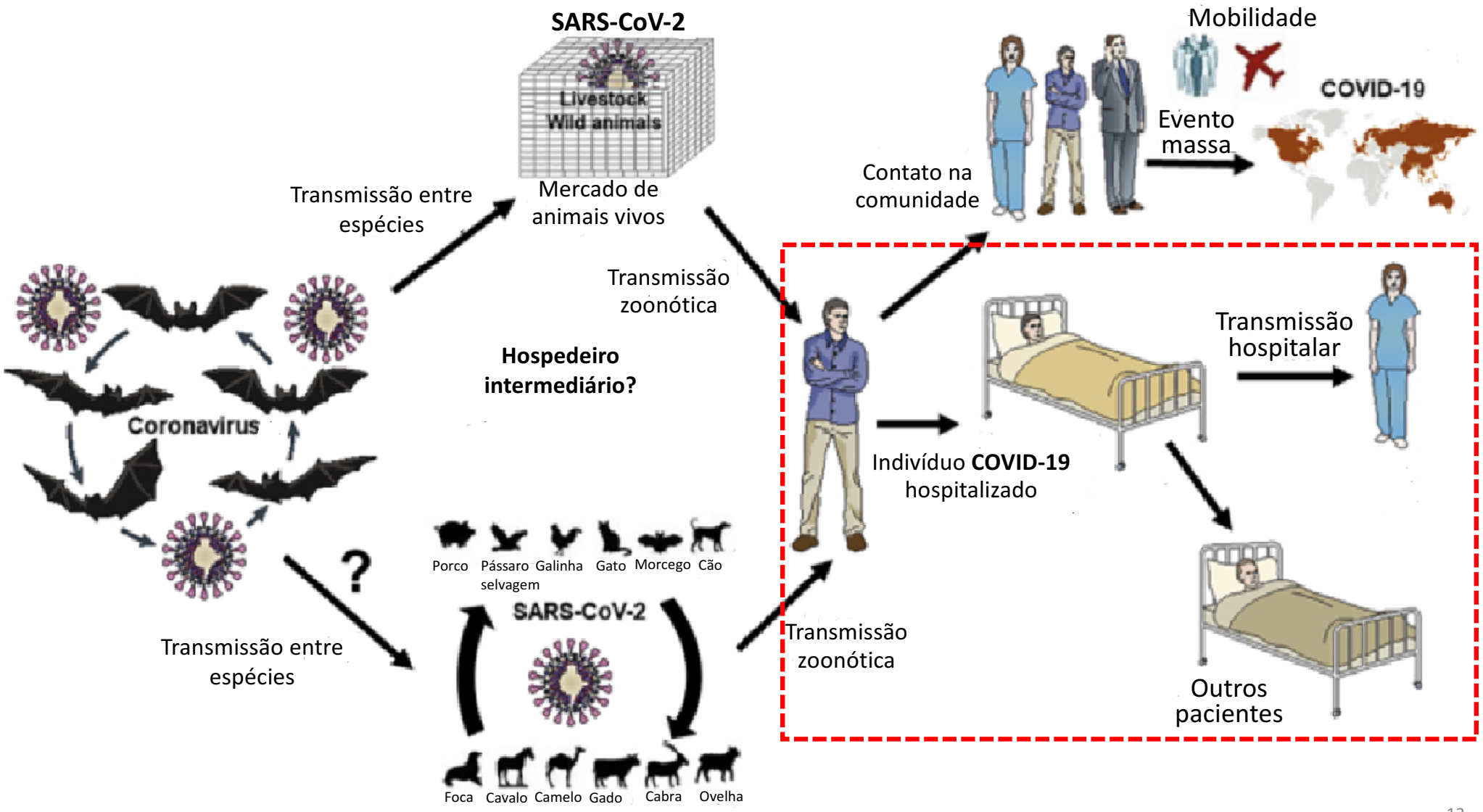


Figure 3. Clinical course of SARS-CoV-2 infection.

Soriano, V., & Barreiro, P. (2020). Why such excess of mortality for COVID-19 in Spain? *Therapeutic Advances in Infectious Disease*. https://doi.org/10.1177/2049936120932755



El Zowalaty ME, Järhult JD. From SARS to COVID-19: A previously unknown SARS- related coronavirus (SARS-CoV-2) of pandemic potential infecting humans - Call for a One Health approach. *One Health*. 2020;9:100124. Published 2020 Feb 24. doi:10.1016/j.onehlt.2020.100124. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7075990/

Profissionais de Saúde e COVID-19: China 1 a 22 de Janeiro

Characteristic	Before January 1 (N=47)	January 1 –January 11 (N=248)	January 12 –January 22 (N=130)
Median age (range) — yr	56 (26–82)	60 (21–89)	61 (15–89)
Age group — no./total no. (%)			
<15 yr	0/47	0/248	0/130
15–44 yr	12/47 (26)	39/248 (16)	33/130 (25)
45–64 yr	24/47 (51)	106/248 (43)	49/130 (38)
≥65 yr	11/47 (23)	103/248 (42)	48/130 (37)
Male sex — no./total no. (%)	31/47 (66)	147/248 (59)	62/130 (48)
Exposure history — no./total no. (%)			
Wet market exposure	30/47 (64)	32/196 (16)	5/81 (6)
Huanan Seafood Wholesale Market	26/47 (55)	19/196 (10)	5/81 (6)
Other wet market but not Huanan Seafood Wholesale Market	4/47 (9)	13/196 (7)	0/81
Contact with another person with respiratory symptoms	14/47 (30)	30/196 (15)	21/83 (25)
No exposure to either market or person with respiratory symptoms	12/47 (26)	141/196 (72)	59/81 (73)
Health care worker — no./total no. (%)	0/47	7/248 (3)	8/122 (7)

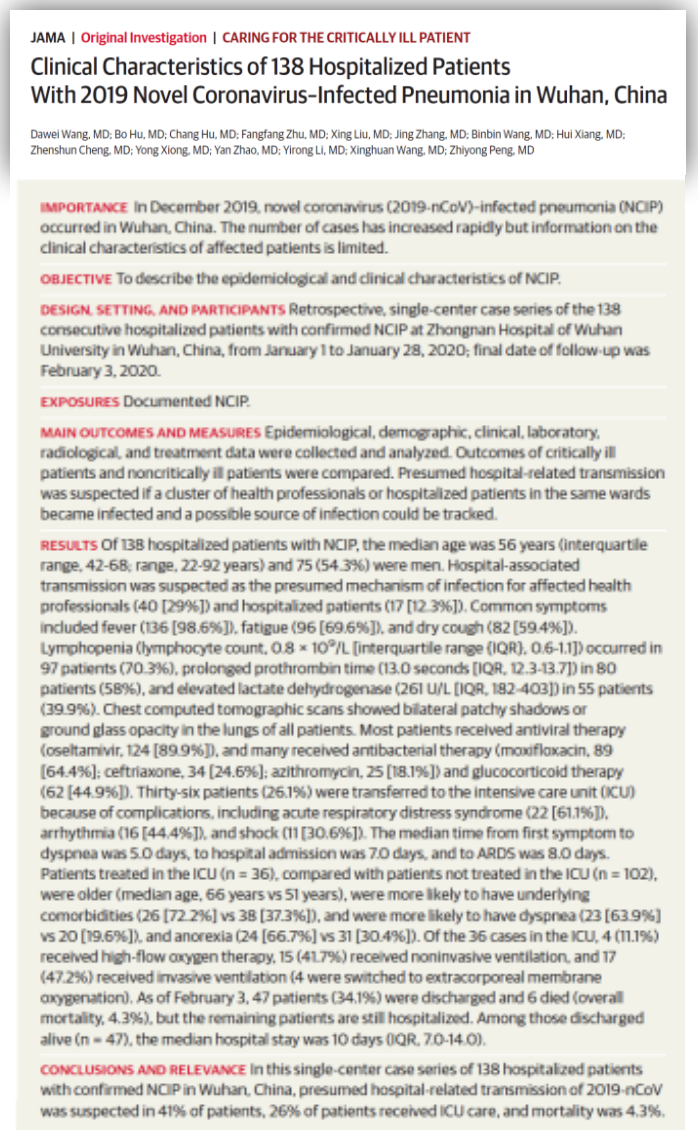
* Reduced denominators indicate missing data. Percentages may not total 100 because of rounding.

Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus-Infected Pneumonia. N Engl J Med. 2020 Mar 26;382(13):1199-1207. doi: 10.1056/NEJMoa2001316.

Profissionais de Saúde e COVID-19: China – em 11/02/2020: 44.672 casos

Baseline characteristics	Confirmed cases, N (%)	Deaths, N (%)	Case fatality rate, %	Observed time, PD	Mortality, per 10 PD
Overall	44,672	1,023	2.3	661,609	0.015
Age, years					
0–9	416 (0.9)	–	–	4,383	–
10–19	549 (1.2)	1 (0.1)	0.2	6,625	0.002
20–29	3,619 (8.1)	7 (0.7)	0.2	53,953	0.001
30–39	7,600 (17.0)	18 (1.8)	0.2	114,550	0.002
40–49	8,571 (19.2)	38 (3.7)	0.4	128,448	0.003
50–59	10,008 (22.4)	130 (12.7)	1.3	151,059	0.009
60–69	8,583 (19.2)	309 (30.2)	3.6	128,088	0.024
70–79	3,918 (8.8)	312 (30.5)	8.0	55,832	0.056
≥80	1,408 (3.2)	208 (20.3)	14.8	18,671	0.111
Sex					
Male	22,981 (51.4)	653 (63.8)	2.8	342,063	0.019
Female	21,691 (48.6)	370 (36.2)	1.7	319,546	0.012
Occupation					
Service industry	3,449 (7.7)	23 (2.2)	0.7	54,484	0.004
Farmer/laborer	9,811 (22.0)	139 (13.6)	1.4	137,992	0.010
Health worker	1,716 (3.8)	5 (0.5)	0.3	28,069	0.002
Retiree	9,193 (20.6)	472 (46.1)	5.1	137,118	0.034
Other/none	20,503 (45.9)	384 (37.5)	1.9	303,946	0.013

The Epidemiological Characteristics of an Outbreak of 2019 Novel Coronavirus Diseases (COVID-19) — China, 2020



JAMA | Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

Clinical Characteristics of 138 Hospitalized Patients With 2019 Novel Coronavirus–Infected Pneumonia in Wuhan, China

Dawei Wang, MD; Bo Hu, MD; Chang Hu, MD; Fangfang Zhu, MD; Xing Liu, MD; Jing Zhang, MD; Binbin Wang, MD; Hui Xiang, MD; Zhenshun Cheng, MD; Yong Xiong, MD; Yan Zhao, MD; Yirong Li, MD; Xinghuan Wang, MD; Zhiyong Peng, MD

IMPORTANCE In December 2019, novel coronavirus (2019-nCoV)–infected pneumonia (NCIP) occurred in Wuhan, China. The number of cases has increased rapidly but information on the clinical characteristics of affected patients is limited.

OBJECTIVE To describe the epidemiological and clinical characteristics of NCIP.

DESIGN, SETTING, AND PARTICIPANTS Retrospective, single-center case series of the 138 consecutive hospitalized patients with confirmed NCIP at Zhongnan Hospital of Wuhan University in Wuhan, China, from January 1 to January 28, 2020; final date of follow-up was February 3, 2020.

EXPOSURES Documented NCIP.

MAIN OUTCOMES AND MEASURES Epidemiological, demographic, clinical, laboratory, radiological, and treatment data were collected and analyzed. Outcomes of critically ill patients and noncritically ill patients were compared. Presumed hospital-related transmission was suspected if a cluster of health professionals or hospitalized patients in the same wards became infected and a possible source of infection could be tracked.

RESULTS Of 138 hospitalized patients with NCIP, the median age was 56 years (interquartile range, 42-68; range, 22-92 years) and 75 (54.3%) were men. Hospital-associated transmission was suspected as the presumed mechanism of infection for affected health professionals (40 [29%]) and hospitalized patients (17 [12.3%]). Common symptoms included fever (136 [98.6%]), fatigue (96 [69.6%]), and dry cough (82 [59.4%]). Lymphopenia (lymphocyte count, 0.8 × 10^9/L [interquartile range {IQR}, 0.6-1.1]) occurred in 97 patients (70.3%), prolonged prothrombin time (13.0 seconds [IQR, 12.3-13.7]) in 80 patients (58%), and elevated lactate dehydrogenase (261 U/L [IQR, 182-403]) in 55 patients (39.9%). Chest computed tomographic scans showed bilateral patchy shadows or ground glass opacity in the lungs of all patients. Most patients received antiviral therapy (oseltamivir, 124 [89.9%]), and many received antibacterial therapy (moxifloxacin, 89 [64.4%]; ceftriaxone, 34 [24.6%]; azithromycin, 25 [18.1%]) and glucocorticoid therapy (62 [44.9%]). Thirty-six patients (26.1%) were transferred to the intensive care unit (ICU) because of complications, including acute respiratory distress syndrome (22 [61.1%]), arrhythmia (16 [44.4%]), and shock (11 [30.6%]). The median time from first symptom to dyspnea was 5.0 days, to hospital admission was 7.0 days, and to ARDS was 8.0 days. Patients treated in the ICU (n = 36), compared with patients not treated in the ICU (n = 102), were older (median age, 66 years vs 51 years), were more likely to have underlying comorbidities (26 [72.2%] vs 38 [37.3%]), and were more likely to have dyspnea (23 [63.9%] vs 20 [19.6%]), and anorexia (24 [66.7%] vs 31 [30.4%]). Of the 36 cases in the ICU, 4 (11.1%) received high-flow oxygen therapy, 15 (41.7%) received noninvasive ventilation, and 17 (47.2%) received invasive ventilation (4 were switched to extracorporeal membrane oxygenation). As of February 3, 47 patients (34.1%) were discharged and 6 died (overall mortality, 4.3%), but the remaining patients are still hospitalized. Among those discharged alive (n = 47), the median hospital stay was 10 days (IQR, 7.0-14.0).

CONCLUSIONS AND RELEVANCE In this single-center case series of 138 hospitalized patients with confirmed NCIP in Wuhan, China, presumed hospital-related transmission of 2019-nCoV was suspected in 41% of patients, 26% of patients received ICU care, and mortality was 4.3%.

Dos 138 pacientes internados com pneumonia por COVID-19:

✓ 57 (41,3%) presumidamente foram infectados no hospital;
- 17 pacientes (29,8%) já estavam internados por outros motivos;
- 40 (70,2%) eram profissionais de saúde.

Dos pacientes hospitalizados:

✓ 7 (41,2%) eram do departamento cirúrgico,;
✓ 5 (29,4%) de medicina interna ;
✓ 5 (29,4%) do departamento de oncologia.

Dos profissionais de saúde infectados:

✓ 31 (77,5%) trabalhavam em enfermarias em geral;
✓ 7 (17,5%) no pronto socorro;
✓ 2 (5%) na UTI.

De um paciente que apresentou sintomas abdominais e foi admitido no departamento cirúrgico:

✓ Provável que **mais de 10 profissionais de saúde foram infectados;**
✓ **Transmissão de paciente para paciente também ocorreu, e pelo menos 4 pacientes da mesma enfermaria foram infectados** e todos apresentaram sintomas abdominais atípicos.

Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19)

20/02/2020:
2.055 casos confirmados de Profissionais de Saúde com COVID-19 de 476 hospitais da China.
88% - Hubei (n= 1.808)

https://www.who.int/publications-detail/report-of-the-who-china-joint-mission-on-coronavirus-disease-2019-(covid-19)

Remarkably, more than 40,000 HCW have been deployed from other areas of China to support the response in Wuhan. Notwithstanding discrete and limited instances of nosocomial outbreaks (e.g. a nosocomial outbreak involving 15 HCW in Wuhan), transmission within health care settings and amongst health care workers does not appear to be a major transmission feature of COVID-19 in China. The Joint Mission learned that, among the HCW infections, most were identified early in the outbreak in Wuhan when supplies and experience with the new disease was lower.

Wuhan: 15 profissionais

Início havia poucos suprimentos e pouca experiência com virus novo.

https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf

Additionally, investigations among HCW suggest that many may have been infected within the household rather than in a health care setting. Outside of Hubei, health care worker infections have been less frequent (i.e. 246 of the total 2055 HCW cases). When exposure was investigated in these limited cases, the exposure for most was reported to have been traced back to a confirmed case in a household.

Fora de Hubei: 246 profissionais

Maioria aquisição no domicílio.

https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf

Characteristics of Health Care Personnel with COVID-19 — United States, February 12–April 9, 2020

CDC COVID-19 Response Team

CDC COVID-19 Response Team. Characteristics of Health Care Personnel with COVID-19 - United States, February 12-April 9, 2020. *MMWR Morb Mortal Wkly Rep*. 2020;69(15):477-481. Published 2020 Apr 17. doi:10.15585/mmwr.mm6915e6

Nos EUA, dos 315.531 casos de COVID-19 (12/02 e 09/04); **dados disponíveis: 49.370 (16%)**

- **9.282 (19%) foram identificados como PS.**
- Desses PS, 780 (55%) relataram contato com um paciente COVID-19 apenas em serviço de saúde.

VIEWPOINT

What Other Countries Can Learn From Italy During the COVID-19 Pandemic

JAMA Internal Medicine Published online April 7, 2020

Em 30/03/2020, 8920 (9%) profissionais de saúde com COVID-19 na Itália

- ✓ A infecção precoce do profissionais levou à disseminação da infecção para outros pacientes nos hospitais.
- ✓ A superlotação hospitalar também pode explicar a alta taxa de infecção dos profissionais.

VIEWPOINT

What Other Countries Can Learn From Italy During the COVID-19 Pandemic

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In the coronavirus disease 2019 (COVID-19) pandemic, Italy has been hit very hard,[1] with 110 574 documented cases and 13 155 documented deaths related to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection as of April 1, 2020. The number of cases and deaths cannot be explained simply because of the epidemic starting in Italy earlier compared with other countries besides China. It is important to understand why death rates were so high in Italy to learn how to best prepare and how to plan for optimal actions in other countries. Some contributing factors may be immutable (eg, age structure of the population), but even these need to be laid out carefully in preparedness assessments. Some other contributing factors are potentially modifiable.

Some factors pertain to demographics and background disease in the population. Italy has the most elderly population in Europe and the second most elderly population in the world after Japan. COVID-19 has a strong age dependence for the severity of the infection and the risk of death. The median age of people infected with SARS-CoV-2 who are dying in Italy has been 80 years, and the average age of patients requiring critical care support has been 67 years. Moreover, COVID-19 morbidity and mortality is strongly dependent on the presence of concomitant serious diseases, and Italy has a high proportion of patients with history of smoking and high rates of chronic obstructive pulmonary disease and ischemic heart disease.[2] The corollary is that preparedness for needs of intensive care unit (ICU) beds and estimates of expected deaths should consider the age structure and chronic diseases of the population served by each health care system. Taking this adjustment into account, burden of disease may be expected to be much less in most areas in the United States, with variability across states and hospital catchment areas. For example, the proportion of the population older than 65 years is 9.5% in Alaska as compared with 19.1% in Florida and 23.1% in Italy.

A second set of factors in Italy is the increased burden of cases that presented themselves to the health care system. The proportion of people infected must have been very high in specific areas that were highly affected. In the town of Vò, all 3300 residents were tested the day the first case was detected in the third week of February, and 3% were found to be infected.[3] Following aggressive testing, the epidemic was extinguished. However, elsewhere in Italy, it is likely that the prevalence of infection was several times higher in the absence of effective public health intervention. For example, it is likely that the health care system was overwhelmed in Bergamo owing to massive viral transmission during the Champions League match on February 19, 2020 (Atalanta vs Valencia), where a third of the population of Bergamo attended and continued celebrations overnight. Italian life is famous for its socialization and frequent congregations and clustering. It is possible also that in early stages, there was not much adoption of standard hygienic measures, and instructions to stay at home proved difficult to accept, with many complaints registered with the police.[4] Accordingly, a higher level of preparedness should be considered for areas where mass gatherings have occurred or where there is extensive social intermingling.

A third set of factors pertains to the standard capacity of the health care system and decisions made during hospital management of the presenting cases. Italy has a highly competent state-run health care system, but it has only a modest number of ICU beds and very few subintensive care beds. Overall, 5090 ICU beds (8.4 per 100 000 population) are available in Italy, and 2601 beds in coronary care units (4.3 per 100 000 population),[5] as opposed to much higher numbers (36 ICU beds per 100 000 population) in the United States.

Given the little experience in dealing with the new virus, it is unavoidable that some strategic mistakes were made about which patients should be hospitalized. In the winter, hospitals tend to run close to full capacity, with 87% average occupancy in Italy during the flu season. Apparently, many patients with relatively modest symptoms were admitted; by the time more patients with severe cases started to arrive, there were limited reserves.

Hospital overcrowding may also explain the high infection rate of medical personnel. As of March 30, 2020, 8920 medical personnel had been found to be infected in Italy,[6] leading to further loss of capacity for hospitals to respond. Moreover, early infection of medical personnel led to the spread of the infection to other patients within hospitals. In Lombardy, SARS-CoV-2 became largely a nosocomial infection. Nine percent of infections in Italy occurred among health care personnel.[6] Characteristically, the first patient with COVID-19 visited the emergency department twice, thus exposing all of the personnel and patients in that area before the infection was recognized.

Italy is a decentralized country; thus, preparedness and containment may have been hampered. There was a delay from the first case detection (February 21, 2020) to the first containment decree from the government that closed the relevant villages 3 days later. The lessons relevant to other countries are the need to (1) avoid bringing patients with suspected SARS-CoV-2 infection to the hospital, except when they clearly require hospital care; (2) maintain strict hygienic procedures in the hospital environment; and (3) act swiftly in

- ✓ Pouca experiência em lidar com o novo vírus.
- ✓ No inverno, **com 87% de ocupação média na Itália devido gripe.**
- ✓ Pacientes com sintomas moderados internados, leitos limitados - casos graves.
- ✓ **Em 30/03/2020: 8920 profissionais de saúde infectados na Itália, causando perda de capacidade dos hospitais para responder.**
- ✓ Na Lombardia, o **SARS-CoV-2 se tornou amplamente uma infecção de acquisição hospitalar.**

https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2764369

TABELLA 5 - DISTRIBUZIONE DEI LUOGHI DI ESPOSIZIONE DEI CASI DIAGNOSTICATI DAL 01/04/2020

Luogo di esposizione	Casi	
	N	%
RSA/Casa di Riposo/Comunità disabili	1.990	44,1
Ambito familiare	1.113	24,7
Ospedale/Ambulatorio	485	10,8
Lavoro*	188	4,2
Comunità religiosa	86	1,9
Nave/Crociera	62	1,4
Centro Accoglienza per rifugiati	8	0,2
Altro	576	12,8
Totale	4.508	

* Per Lavoro si intende qualunque luogo di lavoro diverso da gli altri ambiti riportati

Local de exposição dos casos COVID-19 (4.508 / 58.803) diagnosticados de 1 a 23/04/2020:

- 1.990 (44%) - **lar de idosos ou instituição de longa permanência,**
- 1.113 (25%) - família,
- 485 (10,8%) - **hospital ou ambulatório,**
- 188 (4,2%) - trabalho
- 156 (3,5%): comunidade
- 63 (1,4%): navio/cruzeiro

https://www.epicentro.iss.it/coronavirus/bollettino/Bollettino-sorveglianza-integrata-COVID-19_23-aprile-2020.pdf

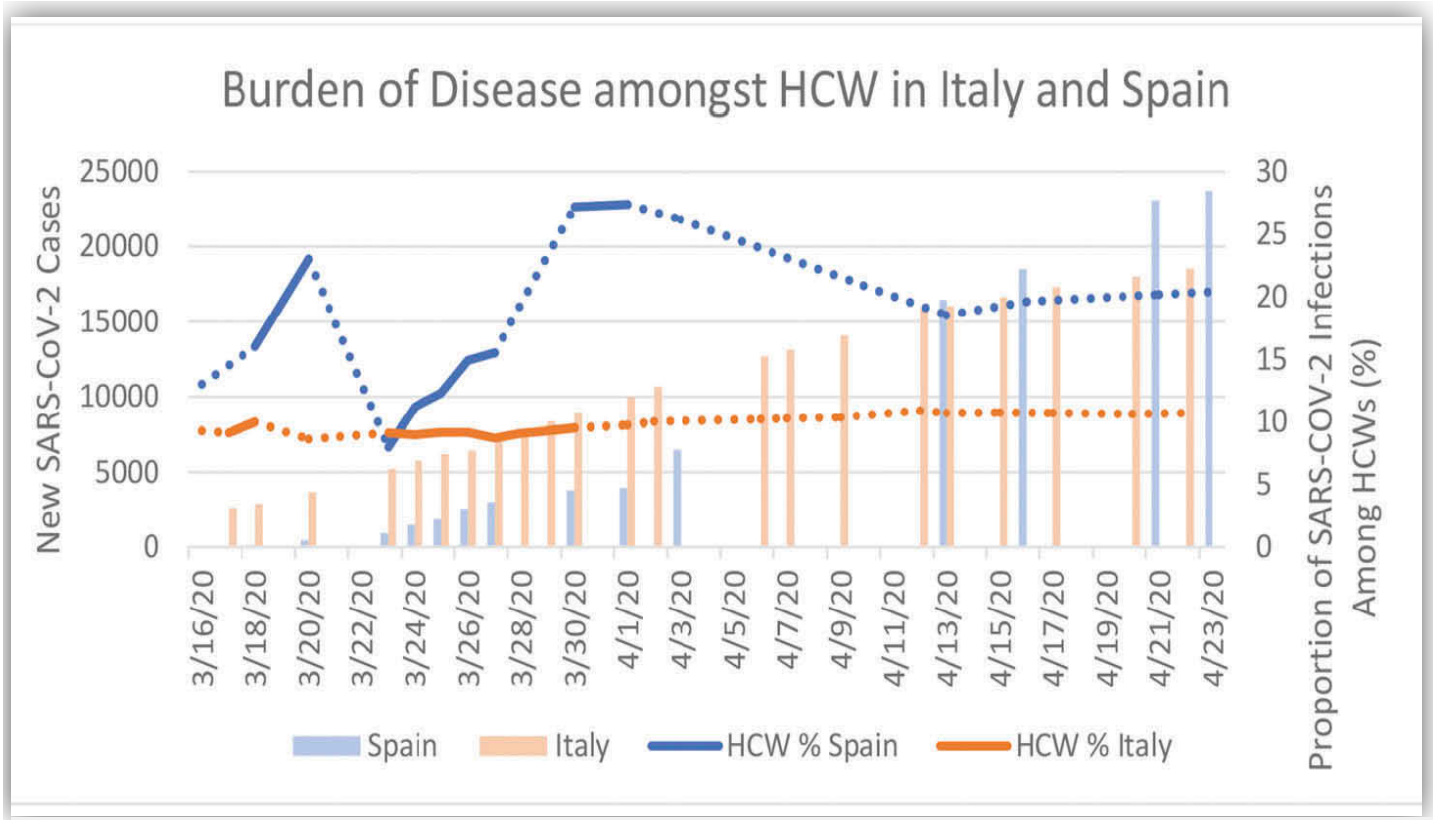
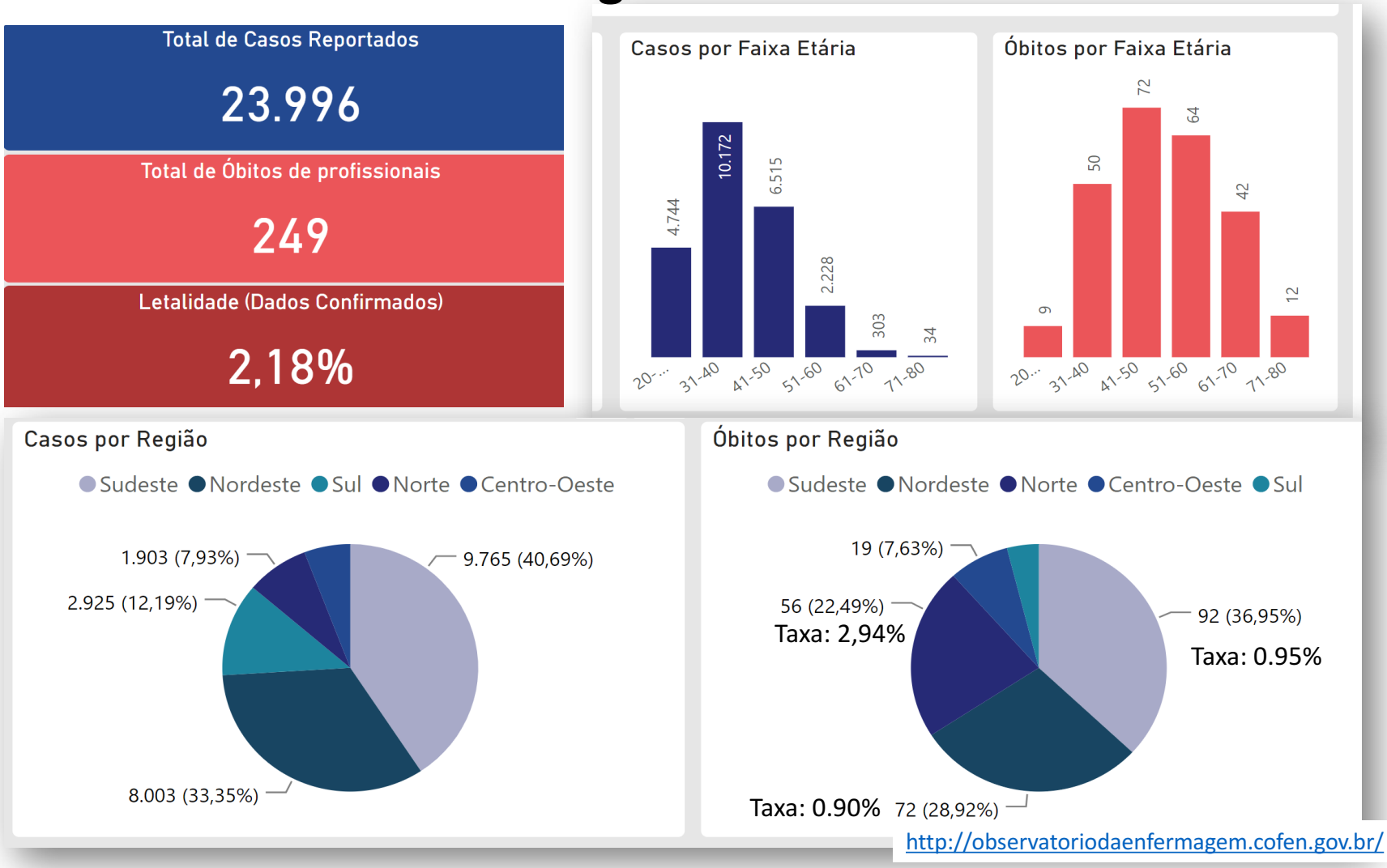


Fig. Representação do número de infecções e proporções (do total de infecções) de Profissionais de Saúde infectados com SARS-CoV-2 ao longo do tempo, conforme relatado na Espanha (ISCII, https://www.isciii.es, acessado em 4/4/2020) e Itália (FNOMCeO, https://portale.fnomceo.it, acessado em 4/4/2020).

Espanha: 20,4% Profissionais de Saúde (PS) com COVID-19 (23.728 / 116.386) notificados ao Centro Nacional de Epidemiologia (28/2 e 23/4/2020)

Itália: taxa de infecção de PS foi 10,7% (18.553 / 173.730), e pelo menos 150 médicos mortos pela doença.

Profissionais de enfermagem - COVID-19 no Brasil



http://observatoriodaenfermagem.cofen.gov.br/

COVID-19 among health workers in Brazil: The silent wave

Emanuelle Pessa Valente[1], Lia Cruz Vaz da Costa Damásio[2], Leonard
Marília Francisca da Silva Pereira[2], Marzia Lazzerini[1]

During the COVID-19 pandemic, Brazilian frontline workers are dangerously ill-equipped due to decades of underinvestment in the public health sector and limited access to appropriate personal protective equipment and training.

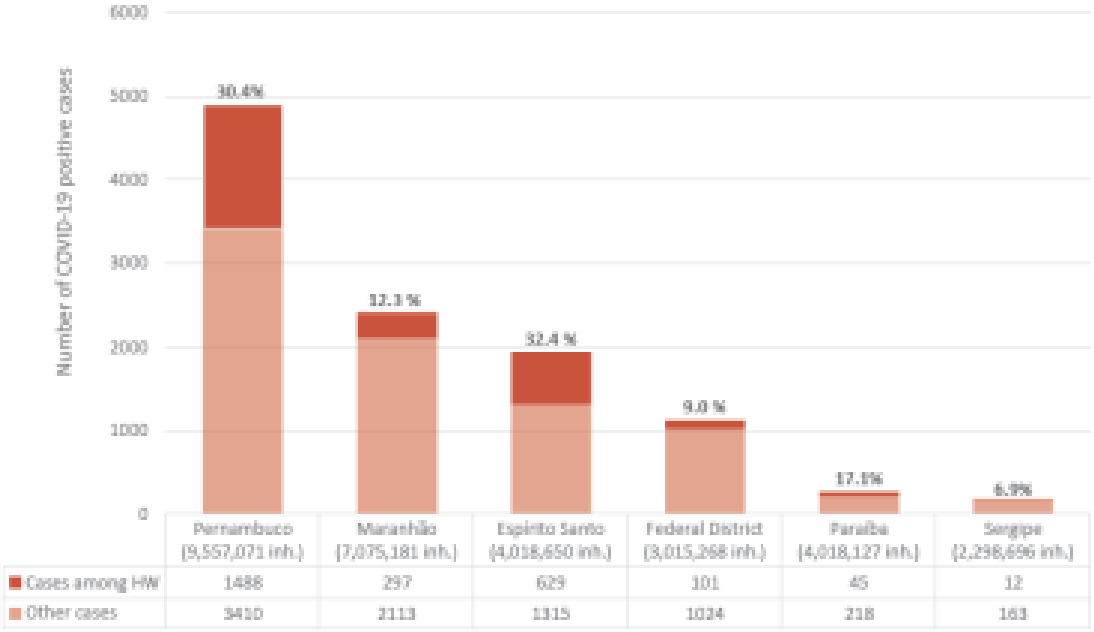


Figure 1. COVID-19 positive cases among health workers by Brazilian federal state. HW – health worker. Note: only six states had data available on health worker infection; Pernambuco state has a policy for HW testing. Data sources: State epidemiological bulletins, accessed 27 April 2020

Pessa Valente E, Cruz Vaz da Costa Damásio L, Luz LS, da Silva Pereira MF, Lazzerini M. COVID-19 among health workers in Brazil: The silent wave. *J Glob Health*. 2020;10(1):010379. doi:10.7189/jogh.10.010379

Global burden of COVID-19 pandemic on healthcare workers

Eleni Papoutsi[1], Vassilis G. Giannakoulis[1], Vasiliki Ntella[1], Sofia Pappa[2] and Paraskevi Katsaounou[1]

We searched all relevant grey literature up to April 17, 2020, in order to identify the most up-to-date government reports, official statements and newspaper reports concerning community or hospital-related COVID-19 infections and deaths of HCWs. Although methods for assessing risk of bias in controlled trials are well established, these may not be appropriate when grey literature is also included [3]. Therefore, a collaborative process was applied, where any disputes were thoroughly discussed and debated by the authors before a consensus was reached. The percentage of HCW cases in relation to the total country, region or city cases was either provided by government reports or calculated as:

$$\frac{\text{HCWs infected on day } x}{\text{Total cases in the country/region/city on day } x} \times 100\%$$

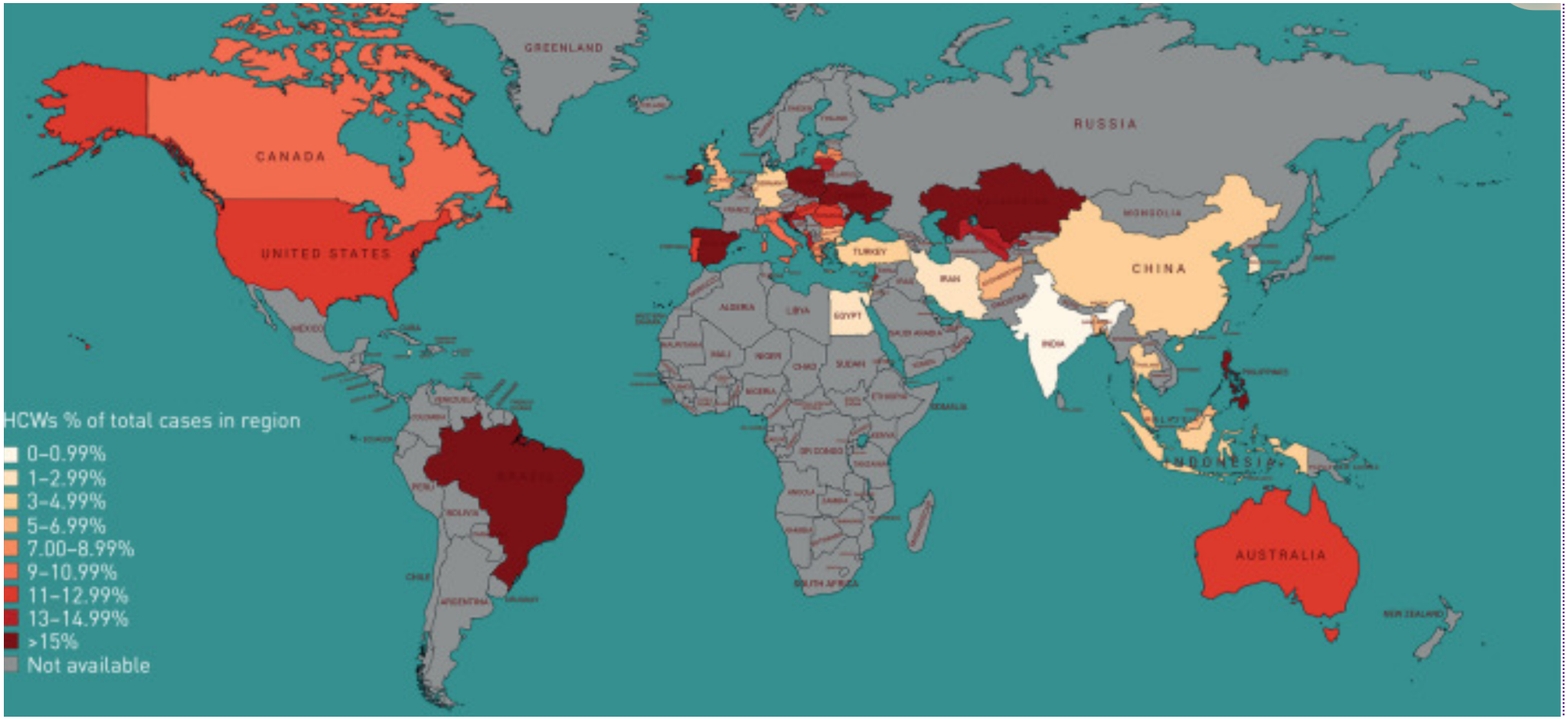
Pesquisa em literatura cinzenta relevante até 17 de abril de 2020, a fim de identificar os relatórios governamentais mais atualizados, declarações oficiais e relatórios de jornais sobre infecções por COVID-19 relacionadas à comunidade ou hospital e mortes de profissionais de saúde.

Foi aplicado um processo colaborativo, no qual todas as controvérsias foram amplamente discutidas e debatidas pelos autores antes de se chegar a um consenso.

A porcentagem de casos de profissionais de saúde em relação ao total de casos em países, regiões ou cidades foi fornecida por relatórios governamentais ou calculado como:

$$\frac{\text{Profissionais com infecção no dia } x}{\text{Total casos no país/região/cidade dia } x} \text{X100}$$

Papoutsi E, Giannakoulis VG, Ntella V, Pappa S, Katsaounou P. Global burden of COVID-19 pandemic on healthcare workers. ERJ Open Res. 2020;6(2):00195-2020. Published 2020 Jul 6. doi:10.1183/23120541.00195-2020



A média (%) de profissionais de saúde com COVID-19 do total de casos foi de 10,04% (0 - 24,09%).

< 3%: Coréia do Sul, Hong Kong (China), Irã, Índia, Egito e Jamaica

>15%: Andorra, Brasil (São Paulo), Irlanda, Cazaquistão, Filipinas, Polônia, Eslovênia, Espanha e Ucrânia.

Papoutsi E, Giannakoulis VG, Ntella V, Pappa S, Katsaounou P. Global burden of COVID-19 pandemic on healthcare workers. ERJ Open Res. 2020;6(2):00195-2020. Published 2020 Jul 6. doi:10.1183/23120541.00195-2020

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Risk of COVID-19 among frontline healthcare workers and the general community: a prospective cohort study

Long H. Nguyen, M.D.[1,2,3*], David A. Drew, Ph.D.[1,2*], Amit D. Joshi, Ph.D.[1,2], Chuan-Guo Guo[1,2,4], M.S., Wenjie Ma, Sc.D.[1,2,3], Raaj S. Mehta, M.D.[1,2,3], Daniel R. Sikavi, M.D.[5], Chun-Han Lo, M.D.[1,2,6], Sohee Kwon, M.D.[1,2], Mingyang Song, Sc.D.[1,2,6,7], Professor Lorelei A. Mucci, Sc.D.[6], Professor Meir J. Stampfer, M.D.[6,8], Professor Walter C. Willett, M.D.[6,7], A. Heather Eliassen, Sc.D.[6], Jaime E. Hart, Sc.D.[8,9], Jorge E. Chavarro, M.D.[6,7,8], Janet W. Rich-Edwards, Sc.D.[6,10], Richard Davies, M.A.[11], Joan Capdevila, Ph.D.[11], Karla A. Lee, MBBCh[12], Mary Ni Lochlainn, MBBCh[12], Thomas Varsavsky, M.Sc.[13], Mark S. Graham, Ph.D.[13], Carole H. Sudre, Ph.D.[13], M. Jorge Cardoso, Ph.D.[13], Jonathan Wolf, B.Sc.[11], Professor Sebastien Ourselin, Ph.D.[13], Claire J. Steves, Ph.D.[12], Professor Tim D. Spector, M.D.[12], Professor Andrew T. Chan, M.D.[1,2,14,15 16]
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16. Massachusetts Consortium on Pathogen Readiness, Cambridge, MA, USA.

Estudo de coorte prospectivo da comunidade em geral, incluindo **profissionais de saúde da linha de frente,** que relataram informações por meio do aplicativo de smartphone *COVID Symptom Study,* 24 de março (Reino Unido, UK) e 29 de março (Estados Unidos, EUA) até 23 de abril de 2020.

Usaram a modelagem de riscos proporcionais de Cox para estimar taxas de risco multivariadas ajustadas (aHRs) de um teste para COVID-19 positivo.

Nguyen LH, Drew DA, Joshi AD, et al. Risk of COVID-19 among frontline healthcare workers and the general community: a prospective cohort study. Preprint. *medRxiv*. 2020;2020.04.29.20084111. Published 2020 May 25. doi:10.1101/2020.04.29.20084111

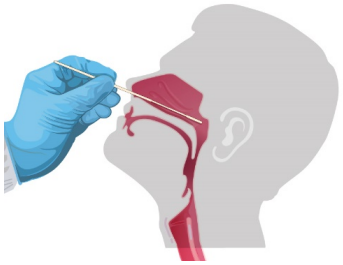
- ✓ Profissionais de saúde da linha de frente tiveram **risco até 12 vezes maior de teste positivo e COVID19** em comparação aos membros da comunidade em geral, mesmo depois de ajustar para outros riscos.
- ✓ O risco maior foi no Reino Unido em comparação com os EUA.
- ✓ Entre os profissionais da linha de frente:
  - a **reutilização de EPI ou EPI inadequado**, que pode indicar fornecimento e / ou qualidade inadequados, **foram associados a um risco subsequente de 31 a 46% maior de COVID-19.**
- ✓ Profissionais de saúde da linha de frente que **trabalhavam em ambiente hospitalar** (relatavam com mais frequência a **reutilização de EPI**) e **casas de repouso** (onde os profissionais relataram com maior frequência **EPI inadequados**) **tiveram o maior risco.**

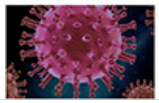
O maior risco associado à reutilização de EPI pode estar relacionado à auto contaminação durante a colocação e descarte repetidos ou quebra de materiais devido ao uso prolongado

Suscetibilidade aumentada à infecção foi evidente mesmo entre aqueles que relataram EPI adequado. Outras estratégias devem ser utilizadas.

Nguyen LH, Drew DA, Joshi AD, et al. Risk of COVID-19 among frontline healthcare workers and the general community: a prospective cohort study. Preprint. *medRxiv*. 2020;2020.04.29.20084111. Published 2020 May 25. doi:10.1101/2020.04.29.20084111

Qual Fator de Risco do Profissional de Saúde da linha de frente adquirir SARS-CoV-2?





Conhecimento inadequado COVID-19

Infecção secundária:
risco ocupacional

Paciente com infecção

Assintomáticos e
pré-sintomáticos

Testes: falta disponibilidade e
acurácia

EPI: suprimento, disponibilidade
e uso inadequado

Estresse e fadiga (Burnout)

Ali S, Noreen S, Farooq I, Bugshan A, Vohra F. Risk Assessment of Healthcare Workers at the Frontline against COVID-19. *Pak J Med Sci*. 2020;36(COVID19-S4):S99-S103. doi:10.12669/pjms.36.COVID19-S4.2790

Annals of Internal Medicine REVIEW

Prevalence of Asymptomatic SARS-CoV-2 Infection

A Narrative Review

Daniel P. Oran, AM, and Eric J. Topol, MD

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has spread rapidly throughout the world since the first cases of coronavirus disease 2019 (COVID-19) were observed in December 2019 in Wuhan, China. It has been suspected that infected persons who remain asymptomatic play a significant role in the ongoing pandemic, but their relative number and effect have been uncertain. The authors sought to review and synthesize the available evidence on asymptomatic SARS-CoV-2 infection. Asymptomatic persons seem to account for approximately 40% to 45% of SARS-CoV-2 infections, and they can transmit the virus to others for an extended period, perhaps longer than 14 days. Asymptomatic infection may be associated with subclinical lung abnormalities, as detected by computed tomography. Because of the high risk for silent spread by asymptomatic persons, it is imperative that testing programs include those without symptoms. To supplement conventional diagnostic testing, which is constrained by capacity, cost, and its one-off nature, innovative tactics for public health surveillance, such as crowdsourcing digital wearable data and monitoring sewage sludge, might be helpful.

Ann Intern Med. doi:10.7326/M20-3012 Annals.org
For author, article, and disclosure information, see end of text.
This article was published at Annals.org on 3 June 2020.

In the early months of the coronavirus disease 2019 (COVID-19) pandemic, an iconic image has been the "proned" patient in intensive care, gasping for breath, in imminent need of artificial ventilation. This is the deadly face of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which as of 26 May 2020 had claimed more than 348 000 lives worldwide (1). But it is not the only face, because SARS-CoV-2 now seems to have a dual nature: tragically lethal in some persons and surprisingly benign in others.

Since February 2020 (2, 3), there have been reports of persons who were infected with SARS-CoV-2 but did not develop symptoms of COVID-19. In some cases (4, 5), the viral load of such asymptomatic persons has been equal to that of symptomatic persons, suggesting similar potential for viral transmission. The prevalence of asymptomatic SARS-CoV-2 infection, however, has remained uncertain. We sought to review and synthe-

tions of the individual over time. Unfortunately, only 5 of our cohorts include longitudinal data. We must therefore acknowledge the possibility that some of the proportions of asymptomatic persons are lower than reported.

Methods

From 19 April through 26 May 2020, using the keywords *COVID-19*, *SARS-CoV-2*, *symptoms*, and *asymptomatic*, we periodically searched the published medical literature using the PubMed service maintained by the U.S. National Library of Medicine of the National Institutes of Health. We also searched for unpublished manuscripts using the bioRxiv and medRxiv services operated by Cold Spring Harbor Laboratory. In addition, we searched for news reports using Google and monitored relevant information shared on Twitter.

Pessoas assintomáticas parecem ser responsáveis por cerca de 40% a 45% das infecções por SARS-CoV-2 e podem transmitir o vírus a outras pessoas por um período prolongado, talvez por mais de 14 dias.

A infecção assintomática pode estar associada a anormalidades subclínicas do pulmão, detectadas pela tomografia computadorizada. Devido ao alto risco de disseminação silenciosa por pessoas assintomáticas, é imperativo que os programas de testes incluam aqueles também os sem sintomas.

COVID-19: PCR screening of asymptomatic health-care workers at London hospital

The exponential growth in coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) across the UK has been successfully reversed by social distancing and lockdown.[1] RNA testing for prevalent infection is a key part of the exit strategy, but the role of testing for asymptomatic infection remains unclear.[2] Understanding the determinants of asymptomatic or pauci-symptomatic infection will provide new opportunities for personalised risk stratification and reveal much-needed correlates of protective immunity, whether induced by vaccination or natural exposure. To address this, we set up COVIDsortium (NCT04318314), a bioresource focusing on asymptomatic health-care workers (HCWs—doctors, nurses, allied health professionals, administrators, and others) at Barts Health NHS Trust, London, UK, to collect data through 16 weekly assessments (unless ill, self-isolating, on holiday, or redeployed) with a health questionnaire, nasal swab,

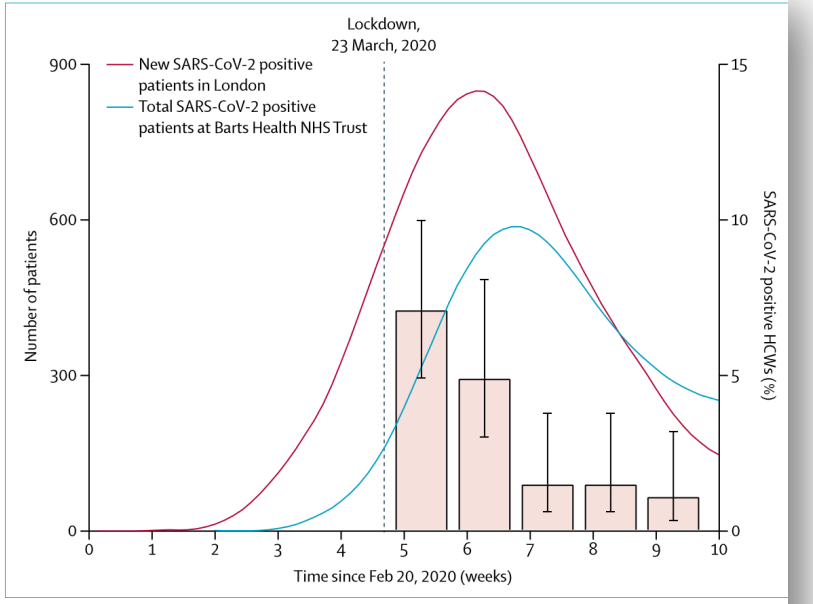


***Figure*: Number of patients testing positive for SARS-CoV-2 in Greater London and Barts Health NHS Trust and proportion of the HCW study cohort with SARS-CoV-2-positive nasal swab**
The left y-axis shows number of daily new SARS-CoV-2 positive patients in the Greater London area, derived from Public Health England data (red curve) and the total number of SARS-CoV-2 positive inpatients at Barts Health NHS Trust (blue curve). Both curves show 7-day averages. The right y-axis shows the percentage (95% CI) of asymptomatic HCWs in this study with SARS-CoV-2 positive swabs in the first 5 weeks of testing. COVID-19=coronavirus disease 2019. SARS-CoV-2=severe acute respiratory syndrome coronavirus 2. HCWs=health-care workers.

from the first 400 participants (figure). We show the number and percentage of asymptomatic HCWs who tested positive for SARS-CoV-2 on consecutive weeks from March 23, 2020: 28 (7·1%; 95% CI 4·9–10·0) of 396 HCWs in week 1, 14 (4·9%;

equipment and of nosocomial transmission.[4] Public fear of hospitals is also currently high, and many serious and treatable diseases are presenting late with adverse outcomes.[5] Testing of HCWs has so far been restricted to symptomatic individuals, and no studies

Dados sugerem que a **taxa de infecção assintomática entre os profissionais de saúde reflete** mais, provavelmente, a transmissão geral da comunidade do que a exposição hospitalar.

À medida que a onda epidêmica geral recua, a infecção assintomática entre os profissionais de saúde é baixa e dificilmente será uma importante fonte de transmissão.

www.thelancet.com Published online May 7, 2020 https://doi.org/10.1016/S0140-6736(20)31100-4

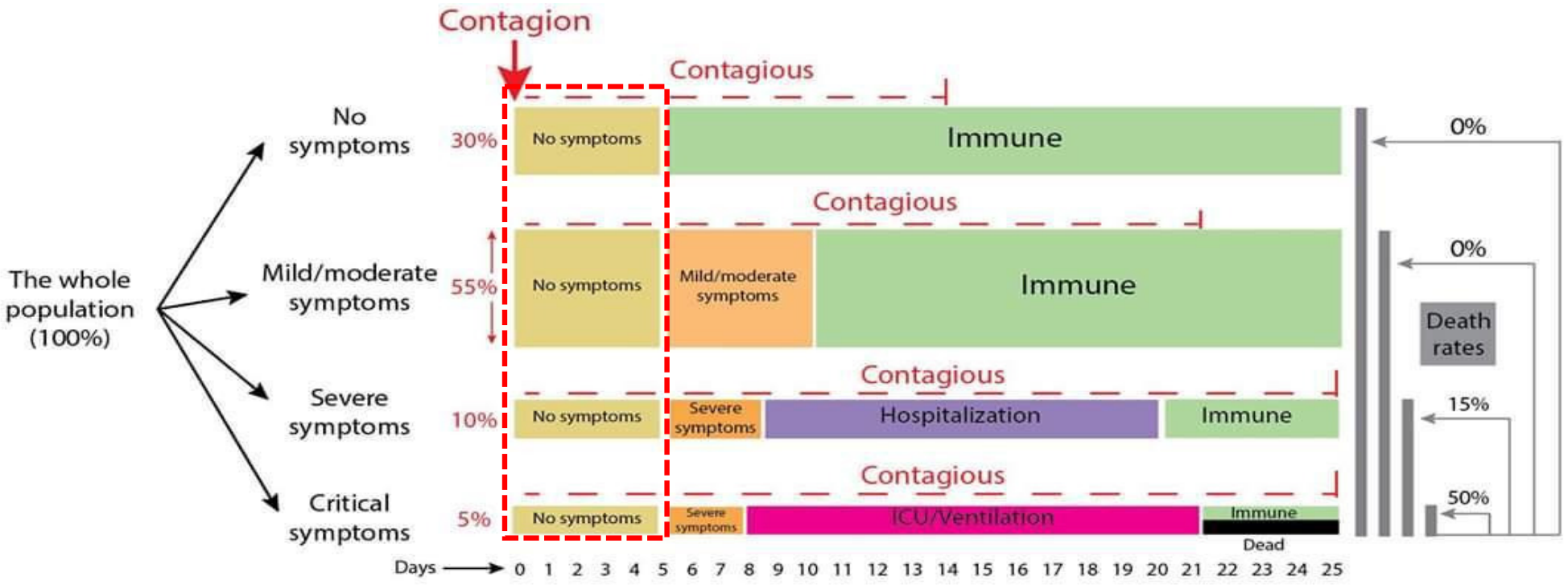
Prevalência de infecção assintomática por SARS-CoV-2

Table. Summary of SARS-CoV-2 Testing Studies

Cohort	Tested, *n*	SARS-CoV-2 Positive, *n* (%)	Positive but Asymptomatic, *n* (%)	Notes*
Iceland residents (6)	13 080	100 (0.8)	43 (43.0)	R
Vo', Italy, residents (7)	5155	102 (2.0)	43 (42.2)	R, L
Diamond Princess cruise ship passengers and crew (8)	3711	712 (19.2)	331 (46.5)	–
Boston homeless shelter occupants (9)	408	147 (36.0)	129 (87.8)	–
New York City obstetric patients (11)	214	33 (15.4)	29 (87.9)	L
U.S.S. *Theodore Roosevelt* aircraft carrier crew (12)	4954	856 (17.3)	~500 (58.4)	E
Japanese citizens evacuated from Wuhan, China (2)	565	13 (2.3)	4 (30.8)	L
Greek citizens evacuated from the United Kingdom, Spain, and Turkey (14)†	783	40 (5.1)	35 (87.5)	L
Charles de Gaulle aircraft carrier crew (13)	1760	1046 (59.4)	~500 (47.8)	E
Los Angeles homeless shelter occupants (10)	178	43 (24.2)	27 (62.8)	–
King County, Washington, nursing facility residents (15)	76	48 (63.2)	3 (6.3)	L
Arkansas, North Carolina, Ohio, and Virginia inmates (16)	4693	3277 (69.8)	3146 (96.0)	–
New Jersey university and hospital employees (17)	829	41 (4.9)	27 (65.9)	–
Indiana residents (18)	4611	78 (1.7)	35 (44.8)	R
Argentine cruise ship passengers and crew (19)	217	128 (59.0)	104 (81.3)	–
San Francisco residents (29)	4160	74 (1.8)	39 (52.7)	–

E = estimated from incomplete source data; L = longitudinal data collected; R = representative sample.
* A dash indicates that the study did not have a representative sample, collected no longitudinal data, and did not require estimation of missing data.
† Clarified via e-mail communication with coauthor.

Oran DP, Topol EJ. Prevalence of Asymptomatic SARS-CoV-2 Infection: A Narrative Review [published online ahead of print, 2020 Jun 3]. *Ann Intern Med*. 2020;M20-3012. doi:10.7326/M20-3012



References:
1. The Incubation Period of Coronavirus Disease 2019 (COVID-19) From Publicly Reported Confirmed Cases: Estimation and Application. Lauer SA et al. Ann Intern Med. 2020 Mar 10.
2. Impact of non-pharmaceutical interventions (NPIs) to reduce COVID19 mortality and healthcare demand. Neil M Ferguson et al. Imperial College COVID-19 Response Team. 16 March 2020.
3. Viral dynamics in mild and severe cases of Covid-19. Yang Liu et al. The Lancet, March 19, 2020.

REVIEW

Risks to healthcare workers with emerging diseases: lessons from MERS-CoV, Ebola, SARS, and avian flu

Purpose of review

Several viral diseases have emerged and impacted healthcare systems worldwide. Healthcare personnels (HCPs) are at high risk of acquiring some emerging infections while caring for patients. We provide a review of risk factors, evidence of infection in HCPs, and prevention strategies with Middle East respiratory syndrome coronavirus, Ebola virus disease (Ebola), severe acute respiratory syndrome (SARS), and avian influenza.

Recent findings

HCP-related infections with Middle East respiratory syndrome coronavirus, Ebola, and SARS have been reported among 1–27%, 2.5–12%, and 11–57% of total cases, respectively. The case fatality rate of Ebola in HCPs has been reported up to 73%. The WHO guidelines for the global surveillance of SARS were developed in 2004 and used as a template for other emerging diseases preparedness. Risks to HCPs with emerging diseases are related to inappropriate and insufficient infection control measures during an initial encounter, at the beginning of outbreak and with an overwhelming number of patient cases. To date, there are no reports of avian influenza transmission to HCPs from affected cases.

Summary

Early and rapid detection of suspected infected patients with communicable diseases along with appropriate infection control practice, education, national and global preparedness guidelines would help to prevent disease transmission to HCPs.

Suwantarat N, Apisarnthanarak A. Risks to healthcare workers with emerging diseases: lessons from MERS-CoV, Ebola, SARS, and avian fluCurr Opin Infect Dis 2015, 28:349–361

Revisão: fatores de risco das **infecções adquiridas pelos PS** e **estratégias de prevenção** para coronavírus da síndrome respiratória do Oriente Médio (MERS-CoV), vírus Ebola, síndrome respiratória aguda grave (SARS-CoV) e influenza aviária.

-Infecções relacionadas aos PS (do total de casos)

- ✓ **MERS-CoV:** 1 a 27%
- ✓ **Ebola:** 2,5% a 12%
- ✓ **SARS:** 11 a 57%.

- Taxa de mortalidade de PS com Ebola - **até 73%.**

- Riscos para os PS: medidas inadequadas e insuficientes de controle de infecções durante um encontro inicial, no início do surto e número aumentado de casos de pacientes.

- Estratégias de prevenção:

- detecção precoce e rápida de pacientes suspeitos de infecção,
- práticas apropriadas de controle de infecções, educação, diretrizes nacionais/globais de preparação para impedir a transmissão aos profissionais.

Exemplos para instituir hierarquia de controles para exposições - contato e aerossol

Mais efetivo

Menos efetivo

Nível	Exemplos	Útil para exposição de contato	Útil para exposição a aerossol
Eliminação Remover o perigo inteiramente	Telemedicina	X	X
Controle de engenharia Isolar o trabalhador de perigos ou colocar barreiras entre o trabalhador e o perigo	Barreira física separando o profissional do paciente na triagem;	X	X
	Pressão negativa; sala de isolamento para infecção transmitida por aerossol com filtro HEPA;		X
	Comunicação de circuito de audio e vídeo fechado entre profissional e paciente em isolamento	X	X
Controle administrativo e práticas seguras de trabalho Mudar como os trabalhadores executam as suas atividades	Períodos de descanso para evitar fadiga	X	X
	Treinamento dos profissionais para trabalhar com segurança	X	X
	Consciência situacional (comunicação sobre exposição a perigos)	X	X
Equipamento de proteção individual - Itens usados para evitar exposições que não podem ser controladas por outros meios	Barreiras de proteção (luvas simples e/ ou grossas; óculos de proteção ou protetores faciais; avental e outras vestimentas de proteção)	X	X
	Respiradores apropriados		X

Brown CK, Mitchell AH. Realigning the conventional routes of transmission: an improved model for occupational exposure assessment and infection prevention. *J Hosp Infect*. 2020;105(1):17-23. doi:10.1016/j.jhin.2020.03.011

Principais Práticas de Prevenção e Controle de Infecções - Assistência Segura em todos os Serviços de Saúde. CDC, 2017

1. Suporte da liderança
2. Educação e treinamento em prevenção e controle de infecção
3. Educação de pacientes, familiares e cuidadores
4. Monitoramento de desempenho e retroalimentação (feedback)
5. **Precauções Padrão – todos pacientes, todo o tempo, em todos os serviços de saúde**
   5a. Higiene das mãos
   5b. Limpeza e desinfecção ambiental
   5c. Medicação e Injeção segura
   5d. Avaliação de risco para **uso de equipamento de proteção pessoal adequado** (por exemplo, **luvas**, **avental, máscara**) com base nas atividades realizadas
   5e. Minimizar as exposições potenciais (por exemplo, **higiene respiratória e tosse com etiqueta**)
   5f. **Reprocessamento de material reutilizável entre cada paciente e no mesmo paciente - respiratório**
6. **Precauções baseadas no modo de transmissão (contato/gotículas/aérea ou aerossóis) ➔ Higiene das Mãos**
7. Prevenção de infecção associadas a **Dispositivos Invasivos ➔ Higiene das Mãos**
8. Saúde ocupacional. Vacinação **➔ Higiene das Mãos**

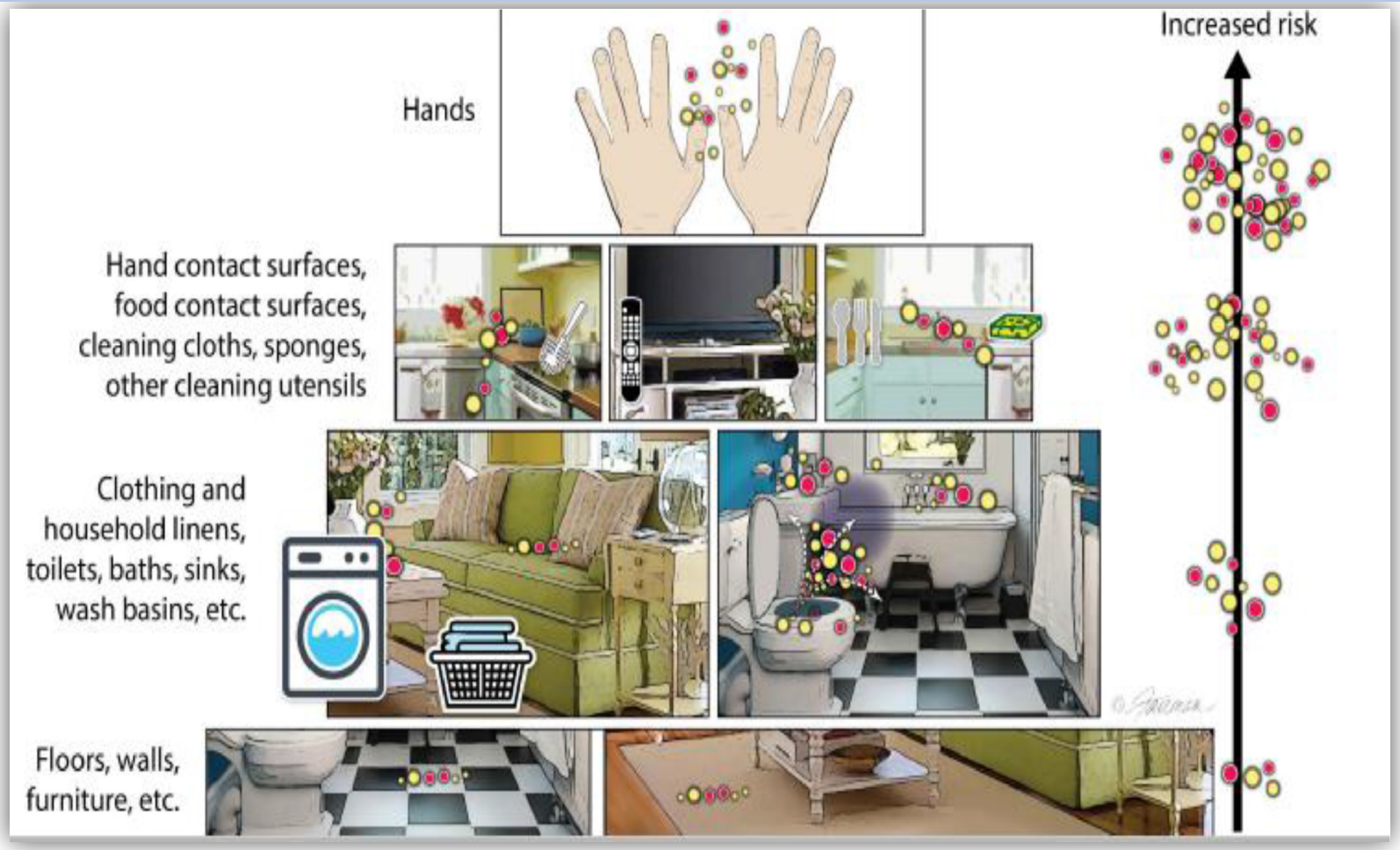
Core Infection Prevention and Control Practices for Safe Healthcare Delivery in All Settings. CDC, 2017 https://www.cdc.gov/hicpac/recommendations/core-practices.html

As recomendações de saúde pública foram atualizadas para acomodar novas evidências científicas, epidemiologia em evolução e a necessidade de simplificar a avaliação de riscos. Novas recomendações são baseadas em:

- ✓Evidência crescente de risco de transmissão de pessoas infectadas sem sintomas (assintomáticos) ou antes do início dos sintomas reconhecidos (pré-sintomáticos);
- ✓Maior transmissão da comunidade em muitas partes do país;
- ✓Necessidade de se comunicar efetivamente com o público em geral;
- ✓Foco contínuo na redução da transmissão por meio do distanciamento social e outras estratégias de prevenção pessoal.

https://www.cdc.gov/coronavirus/2019-ncov/php/public-health-recommendations.html

Exemplos de superfícies em casa ordenadas pelo risco de transmissão de microrganismos patogênicos (vermelho) e não patogênicos (amarelo)



Scott EA, Bruning E, Nims RW, Rubino JR, Ijaz MK. A 21st century view of infection control in everyday settings: Moving from the Germ Theory of Disease to the Microbial Theory of Health [published online ahead of print, 2020 May 19]. *Am J Infect Control*. 2020;S0196-6553(20)30310-2. doi:10.1016/j.ajic.2020.05.012

Superfícies de toque comum de alto risco para transmissão de microrganismos em casa ou fora de casa (escola, local de trabalho, locais de lazer)

Scott EA, Bruning E, Nims RW, Rubino JR, Ijaz MK. A 21st century view of infection control in everyday settings: Moving from the Germ Theory of Disease to the Microbial Theory of Health [published online ahead of print, 2020 May 19]. *Am J Infect Control*. 2020;S0196-6553(20)30310-2. doi:10.1016/j.ajic.2020.05.012

Como se proteger da COVID-19?

Diminuindo o risco de exposição ao SARS-CoV-2:

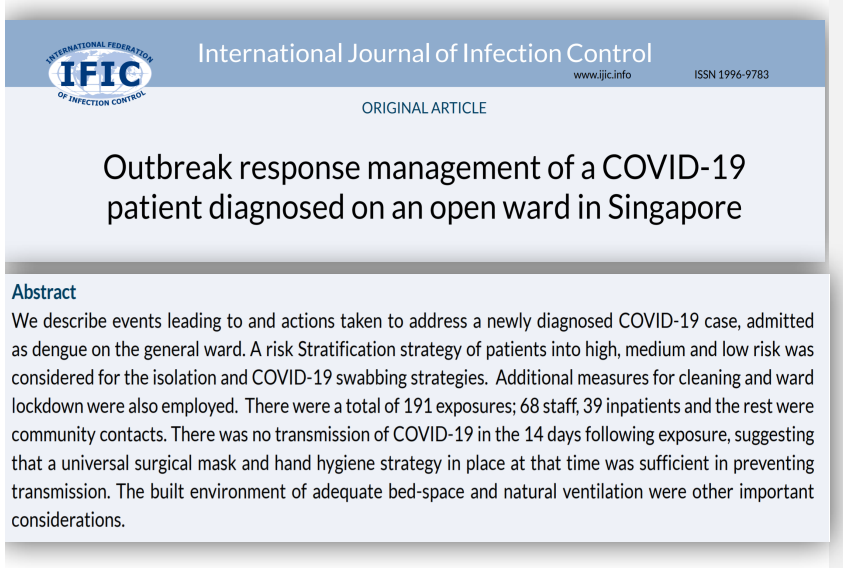
- Para o público em geral:

- ✓Evitar o contato próximo com pessoas doentes (um metro de distância);
- ✓Higienizar as mãos (sabonete/água ou fricção com produto à base de álcool);
- ✓Evitar tocar olhos, nariz, e boca com mãos não higienizadas;
- ✓Praticar higiene respiratória/etiqueta da tosse. Máscara universal.

- **Para os profissionais de saúde:**

- ✓Seguir as precauções acima na comunidade e áreas comuns do serviço de saúde (vestiário, refeitório, secretaria, banco, etc)
- ✓No cuidado assistencial: precauções padrão e precauções contato/gotículas/ aerossol S/N (uso adequado EPI).

É possível prevenir transmissão de SARS-CoV-2 em serviços de saúde?



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ORIGINAL ARTICLE

Outbreak response management of a COVID-19 patient diagnosed on an open ward in Singapore

Abstract

We describe events leading to and actions taken to address a newly diagnosed COVID-19 case, admitted as dengue on the general ward. A risk Stratification strategy of patients into high, medium and low risk was considered for the isolation and COVID-19 swabbing strategies. Additional measures for cleaning and ward lockdown were also employed. There were a total of 191 exposures; 68 staff, 39 inpatients and the rest were community contacts. There was no transmission of COVID-19 in the 14 days following exposure, suggesting that a universal surgical mask and hand hygiene strategy in place at that time was sufficient in preventing transmission. The built environment of adequate bed-space and natural ventilation were other important considerations.

- ✓ Descrição de eventos que levaram a ações tomadas para resolver um caso COVID-19 recém-diagnosticado, admitido como dengue na ala geral.
- ✓ Estratégia de estratificação de risco dos pacientes para alto, médio e baixo risco foi considerada para isolamento e realização de teste PCR.
- ✓ Medidas adicionais para limpeza e bloqueio da ala também foram empregadas.
- ✓ **Houve um total de 191 exposições; 68 funcionários, 39 pacientes internados** e o restante era contatos da comunidade.

- ✓ **Não houve transmissão do COVID-19 nos 14 dias após a exposição,** sugerindo que a máscara cirúrgica universal e estratégias de higiene das mãos em vigor naquele momento foram suficientes para impedir a transmissão.
- ✓ O ambiente construído com espaço adequado e ventilação natural foram outras medidas importantes.

https://www.ijic.info/article/view/20197/13523

É possível prevenir transmissão de SARS-CoV-2 em serviços de saúde?

Containment of COVID-19 cases among healthcare workers: The role of surveillance, early detection, and outbreak management

Durante um surto de SARS-COV-2 com transmissão comunitária, a instituição usou uma estratégia integrada para detecção e contenção precoce de casos de COVID-19 entre os profissionais de saúde.

Estratégia compreendia três componentes principais:

(1) imposição de relatórios de profissionais de saúde com doenças respiratórias agudas (IRA) à clínica da equipe da instituição para monitoramento;

(2) realização de vigilância sindrômica em andamento para obter um alerta precoce de possíveis aglomerados de COVID-19;

(3) investigação e gestão de surtos.

Resultados: Durante o período de vigilância de 16 semanas, detectaram 14 casos de COVID-19 entre os profissionais de saúde com sintomas de IRA. Dois dos casos tiveram vínculo epidemiológico e, portanto, constituíram um cluster COVID-19 com transmissão intra-hospitalar entre profissionais; 1 grupo familiar e 2 grupos entre profissionais de saúde que compartilharam acomodações.

Não foi detectada transmissão para profissionais de saúde ou pacientes após a instituição de medidas de contenção.

Conclusões: A estratégia de vigilância integrada, gerenciamento de surtos e incentivo à responsabilidade individual foram bem-sucedidos na detecção precoce de grupos de COVID-19 entre os profissionais.

Com a transmissão local em andamento, a **vigilância deve ser mantida quanto à disseminação intra-hospitalar em áreas não clínicas onde ocorre a mistura social de profissionais de saúde**.

Como a maioria dos indivíduos com COVID-19 apresenta sintomas leves, **abordar o presenteísmo é crucial para minimizar a exposição potencial da equipe e do paciente.**

Wee LE, Sim XYJ, Conceicao EP, et al. Containment of COVID-19 cases among healthcare workers: The role of surveillance, early detection, and outbreak management [published online ahead of print, 2020 May 11]. *Infect Control Hosp Epidemiol*. 2020;1-7. doi:10.1017/ice.2020.219

Proteja-se, proteja outras pessoas, proteja sua família e a sua comunidade!

Obrigada!