

Surto 2019-nCoV

R. Jesus, J. Batista,
P. Pacheco,
6-02-2020



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2019-nCoV



“This is the time for facts, not fear
This is the time for science, not rumors
This is the time for solidarity, not stigma”

“We are all in this together”

Tedros Adhanon, WHO

Agenda

- ◇ Perspectiva geral sobre 2019-nCoV
 - ◇ P. Pacheco
- ◇ Publicações científicas
 - ◇ R. Jesus
- ◇ Resposta nacional e local
 - ◇ J. Batista

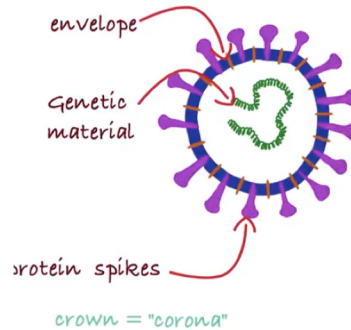
2019-nCoV

- ◆ Surto de pneumonia de origem desconhecida em Wuhan (11 M hab) Dezembro 2019
- ◆ OMS informada a 31-12-2019
- ◆ Link com Mercado de alimentos e animais vivos na cidade
- ◆ 7-01-2020 – identificação de novo coronavirus
- ◆ Encerramento do mercado dia 1-01-2020



CORONAVIRUSES

Large group of viruses

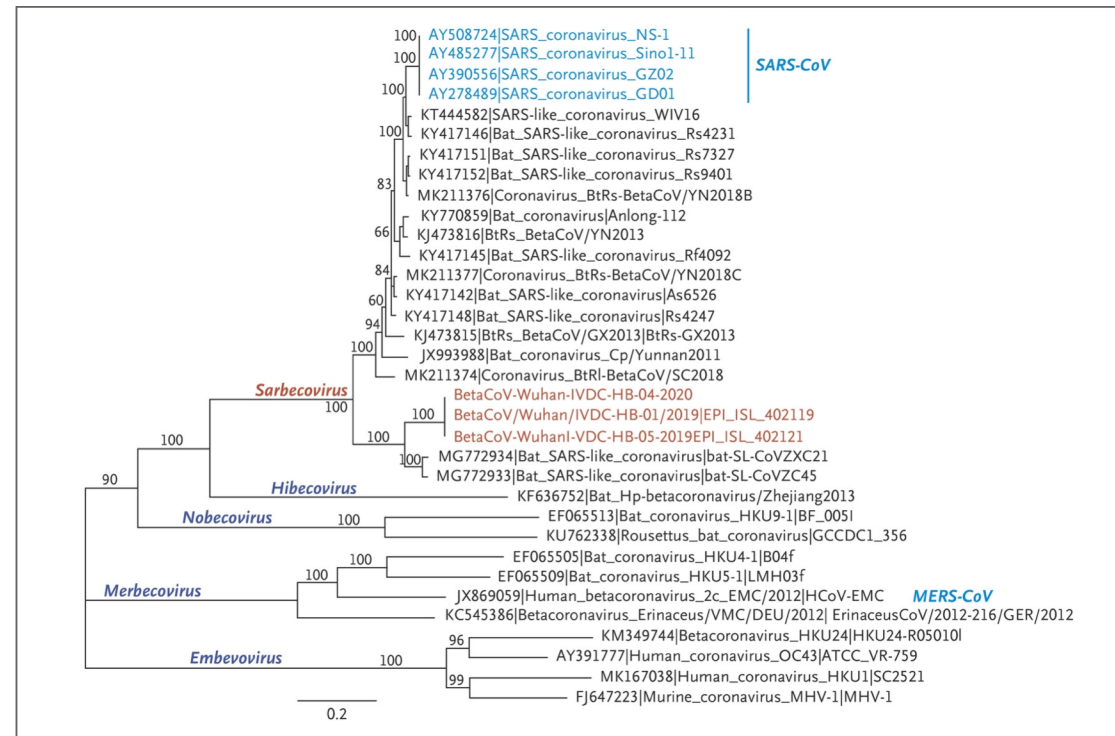


NOVO CORONAVÍRUS (2019-nCoV)

ORIGINAL ARTICLE BRIEF REPORT

A Novel Coronavirus from Patients with Pneumonia in China, 2019

Na Zhu, Ph.D., Dingyu Zhang, M.D., Wenling Wang, Ph.D., Xinwang Li, M.D., Bo Yang, M.S., Jingdong Song, Ph.D., Xiang Zhao, Ph.D., Baoying Huang, Ph.D., Weifeng Shi, Ph.D., Roujian Lu, M.D., Peihua Niu, Ph.D., Faxian Zhan, Ph.D., *et al.*, for the China Novel Coronavirus Investigating and Research Team



Coronavirus

ORIGIN OF THE VIRUS

circulate in a range of animals



spillover

range of factors



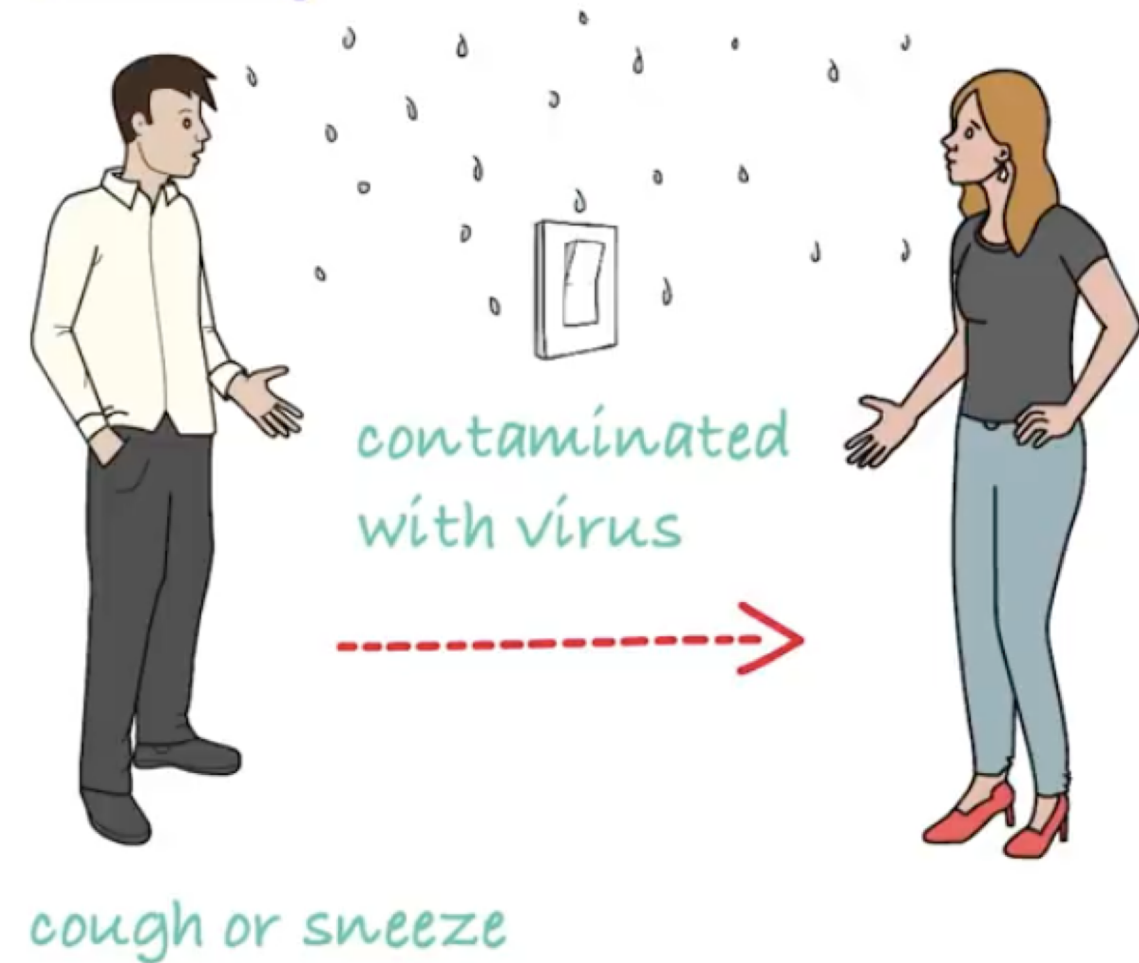
MERS -CoV



SARS-CoV

TRANSMISSION

exact dynamics yet to be determined
generally



GROUPS MOST AT RISK

close contact with animals

live animal market workers



caring for those with infection

family members or healthcare workers



Table 1. Countries, territories or areas with reported confirmed cases of 2019-nCoV, 20 January 2020

WHO Regional Office	Country, territory, area	Total number of confirmed cases
WPRO	China – Hubei Province	258
	China – Guangdong	14
	China – Beijing Municipality	5
	China – Shanghai Municipality	1
	Japan	1
	Republic of Korea	1
SEARO	Thailand	2
Total confirmed cases		282



**World Health
Organization**

Novel Coronavirus (2019-nCoV)
SITUATION REPORT - 1
21 JANUARY 2020

Novel Coronavirus(2019-nCoV)

Situation Report – 16 - ERRATUM

Data as reported by 5 February 2020*

HIGHLIGHTS

- Belgium reported its first confirmed case of 2019-nCoV acute respiratory disease.
- WHO and partners have developed a global [strategic preparedness and response plan](#), which outlines the public health measures that the international community can provide to support all countries to prepare for and respond to the 2019-nCoV outbreak. The overall goal of the plan is to stop further transmission of 2019-nCoV within China and to other countries, and to mitigate the impact of the outbreak in all countries.
- WHO is working with the travel and tourism industry to discuss real and perceived risks experienced in the industry, measures put in place for customers and employees, and challenges faced regarding implementation of the [Temporary Recommendations associated with the declaration of a Public Health Emergency of International Concern](#). In the coming days, WHO will work with the industry to identify solutions to these challenges, within the framework of the International Health Regulations (2005).

SITUATION IN NUMBERS

total and new cases in last 24 hours

Globally

24554 confirmed (3925 new)

China

24363 confirmed (3893 new)

3219 severe (431 new)

491 deaths (66 new)

Outside of China

191 confirmed (32 new)

24 countries (1 new)

1 death

WHO RISK ASSESSMENT

China	Very High
Regional Level	High
Global Level	High

Coronavírus. China à beira de grave crise económica

Milhões de pessoas de quarentena e fechadas em casa praticamente em todo o país, atividade económica reduzida ao mínimo, fronteiras nacionais e internacionais encerradas. O impacto da epidemia de coronavírus na economia chinesa, a segunda maior do planeta, ainda está por avaliar, mas deverá ser profundo e atingir outras economias em todo o mundo.

60 milhões de pessoas retidas nas cidades em quarentena

A photograph of a crowd of people, likely at an airport or public transit station. Many individuals are wearing face masks. A prominent blue horizontal banner is overlaid on the image, containing white text and social media icons. The background is dark, possibly a night scene or a dimly lit indoor space.

WHO declares the new coronavirus outbreak a Public Health Emergency of International Concern



Risco de transmissão- OMS

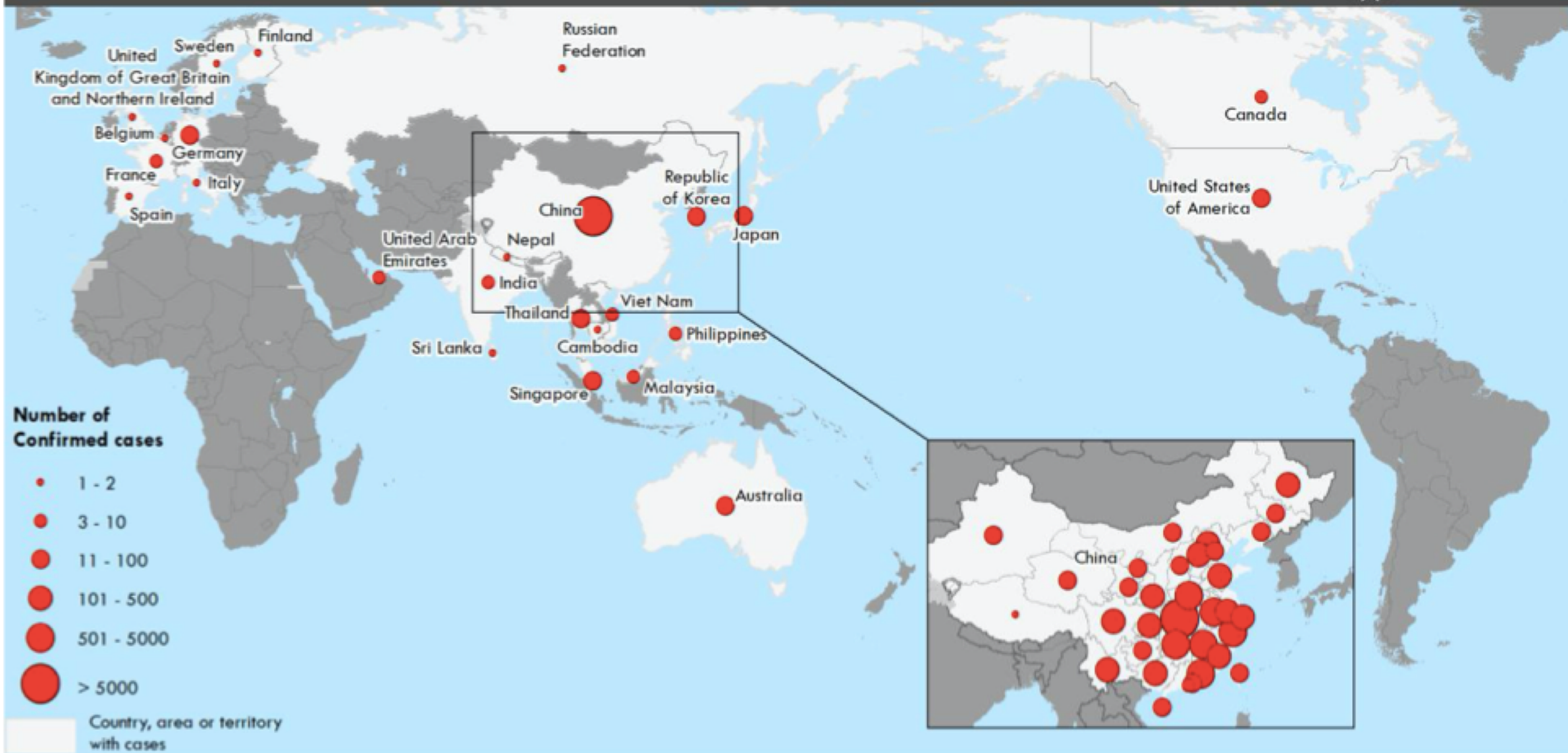
Risco muito elevado - China

Risco elevado – a nível regional

Risco moderado elevado – a nível global



Distribution of 2019-nCoV cases as of 05 February 2020



Data Source: World Health Organization, National Health Commission of the People's Republic of China

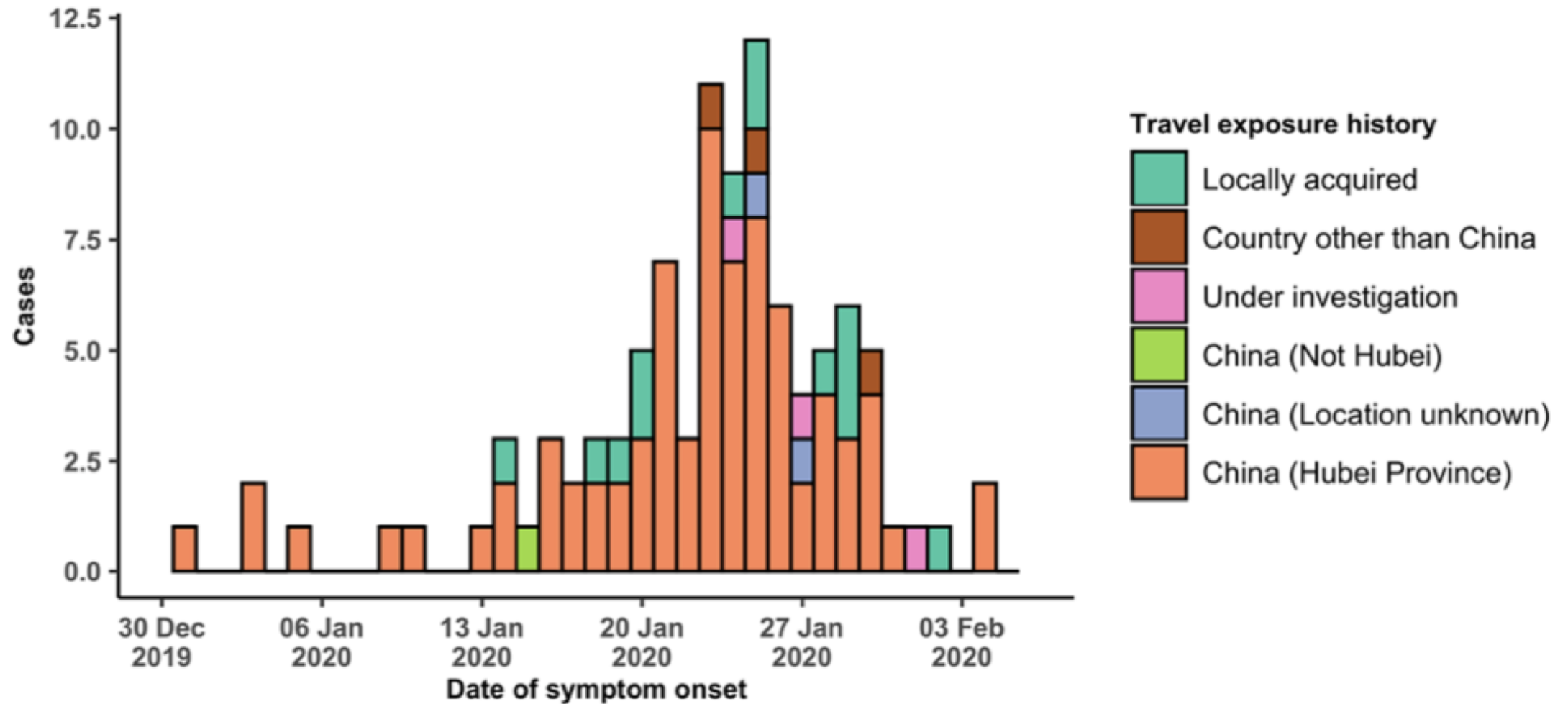
Map Production: WHO Health Emergencies Programme

0 2,500 5,000 km

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The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Figure 2: Epidemic curve of 2019-nCoV cases (n=100) identified outside of China, by date of onset of symptoms and travel history, 5 February 2020





Health worker infections are an ominous finding in any emerging infection. Front-line health workers can be initially at risk and infected when they examine and treat patients who present with a respiratory infection; if handwashing or other infection prevention and control measures are not in place, these health workers are at great risk of infection and become the inadvertent carriers to patients who are in hospital for other diseases and treatments, family members, and the community.

David L Heymann
January 24, 2020, *The Lancet*

TIME

I just want to say that don't be complacent.

NOVO CORONAVÍRUS (2019-nCoV)

Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study

Nanshan Chen*, Min Zhou*, Xuan Dong*, Jieming Qu*, Fengyun Gong, Yang Han, Yang Qiu, Jingli Wang, Ying Liu, Yuan Wei, Jia'an Xia, Ting Yu, Xinxin Zhang, Li Zhang

	Patients (n=99)
Age, years	
Mean (SD)	55.5 (13.1)
Range	21–82
≤39	10 (10%)
40–49	22 (22%)
50–59	30 (30%)
60–69	22 (22%)
≥70	15 (15%)
Sex	
Female	32 (32%)
Male	67 (68%)

Exposure to Huanan seafood market*	49 (49%)
Long-term exposure history	47 (47%)
Short-term exposure history	2 (2%)
Chronic medical illness	50 (51%)
Cardiovascular and cerebrovascular diseases	40 (40%)
Digestive system disease	11 (11%)
Endocrine system disease†	13 (13%)
Malignant tumour	1 (1%)
Nervous system disease	1 (1%)
Respiratory system disease	1 (1%)

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Patients (n=99)	
Signs and symptoms at admission	
Fever	82 (83%)
Cough	81 (82%)
Shortness of breath	31 (31%)
Muscle ache	11 (11%)
Confusion	9 (9%)
Headache	8 (8%)
Sore throat	5 (5%)
Rhinorrhoea	4 (4%)
Chest pain	2 (2%)
Diarrhoea	2 (2%)
Nausea and vomiting	1 (1%)
More than one sign or symptom	89 (90%)
Fever, cough, and shortness of breath	15 (15%)
Comorbid conditions	
Any	33 (33%)
ARDS	17 (17%)

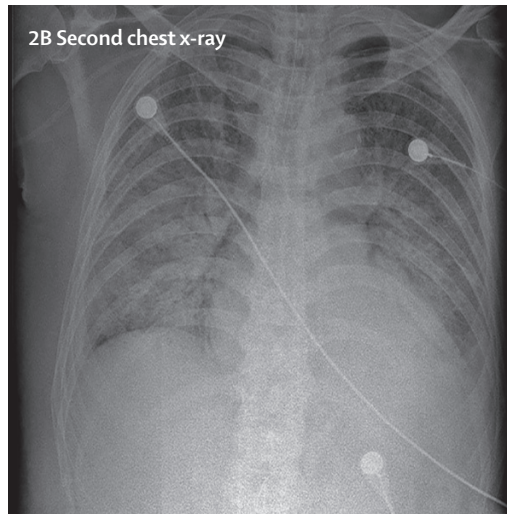
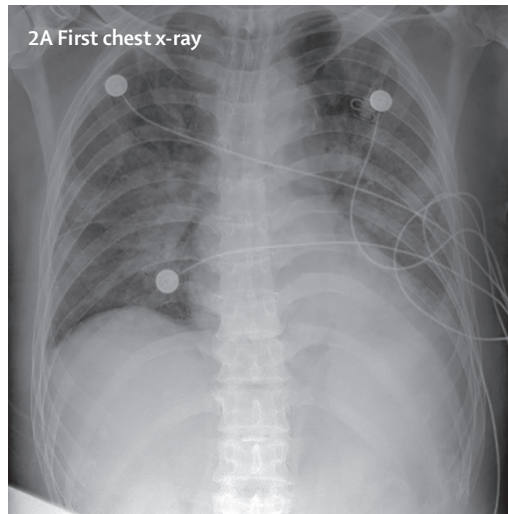
Acute renal injury	3 (3%)
Acute respiratory injury	8 (8%)
Septic shock	4 (4%)
Ventilator-associated pneumonia	1 (1%)
Chest x-ray and CT findings	
Unilateral pneumonia	25 (25%)
Bilateral pneumonia	74 (75%)
Multiple mottling and ground-glass opacity	14 (14%)
Treatment	
Oxygen therapy	75 (76%)
Mechanical ventilation	
Non-invasive (ie, face mask)	13 (13%)
Invasive	4 (4%)
CRRT	9 (9%)
ECMO	3 (3%)
Antibiotic treatment	70 (71%)
Antifungal treatment	15 (15%)
Antiviral treatment	75 (76%)
Glucocorticoids	19 (19%)
Intravenous immunoglobulin therapy	27 (27%)

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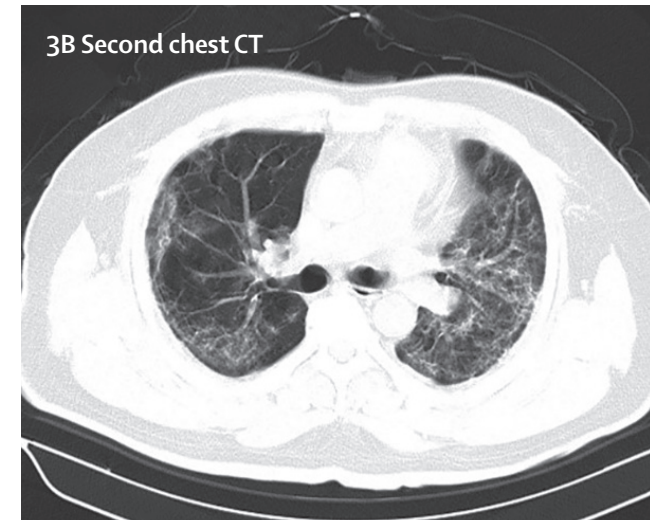
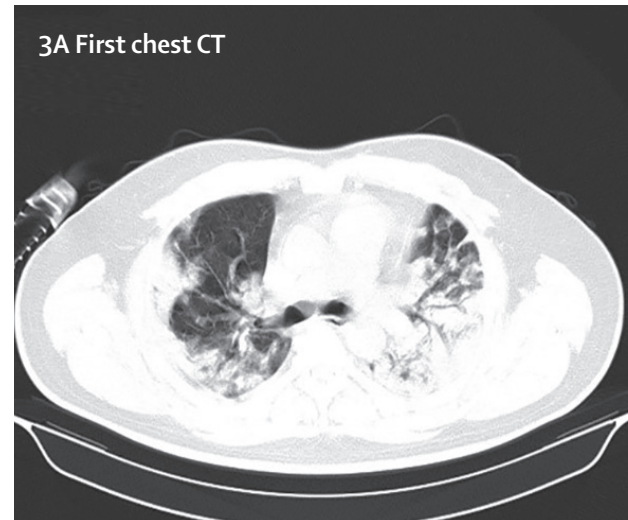
Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study

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Case 2



Case 3



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Muscle ache	11 (11%)
Confusion	9 (9%)
Headache	8 (8%)
Sore throat	5 (5%)
Rhinorrhoea	4 (4%)
Chest pain	2 (2%)
Diarrhoea	2 (2%)
Nausea and vomiting	1 (1%)
More than one sign or symptom	89 (90%)
Fever, cough, and shortness of breath	15 (15%)
Comorbid conditions	
Any	33 (33%)
ARDS	17 (17%)

Acute renal injury	3 (3%)
Acute respiratory injury	8 (8%)
Septic shock	4 (4%)
Ventilator-associated pneumonia	1 (1%)
Chest x-ray and CT findings	
Unilateral pneumonia	25 (25%)
Bilateral pneumonia	74 (75%)
Multiple mottling and ground-glass opacity	14 (14%)
Treatment	
Oxygen therapy	75 (76%)
Mechanical ventilation	
Non-invasive (ie, face mask)	13 (13%)
Invasive	4 (4%)
CRRT	9 (9%)
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Patients (n=99)	
Blood routine	
Leucocytes ($\times 10^9$ per L; normal range 3.5-9.5)	7.5 (3.6)
Increased	24 (24%)
Decreased	9 (9%)
Neutrophils ($\times 10^9$ per L; normal range 1.8-6.3)	5.0 (3.3-8.1)
Increased	38 (38%)
Lymphocytes ($\times 10^9$ per L; normal range 1.1-3.2)	0.9 (0.5)
Decreased	35 (35%)
Platelets ($\times 10^9$ per L; normal range 125.0-350.0)	213.5 (79.1)
Increased	4 (4%)
Decreased	12 (12%)
Haemoglobin (g/L; normal range 130.0-175.0)	129.8 (14.8)
Decreased	50 (51%)
Coagulation function	
Activated partial thromboplastin time (s; normal range 21.0-37.0)	27.3 (10.2)
Increased	6 (6%)
Decreased	16 (16%)
Prothrombin time (s; normal range 10.5-13.5)	11.3 (1.9)
Increased	5 (5%)
Decreased	30 (30%)
D-dimer ($\mu\text{g/L}$; normal range 0.0-1.5)	0.9 (0.5-2.8)
Increased	36 (36%)

Blood biochemistry	
Albumin (g/L; normal range 40.0-55.0)	31.6 (4.0)
Decreased	97 (98%)
Alanine aminotransferase (U/L; normal range 9.0-50.0)	39.0 (22.0-53.0)
Increased	28 (28%)
Aspartate aminotransferase (U/L; normal range 15.0-40.0)	34.0 (26.0-48.0)
Increased	35 (35%)
Total bilirubin ($\mu\text{mol/L}$; normal range 0.0-21.0)	15.1 (7.3)
Increased	18 (18%)
Blood urea nitrogen (mmol/L; normal range 3.6-9.5)	5.9 (2.6)
Increased	6 (6%)
Decreased	17 (17%)
Serum creatinine ($\mu\text{mol/L}$; normal range 57.0-111.0)	75.6 (25.0)
Increased	3 (3%)
Decreased	21 (21%)
Creatine kinase (U/L; normal range 50.0-310.0)	85.0 (51.0-184.0)
Increased	13 (13%)
Decreased	23 (23%)
Lactate dehydrogenase (U/L; normal range 120.0-250.0)	336.0 (260.0-447.0)
Increased	75 (76%)

Myoglobin (ng/mL; normal range 0.0-146.9)	49.5 (32.2-99.8)
Increased	15 (15%)
Glucose (mmol/L; normal range 3.9-6.1)	7.4 (3.4)
Increased	51 (52%)
Decreased	1 (1%)
Infection-related biomarkers	
Procalcitonin (ng/mL; normal range 0.0-5.0)	0.5 (1.1)
Increased	6 (6%)
Interleukin-6 (pg/mL; normal range 0.0-7.0)	7.9 (6.1-10.6)
Increased	51 (52%)
Erythrocyte sedimentation rate (mm/h; normal range 0.0-15.0)	49.9 (23.4)
Increased	84 (85%)
Serum ferritin (ng/mL; normal range 21.0-274.7)	808.7 (490.7)
Increased	62 (63%)
C-reactive protein (mg/L; normal range 0.0-5.0)*	51.4 (41.8)
Increased	63/73 (86%)
Co-infection	
Other viruses	0
Bacteria	1 (1%)
Fungus	4 (4%)

NOVO CORONAVÍRUS (2019-nCoV)

Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China

Chaolin Huang*, Yeming Wang*, Xingwang Li*, Lili Ren*, Jianping Zhao*, Yi Hu*, Li Zhang, Guohui Fan, Jiuyang Xu, Xiaoying Gu, Zhenshun Cheng, Ting Yu, Jiaan Xia, Yuan Wei, Wenjuan Wu, Xuelei Xie, Wen Yin, Hui Li, Min Liu, Yan Xiao, Hong Gao, Li Guo, Jungang Xie, Guangfa Wang, Rongmeng Jiang, Zhancheng Gao, Qi Jin, Jianwei Wang†, Bin Cao‡

	All patients (n=41)	ICU care (n=13)	No ICU care (n=28)	p value
White blood cell count, × 10 ⁹ /L	6.2 (4.1-10.5)	11.3 (5.8-12.1)	5.7 (3.1-7.6)	0.011
<4	10/40 (25%)	1/13 (8%)	9/27 (33%)	0.041
4-10	18/40 (45%)	5/13 (38%)	13/27 (48%)	..
>10	12/40 (30%)	7/13 (54%)	5/27 (19%)	..
Neutrophil count, × 10 ⁹ /L	5.0 (3.3-8.9)	10.6 (5.0-11.8)	4.4 (2.0-6.1)	0.00069
Lymphocyte count, × 10 ⁹ /L	0.8 (0.6-1.1)	0.4 (0.2-0.8)	1.0 (0.7-1.1)	0.0041
<1.0	26/41 (63%)	11/13 (85%)	15/28 (54%)	0.045
≥1.0	15/41 (37%)	2/13 (15%)	13/28 (46%)	..
Haemoglobin, g/L	126.0 (118.0-140.0)	122.0 (111.0-128.0)	130.5 (120.0-140.0)	0.20
Platelet count, × 10 ⁹ /L	164.5 (131.5-263.0)	196.0 (165.0-263.0)	149.0 (131.0-263.0)	0.45
<100	2/40 (5%)	1/13 (8%)	1/27 (4%)	0.45
≥100	38/40 (95%)	12/13 (92%)	26/27 (96%)	..
Prothrombin time, s	11.1 (10.1-12.4)	12.2 (11.2-13.4)	10.7 (9.8-12.1)	0.012
Activated partial thromboplastin time, s	27.0 (24.2-34.1)	26.2 (22.5-33.9)	27.7 (24.8-34.1)	0.57
D-dimer, mg/L	0.5 (0.3-1.3)	2.4 (0.6-14.4)	0.5 (0.3-0.8)	0.0042
Albumin, g/L	31.4 (28.9-36.0)	27.9 (26.3-30.9)	34.7 (30.2-36.5)	0.0066
Alanine aminotransferase, U/L	32.0 (21.0-50.0)	49.0 (29.0-115.0)	27.0 (19.5-40.0)	0.038
Aspartate aminotransferase, U/L	34.0 (26.0-48.0)	44.0 (30.0-70.0)	34.0 (24.0-40.5)	0.10
≤40	26/41 (63%)	5/13 (38%)	21/28 (75%)	0.025
>40	15/41 (37%)	8/13 (62%)	7/28 (25%)	..

Total bilirubin, mmol/L	11.7 (9.5-13.9)	14.0 (11.9-32.9)	10.8 (9.4-12.3)	0.011
Potassium, mmol/L	4.2 (3.8-4.8)	4.6 (4.0-5.0)	4.1 (3.8-4.6)	0.27
Sodium, mmol/L	139.0 (137.0-140.0)	138.0 (137.0-139.0)	139.0 (137.5-140.5)	0.26
Creatinine, μmol/L	74.2 (57.5-85.7)	79.0 (53.1-92.7)	73.3 (57.5-84.7)	0.84
≤133	37/41 (90%)	11/13 (85%)	26/28 (93%)	0.42
>133	4/41 (10%)	2/13 (15%)	2/28 (7%)	..
Creatine kinase, U/L	132.5 (62.0-219.0)	132.0 (82.0-493.0)	133.0 (61.0-189.0)	0.31
≤185	27/40 (68%)	7/13 (54%)	20/27 (74%)	0.21
>185	13/40 (33%)	6/13 (46%)	7/27 (26%)	..
Lactate dehydrogenase, U/L	286.0 (242.0-408.0)	400.0 (323.0-578.0)	281.0 (233.0-357.0)	0.0044
≤245	11/40 (28%)	1/13 (8%)	10/27 (37%)	0.036
>245	29/40 (73%)	12/13 (92%)	17/27 (63%)	..
Hypersensitive troponin I, pg/mL	3.4 (1.1-9.1)	3.3 (3.0-163.0)	3.5 (0.7-5.4)	0.08
>28 (99th percentile)	5/41 (12%)	4/13 (31%)	1/28 (4%)	0.017
Procalcitonin, ng/mL	0.1 (0.1-0.1)	0.1 (0.1-0.4)	0.1 (0.1-0.1)	0.031
<0.1	27/39 (69%)	6/12 (50%)	21/27 (78%)	0.0029
≥0.1 to <0.25	7/39 (18%)	3/12 (25%)	4/27 (15%)	..
≥0.25 to <0.5	2/39 (5%)	0/12	2/27 (7%)	..
≥0.5	3/39 (8%)	3/12 (25%)*	0/27	..
Bilateral involvement of chest radiographs	40/41 (98%)	13/13 (100%)	27/28 (96%)	0.68
Cycle threshold of respiratory tract	32.2 (31.0-34.5)	31.1 (30.0-33.5)	32.2 (31.1-34.7)	0.39

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CRRT	9 (9%)
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Antibiotic treatment	70 (71%)
Antifungal treatment	15 (15%)
Antiviral treatment	75 (76%)
Glucocorticoids	19 (19%)
Intravenous immunoglobulin therapy	27 (27%)

Admission to intensive care unit	23 (23%)
Clinical outcome	
Remained in hospital	57 (58%)
Discharged	31 (31%)
Died	11 (11%)

Oseltamivir
Ganciclovir
Lopinavir/ritonavir

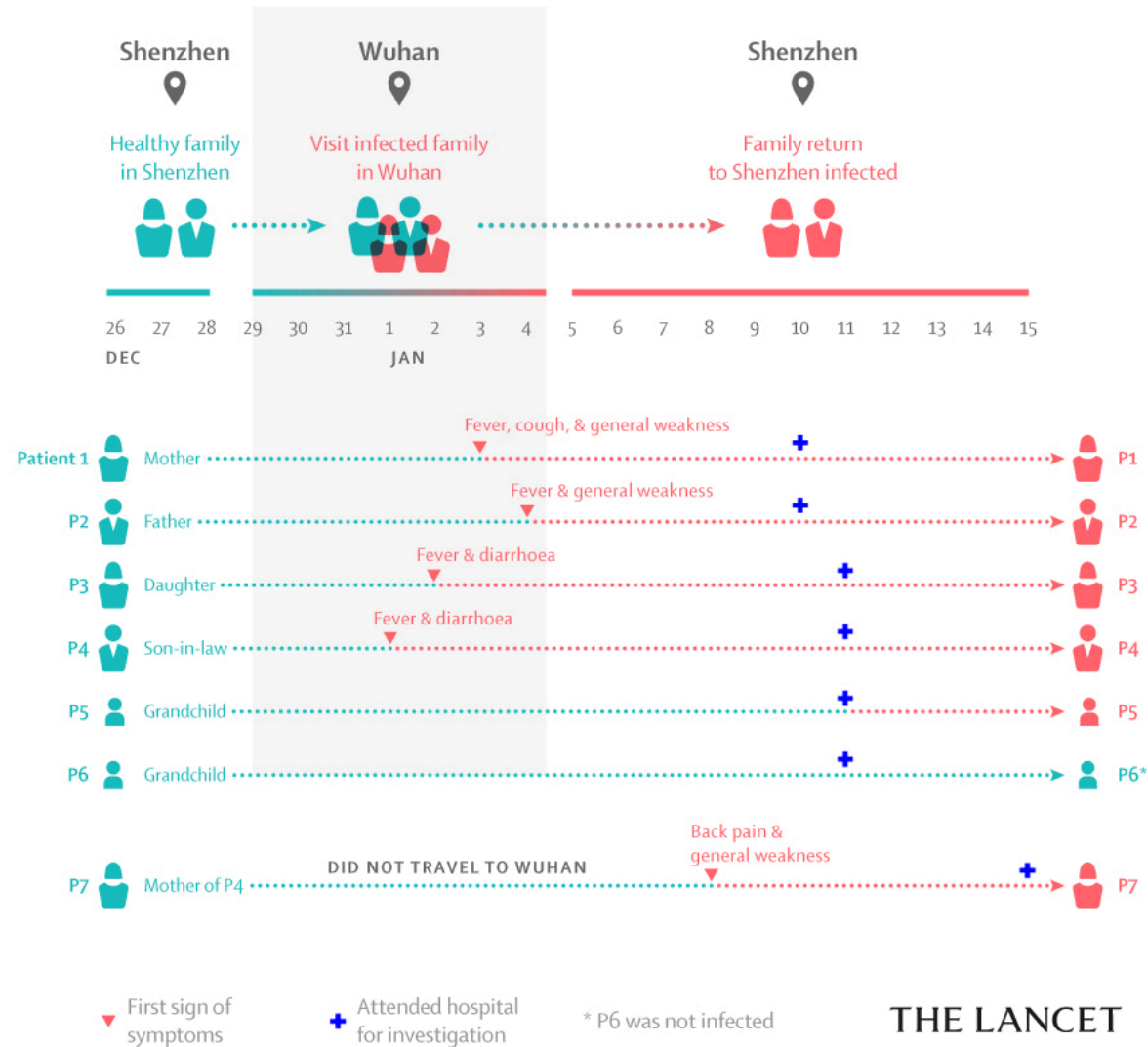
NOVO CORONAVÍRUS (2019-nCoV)

A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster

Jasper Fuk-Woo Chan, Shuofeng Yuan*, Kin-Hang Kok*, Kelvin Kai-Wang To*, Hin Chu*, Jin Yang, Fanfan Xing, Jieling Liu, Cyril Chik-Yan Yip, Rosana Wing-Shan Poon, Hoi-Wah Tsoi, Simon Kam-Fai Lo, Kwok-Hung Chan, Vincent Kwok-Man Poon, Wan-Mui Chan, Jonathan Daniel Ip, Jian-Piao Cai, Vincent Chi-Chung Cheng, Honglin Chen, Christopher Kim-Ming Hui, Kwok-Yung Yuen*

Real-time RT-PCR (spike gene)
Nasopharyngeal swab	+(Ct 31)	+(Ct 27)	ND	+(Ct 31)	ND	+(Ct 27)
Throat swab	NA	NA	ND	ND	+(Ct 40)	+(Ct 33)
Sputum	NA	NA	NA	NA	+(Ct 27)	+(Ct 25)
Serum	ND	+(Ct 40)	NA	NA	ND	NA
Plasma	NA	NA	ND	ND	ND	ND
Urine	ND	ND	ND	ND	ND	NA
Stool	NA	NA	ND	ND	ND	ND

NOVO CORONAVÍRUS (2019-nCoV)



NOVO CORONAVÍRUS (2019-nCoV)

CORRESPONDENCE

Importation and Human-to-Human Transmission of a Novel Coronavirus in Vietnam

Phan L. *et al.* NEJM, 2020

CORRESPONDENCE

Transmission of 2019-nCoV Infection from an Asymptomatic Contact in Germany

Rothe C. *et al.* NEJM, 2020

ORIGINAL ARTICLE BRIEF REPORT

First Case of 2019 Novel Coronavirus in the United States

Holshue M. *et al.* NEJM, 2020

NOVO CORONAVÍRUS (2019-nCoV)

Discovery of a novel coronavirus associated with the recent pneumonia outbreak in humans and its potential bat origin

Peng Zhou, Xing-Lou Yang, Xian-Guang Wang, Ben Hu, Lei Zhang, Wei Zhang, Hao-Rui Si, Yan Zhu, Bei Li, Chao-Lin Huang, Hui-Dong Chen, Jing Chen, Yun Luo, Hua Guo, Ren-Di Jiang, Mei-Qin Liu, Ying Chen, Xu-Rui Shen, Xi Wang, Xiao-Shuang Zheng, Kai Zhao, Quan-Jiao Chen, Fei Deng, Lin-Lin Liu, Bing Yan, Fa-Xian Zhan, Yan-Yi Wang, Gengfu Xiao, Zheng-Li Shi

Since the SARS outbreak 18 years ago, a large number of severe acute respiratory syndrome related coronaviruses (SARSr-CoV) have been discovered in their natural reservoir host, bats. Previous studies indicated that some of those bat SARSr-CoVs have the potential to infect humans. Here we report the identification and characterization of a novel coronavirus (nCoV-2019) which caused an epidemic of acute respiratory syndrome in humans, in Wuhan, China. The epidemic, started from December 12th, 2019, has caused 198 laboratory confirmed infections with three fatal cases by January 20th, 2020. Full-length genome sequences were obtained from five patients at the early stage of the outbreak. They are almost identical to each other and

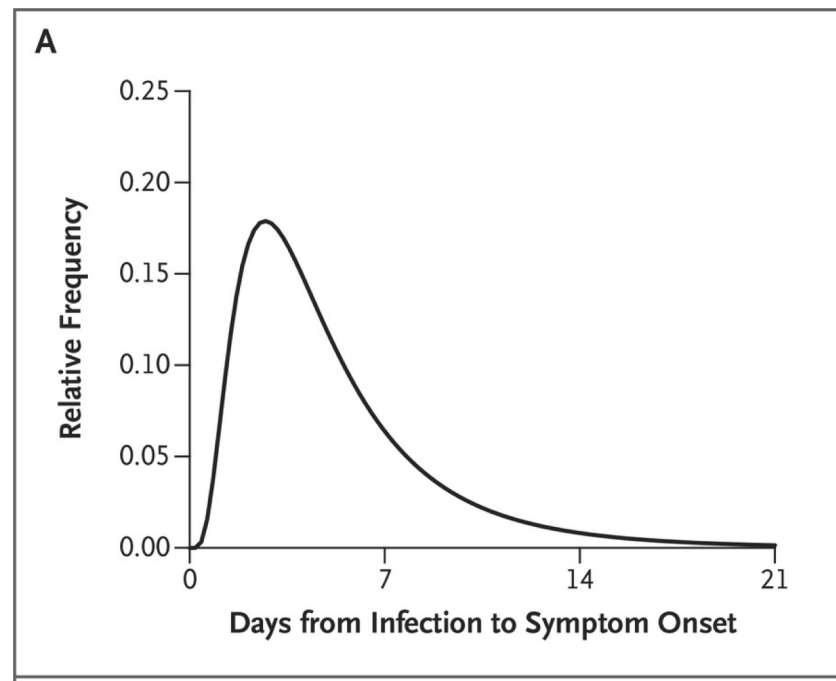
share 79.5% sequence identify to SARS-CoV. Furthermore, it was found that nCoV-2019 is 96% identical at the whole genome level to a bat coronavirus. The pairwise protein sequence analysis of seven conserved non-structural proteins show that this virus belongs to the species of SARSr-CoV. The nCoV-2019 virus was then isolated from the bronchoalveolar lavage fluid of a critically ill patient, which can be neutralized by sera from several patients. Importantly, we have confirmed that this novel CoV uses the same cell entry receptor, ACE2, as SARS-CoV.

NOVO CORONAVÍRUS (2019-nCoV)

ORIGINAL ARTICLE

Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus–Infected Pneumonia

Qun Li, M.Med., Xuhua Guan, Ph.D., Peng Wu, Ph.D., Xiaoye Wang, M.P.H., Lei Zhou, M.Med., Yeqing Tong, Ph.D., Ruiqi Ren, M.Med., Kathy S.M. Leung, Ph.D., Eric H.Y. Lau, Ph.D., Jessica Y. Wong, Ph.D., Xuesen Xing, Ph.D., Nijuan Xiang, M.Med., et al.



Período de incubação
médio: **5.2 dias** !

NOVO CORONAVÍRUS (2019-nCoV)

Report 3: Transmissibility of 2019-nCoV

Natsuko Imai, Anne Cori, Iliaria Dorigatti, Marc Baguelin, Christl A. Donnelly, Steven Riley, Neil M. Ferguson

WHO Collaborating Centre for Infectious Disease Modelling, MRC Centre for Global Infectious Disease Analysis, J-IDEA, Imperial College London, UK

Self-sustaining human-to-human transmission of the novel coronavirus (2019-nCoV) is the only plausible explanation of the scale of the outbreak in Wuhan. We estimate that, on average, each case infected 2.6 (uncertainty range: 1.5-3.5) other people up to 18th January 2020, based on an analysis combining our past estimates of the size of the outbreak in Wuhan with computational modelling of potential epidemic trajectories. This implies that control measures need to block well over 60% of transmission to be effective in controlling the outbreak. It is likely,

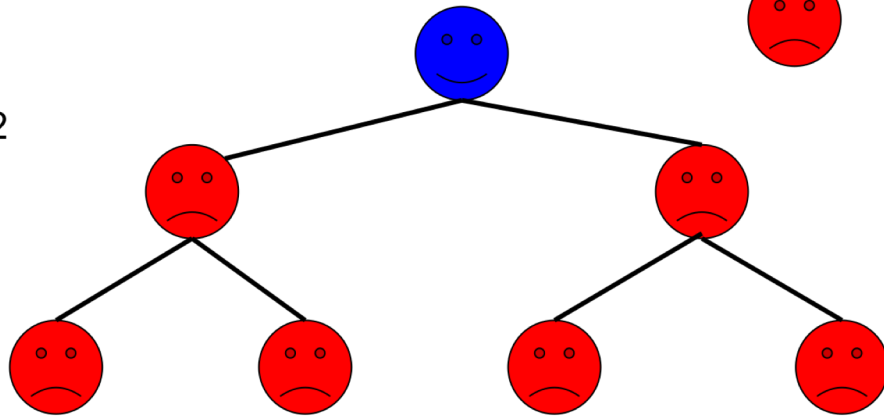
R_0 Número básico de reprodução !

R_0 Número básico de reprodução

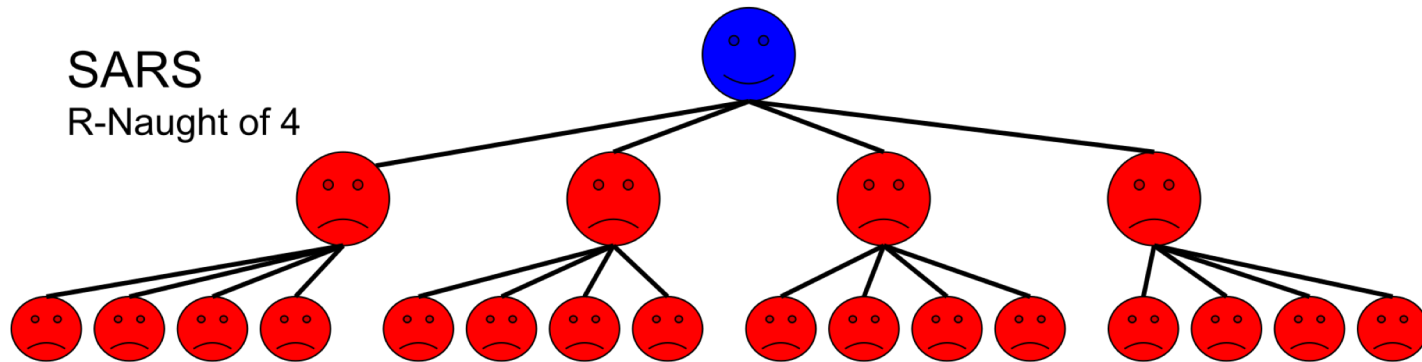
 Patient Zero

 Infected

Ebola:
R-Naught of 2



SARS
R-Naught of 4



Values of R_0 of well-known infectious diseases^[1]

Disease	Transmission	R_0
Measles	Airborne	12-18
Diphtheria	Saliva	6-7
Smallpox	Airborne droplet	5-7
Polio	Fecal-oral route	5-7
Rubella	Airborne droplet	5-7
Mumps	Airborne droplet	4-7
HIV/AIDS	Sexual contact	2-5
Pertussis	Airborne droplet	5.5 ^[2]
SARS	Airborne droplet	2-5 ^[3]
Influenza (1918 pandemic strain)	Airborne droplet	2-3 ^[4]
Ebola (2014 Ebola outbreak)	Bodily fluids	1.5-2.5 ^[5]

R_0 Número básico de reprodução

If 5 people with new coronavirus each infected 2.6 others ...



... there could be **5 people sick** after **1 cycle**.

R_0 Número básico de reprodução

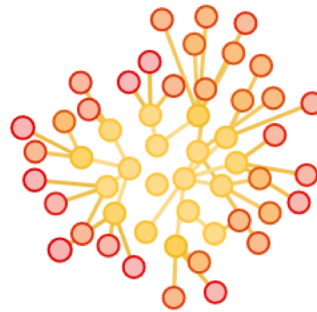
If 5 people with new coronavirus each infected 2.6 others ...



... there could be **18 people sick** after **2 cycles**.

R_0 Número básico de reprodução

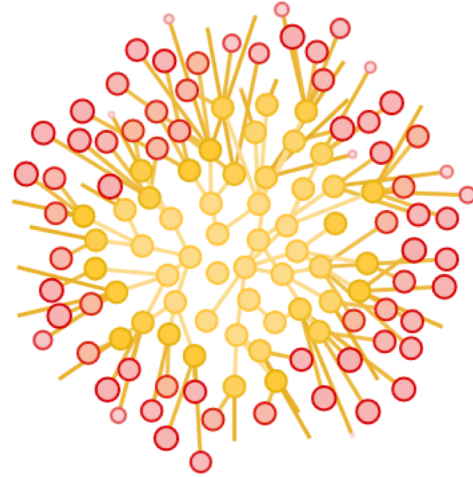
If 5 people with new coronavirus each infected 2.6 others ...



... there could be **52 people sick** after **3 cycles**.

R_0 Número básico de reprodução

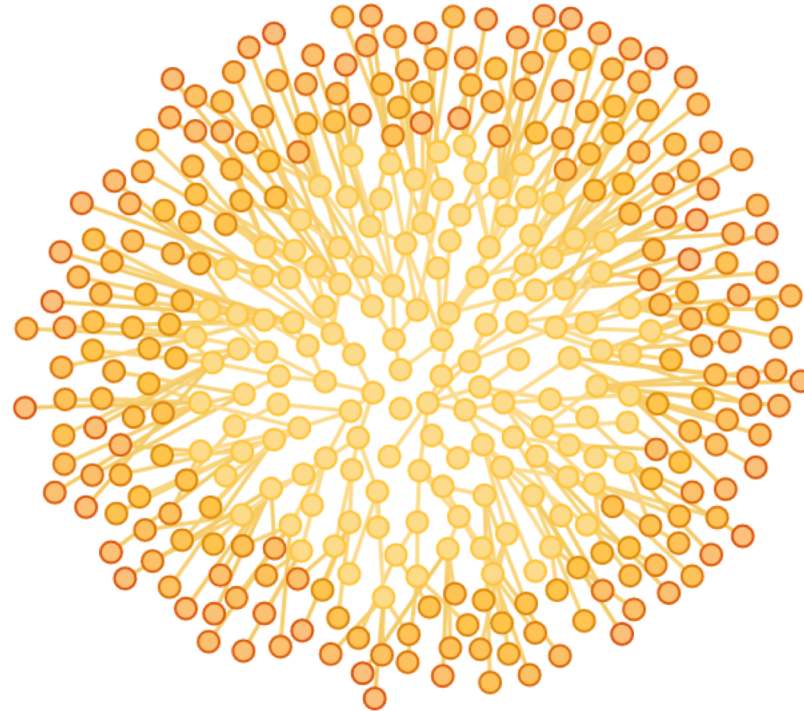
If 5 people with new coronavirus each infected 2.6 others ...



... there could be **140 people sick** after **4 cycles**.

R_0 Número básico de reprodução

If 5 people with new coronavirus each infected 2.6 others ...



... there could be **368 people sick** after **5 cycles**.

R_0 Número básico de reprodução

If 5 people with new coronavirus each infected 2.6 others ... If 5 people with seasonal flu each infected 1.3 others ...



... there could be **5 people sick** after **1 cycle**.

... there could be **5 people sick** after **1 cycle**.

R_0 Número básico de reprodução

If 5 people with new coronavirus each infected 2.6 others ... If 5 people with seasonal flu each infected 1.3 others ...



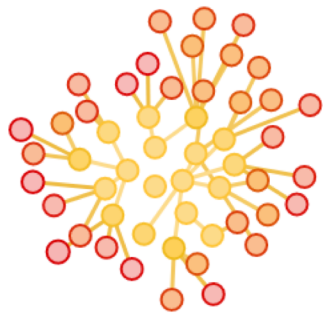
... there could be **18 people sick** after **2 cycles**.



... there could be **12 people sick** after **2 cycles**.

R_0 Número básico de reprodução

If 5 people with new coronavirus each infected 2.6 others ... If 5 people with seasonal flu each infected 1.3 others ...

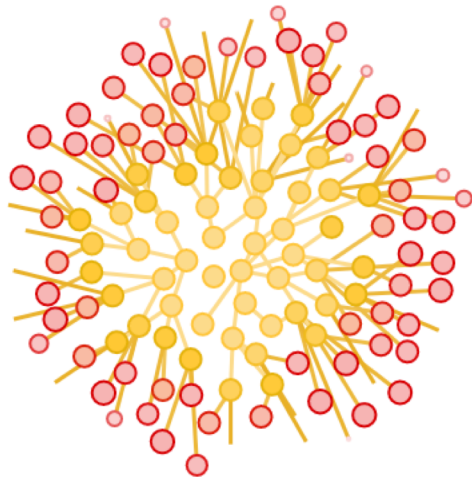


... there could be **52 people sick** after **3 cycles**.

... there could be **20 people sick** after **3 cycles**.

R_0 Número básico de reprodução

If 5 people with new coronavirus each infected 2.6 others ... If 5 people with seasonal flu each infected 1.3 others ...



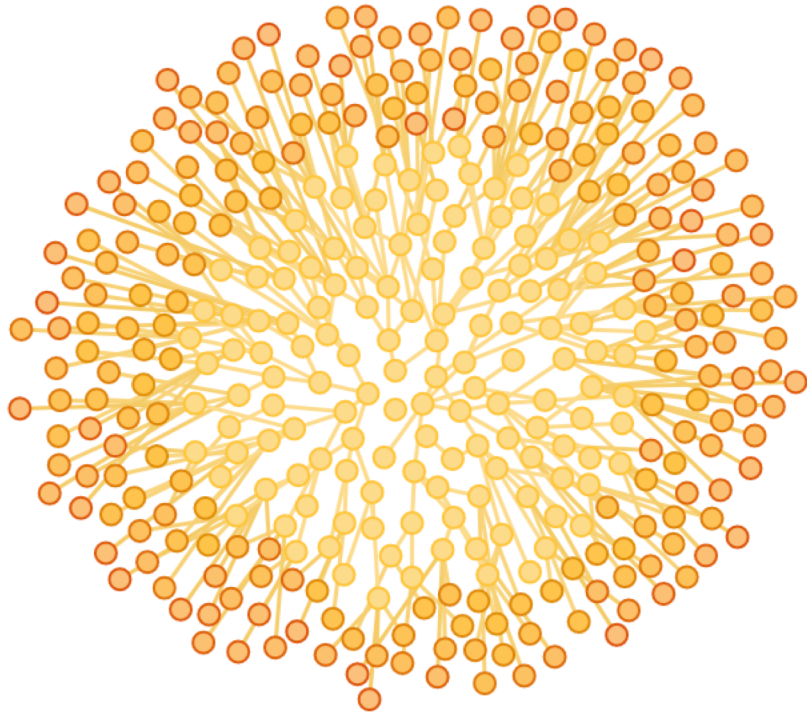
... there could be **140 people sick** after **4 cycles**.



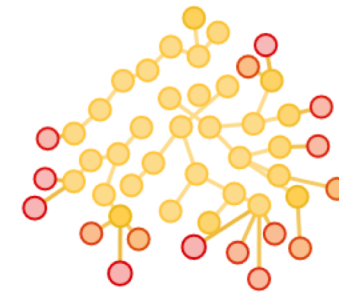
... there could be **31 people sick** after **4 cycles**.

R_0 Número básico de reprodução

If 5 people with new coronavirus each infected 2.6 others ... If 5 people with seasonal flu each infected 1.3 others ...



... there could be **368 people sick** after **5 cycles**.



... there could be **45 people sick** after **5 cycles**.

NOVO CORONAVÍRUS (2019-nCoV)



NOVO CORONAVÍRUS (2019-nCoV)

ORIGINAL ARTICLE

Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus–Infected Pneumonia

Qun Li, M.Med., Xuhua Guan, Ph.D., Peng Wu, Ph.D., Xiaoye Wang, M.P.H., Lei Zhou, M.Med., Yeqing Tong, Ph.D., Ruiqi Ren, M.Med., Kathy S.M. Leung, Ph.D., Eric H.Y. Lau, Ph.D., Jessica Y. Wong, Ph.D., Xuesen Xing, Ph.D., Nijuan Xiang, M.Med., [et al.](#)

the 95th percentile of the distribution at 12.5 days. In its early stages, the epidemic doubled in size every 7.4 days. With a mean serial interval of 7.5 days (95% CI, 5.3 to 19), the basic reproductive number was estimated to be 2.2 (95% CI, 1.4 to 3.9).




NOVO CORONAVÍRUS (2019-nCoV)



NOVO CORONAVÍRUS (2019-nCoV)

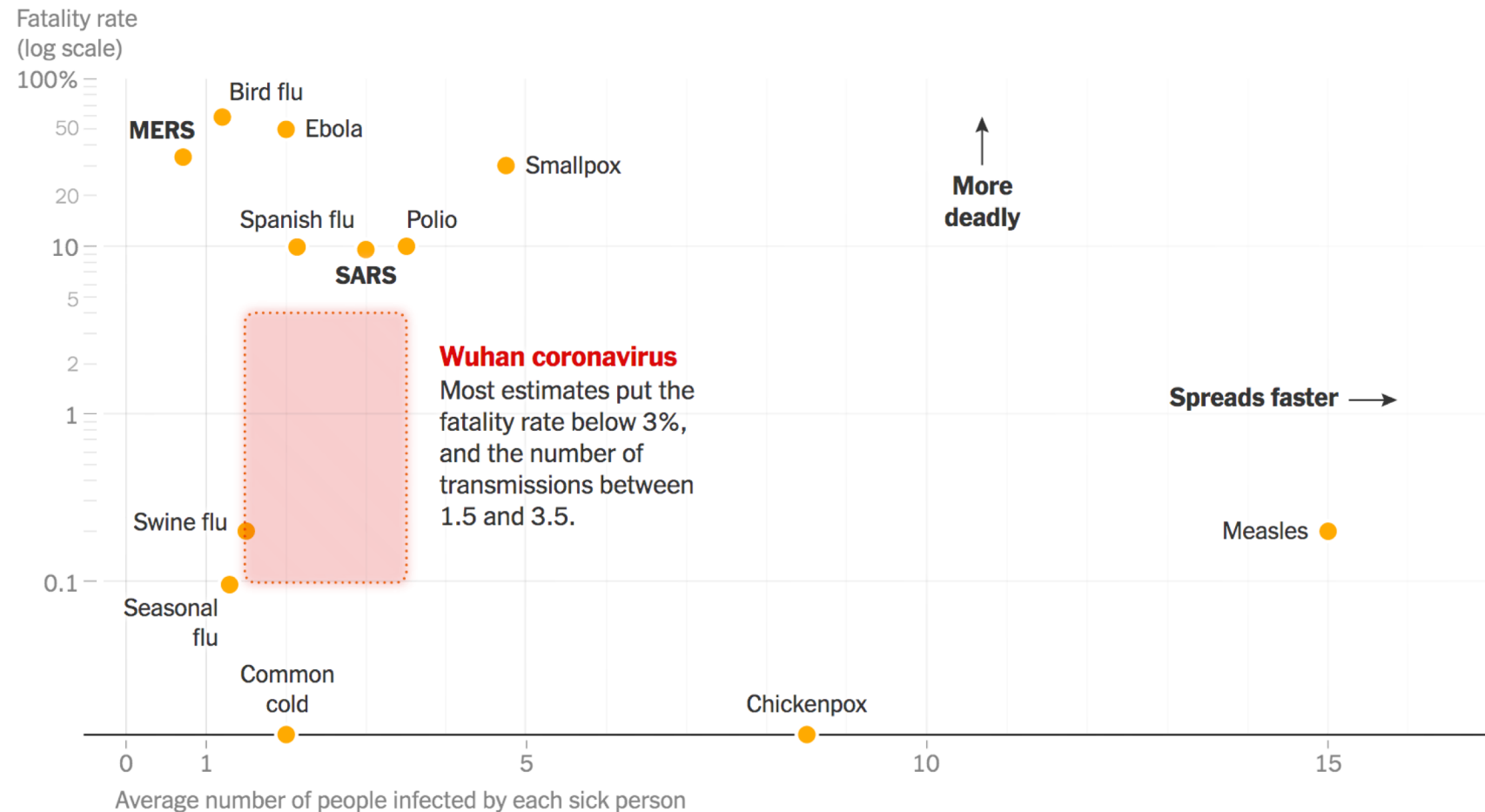


Table 1. Pathogenicity and Transmissibility Characteristics of Recently Emerged Viruses in Relation to Outbreak Containment.

Virus	Case Fatality Rate (%) 	Pandemic	Contained	Remarks
2019-nCoV	Unknown*	Unknown	No, efforts ongoing	
pH1N1	0.02–0.4	Yes	No, postpandemic circulation and establishment in human population	
H7N9	39	No	No, eradication efforts in poultry reservoir ongoing	
NL63	Unknown	Unknown	No, endemic in human population	
SARS-CoV	9.5	Yes	Yes, eradicated from intermediate animal reservoir	58% of cases result from nosocomial transmission
MERS-CoV	34.4	No	No, continuous circulation in animal reservoir and zoonotic spillover	70% of cases result from nosocomial transmission
Ebola virus (West Africa)	63	No	Yes	

* Number will most likely continue to change until all infected persons recover.

NOVO CORONAVÍRUS (2019-nCoV)



NOVO CORONAVÍRUS (2019-nCoV)



Clinical management of severe acute respiratory infection when novel coronavirus (2019-nCoV) infection is suspected

Interim guidance

28 January 2020

[WHO/nCoV/Clinical/2020.2](https://www.who.int/publications/item/WHO-nCoV-Clinical-2020.2)



This document is organized into the following sections:

1. Triage: recognize and sort patients with SARI
2. Immediate implementation of appropriate infection prevention and control (IPC) measures
3. Early supportive therapy and monitoring
4. Collection of specimens for laboratory diagnosis
5. Management of hypoxemic respiratory failure and acute respiratory distress syndrome (ARDS)
6. Management of septic shock
7. Prevention of complications
8. Specific anti-nCoV treatments
9. Special considerations for pregnant patients



8. Specific anti-Novel-CoV treatments and clinical research

⚠ There is no current evidence from RCTs to recommend any specific anti-nCoV treatment for patients with suspected or confirmed 2019-nCoV infection.

✅ Unlicensed treatments should be administered only in the context of ethically-approved clinical trials or the Monitored Emergency Use of Unregistered Interventions Framework (MEURI), with strict monitoring.

<https://www.who.int/ethics/publications/infectious-disease-outbreaks/en/>

✅ Clinical characterization protocols are available, at the WHO 2019 nCoV website:

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>. WHO has established Global 2019-nCoV Clinical Data Platform, for member countries to contribute. Contact EDCARN@who.int for additional questions.

NOVO CORONAVÍRUS (2019-nCoV)



ORIENTAÇÃO

NÚMERO: 002/2020

DATA: 25/01/2020

ASSUNTO: Infecção pelo novo Coronavírus (2019-nCoV)

PALAVRAS-CHAVE: Coronavírus; Infecção Respiratória Aguda grave.

PARA: Profissionais do Sistema de Saúde

CONTACTOS: Direção de Serviços de Prevenção da Doença e Promoção da Saúde: dspdps@dgs.min-saude.pt | Centro de Emergências em Saúde Pública: cesp@dgs.min-saude.pt

4. Tratamento

O tratamento do caso confirmado é sintomático e de suporte de órgãos.^{12 13}

Grávidas com infecção suspeita ou confirmada por nCoV devem ser tratadas com medicação de suporte, tomando em consideração as adaptações fisiológicas da gravidez.

NOVO CORONAVÍRUS (2019-nCoV)



SARS-CoV infections.^{33,34} As 2019-nCoV is an emerging virus, an effective treatment has not been developed for disease resulting from this virus. Since the combination of lopinavir and ritonavir was already available in the designated hospital, a randomised controlled trial has been initiated quickly to assess the efficacy and safety of combined use of lopinavir and ritonavir in patients hospitalised with 2019-nCoV infection.

Huang C. *et al.* Lancet, 2020

nitiation and isolation of cases. Broad-spectrum antivirals, such as remdesivir, an RNA polymerase inhibitor, as well as lopinavir/ritonavir and interferon beta have shown promise against MERS-CoV in animal models and are being assessed for activity against 2019-nCoV.⁵ Vaccines, which have adapted approaches used for SARS-CoV or MERS-CoV, are also being pursued. For example, sci-

Fauci A. *et al.* JAMA, 2020

Comparative therapeutic efficacy of remdesivir and combination lopinavir, ritonavir, and interferon beta against MERS-CoV

Sheahan T. *et al.* Nat Commun, 2020

NOVO CORONAVÍRUS (2019-nCoV)



A randomized, open-label, blank-controlled trial for the efficacy and safety of lopinavir-ritonavir and interferon-alpha 2b in hospitalization patients with 2019-nCoV infection

[download](#)

Registration number:	ChiCTR2000029308
Date of Last Refreshed on:	2020-02-04
Date of Registration:	2020-01-23
Registration Status:	Prospective registration
Public title:	A randomized, open-label, blank-controlled trial for the efficacy and safety of lopinavir-ritonavir and interferon-alpha 2b in hospitalization patients with 2019-nCoV infection
English Acronym:	
Scientific title:	A randomized, open-label, blank-controlled trial for the efficacy and safety of lopinavir-ritonavir and interferon-alpha 2b in hospitalization patients with 2019-nCoV infection

A randomized controlled trial for comparing three strategies in the treatment of 2019-nCoV pneumonia

[download](#)

Registration number:	ChiCTR2000029387
Date of Last Refreshed on:	2020-02-04
Date of Registration:	2020-01-28
Registration Status:	Prospective registration
Public title:	A randomized controlled trial for comparing three strategies in the treatment of 2019-nCoV pneumonia
English Acronym:	
Scientific title:	A randomized controlled trial for comparing three strategies in the treatment of 2019-nCoV pneumonia

NOVO CORONAVÍRUS (2019-nCoV)



Thailand sees apparent success treating coronavirus with drug cocktail

The doctors combined the anti-flu drug oseltamivir with lopinavir and ritonavir, anti-virals used to treat HIV, Kriengsak said, adding the ministry was awaiting research results to prove the findings.

Fonte: <https://www.dawn.com/news/1532081/?fbclid=IwAR2ZOv3YLnAbwFWhYRcNIKK74Z-fzLWszkvgLm1S8gXl3Za3c68Tjfw7gU0>

ORIGINAL ARTICLE BRIEF REPORT

First Case of 2019 Novel Coronavirus in the United States

development of radiographic pneumonia in this patient, clinicians pursued compassionate use of an investigational antiviral therapy. Treatment with intravenous remdesivir (a novel nucleotide analogue prodrug in development^{10,11}) was initiated on the evening of day 7, and no adverse events were observed in association with the infusion. Vancomycin was discontinued on the evening of day 7, and cefepime was

NOVO CORONAVÍRUS (2019-nCoV)



Baricitinib as potential treatment for 2019-nCoV acute respiratory disease

Most viruses enter cells through receptor-mediated endocytosis. The receptor that 2019-nCoV uses to infect lung cells might be ACE2, a cell-surface protein on cells in the kidney, blood vessels, heart, and, importantly, lung AT2 alveolar epithelial cells (figure). These AT2 cells are particularly prone to viral infection.³ One of the known regulators of endocytosis is the AP2-associated protein kinase 1 (AAK1). Disruption of AAK1 might, in turn, interrupt the passage of the virus into cells and also the intracellular assembly of virus particles.⁴

By contrast, one of the six high-affinity AAK1-binding drugs was the janus kinase inhibitor baricitinib, which also binds the cyclin G-associated kinase, another regulator of endocytosis. Because the plasma concentration of baricitinib on therapeutic dosing (either as 2 mg or 4 mg once daily) is sufficient to inhibit AAK1, we suggest it could be trialled, using an appropriate patient population with 2019-nCoV acute respiratory disease, to reduce both the viral entry and the inflammation in patients, using endpoints such as the MuLBSTA score, an early warning model for predicting mortality in viral pneumonia.⁷

NOVO CORONAVÍRUS (2019-nCoV)



RESPOSTA NACIONAL E LOCAL AO SURTO

Coronavirus outbreak

China's reaction to the coronavirus outbreak violates human rights

Frances Eve

The Guardian, 02.02.2020

Sun 2 Feb 2020 12:32 GMT

The WHO has praised country's response, but heavy-handed approach could make things worse

Q Search

Bloomberg

Sign

Prognosis

U.S. to Quarantine Americans Returning From Hubei: Virus Update

Bloomberg News

30 de janeiro de 2020, 22:31 WET Updated on 31 de janeiro de 2020, 21:26 WET

CORONAVÍRUS

Portugueses que regressam da China só ficam em quarentena se aceitarem

SIC Notícias, 02.02.2020

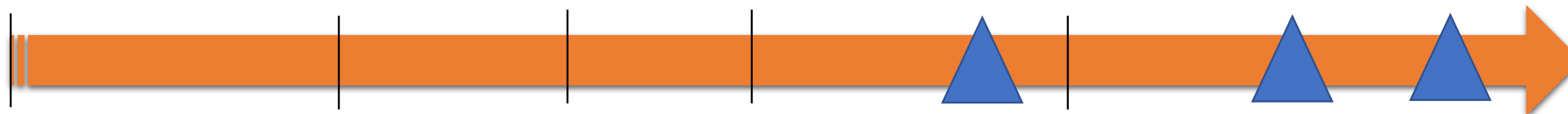
PAÍS

atualizado

Coronavírus. Portugueses em quarentena garantem estar bem

RTP, 03.02.2020

RESPOSTA NACIONAL AO SURTO



31.Dez:
Primeiro alerta na OMS
de vários casos de
pneumonia na China

7. Jan:
Identificado 2019-
ncOV

11.Jan:
Primeira morte
na China

13.Jan:
Primeiro caso
fora da China

25.Jan

28.Jan:
Primeiro caso
na Alemanha

30.Jan

01.Fev

NÚMERO: 002/2020
DATA: 25/01/2020

ASSUNTO: Infecção pelo novo Coronavírus (2019-nCoV)
PALAVRAS-CHAVE: Coronavírus; Infecção Respiratória Aguda grave.
PARA: Profissionais do Sistema de Saúde

ORIENTAÇÃO

Maria da Graça
Gregório de Freitas

Digitally signed by Maria da Graça Gregório de Freitas
DN: c=PT, o=Direção-Geral da Saúde, cn=Maria da Graça Gregório de Freitas
Date: 2020.01.25 21:08:15 Z

NÚMERO: 03/2020
DATA: 30/01/2020

ASSUNTO: Prevenção e Controlo de Infecção por novo Coronavírus (2019-nCoV)
PALAVRAS-CHAVE: Coronavírus; Medidas de Prevenção e Controlo de Infecção

ORIENTAÇÃO

Maria da Graça
Gregório de
Freitas

Digitally signed by Maria da Graça Gregório de Freitas
DN: c=PT, o=Direção-Geral da Saúde, cn=Maria da Graça Gregório de Freitas
Date: 2020.01.30 18:36:19 Z

NÚMERO: 004/2020
DATA: 01/02/2020

ASSUNTO: Infecção por novo Coronavírus (2019-nCoV). Procedimentos de vigilância de aeroportos e viajantes por via aérea
PALAVRAS-CHAVE: Coronavírus; Vigilância; Viajante; Aeroportos; Autoridades de Saúde; Companhias Aéreas
PARA: Companhias aéreas, aeroportos e Autoridades de Saúde dos aeroportos
CONTACTOS: Unidade de Apoio à Autoridade de Saúde Nacional e à Gestão das Emergências de Saúde Pública: cesp@dgs.min-saude.pt

ORIENTAÇÃO

Maria da Graça
Gregório de
Freitas

Digitally signed by Maria da Graça Gregório de Freitas
DN: c=PT, o=Direção-Geral da Saúde, cn=Maria da Graça Gregório de Freitas
Date: 2020.02.01 21:19:24 Z

DEFINIÇÃO DE CASO

	Critérios clínicos	Critérios epidemiológicos
Caso Suspeito	Doente com infeção respiratória aguda, grave (febre, tosse, e necessidade de admissão hospitalar) [sem outra causa que explique a etiologia dos sintomas]	História de viagem a, ou residência em Wuhan, na Província de Hubei, China, nos 14 dias antes do início dos sintomas OU Profissional de saúde que tenha trabalhado em ambientes onde se prestam cuidados a doentes com infeções agudas respiratórias graves de origem desconhecida, onde foram reportados casos de doentes com infeção por nCoV
	Doente com doença respiratória aguda	Contato próximo com caso confirmado ou provável de infeção por nCoV, nos 14 dias antes do início dos sintomas OU Visitas ou trabalho em mercados de animais vivos em Wuhan, na Província de Hubei, China nos 14 dias antes do início dos sintomas Frequentou uma unidade de prestação de cuidados de saúde, nos 14 dias antes do início dos sintomas, onde foram reportados casos de doentes com infeção por nCoV associada a cuidados de saúde.
Caso Provável	Caso suspeito em investigação com teste diagnóstico com resultado inconclusivo para nCOV ou positivo para pan-coronavirus	
Caso Confirmado	Pessoa com confirmação laboratorial de infeção por nCOV, independentemente dos sinais e sintomas.	

DEFINIÇÃO DE CONTACTO PRÓXIMO

Ligação
epidemiológica
14 dias

Prestação de cuidados diretos a doentes com nCoV

Trabalho com profissionais de saúde infetados com nCoV

Visitas a doentes ou permanência no mesmo ambiente com doentes infetados por nCoV

Trabalho em contacto próximo, ou partilha da mesma sala de aula, com um doente com infeção por nCoV

Viagem com doente infetado por nCoV

Coabitação com doente infetado por nCoV



Figura 1 - Identificação de passageiros à volta do doente

DGS: Circuito do doente com suspeita de infeção por 2019-nCov

Circuito A



1. Contacto com Linha Saúde 24
2. Permanência no domicílio, a aguardar instruções da DGS
3. Validação do caso

Circuito B



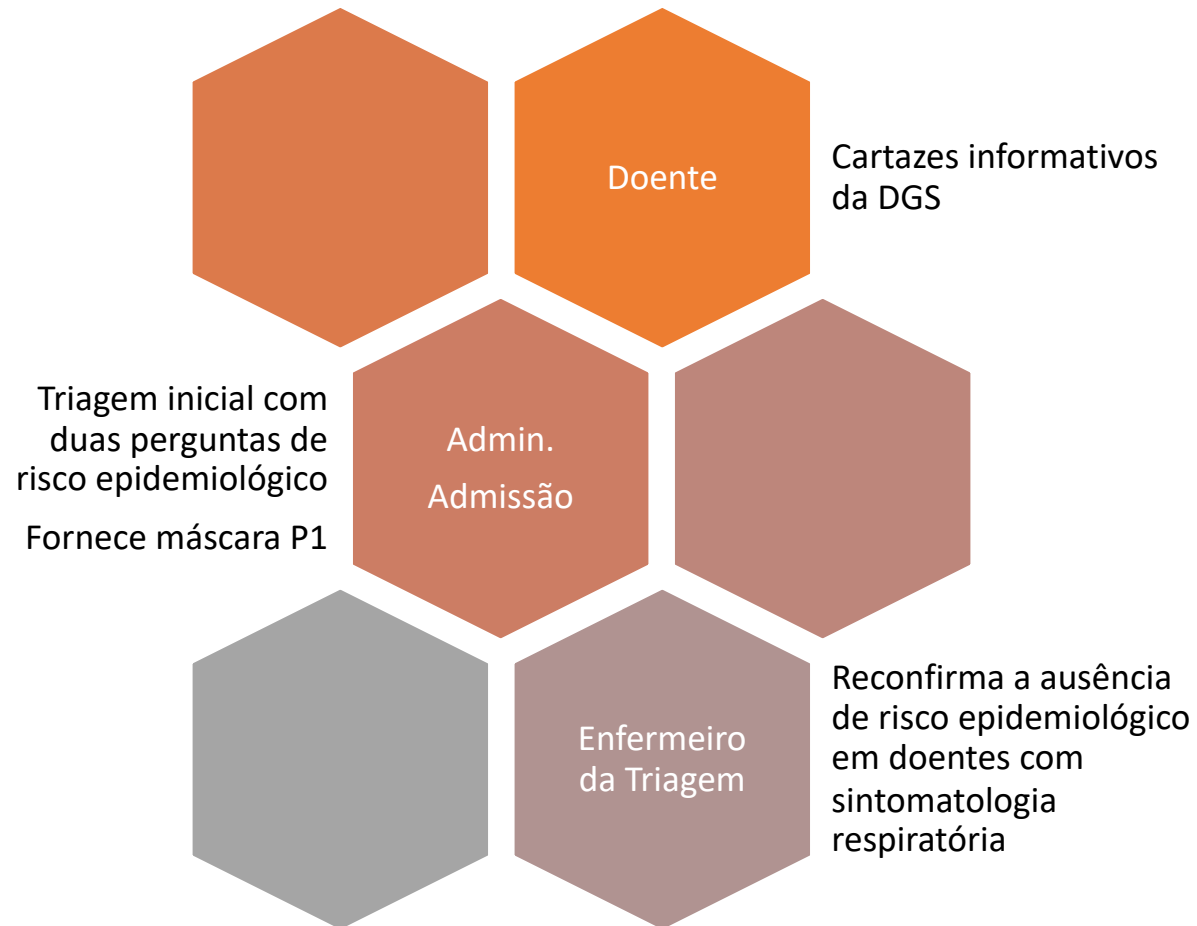
1. Contacto presencial desencadeia deteção de caso suspeito
2. Doente: máscara cirúrgica e isolamento
3. Profissional: EPI e minimização de contactos
4. Validação do caso

“Reativação dos Planos de Contingência para vírus emergentes”

Independentemente do cenário, após validação do caso, a DGS ativa o INEM, INSA e Autoridade de Saúde Coordenadora

No HFF: “Circuito Interno do Doente Com Suspeita de Infeção por Vírus 2019- nCoV (novo coronavírus)- Fase de Contenção”

1. Identificação precoce de casos suspeitos



2. Unificação dos fluxos de doentes

- Grávidas com sintomatologia respiratória
- Crianças
- Adultos



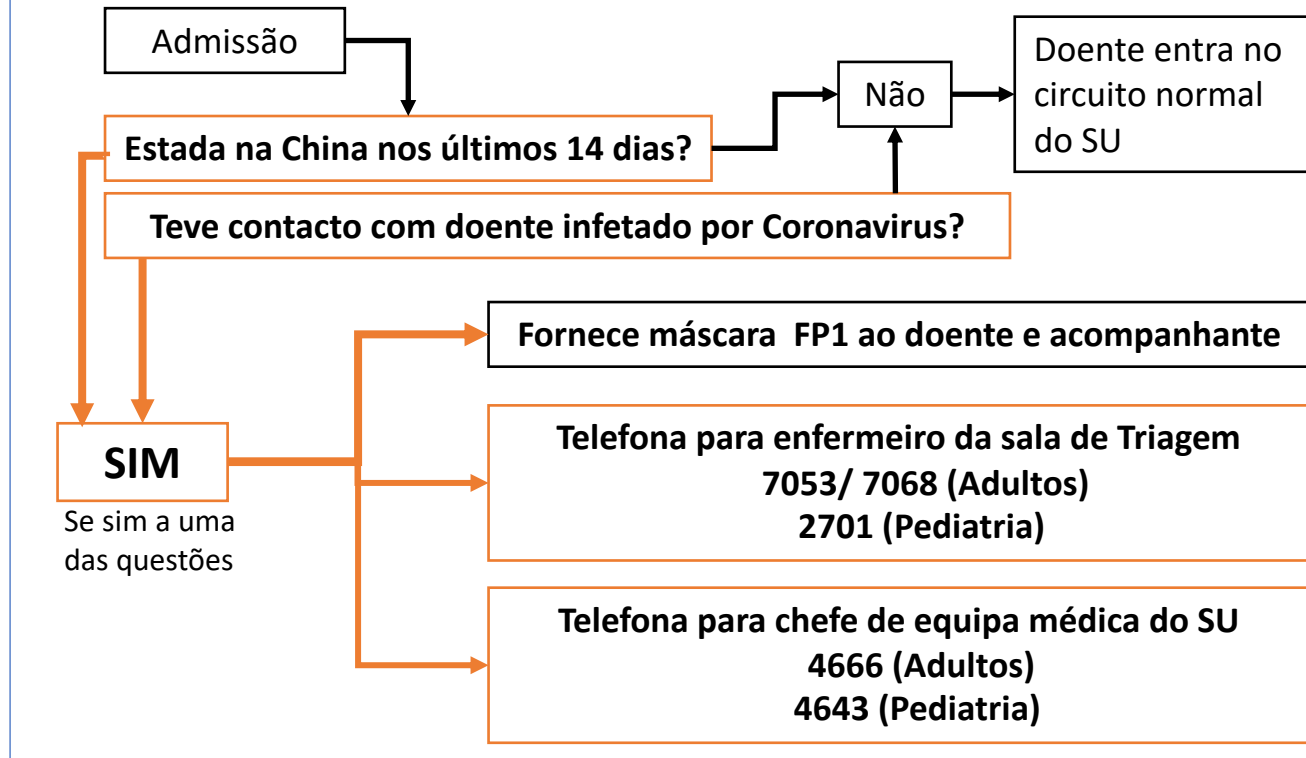
Gabinete 34

3. Reforço das medidas de proteção individual

- ✓ Higiene das mãos
- ✓ Etiqueta respiratória
- ✓ Utilização correta e adequada do EPI
- ✓ Utilização de máscaras P1
- ✓ Limpeza e desinfeção dos espaços

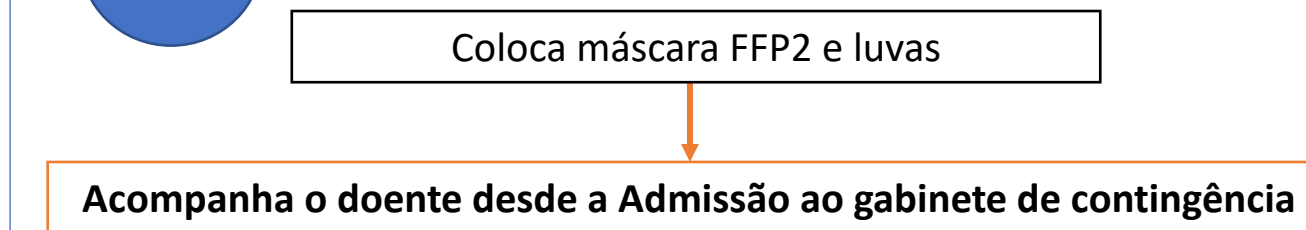
1

Administrativo da Admissão do SU



2

Enfermeiro da Sala de Triagem



3

Médico

Coloca equipamento de proteção individual

- Touca
- Óculos
- Máscara FFP3
- Proteção do calçado
- Bata
- Luvas de punho alto

Avaliação de sinais vitais e spO2

Avaliação de dados clínicos e epidemiológicos de acordo com questionário

Caso suspeito?

Não

Doente entra no circuito normal do SU

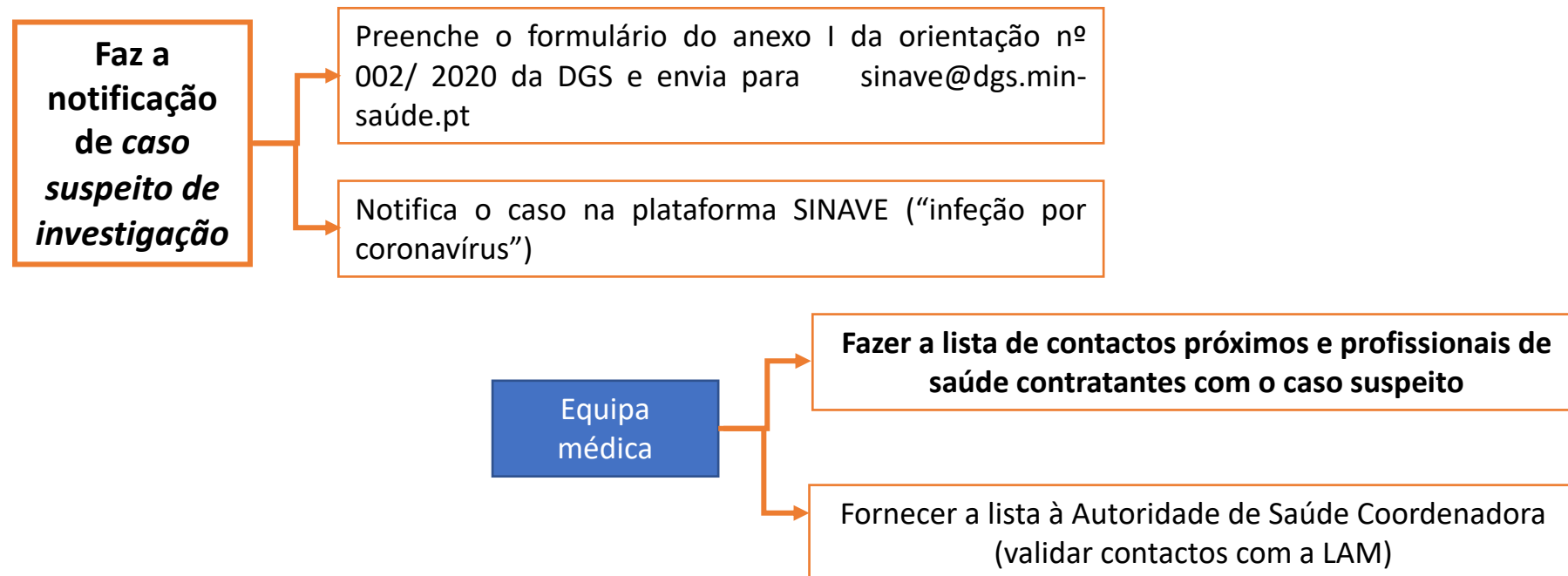
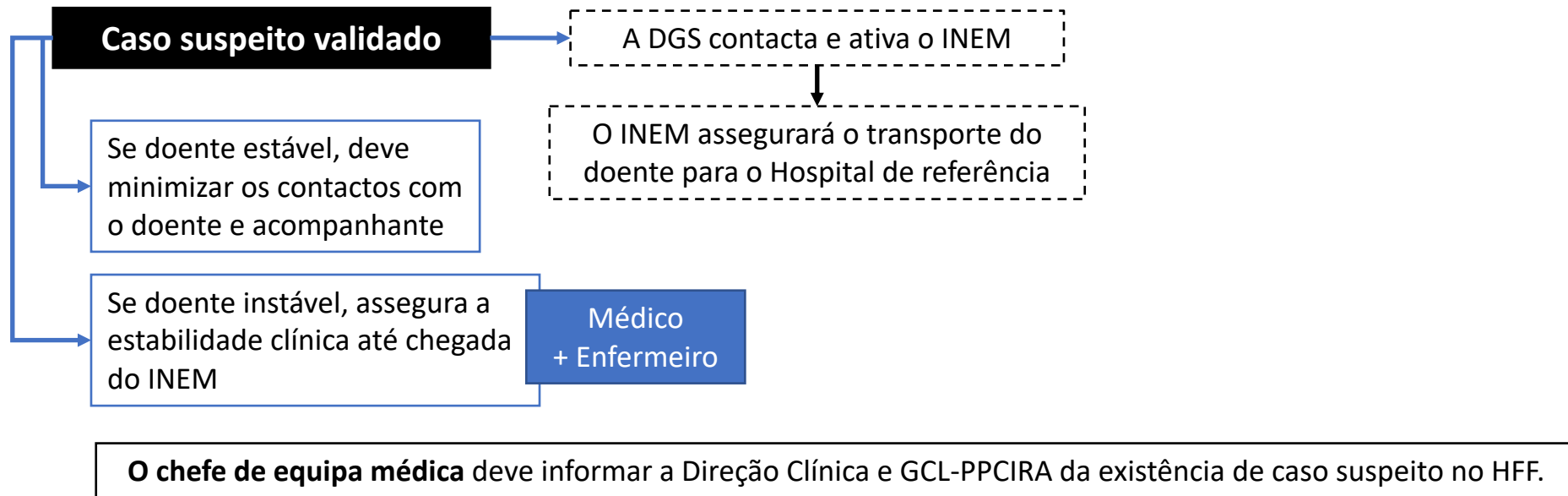
SIM

Contacta Linha de Apoio ao Médico (DGS) para validação
300 015015

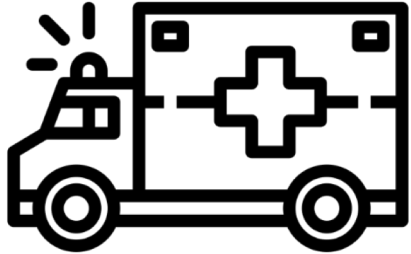
Suspeita não validada



- Filtra 99% das partículas
- *versus* 94% das máscaras FFP2;
- Exige treino de colocação e de ajuste à face;
- Antes do contacto com doente, deve ser realizado um teste de selagem.

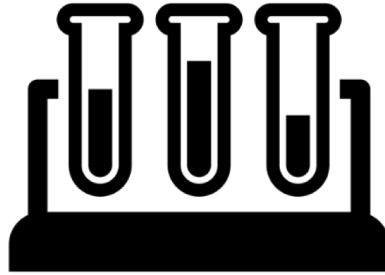


VALIDAÇÃO DO CASO PELA DGS



INEM

- Transferência do doente para Hospital de Referência



INSA

- Diagnóstico laboratorial da infeção por PCR
- Amostras respiratórias e soro



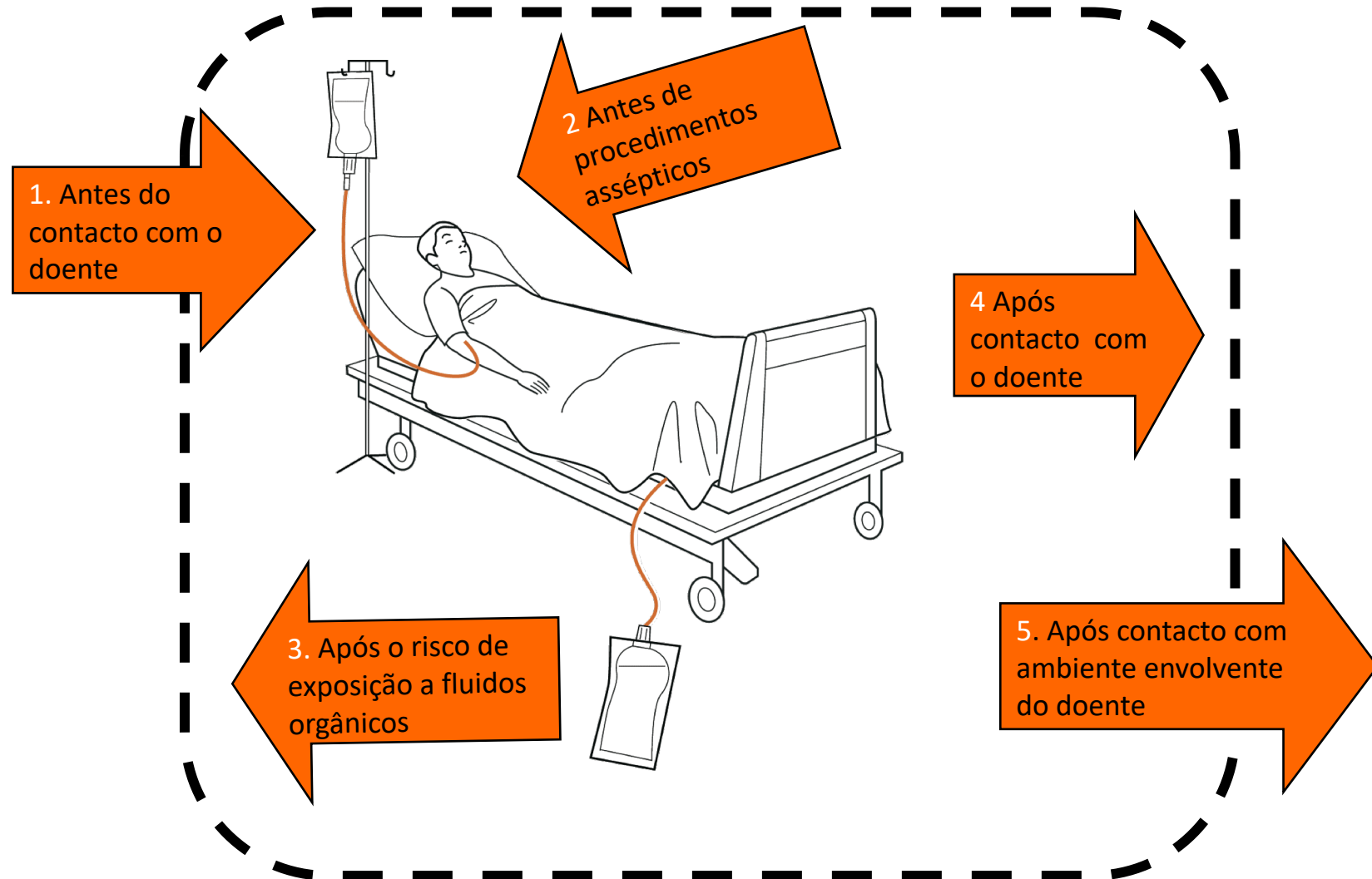
Autoridade de Saúde Coordenadora

- Investigação epidemiológica
- Rastreio exaustivo de contactos

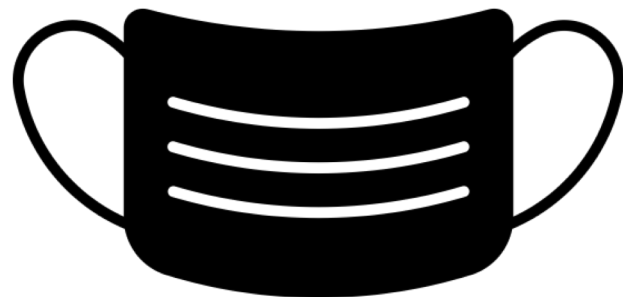
MEDIDAS DE PROTEÇÃO INDIVIDUAL



Higiene das mãos com
SABA



MEDIDAS DE ETIQUETA RESPIRATÓRIA



Com sintomas respiratórios,
utilização de máscaras P1



Respiratory and cough hygiene



- Cough or sneeze into a clean tissue, not into your hands.



- Dispose of the tissue immediately into the nearest waste bin.



- If you do not have a tissue, cough or sneeze into your upper sleeve.



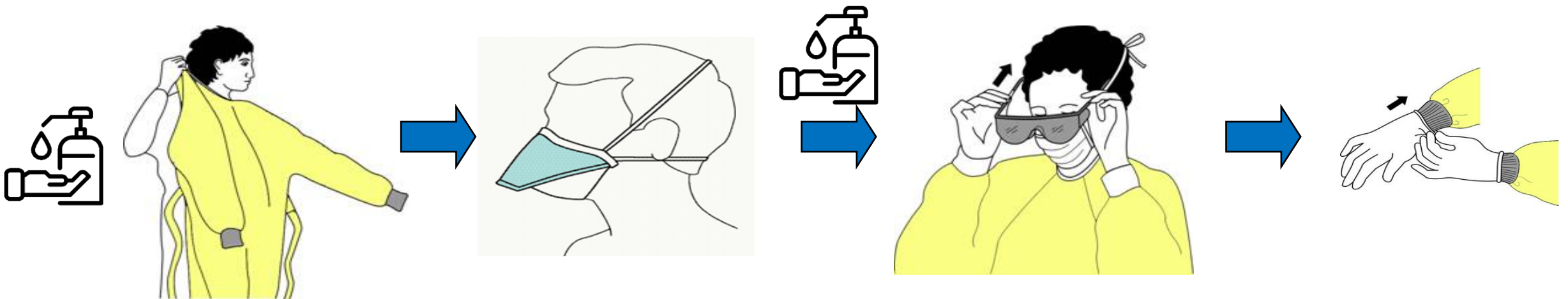
- Always clean your hands after coughing or sneezing, either using soap and warm running water, alcohol handrub or hand wipes.

These steps will help prevent the spread of colds, flu and other respiratory infections

UTILIZAÇÃO CORRETA DO EQUIPAMENTO DE PROTEÇÃO INDIVIDUAL

Depende de:

- ✓ Treino dos profissionais;
- ✓ Higiene das mãos;
- ✓ Disponibilização do equipamento adequado.



Deve ser retirado e descartado corretamente.

Obrigada pela vossa atenção!



BANX