CoVid 19: summary of knowledge and reliable information sources, March 26th 2020

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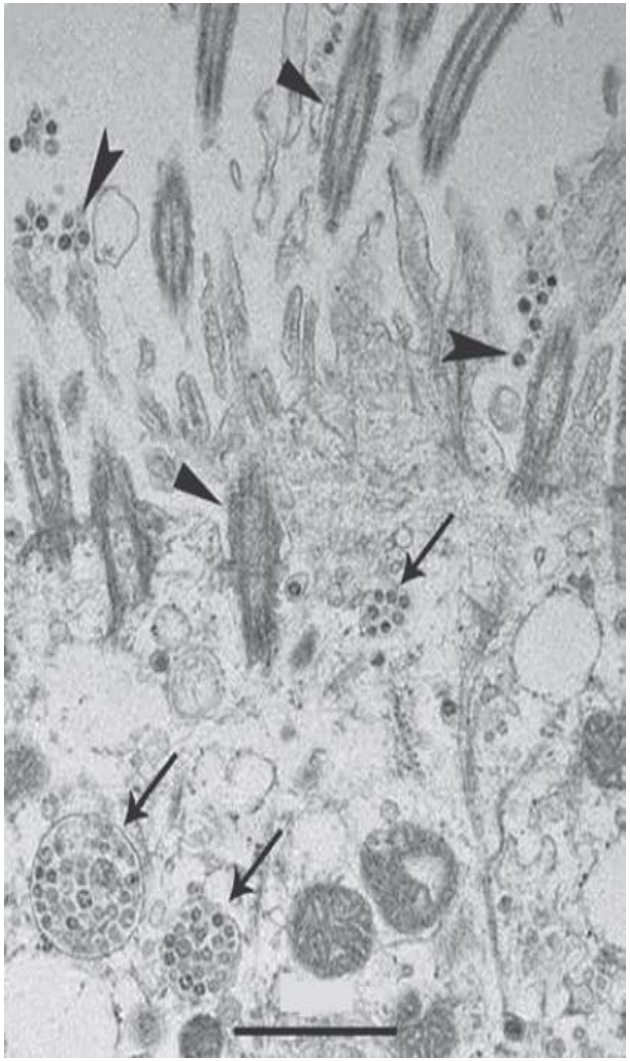
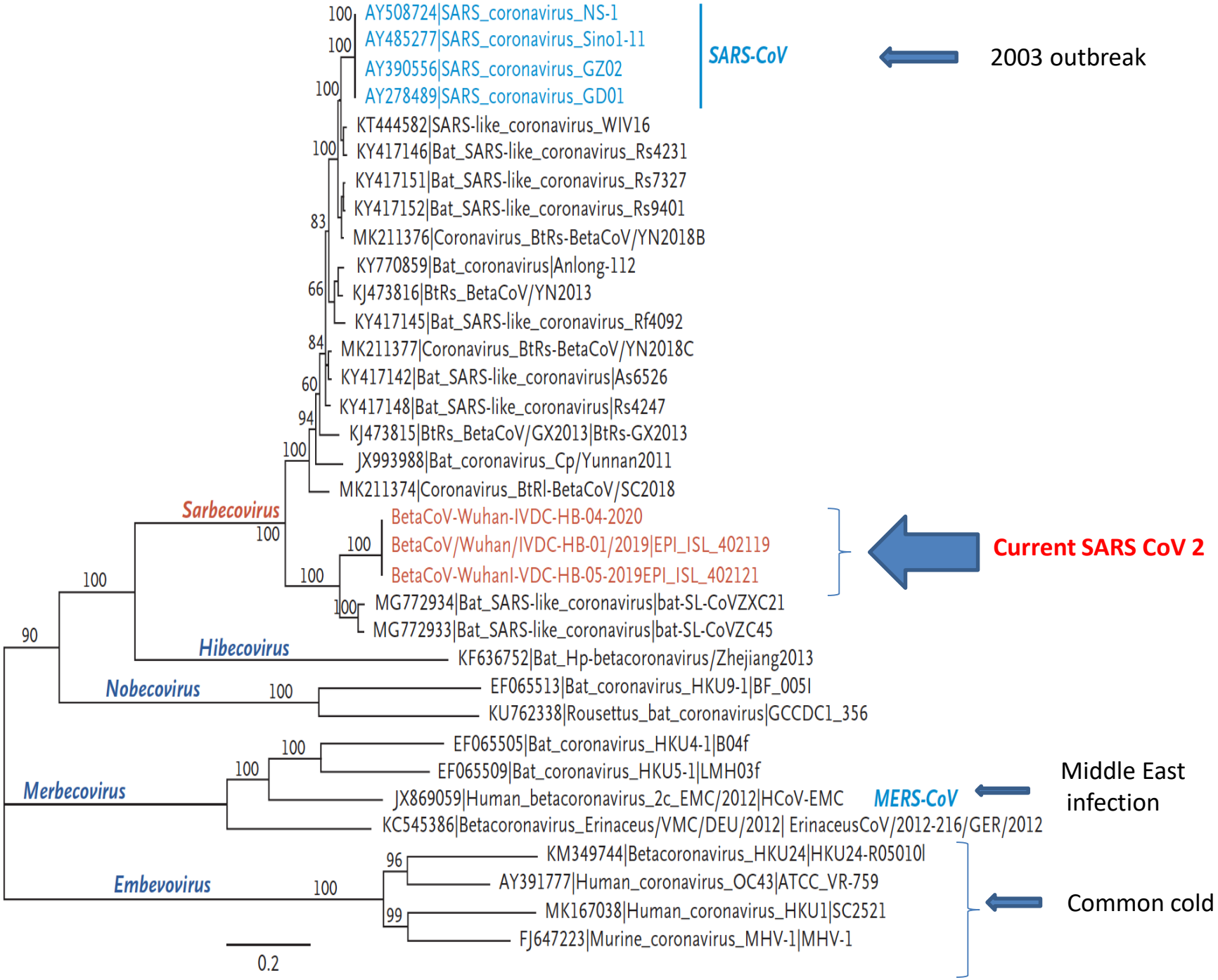
The virus: SARS-CoV 2

- December 2019, cluster of patients presenting with pneumonia in Wuhan (China)
- Betacoronavirus identified in samples obtained from respiratory secretions and isolated on cell cultures
- New coronavirus, named SARS-CoV2, subgenus Sarbecovirus, subfamily Orthocoronavirinae.
- Differs from MERS-CoV and SARS-CoV, and from viruses responsible for common cold (229E, OC43, NL63, et HKU1)
- SARS-CoV2 is the 7th member of coronavirus family able to infect humans

Na Zhu et al.
NEJM, 2020, Jan., DOI: 10.1056/NEJMoa2001017

First described case




AY508724|SARS_coronavirus_NS-1
AY485277|SARS_coronavirus_Sino1-11
AY390556|SARS_coronavirus_GZ02
AY278489|SARS_coronavirus_GD01
SARS-CoV
2003 outbreak
KT444582|SARS-like_coronavirus_WIV16
KY417146|Bat_SARS-like_coronavirus_Rs4231
KY417151|Bat_SARS-like_coronavirus_Rs7327
KY417152|Bat_SARS-like_coronavirus_Rs9401
MK211376|Coronavirus_BtRs-BetaCoV/YN2018B
KY770859|Bat_coronavirus|Anlong-112
KJ473816|BtRs_BetaCoV/YN2013
KY417145|Bat_SARS-like_coronavirus_Rf4092
MK211377|Coronavirus_BtRs-BetaCoV/YN2018C
KY417142|Bat_SARS-like_coronavirus|As6526
KY417148|Bat_SARS-like_coronavirus|Rs4247
KJ473815|BtRs_BetaCoV/GX2013|BtRs-GX2013
JX993988|Bat_coronavirus_Cp/Yunnan2011
MK211374|Coronavirus_BtRl-BetaCoV/SC2018
Sarbecovirus
BetaCoV-Wuhan-IVDC-HB-04-2020
BetaCoV/Wuhan/IVDC-HB-01/2019|EPI_ISL_402119
BetaCoV-WuhanI-VDC-HB-05-2019EPI_ISL_402121
Current SARS CoV 2
MG772934|Bat_SARS-like_coronavirus|bat-SL-CoVZXC21
MG772933|Bat_SARS-like_coronavirus|bat-SL-CoVZC45
Hibecovirus
KF636752|Bat_Hp-betacoronavirus/Zhejiang2013
Nobecovirus
EF065513|Bat_coronavirus_HKU9-1|BF_005I
KU762338|Rousettus_bat_coronavirus|GCCDC1_356
EF065505|Bat_coronavirus_HKU4-1|B04f
EF065509|Bat_coronavirus_HKU5-1|LMH03f
Merbecovirus
JX869059|Human_betacoronavirus_2c_EMC/2012|HCoV-EMC
MERS-CoV
Middle East infection
KC545386|Betacoronavirus_Erinaceus/VMC/DEU/2012| ErinaceusCoV/2012-216/GER/2012
KM349744|Betacoronavirus_HKU24|HKU24-R05010I
AY391777|Human_coronavirus_OC43|ATCC_VR-759
Embevovirus
MK167038|Human_coronavirus_HKU1|SC2521
FJ647223|Murine_coronavirus_MHV-1|MHV-1
Common cold
0.2

« Real time » distribution of cases

https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6

Coronavirus COVID-19 Global Cases by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU)

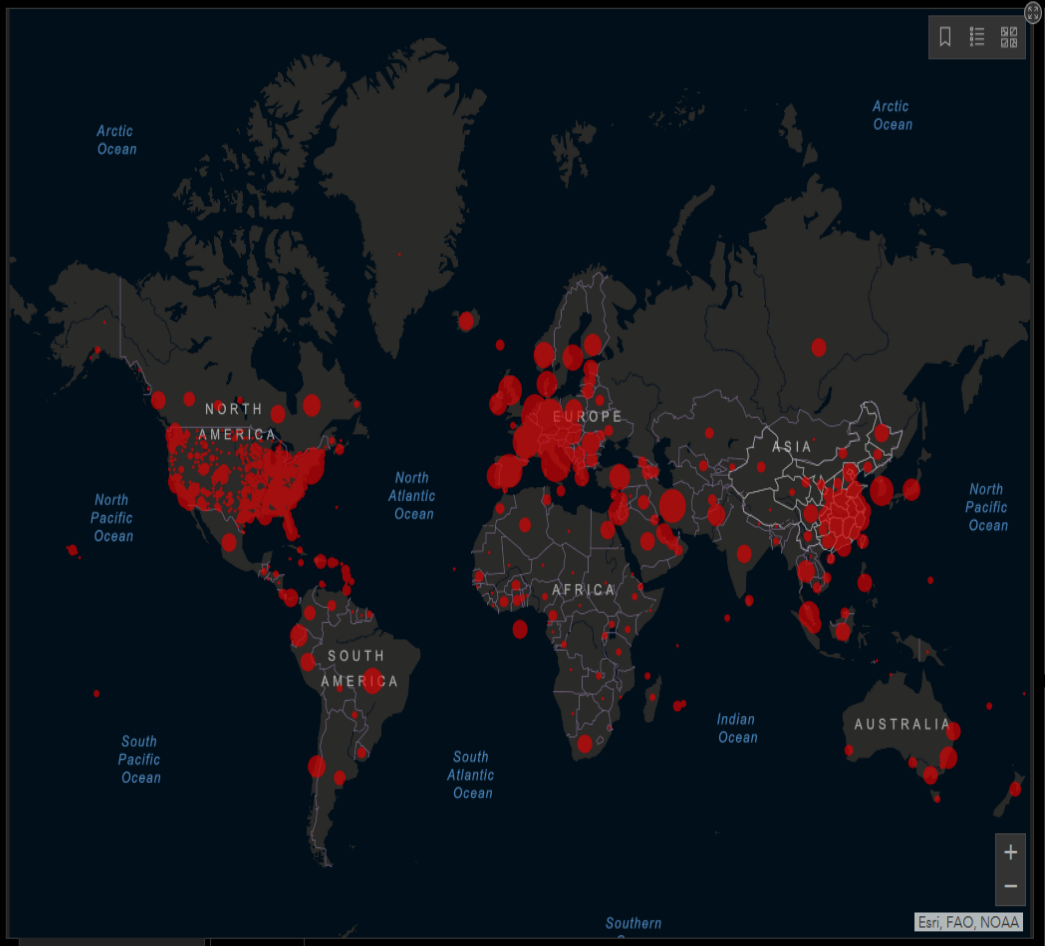
Total Confirmed
436 159

Confirmed Cases by Country/Region/Sovereignty

- 81 661 China
- 69 176 Italy
- 55 238 US
- 47 610 Spain
- 34 009 Germany
- 27 017 Iran
- 22 637 France
- 10 456 Switzerland
- 9 137 Korea, South
- 8 167 United Kingdom
- 5 585 Netherlands
- 5 499 Austria
- 4 937 Belgium
- 2 995 Portugal
- 2 902 Norway
- 2 792 Canada
- 2 364 Australia
- 2 318 Sweden

Admin1 | Admin2 | Admin3

Last Updated at (M/D/YYYY)
3/25/2020 1:38:11 PM



Cumulative Confirmed Cases | Active Cases

172
countries/regions

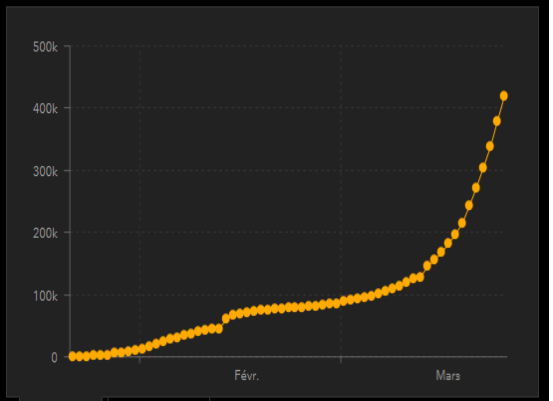
Lancet Inf Dis Article: Here. Mobile Version: Here. Visualization: JHU CSSE. Automation Support: Esri Living Atlas team and JHU Data Sources: WHO, CDC, ECDC, NHC, DXY, 1point3acres, Worldometers.info, BNO, state and national government health Departments, and local media reports. Read more here in this blog.
Confirmed cases include **presumptive positive** cases.
Recovered cases outside China are estimates based on local media reports, and may be substantially lower than the true number.
Active cases = total confirmed - total recovered - total deaths

Total Deaths
19 648

- 6 820 deaths Italy
- 3 434 deaths Spain
- 3 163 deaths **Hubei** China
- 2 077 deaths Iran
- 1 100 deaths France
- 422 deaths United Kingdom
- 276 deaths Netherlands
- 192 deaths New York City **New York** US
- 178 deaths Belgium
- 172 deaths

Total Recovered
111 847

- 60 811 recovered **Hubei** China
- 9 625 recovered Iran
- 8 326 recovered Italy
- 5 367 recovered Spain
- 3 730 recovered Korea, South
- 3 532 recovered Germany
- 3 281 recovered France
- 1 336 recovered **Guangdong** China
- 1 250 recovered **Henan** China
- 1 221 recovered



Confirmed | Daily Increase

Viral transmission

- Initially probably a zoonosis: bats, pangolin ? but zoonotic transmission is no longer significant
- Human to human transmission by droplets and smears
- Hand carriage
- Incubation: maximum 14 days, usually 3 to 7
- R0 2 to 3, *in the absence of control measures*
- Intergenerational interval : about 5 days *in the absence of control measures*
- Transmission can occur 1 to 2 days before onset

It has to be updated according increasing knowledge during the outbreak

Clinical presentation: summary

- Agueusia and/or anosmia are frequent at the early stage, before respiratory symptoms and are very evocative

- Infrequent diarrhea
- Upper respiratory tract « viral » symptoms : non specific
- Pneumonia +++

- Possible worsening of respiratory symptoms on day 7 to 10

- Severity:
  - direct link with respiratory failure (Acute Respiratory Distress Syndrom)
  - More frequent in male patients /elderlies / patients with underlying conditions

- Pediatric cases are infrequent

Viral load and clinical presentation

- **Mild, moderate**
  - ✓ Important viral inoculum since the onset, for 6 to 7 days and then it decreases. Nasal sampling is the standard
  - ✓ Possible respiratory symptoms (LRT) for 2 to 3 days. Virus can be isolated in LRT samples in this case

- **Initial mild or moderate and complication**
  - ✓ Same evolution of the viral load, but LRT symptoms are more severe and images on lung CT scan. At this stage, nasal sampling is possibly negative

- **Initial complicated presentation**
  - ✓ High viral load in nasal and LRT samples

Lung images

Sana Saleh et al. Coronavirus disease 2019 (CoVid 19): a systematic review of imaging findings in 919 patients. Am. J. Roentgenol. 1-7. 10.2214/AJR.20.23034

Initial typical images on CT scan:

- bilateral multilobar ground-glass opacification
- peripheral or posterior distribution, in the lower lobes
- less frequently within the right middle lobe.

Images at a later stage:

- increase in the number and size of ground-glass opacification
- progressive transformation of ground-glass opacification into multifocal consolidative opacities,

Treatment

- Supportive care, but no steroid nor non-steroid anti-inflammatory drugs

- Antiviral drugs

✓ Remdesivir: previously used in MERS Cov and Ebola infections. Trials ongoing

✓ Lopinavir/Ritonavir in severe cases: recent publication reporting failure in this indication.

✓ Interferons, monoclonal antibodies: ongoing trials

Hydroxychloroquine

https://doi.org/10.1016/j.medmal.2020.03.004

- Known to have *in vitro* antiviral activity
- A trial for the treatment of Chickungunya was stopped:
  - severe cardiac events
  - no clinical efficacy in the chloroquine arm.
- Used in dengue: no benefit vs placebo.

It is way too early to recommend it as a treatment

- Preliminary results only, study with important limitations
- Ongoing trial

Conclusion about drugs, on March 26th

So far, no specific drug is recommended as an antiviral treatment.

Trials are ongoing.

Current recommendations for IPC and outbreak control

- General population
  - Mask for infected patients
  - Hand washing as frequently as possible
  - Lock-down in a significant number of countries
  - Social distanciation for those essential to the functionning of countries or when lock-down is not possible

- Health care workers
  - Surgical masks in hospital
  - FFP2 masks during care giving
  - Cancel/postpone non-essential healthcare activities
  - Keep in mind other life-threatening infections/diseases can still occur

Reliable sources

➢ **Public Health Agencies:**

- ECDC : https://www.ecdc.europa.eu/en/coronavirus
- WHO https://www.who.int/emergencies/diseases/novel-coronavirus-2019
- CDC https://www.cdc.gov/coronavirus/2019-ncov/index.html
- Reacting https://reacting.inserm.fr/literature-review/. Daily updated bibliography

➢ **Journals with free access to CoViD 19 LITERATURE:**

- JAMA: https://jamanetwork.com/journals/jama/pages/coronavirus-alert. Papers for a lot of specialists, not only Infectious Diseases
- New England Journal of Medicine: https://www.nejm.org/coronavirus?query=CON&cid=DM88964_Catalyst_Non_Subscriber&bid=172184965
- Lancet : Covid Resource center https://www.thelancet.com/coronavirus

➢ **Scientific societies:**

- All national ID societies provide recommendations in local language
- French Infectious Diseases Society, for French speaking physicians, collects all official texts in french: https://www.infectiologie.com/fr/

Take home points :

- Be prudent
- Take care of yourself, your patients and your loved ones