COVID-19

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[68]

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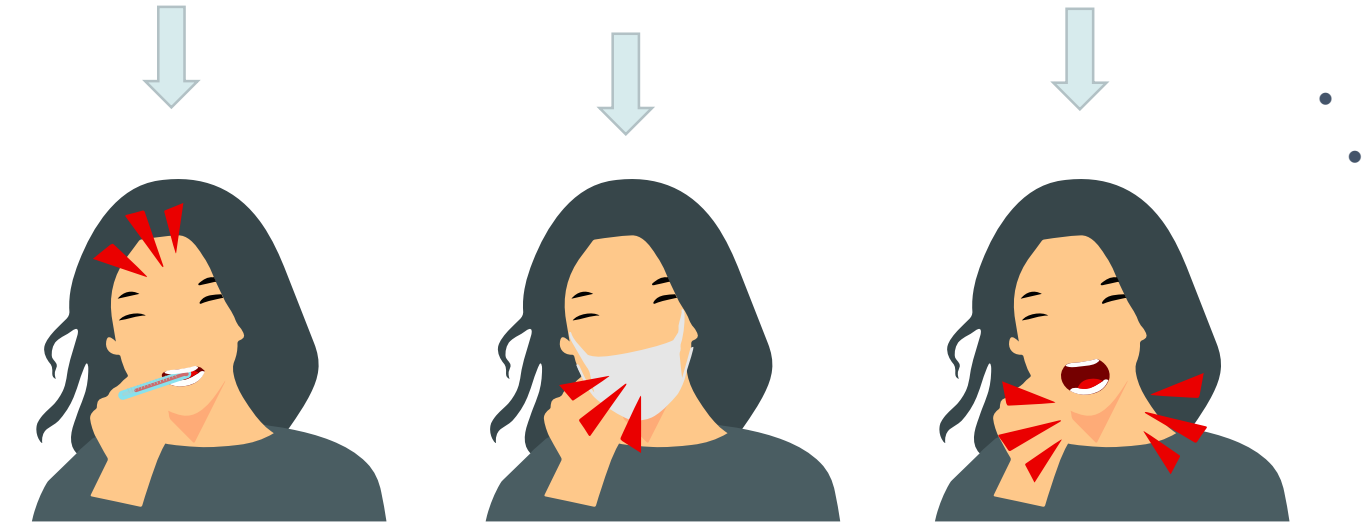
COVID-19

- **COVID 19 (SARS-COV2)** is a novel virus under the family of RNA viruses called Coronaviruses [1]

COVID-19

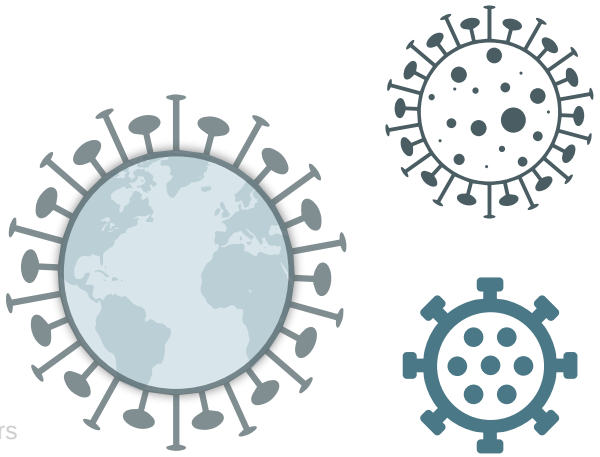
- It primarily causes **Acute Mild Respiratory Illness** with common symptoms of:



Fever | **Cough** | **Shortness Of Breath**

The modes of transmission include: [2]

- Person-to-person through contact with large respiratory droplets
- Aerosol transmission of small respiratory droplets
- Contact with a surface contaminated by respiratory droplets



[1] Source: Merck manual professional version.L.Brenda Tesini.Common cold,Upper respiratory infection;URI;CORYZA.[internet].[cited June 2020].Available from:https://www.merckmanuals.com/professional/infectious-diseases/respiratory-viruses/coronaviruses-and-acute-respiratory-syndromes-covid-19-mers-and-sars
[2] World health organization.Q&A on coronaviruses(covid 19).[internet].[cited 17 April 2020].Available from:https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-coronaviruses#:~:text=symptoms

World Statistics

- As of June 30th – **10,346,254** cases worldwide [3]

506,290 deaths

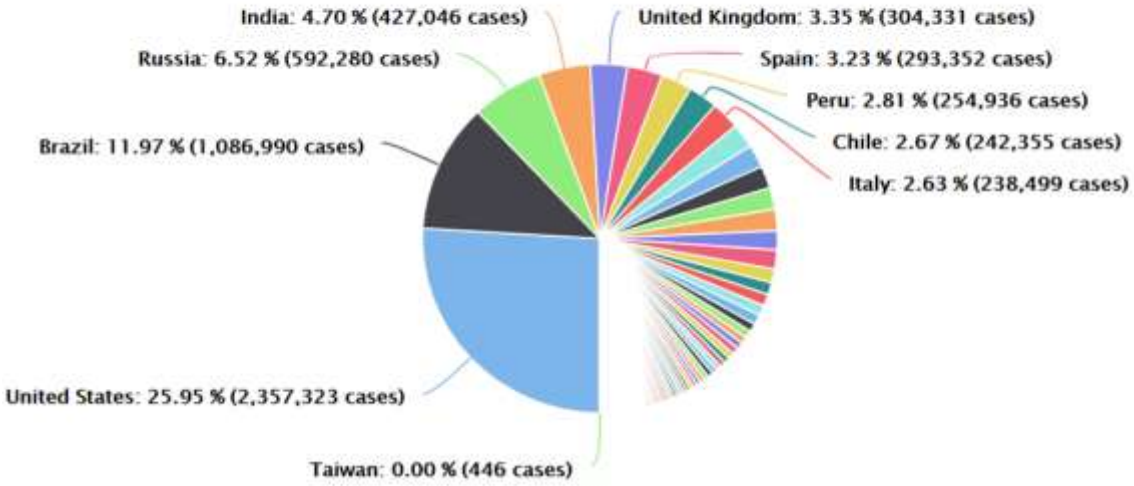
5,611,575 recoveries

Georgia Statistics – **926** cases

15 deaths

791 recoveries

Distribution of cases [4]



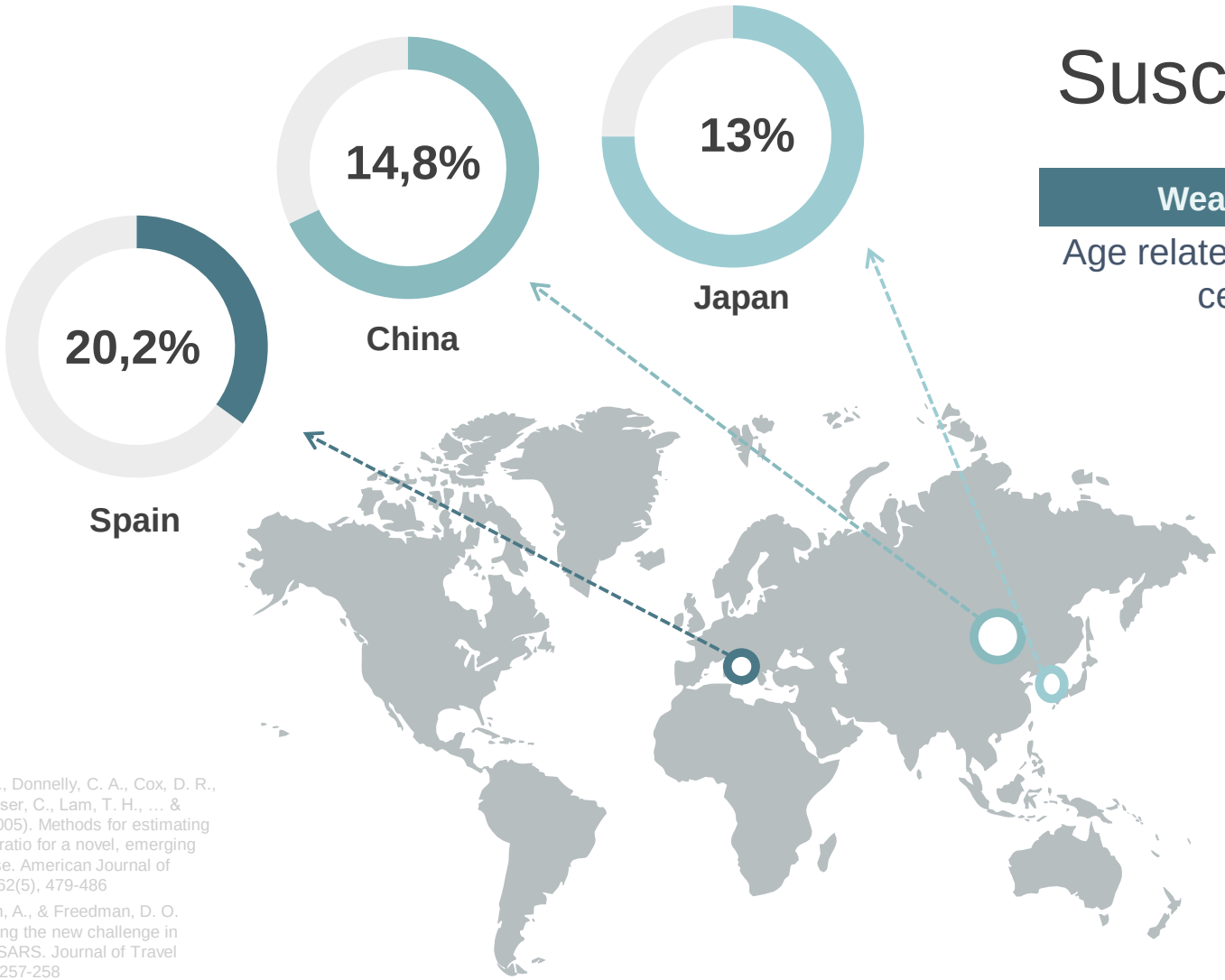
On March 11th, the WHO declared the Novel COVID-19 outbreak a pandemic [5]

[3] Coronavirus Cases: [Internet]. Worldometer. 2020 [cited 2020 June 25]. Available from: https://www.worldometers.info/coronavirus/

[4] Worldometer. W. Coronavirus Worldwide Graphs [Internet]. COVID-19 CORONAVIRUS / GRAPHS. 2020 [cited 2020Jun25]. Available from: https://www.worldometers.info/coronavirus/worldwide-graphs/

[5] WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020 [Internet] .www.who.int. *2020 [cited 2020Jun22].]. Available from::*https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020

COVID-19 & Elderly



Susceptibility [66]

Weak immunity

Age related decrease in T cell count

Coexisting disease

- **Type II Diabetes**
- **Arterial hypertension**
- **Coronary Artery Disease**
- **Congestive Heart Failure**
- **Chronic Kidney Disease**

Uncommon symptoms + late diagnosis

Poverty + dependence on pension

[67]

[66] Ghani, A. C., Donnelly, C. A., Cox, D. R., Griffin, J. T., Fraser, C., Lam, T. H., ... & Leung, G. M. (2005). Methods for estimating the case fatality ratio for a novel, emerging infectious disease. American Journal of Epidemiology, 162(5), 479-486

[67] Wilder-Smith, A., & Freedman, D. O. (2003). Confronting the new challenge in travel medicine: SARS. Journal of Travel Medicine, 10(5), 257-258

Infected Healthcare Workers

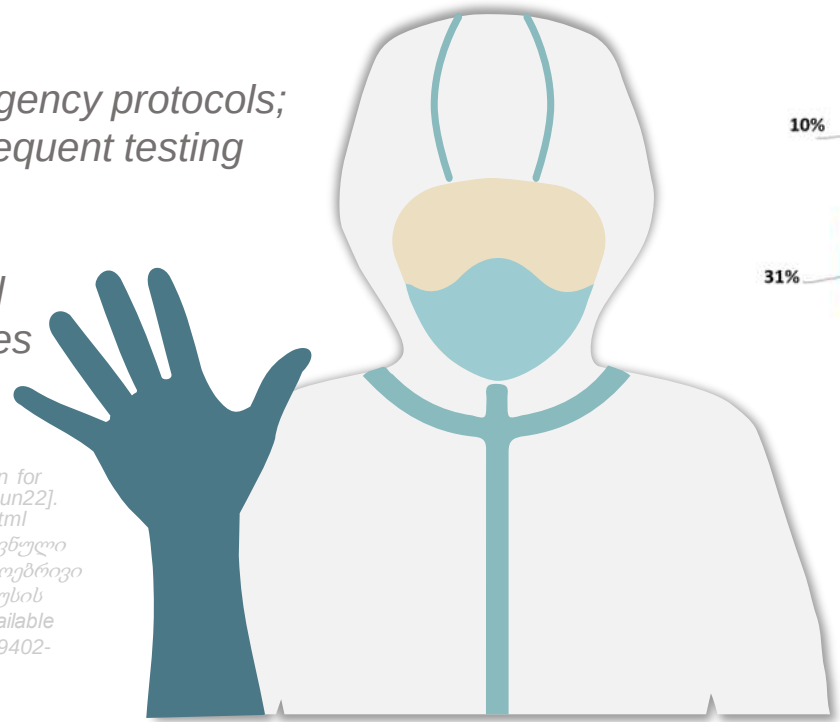
[6] MadaraszG. PR_20_Infections and deaths from COVID-19 among nurses.pdf. Geneva, Switzerland: www.icn.ch; 2020. [cited2020Jun22].

> 90,000 *Infected Medical Staff Worldwide* [6]

- June 16th = **119** confirmed cases in medical staff **Georgia** [8]

Best ways of protection: [7]

- Optimize PPE Supply → *Glasses; N95 Masks; Gloves*
- Preparedness Tools → *Emergency protocols; Frequent testing*
- Guidance for Non-U.S. Facilities → *Hospital Guidelines*

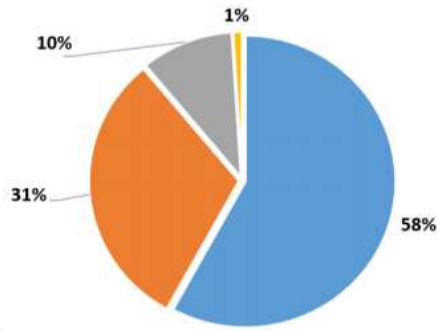


101 - Health Care Professionals

(12.1% of all cases)

18 - Technical personnel

(0.2% of all cases)



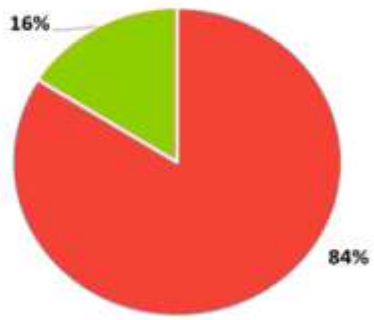


Image 11. Infected medical personnel distribution by profession and gender [9]

- Nurses – 58 cases
- Doctors – 31 cases
- Junior Doctors – 10
- Epidemiologist – 1 case

- Women – 85 cases
- Men – 16 cases

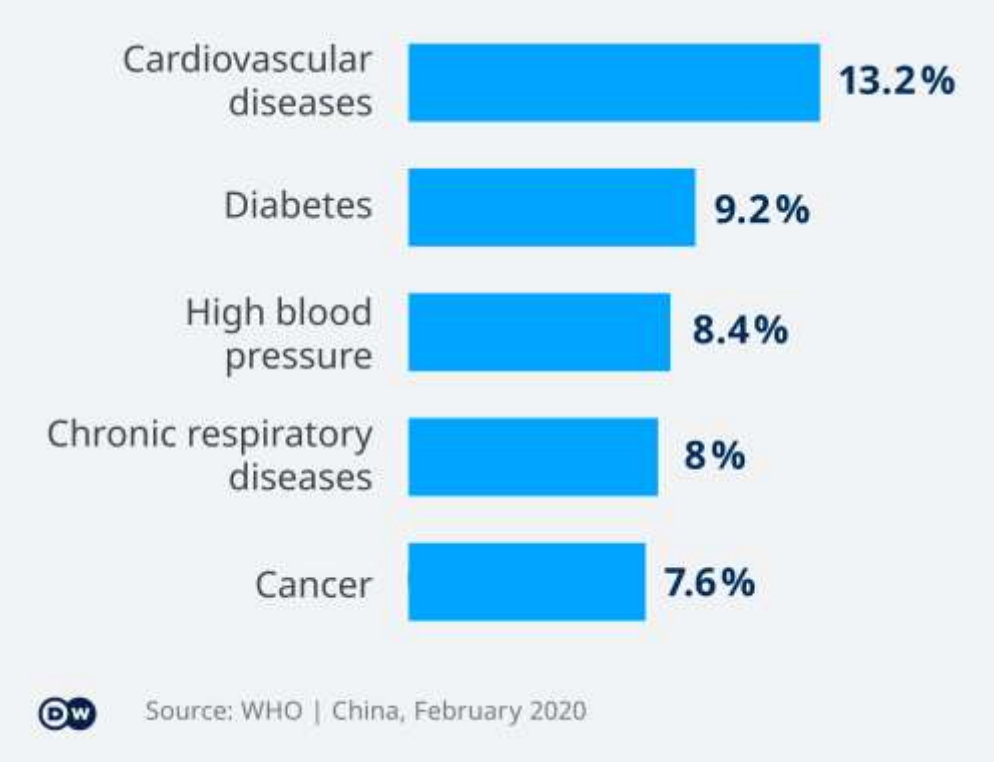
[7]Center for Diseases Control and Prevention CDC. [Internet]. Information for Healthcare Professionals about Coronavirus (COVID-19).2020 [cited 2020Jun22]. Available from:https://www.cdc.gov/coronavirus/2019-nCoV/hcp/index.html

[8]დაავადებათა კონტროლისა და საზოგადოებრივი ჯანმრთელობის ეროვნული ცენტრის ანალიზი მეორე ანგარიშიდაავადებათა კონტროლისა და საზოგადოებრივი ჯანმრთელობის ეროვნული ცენტრი. საქართველოში ახალიკორონავირუსის მიმდინარეობა.Tbilisi, Georgia: www.ncdc.ge; 2020.•[cited 2020Jun22]. Available from:https://www.ncdc.ge/Handlers/GetFile.ashx?ID=d0bb7261-abb6-4f32-9402-51d32ef0ef2d&fbclid=IwAR2YKO_E4VZcWP9mzcNzFwV-Wr8NF23CT3VsPkiThsEjqooSgEttXdTekic

[9] სურათი11. ინფიცირებული სამედიცინო პერსონალის განაწილება პროფესიული ჯგუფების და სქესის მიხედვით[Internet]. www.ncdc.ge. 2020 [cited 2020Jun22]

COVID-19 & Diabetes

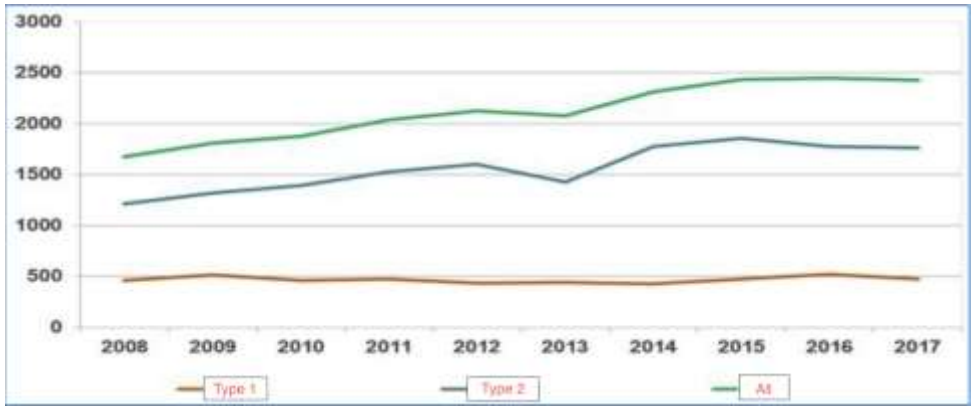
SARS-CoV-2 mortality rate after previous illness [10]



- **DIABETES** [11]
  - Risk of developing type 2 **diabetes increases with age**
  - Main risk factor
    - **Obesity**
  - Complications
    - **Caridovascular diseases**
    - **High blood pressure**
    - Nephropathy

Prevalence of diabetes is high all around the world, and Georgia is not an exception (8.1%) [12]

Prevalence of Diabetes in Georgia



[14]

[10]Cited: Alexander Freund. Coronavirus: Who is particularly at risk and why? Deutsche Welle [Internet]. 2020 March [11] [Cited June 23 2020]
.Adopted from: https://www.dw.com/en/coronavirus-who-is-particularly-at-risk-and-why/a-52710881

[12]Adapted from: Marina Basina, MD Everything You Need to Know About Diabetes. Healthline.[Internet] February 26 2020. [Cited: June 23 2020]. Available from: https://www.healthline.com/health/diabetes%23treatment

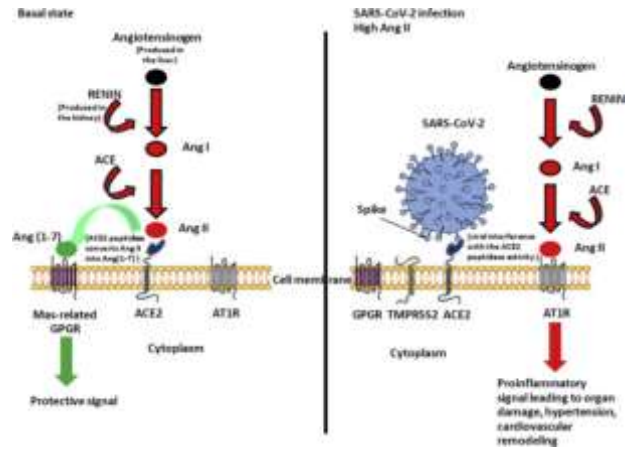
[13]Adapted from: National Center of Disease Control. შაქრიანი დიაბეტი [Internet]. 2017 [Cited June 23 2020] Available from: https://ncdc.ge/Handlers/GetFile.ashx?ID=03f46e02-ca53-4ce1-afd7-ac7cb2111a55

[14]Devaux CA, Rolain J-M, Raoult D. ACE2 receptor polymorphism: Susceptibility to SARS-CoV-2, hypertension, multi-organ failure, and COVID-19 disease outcome [Internet]. Journal of Microbiology, Immunology and Infection. Elsevier; 2020 [cited 2020Jun23]. Available from: https://www.sciencedirect.com/science/article/pii/S1684118220301092?fbclid=IwAR0wY7UYIP6zx4NBHhAhYaT7aiGQNAXmzYjCUKCL_pwQKwBy77LERNlkKW0
[15]A genetic predisposition for Cytokine Storm in life-threatening COVID-19 infection [Internet]. OSF. [cited 2020Jun23]. Available from: https://osf.io/mxsvw/?fbclid=IwAR2O9rwYrrETHmSer_Siy3X_SbXsUD61UCN_vrASwqkB9fSGk19afwmfhWU
[16]Zietz M, Tatonetti NP. Meta-analysis of data from Wuhan, Shenzhen, and NYP/CUIMC.... [Internet]. ResearchGate. 2020 [cited 2020Jun23]. Available from: https://www.researchgate.net/figure/Meta-analysis-of-data-from-Wuhan-Shenzhen-and-NYP-CUIMC-Distributions-of-blood-groups_tbl2_340591535

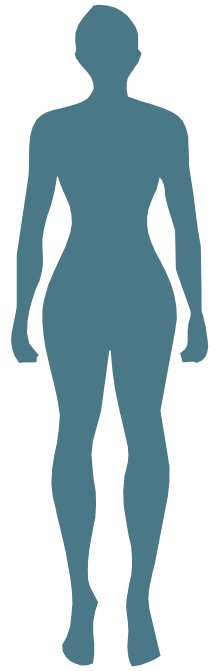
COVID-19 & Genetics

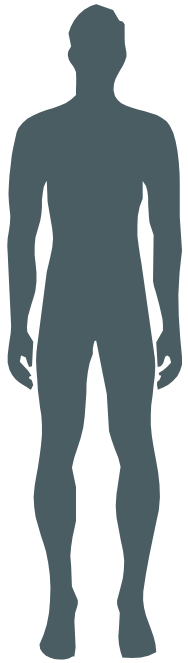
- **Role of ACE2 gene in entry of COVID-19**

Men have a higher ACE2 expression in lung and Asian people express ACE2 higher than Caucasian and African American populations [16]



[16]





- **Genetic predisposition for cytokine storm syndrome in COVID-19 patients**

1. The highest number of COVID-19 deaths per 100,000 population are –
   ⇨ Southern Europe (Spain, Italy, and France) or the Middle East (Iran) [14]
1. They hypothesise - *mutations in MEFV could predispose to more severe forms of COVID-19* [14]

- **ABO blood group and COVID-19 susceptibility**

1. New England Journal of Medicine found - Blood Type A have a 45% higher risk of suffering severe effects of COVID-19 compared to people with other blood types [15]
2. Blood type O - the most common type, are somewhat protected from the effects of the coronavirus [14]
3. **Georgia** – 41% of population has Blood Type O (most common type) [69]

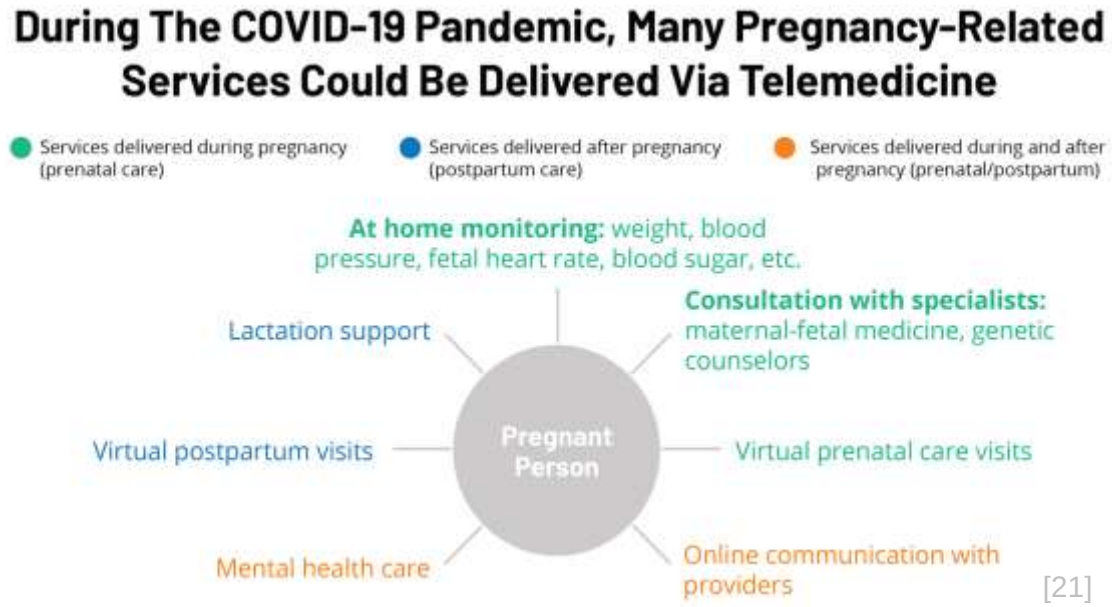
Blood group	NYP general pop.	NYP COV+	Shenzhen general pop.	Shenzhen COV+	Wuhan general pop.	Wuhan Jinyintan COV+	Wuhan Renmin COV+	OR	95% CI	p-value
A	32.7% (25643)	34.2% (233)	28.8% (6728)	28.8% (82)	32.2% (1188)	37.7% (670)	39.8% (45)	1.164	1.015 - 1.333	**0.0291**
AB	4.2% (4582)	3.1% (21)	7.3% (1712)	13.7% (39)	9.1% (336)	10% (178)	13.3% (15)	1.2519	0.8384 - 1.8694	0.2721
B	14.9% (16229)	17% (116)	25.1% (5880)	29.1% (83)	24.9% (920)	26.4% (469)	22.1% (25)	1.1101	1.0068 - 1.2240	**0.0361**
O	48.1% (52406)	45.7% (312)	38.8% (9066)	28.4% (81)	33.8% (1250)	25.8% (458)	24.8% (28)	0.7252	0.5971 - 0.8807	**0.0012**

[16]

Zietz M, Tatonetti NP. Meta-analysis of data from Wuhan, Shenzhen, and NYP/CUIMC.... [Internet]. ResearchGate. 2020 [cited 2020Jun23]. Available from: https://www.researchgate.net/figure/Meta-analysis-of-data-from-Wuhan-Shenzhen-and-NYP-CUIMC-Distributions-of-blood-groups_tbl2_340591535

COVID-19 & Pregnancy

- Preterm delivery and C-section are increased in severe cases [17]
- 538 pregnant COVID-19 patients reported that
  - ⟹ *20 % delivered before 37 weeks*
  - ⟹ *85 % were delivered by cesarean* [17]
  - No miscarriage [18]
  - Route of delivery [19]



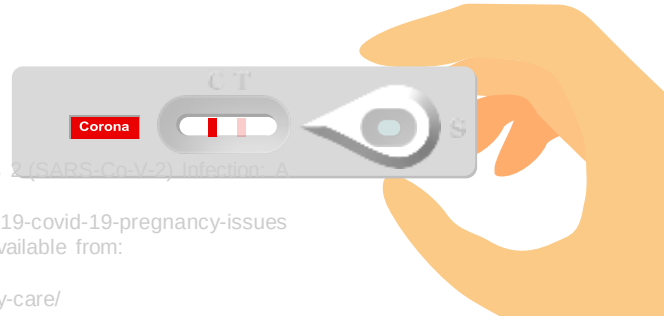
[21]

[21] **Figure 1: Many healthcare services can be delivered via telemedicine during and after pregnancy** https://www.kff.org/womens-health-policy/issue-brief/telemedicine-and-pregnancy-care/

Postnatal care:

- Women who are infected should wear face masks during breastfeeding or express milk [20]
- Face shields for infants aren't recommended [20]

Georgia: *2 cases* - At 8 and 23 weeks of gestation.[68]



[17] Huntley BJ, Huntley ES, Di Mascio D, et al. Rates of Maternal and Perinatal Mortality and Vertical Transmission in Pregnancies Complicated by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-Co-V-2) Infection: A Systematic Review. Obstet Gynecol 2020

[18] Berghella V. Coronavirus disease 2019 (COVID-19): Pregnancy issues [Internet]. UpToDate. 2019 [cited 2020Jun25]. Available from: https://www.uptodate.com/contents/coronavirus-disease-2019-covid-19-pregnancy-issues

[19] If You Are Pregnant, Breastfeeding, or Caring for Young Children [Internet]. Centers for Disease Control and Prevention. Centers for Disease Control and Prevention; 2020 [cited 2020Jun25]. Available from: https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/pregnancy-breastfeeding.html

[20] Gabriela Weigel BF. Telemedicine and Pregnancy Care [Internet]. KFF. 2020 [cited 2020Jun25]. Available from: https://www.kff.org/womens-health-policy/issue-brief/telemedicine-and-pregnancy-care/

COVID-19 & Smoking

Nicotine

- Changes in ACE 2 receptor expression
- Up regulates the ACE/Angiotensin II type 1 receptor
- Downregulated the compensatory ACE-2/ANG
- Interferes further SARS-CoV-2-ACE2 binding [22]

Georgia

- One of the highest smoking countries in Europe
- 22% of deaths annually
- From 2010-2016 Prevalence of smoking increased
- *33.7%* ⇨ ***57%***
- *50% men 7% women* [73]

		COVID-19 Outcome				
Age Group	Smoking Status	Died	Inpatient Admission	Unknown Outcome	Never Admitted	Total Patients
19-44	Never	0.6%	14.2%	39.9%	45.3%	25,713
	Former	0.6%	13.7%	42.7%	43.0%	4,070
	Current	0.6%	13.3%	47.9%	38.2%	2,949
45-54	Never	2.1%	20.9%	38.1%	38.9%	14,654
	Former	2.2%	19.1%	40.7%	37.9%	3,442
	Current	2.0%	19.1%	45.6%	33.3%	1,581
55-64	Never	4.4%	25.8%	35.6%	34.2%	14,577
	Former	5.3%	25.1%	38.4%	31.2%	5,978
	Current	4.8%	25.3%	45.0%	24.9%	1,818
65-74	Never	10.7%	33.2%	31.5%	24.7%	8,887
	Former	12.8%	30.9%	35.6%	20.7%	5,816
	Current	13.5%	31.1%	39.6%	15.8%	986
75-84	Never	20.2%	35.1%	29.5%	15.1%	5,270
	Former	23.3%	32.6%	29.7%	14.5%	4,366
	Current	20.7%	30.2%	36.1%	12.9%	410
85+	Never	26.4%	28.7%	33.0%	11.9%	4,061
	Former	30.0%	27.5%	30.7%	11.8%	2,526
	Current	33.6%	23.3%	34.5%	8.6%	116

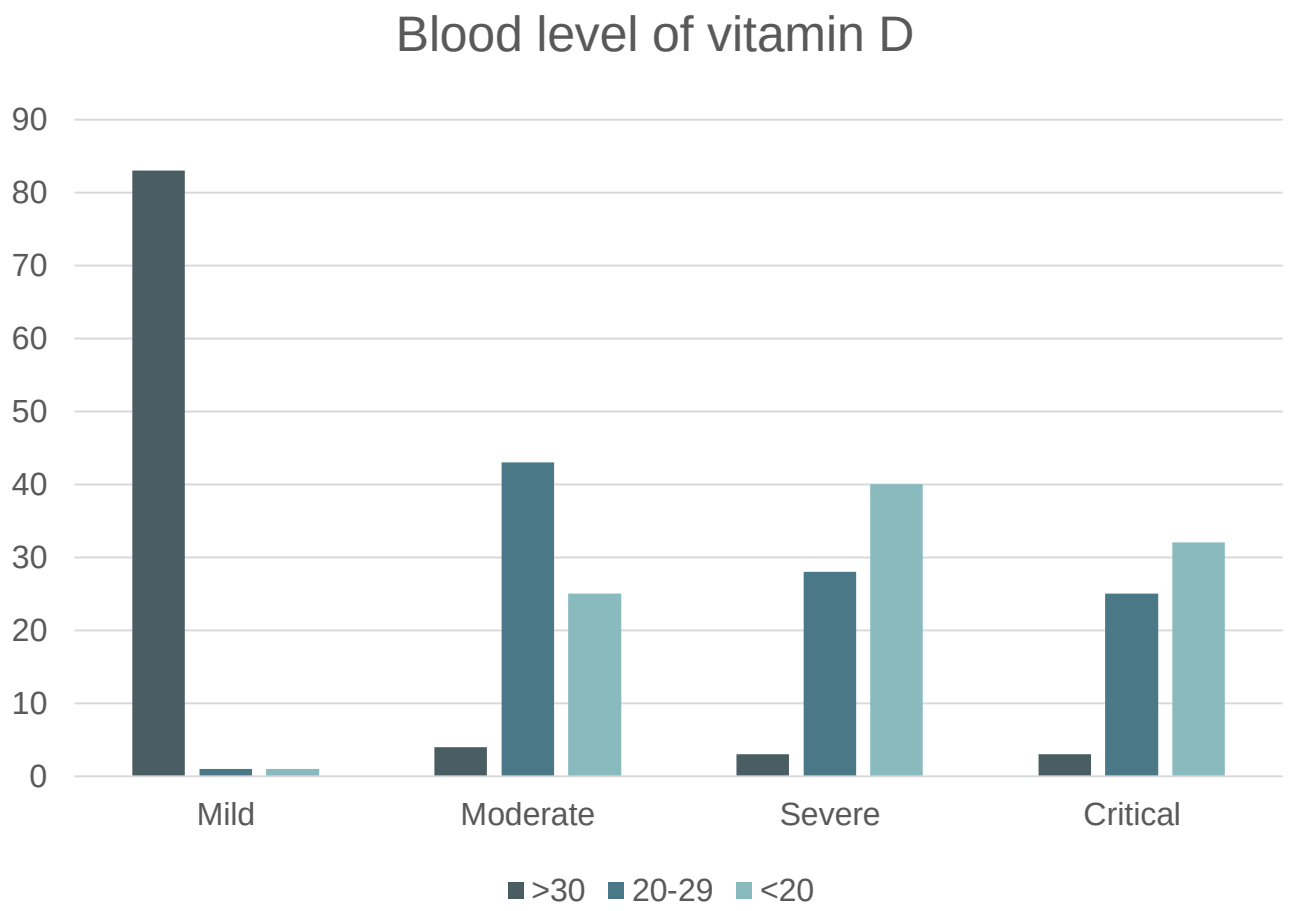
COVID-19 outcomes by smoking status for additional age groups [23]

[22] The role of nicotine in COVID-19 infection. (2020, May 28). Retrieved June 22, 2020, from https://www.cebm.net/covid-19/nicotine-replacement-therapy/

[23] COVID-19 Severity by Smoking Status. (2020, May 27). Retrieved June 22, 2020, fromhttps://ehrn.org/covid-19-severity-by-smoking-status/

COVID-19 & Vitamin D

- Vitamin D effects on the **innate and adaptive** immunity [24]
- Vitamin D deficiencies have **weak** or **abnormal** immune responses that make them more **susceptible** to developing COVID 19 and experiencing severe symptoms
- **Deficiency** are particularly common among groups such as **older adults** nursing home residents, and African-Americans and other minorities. Obesity, another risk factor for severe COVID -19 , is also associated with low vitamin D levels
- Vitamin D has already been shows to protect against acute respiratory infections and it was shown to be safe [24]



[24] Vitamin D distribution [Internet] Dr David Grimes. [cited 2020Jun22]. Available from: http://www.drdavidgrimes.com/

Use of CT for the Early Diagnosis of COVID-19 Pneumonia

TABLE 1: Basic Clinical and Epidemic Features

TABLE 1: Basic Clinical and Epidemic Features

Feature	All Patients (*n* = 101)
Sex	
Male	56 (55.4)
Female	45 (44.6)
Age (y)	
Mean	44.44
Range	17–75
Age group (y)	
≤ 20	1 (1.0)
21–40	44 (43.6)
41–50	27 (26.6)
51–60	14 (13.9)
61–70	14 (13.9)
≥ 70	1 (1.0)
Epidemiologic history	
Direct exposure	84 (83.2)
Indirect exposure	12 (11.9)
No exposure	5 (4.9)
Onset symptoms	
Fever	79 (78.2)
Cough	63 (62.4)
Myalgia or fatigue	17 (16.8)
Sore throat	12 (11.9)
Dyspnea	1 (1.0)

Statistics and Record of Patients [26] [27]
(Radiology quality control center, Hanan)

[27] Relation Between Chest CT Findings and Clinical Conditions of Coronavirus Disease (COVID-19) Pneumonia: A Multicenter Study : American Journal of Roentgenology : Vol. 214, No. 5 (AJR). (n.d.). Retrieved June 25, 2020, from https://www.ajronline.org/doi/10.2214/AJR.20.22976

Characteristic findings	All Patients (n=101)	Non-emergency (n=87)	Emergency (n=14)
Lung region distribution			
Unilateral	10 (9.9)	10 (11.5)	0 (0)
Bilateral	83 (82.2)	69 (79.3)	14 (100)
Scattered distribution			
Focal	6 (5.9)	6 (6.9)	0 (0)
Multifocal	55 (54.5)	52 (59.8)	3 (21.4)
Diffuse	32 (31.7)	21 (24.1)	11 (78.6)
Extent of lesion	6.39 (0–20)[b]	5.34 (3.84)[a]	12.86 (4.59)[a]
No. without CT findings	8 (7.9)	8 (9.2)	0 (0)

Note—Except where otherwise indicated, data are number with percentage in parentheses. NA = not applicable.
[a]Mean (SD).
[b]Mean (range).

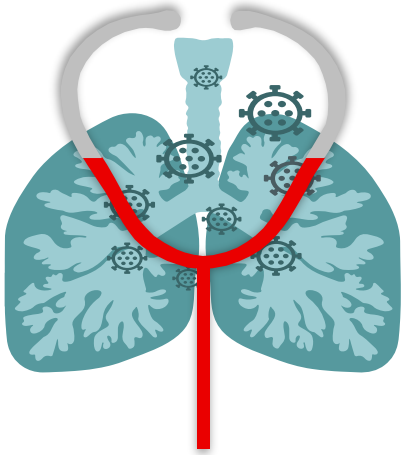
Fig. 1C —37-year-old man with confirmed coronavirus disease (COVID-19), common type. Patient had short-term exposure history to Wuhan and onset symptoms of fever (38°C) and cough. CT was performed on day of admission.

C, CT images show bilateral multifocal ground-glass opacities (GGO) and mixed GGO and consolidation lesions. Traction bronchiectasis (arrowhead, C) and vascular enlargement (arrow, B and D) are also present. CT involvement score is 5.

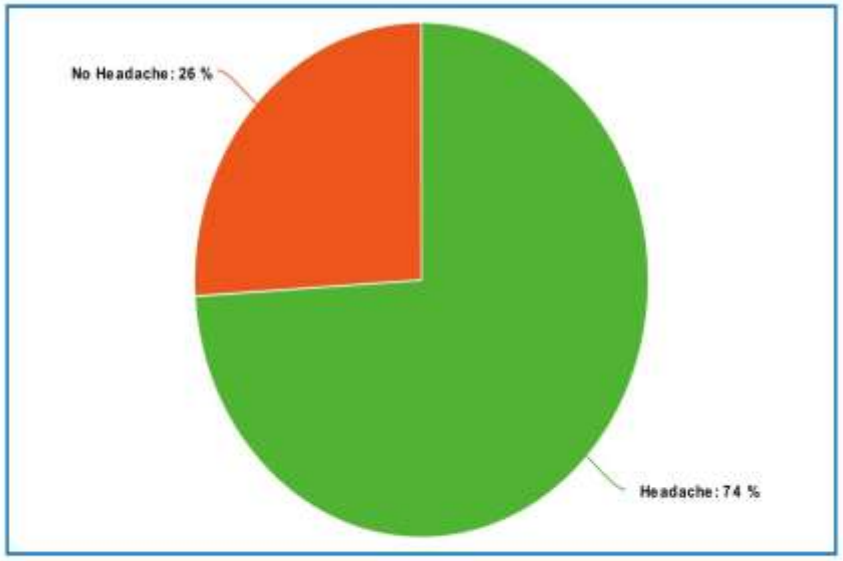
[26] National Administration of Traditional Chinese Medicine. Retrieved June 25, 2020, from http://bgs.satcm.gov.cn/zhengcewenjian/2020-02-06/12847.html [26] [27]

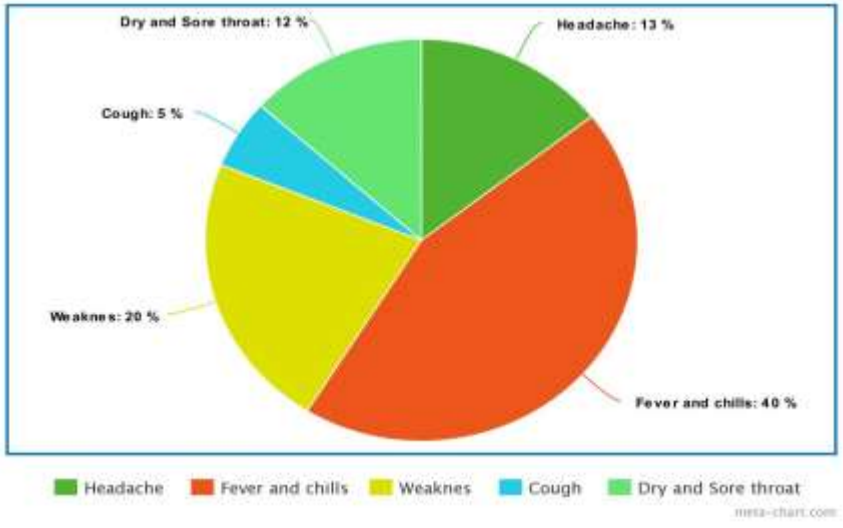
Results: [2]
It showed that there are specific C.T Findings for COVID-19 pneumonia
And it is more evident at the non-emergency (early) state.

Georgia
– only uses *PCR* as diagnosis



COVID-19 & Headache





- Out of **100 patients** followed up
  - ⇨ *74 patients* had headache.
  - ⇨ *38%* had continuous headache after 6 weeks

- Which explained that some patients will still experience new onset persistent headache after a 3-month period has passed [29]

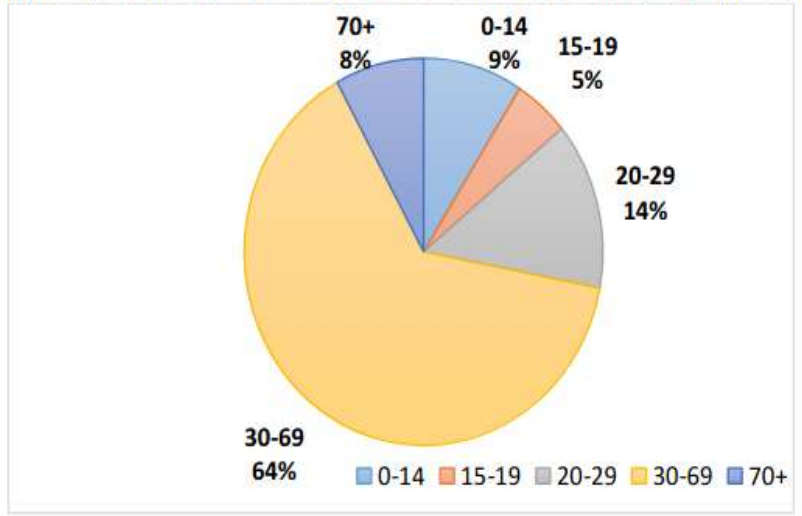
Georgia:

Headache was among the common symptom
Of COVID-19. [28]

Conclusion: Those that presented with headache had less hospital stay and developed milder diseases [28] compared to those without headache

[29]

Figure 16. Distribution of COVID - 19 confirmed cases by age (n = 500)

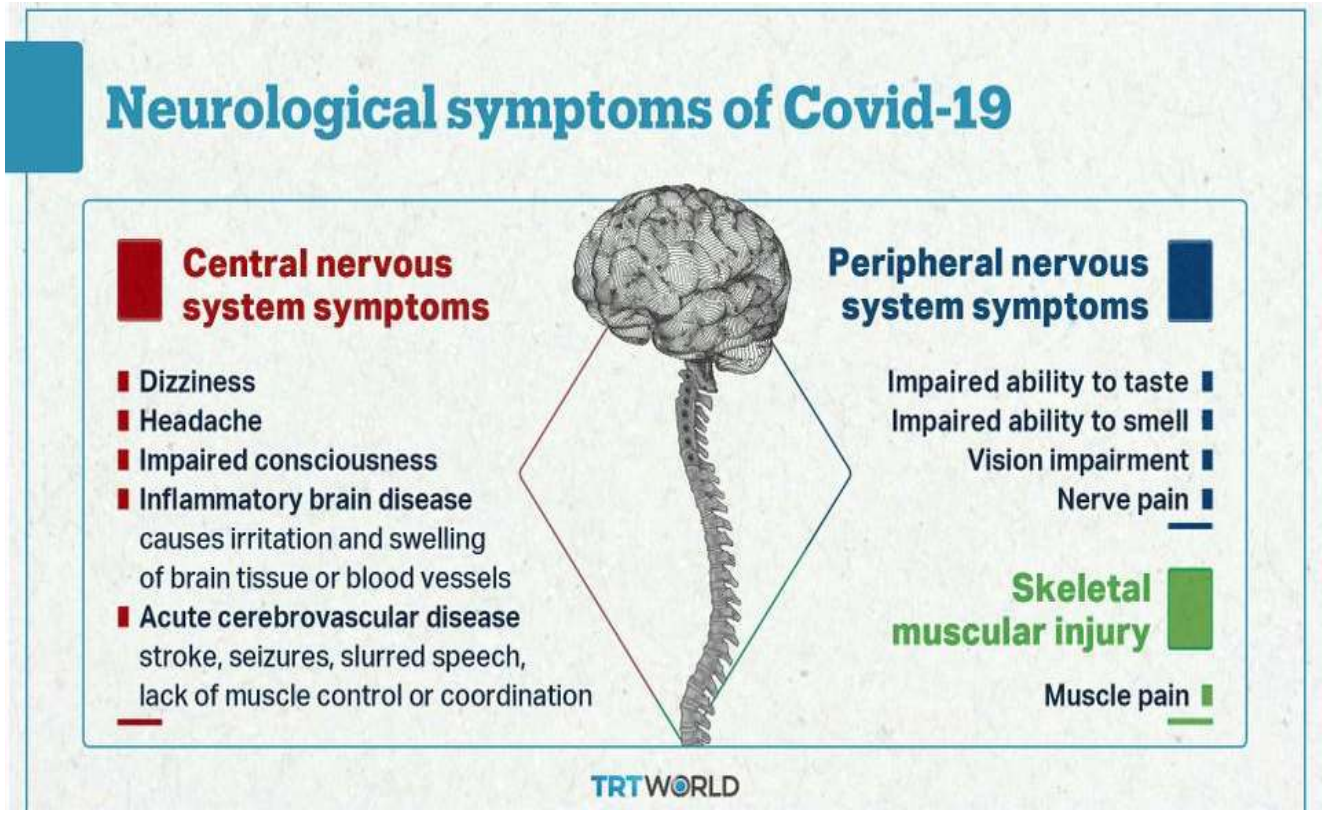


[28]. Novel Coronavirus Response in Georgia. Implementaton Status Report National Center for Disease control and public health https://www.ncdc.ge/Handlers/GetFile.ashx?ID=071ba921-bf8c-4e46-8222-6589e75c076b accessed 23 June 2020.

[29] Medscape News. Erik Greb https://www.medscape.com/viewarticle/932637#vp_2 published June 19, 2020 Accessed 23 June 2020

COVID-19 In Neurons

- Viral invasion of nerve cells can be direct entry from the olfactory nerve or migration of infected WBC through the blood brain barrier. [30]
- Neurologic symptoms manifest in a notable proportion of patients with coronavirus disease 2019. [30]
- In a case series of 214 patients with coronavirus disease 2019, neurologic symptoms were seen in 36.4% of patients [30]
- COVID-19 infection may present with neurological symptoms initially, before fever, cough or respiratory problems. [31]
- According to a report done by the European Academy of Neurology where a neurologist working in First University Clinic of Tbilisi State Medical University was interviewed, there are no cases of neurological manifestation of COVID-19 in **Georgia** [72]

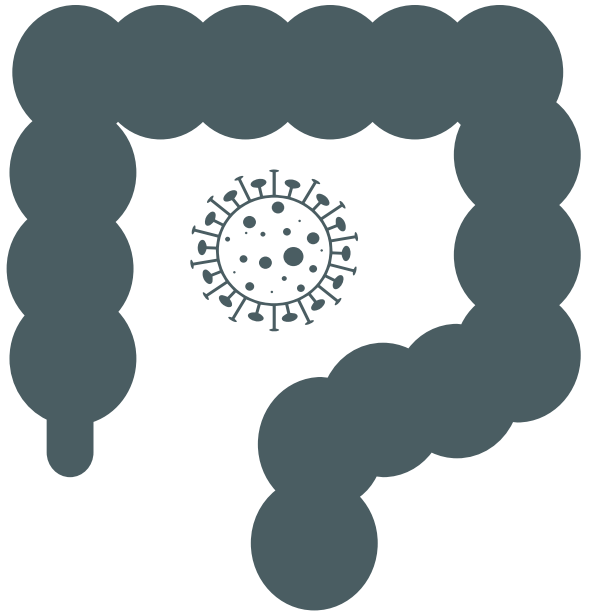


[32]

[30] Zubair, A. S., Lindsay S. ,McAlpine,Tova Gardin. Neuropathogenesis and Neurologic Manifestations of the Coronaviruses in the Age of Coronavirus Disease 2019: A Review. JAMA Neurology. May 29, 2020. Available from https://jamanetwork.com/journals/jamaneurology/fullarticle/2766766
[31] Igor. J Koralnik, Kenneth L.Tyler. COVID -19: a global threat to the nervous system, Annals of Nuerology. Wiley online library. 07 June 2020. Available from https://onlinelibrary.wiley.com/doi/10.1002/ana.25807
[32] This TRT World graphic shows a list of neurological manifestations seen in Covid-19 patients. May 7, 2020. (TRTWorld). Available fromhttps://www.trtworld.com/life/as-pandemic-deepens-covid-19-symptoms-multiply-36131

COVID-19 & Gastrointestinal Symptoms

- From recent analysis from China of 200 patients from 3 hospitals found that almost 1 in 5 had at least one gastrointestinal symptom = ***diarrhea, vomiting, or stomach pain***. [33]
- Nearly 80% also ***lacked an appetite*** [33]
- Recent studies have shown = the **ACE2 receptor**, is highly expressed not only in lung AT2 cells but also in **absorptive enterocytes in the ileum and colon** [34]
- **Georgia** - **7.1%** of patients presented with ***stomach ache*****, 6.9 %** with ***nausea*** and **12.2 %** with ***diarrhea*****.** [35]
- Positive findings of reverse transcription polymerase chain reaction of stool samples showed that COVID-19 may **spread by fecal-oral transmission** [36]
- Further research on whether the incidence of GI symptoms occurs before the incidence of respiratory disorders in patients confirmed to have COVID-19 pneumonia **may offer better, more effective therapeutic management, before lung involvement, of the COVID-19 virus** [37]



[33] Nazario, B. (2020, April 17). Digestive Symptoms of Coronavirus (COVID-19). Retrieved June 25, 2020, from https://www.webmd.com/lung/covid19-digestive-symptoms

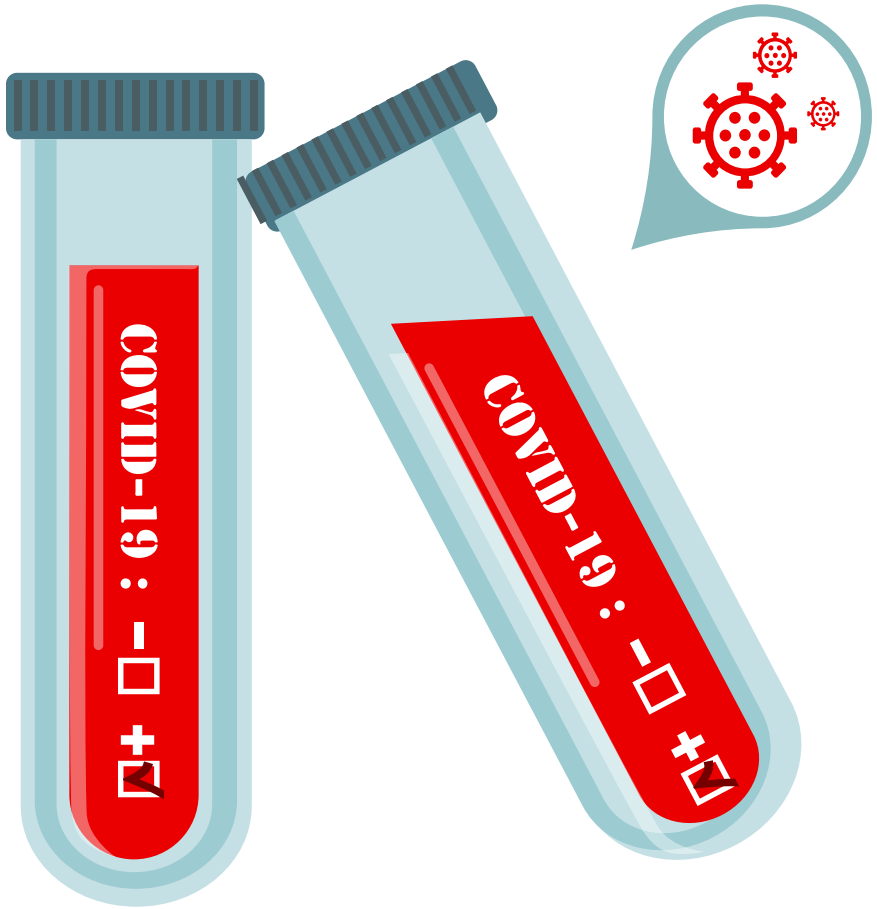
[34] Gui, M., Song, W., Zhou, H., Xu, J., Chen, S., Xiang, Y., & Wang, X. (2017, January). Cryo-electron microscopy structures of the SARS-CoV spike glycoprotein reveal a prerequisite conformational state for receptor binding. Retrieved June 25, 2020, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5223232/

[35] Novel Coronavirus Response in Georgia Implementation Status Report [Internet]. ncdc.ge. Novel Coronavirus Response in Georgia Implementation Status Report; [cited 2020Jun23]. Available from: https://www.ncdc.ge/Handlers/GetFile.ashx?ID=071ba921-bf8c-4e46-8222-6589e75c076b

[36] Holshue, M., DeBolt, C., Lindquist, S., Lofy, K., Wiesman, J., Bruce, H., . . . Washington State 2019-nCoV Case Investigation Team. (2020, March 5). First Case of 2019 Novel Coronavirus in the United States. Retrieved June 25, 2020, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7092802/

[37] Ahmad Hormati, Alireza Shahhamzeh et.al Can COVID-19 present unusual GI symptoms? [Internet] 18 March 2020 [cited 2020Jun25] Available from: https://covid-19.conacyt.mx/jspui/bitstream/1000/1128/1/105791.pdf

COVID-19 & Hematology



- COVID-19 is a systemic infection - significant impact on the hematopoietic system and hemostasis. [38]
- *Lymphopenia* = a cardinal laboratory finding.

[38]

- Retrospective Cohort Study of 191 COVID-19 patients from Wuhan, China, non-survivors, as compared with survivors, presented more often with: [39]

  high LDH ,-high procalcitonin ,-increased serum ferritin levels,-elevated IL-6.

- Venous thromboembolism (VTE) risk in hospitalized COVID-19 patients is an emerging issue
- The most common pattern of coagulopathy in hospitalized COVID-19 patients is characterized by **elevations in fibrinogen and D-dimer levels.**
- This correlates with a parallel rise in markers of inflammation (e.g. CRP).
- Unlike the pattern seen in classic DIC from bacterial sepsis or trauma, prolongation of the APTT and/or PT is minimal, thrombocytopenia is mild (platelet count ~100 x109/L), and lab results supporting microangiopathy are not likely. [39]

Georgia: 1 fatal case due to *DIC*.

All the other patients were prophylactically taking Fraxiparine (LMWH)

[38] Terpos E, Ntanasis-Stathopoulos I, Elalamy I, Kastritis E, Sergentanis TN, Politou M, et al. Hematological findings and complications of COVID-19 [Internet]. Wiley Online Library. John Wiley & Sons, Ltd; 2020 [cited 2020June21]. Available from: https://onlinelibrary.wiley.com/doi/full/10.1002/ajh.25829?fbclid=IwAR1sdOhcTRu1wBhgPyYL9SuTqAsuLYuMTzAuZdG9I5spwAEAbMx8YFDvmMg .
[39] COVID-19 and Coagulopathy: Frequently Asked Questions [Internet]. COVID-19 and Coagulopathy - Hematology.org. [cited 2020June21]. Availabale from: https://www.hematology.org/covid-19/covid-19-and-coagulopathy

COVID-19 & Ophthalmology

- **Conjunctivitis** was seen in a few patients with COVID 19 and SARS-CoV-2 was isolated from the tears of affected victims
- Conjunctivitis is seen to be associated with more **severe COVID-19**
- It can stay in patients' eyes for several weeks
  ⟹ could act as a way of transmitting the disease. [40]
- ACE2 protein and the TMPRSS2 enzyme were found in the ocular surfaces of **all patients** [41]
- 2.6% with COVID 19 was seen to have conjunctivitis in **Georgia**
  ⟹ including ***9 males*** and ***2 females***. [42]
- Protective eye gear should be used by all health workers especially to prevent possible transmission [42]

Pink eye now linked as possible symptoms of coronavirus [43]

[40] Headley CW. COVID-19 found to be spread through eyes and is 100 times more infectious than SARS [Internet]. Coronavirus: Eyes could be contagious for weeks, study finds. The Ladders; 2020 [cited 2020Jun22]. Available from: https://www.msn.com/en-za/news/techandscience/coronavirus-eyes-could-be-contagious-for-weeks-study-finds/ar-BB139NsW
[41] Novel Coronavirus Response in Georgia Implementation Status Report [Internet]. ncdc.ge. Novel Coronavirus Response in Georgia Implementation Status Report; [cited 2020Jun23]. Available from: https://www.ncdc.ge/Handlers/GetFile.ashx?ID=071ba921-bf8c-4e46-8222-6589e75c076b
[42] Al-Mujaini AS. Keeping an eye on COVID-19: An ophthalmologist's perspective. Middle East Afr J Ophthalmol [serial online] 2020 [cited 2020 Jun 22];27:1-3. Available from: http://www.meajo.org/text.asp?2020/27/1/1/283486
[43] Liz B. Pink eye now linked as possible symptom of coronavirus.

COVID-19 & Cardiovascular Disease

COVID-19 → Pneumonia → Septic Shock → Multi Organ Failure *(heart inflammation; myocardial injury)* → Blood Pressure Abnormality → Heart Failure → **Death**

- A Meta analysis of 1527 COVID 19 patients – hypertension 17.1% and cardiac disease was 16.4% [44]

Georgia:

Hypertension – 62% of al CVD

CVD = 15% of all registered cases of diseases

- **How we detect CVD in COVID patients?** [45,46]

1. **Clinical findings** (*dyspnea, orthopnea, tachycardia, edema, pulmonary crackles,S3.)*
2. **ECG** *(any abnormality).*
3. **Measure natriuretic peptide and troponin.**
4. **Echocardiography.**

[43] Long, B., Brady, W., Koyfman, A., & Gottlieb, M. (2020, April 18). Cardiovascular complications in COVID-19. Retrieved June 25, 2020, from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7165109/

[44] Howlett, J., By, & Professional.Manuals.TopicPage.LastRevisionDate| Content last modified Feb 2020. (n.d.). Heart Failure (HF) - Cardiovascular Disorders. Retrieved June 25, 2020, from ttps://www.merckmanuals.com/professional/cardiovascular-disorders/heart-failure/heart-failure-hf?query=heart+failure

[45] Fulchand, S. (2020, May 20). Covid-19 and cardiovascular disease. Retrieved June 25, 2020, from https://www.bmj.com/content/369/bmj.m1997

COVID-19 & Manifestations in Pediatric Patients

- Symptoms may not always be present;
- Common symptoms of COVID-19 in children

- COUGH *(48.5%)*
- FEVER *(41.5%)*
- TACHYCARDIA *(42%)* [47]

- Asymptomatic **papulovesicular exanthem** was reported in few cases [48]

- Pediatric inpatients with COVID-19 infection often can be co-infected with other pathogens [49]

- **Georgia** = <1% of pediatric patients [70]

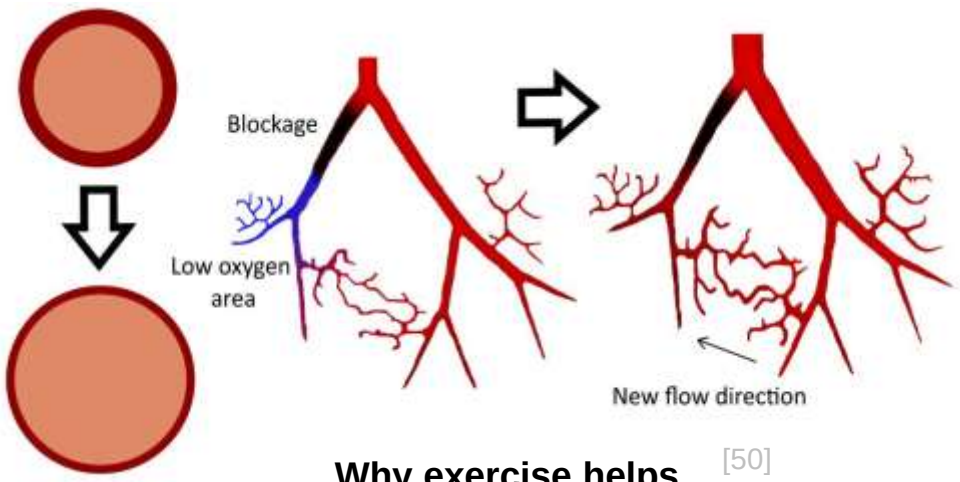
[47] 2020 Feb 28; Accessed: April 9, 2020.Lu X, Zhang L, Du H, et al.; Chinese Pediatric Novel Coronavirus Study Team. SARS-CoV-2 infection in children. N Engl J Med 2020. Epub March 18, 2020. Available at:https://www.nejm.org/doi/full/10.1056/NEJMc2005073

[48] Joob B, Wiwanitkit V. COVID-19 can present with a rash and be mistaken for dengue. *J Am Acad Dermatol*. 2020 May. 82 (5):e177. Genovese G, Colonna C, Marzano AV. Varicella-like exanthem associated with COVID-19 in an 8-year-old girl: A diagnostic clue?. *Pediatr Dermatol*. 2020 Apr 21. Available at [5]Xia W, S: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7156802/

[49]]hao J, Guo Y, Peng X, Li Z, Hu D. Clinical and CT features in pediatric patients with COVID-19 infection: Different points from adults. *Pediatr Pulmonol*. 2020 May. 55 (5):1169-74. Available at: https://onlinelibrary.wiley.com/doi/full/10.1002/ppul.24718

COVID-19 & Muscle Pain

- Due to the lockdown and restriction of movement
- This has caused many people to start feeling muscle pain due to sedentary lifestyle called ***intermittent claudication*** [50]



Why exercise helps [50]

[50] Cited from: **COVID-19 Special. Circulation foundation [Internet] [Cited: Jun 23 2020] avaliable from:** https://www.circulationfoundation.org.uk/news/covid-19-special

Lack of exercise

A cramping/pain/ache that comes on in the calves, thighs and/or buttocks when walking = is caused by *peripheral arterial disease (PAD)*.

- Due to the current outbreak of Covid-19, opportunities for exercise are limited, especially in a formal setting.[50]
- Physical fitness is an essential part of public health. Physical fitness goes a long way in reducing substance abuse.[50]

[50] Cited from: COVID-19 Special. Circulation foundation [Internet] [Cited: Jun 23 2020] avaliable from: https://www.circulationfoundation.org.uk/news/covid-19-special

[53] Thackeray J., Hibbard R., Dowd D. The committee on child abuse and neglect, & the committee on injury, violence, and poison prevention. Intimate partner violence: the role of the pediatrician.2010 May.(cited 2010 Apr 26).Available from:[PubMed]

COVID-19 & Mental Health

[54] Yankun Sun PhD,Yanping Bao PhD,Lin Lu MD, PhD.Addressing mental heath care for the bereaved during the covid 19 pandemic.17 April 2020.Available from: https://doi.org/10.1111/pcn.13008

[55] Jun Shigemura MD, PhDRobert J. Ursano MD Joshua C. Morganstein MD Mie Kurosawa MD, PhD David M. Benedek MD.Public responses to the novel covid 19 in japan:mental health consequences and target population .08 February 2020.Available from: https://doi.org/10.1111/pcn.12988

[56] Al jazeera English.Georgia state of emergencay over coronavirus.[internet].Mar 22,2020. Available from: https://www.youtube.com/watch?v=I9Usf8nus_8&t=78s

Factors that influence the development of Mental Health disorders during the pandemic:

- Death and separation from a family member [54]
- Physical and mental stress (increase in work hours for health care workers)
- Pre-existing mental health problems (e.g. OCD)
- Unemployment [51, 52, 53]
- Alcohol abuse [51, 52, 53]
- Fear of uncertainty & False information [55]

Mental Health disorders that increased during the pandemic:

- *MENTAL STRESS*
- *OBSESSIVE-COMPULSIVE DISORDER*
- *PHOBIAS & IRRATIONAL FEAR*
- *ANXIETY AND DEPRESSION*
- *ACUTE GRIEVE*
- *POST TRAUMATIC STRESS DISORDER*
- *SOMATIZATION*

The health care workers and unemployed individuals are majorly at risk of mental health problems in **Georgia** [56]

Increasing the awareness of the public to the issues and providing & making resources available to help tackle these issues – **the main strategies for intervention & prevention** [55]

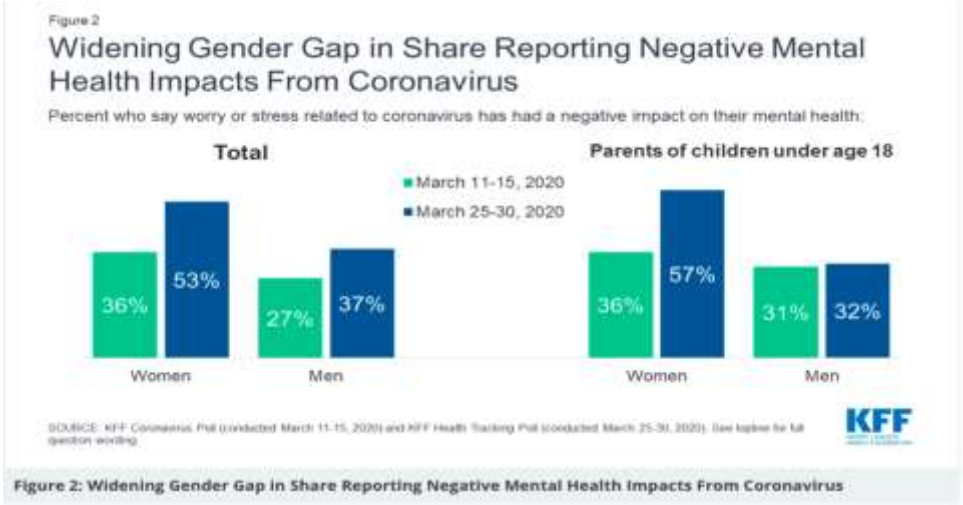
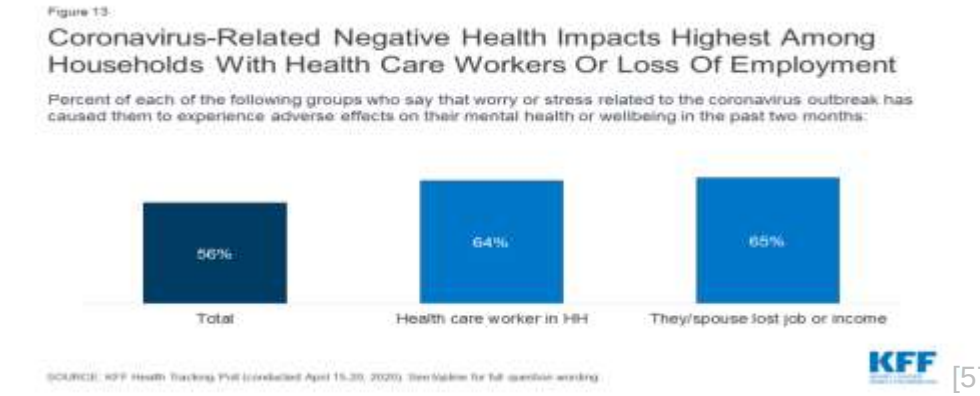


Figure 2: Widening Gender Gap in Share Reporting Negative Mental Health Impacts From Coronavirus

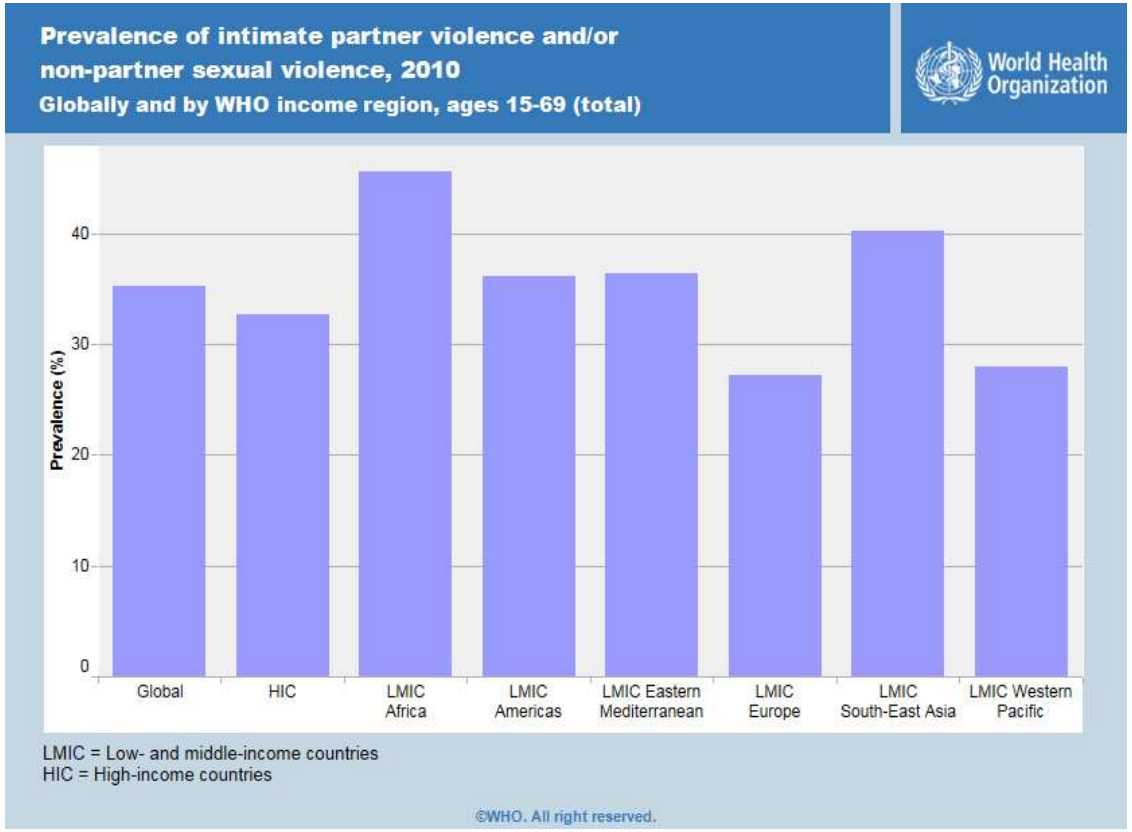


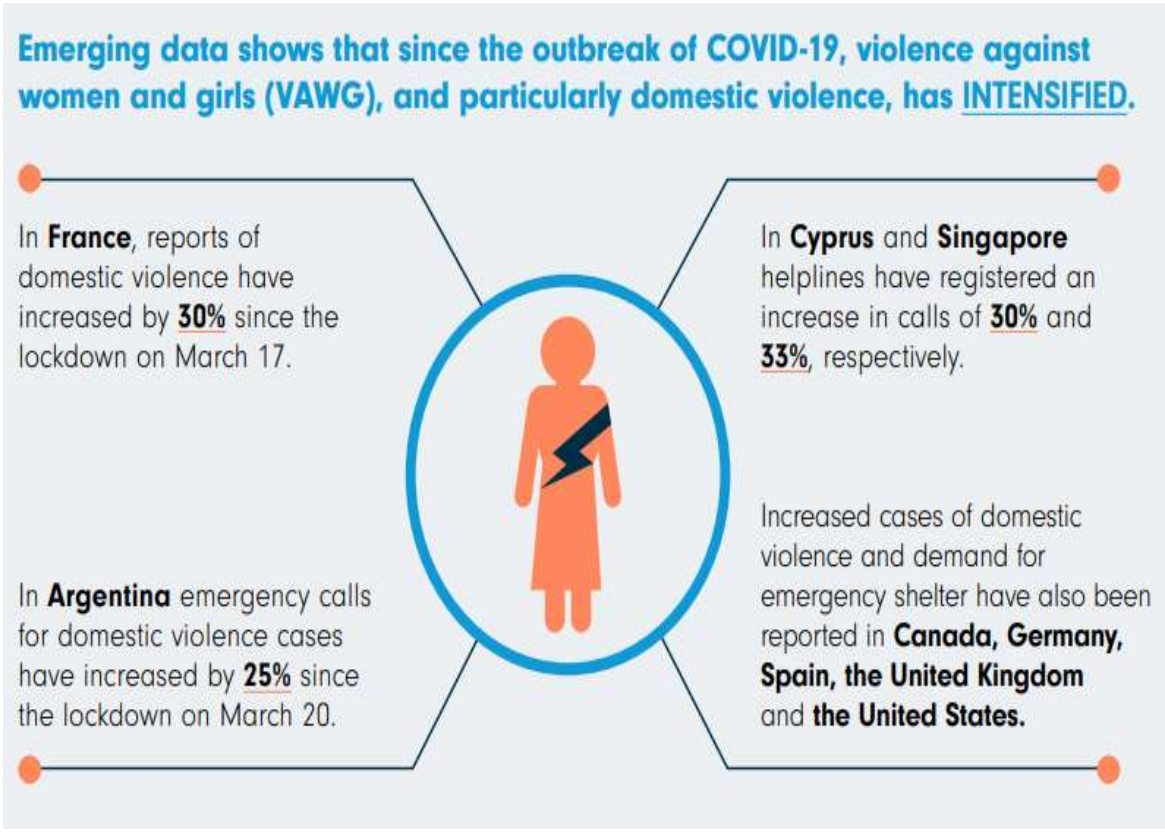
[57]

KFF coronavirus Poll (comducted March 11-15,2020) and KFF health tracking poll(conducted March 25-30).[internet].Available from: https://www.kff.org/report-section/kff-health-tracking-poll-late-april-2020-economic-and-mental-health-impacts-of-coronavirus/

[56] Pyrek, Emily. COVID-19 proving extra challenging for people with OCD and other mental health conditions.[internet].[15 April 2020]. La Crosse Tribune.Available from: https://lacrossetribune.com/news/local/covid-19-proving-extra-challenging-for-people-with-ocd-and-other-mental-health-conditions/article_43aabf97-1bd3-5618-b50f-9b7259a58be8.html

COVID-19 & Domestic Violence





Even before COVID-19, domestic violence – one of the most widespread crimes in **Georgia** where 88% of victims were women

[58] The World Health Organization. Prevalence of intimate partner violence and/or non-partner sexual violence. The World Health Organization; 2010 Cited: [2020 June 22] available from: https://apps.who.int/gho/data/node.wrapper.VIOLENCEAGAINSTWOMEN?lang=en

[59] UN Women. Infographic: The Shadow Pandemic - Violence Against Women and Girls and COVID-19 UN Women; 2020 April 6 [Cited: 2020 June 22] Available at:https://www.unwomen.org/en/digital-library/multimedia/2020/4/infographic-covid19-violence-against-women-and-girls

COVID-19 & Alcohol Consumption

- In a survey conducted by the WHO on yearly alcohol consumption
  - ⇒ Georgia ranked 67th among 195 countries with 7.7L consumed by the average person.
  - ⇒ Belarus ranked 1st (17.6L) Moldova 2nd (16.8L) [60]

- This placed Georgia atop the middle third of countries ranked
- So there is a POTENTIAL for an increase in alcohol consumption [61,62]

[60] Georgian Journal. Georgia among "drunk" countries rating - How much alcohol does a Georgian drink per year [Internet]. [Tbilisi (GE)]: Georgian journal. 2015 January 5 [cited 2020 June 23]. Available from: https://www.georgianjournal.ge/society/29191-georgia-among-drunk-countries-rating-how-much-alcohol-does-a-georgian-drink-per-year.html#:~:text=As%20for%20Georgians%2C%20according%20to,above%20the%20age%20of%2015.&text=According%20to%20that%20data%2C%20the,about%20%2D6.7%20liters%20a%20year.

[61] Monteiro MG, Rehm J, Duennbier M. Alcohol Policy and Coronavirus: An Open Research Agenda. Journal of Studies on Alcohol and Drugs [Internet]. 2020 June 15 [cited 2020 June 23]. Available from: https://www.jsad.com/doi/10.15288/jsad.2020.81.297

<u>Some negative effects COVID-19 could *POTENTIALLY* have on alcohol consumption:</u>

1. Misinformation about therapeutic effects of alcohol [61,62]
2. Use of Alcohol as a coping mechanism [60]
3. Negative impact on teenagers [60]
4. Negative impact on alcohol abusers [60]
5. Decreased work output [60]
6. Increased motor vehicle accidents [60]

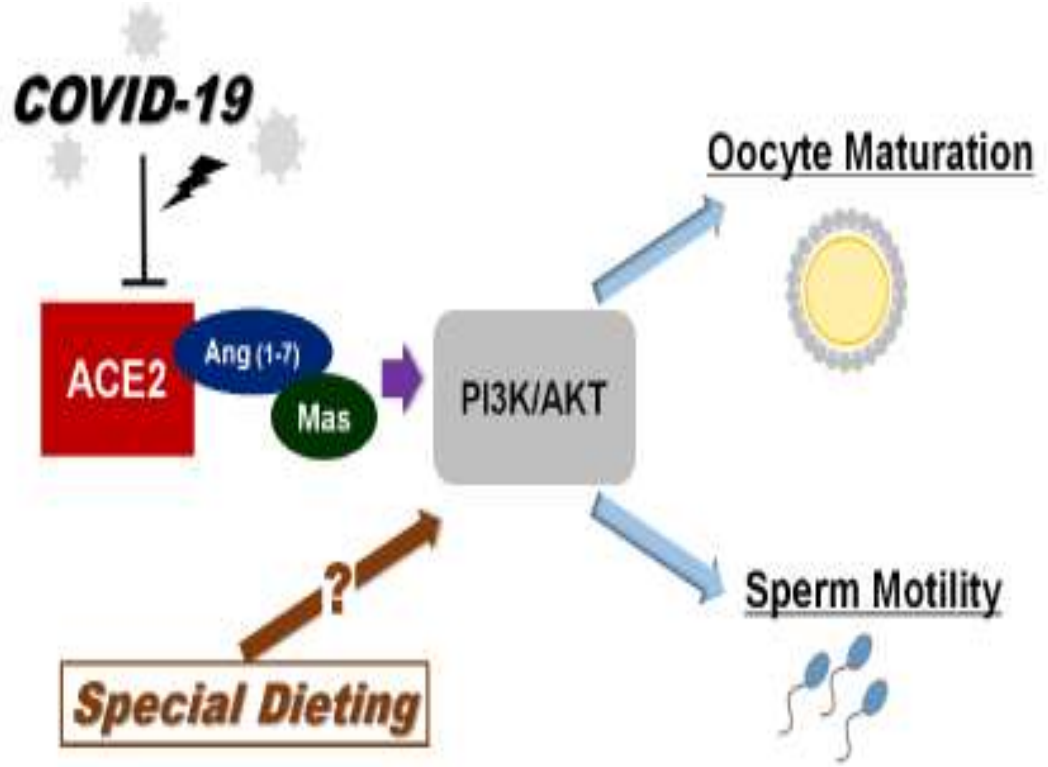
[62] Simet SM, Sisson JH. Alcohol's Effects on Lung Health and Immunity. National Institute on Alcohol Abuse and Alcoholism. Alcohol and the immune system. Alcohol Research: Current Perspectives. 2015. [cited 2020 June 23]. Available from: https://www.arcr.niaaa.nih.gov/arcr372/article05.htm

COVID-19 & Infertility

- Global association
- Countries with > than **30,000** cases shows stronger relationship between COVID-19 and infertility. *[orchitis, defective sperm production and motility]* [63]
- There is *no direct link* between COVID-19 and infertility in **Georgia**.[64]

INDIRECT LINKS

- ► Restriction of movement & postponement of all non-essential surgeries *[IVF, artificial insemination and gamete intrafallopian transfer].* [63]
- ► Increase in cases of abortions, owing to = increase in stress**, anxiety** and also an upsurge in **domestic abuse**. [64]
- ► **Miscarriages** and secondary **amenorrhea** due to the excess release of cortisol [stress hormone [64]
- ► Other menstrual anomaly e.g. dysmenorrhea have also been reported further worsening the infertility in females [64]



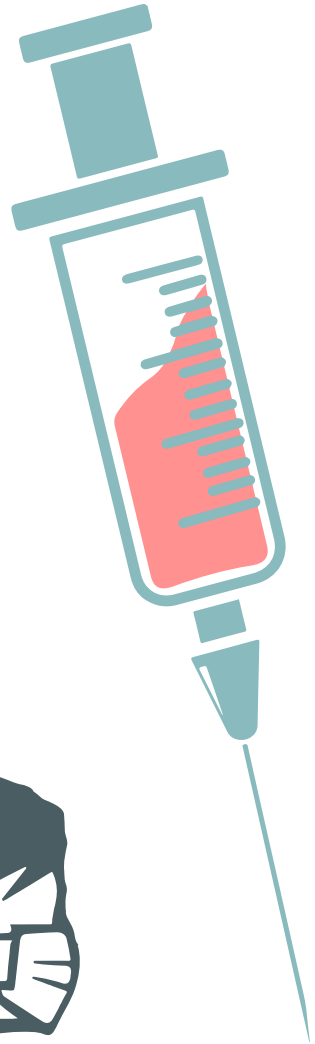
COVID-19, an infertility risk? [65]

[63] COVID-19 and Fertility - RESOLVE: The National Infertility Association [Internet]. RESOLVE. 2020 [cited 2020Jun22]. Available from: https://resolve.org/infertility-101/medical-conditions/covid-19-and-fertility/

[64] Tinatin Gagua OB\GYN Gagua clinic [Internet] [Cited:2020Jun23] avaliable from: https://gaguaclinic.ge/en

[65] Google Images. Google; [cited 2020Jun23]. Available from: https://www.google.com/imgres?imgurl=https%3A%2F%2Fres.feednews.com%2Fassets%2Fv2%2F7c62b11328237dc763feafd059edc566%3Fquality

Management



- There are **no vaccines**
- Prevention is majorly by avoidance and protection from infected people and places
- There is no specific treatment - treatment is symptomatic:
  - ***Antipyretics and analgesics***
  - ***Nasal decongestants*** [2]

[2] World health organization.Q&A on coronaviruses(covid 19).[internet].[cited 17 April 2020].Available from: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-coronaviruses#:~:text=symptoms

Summary

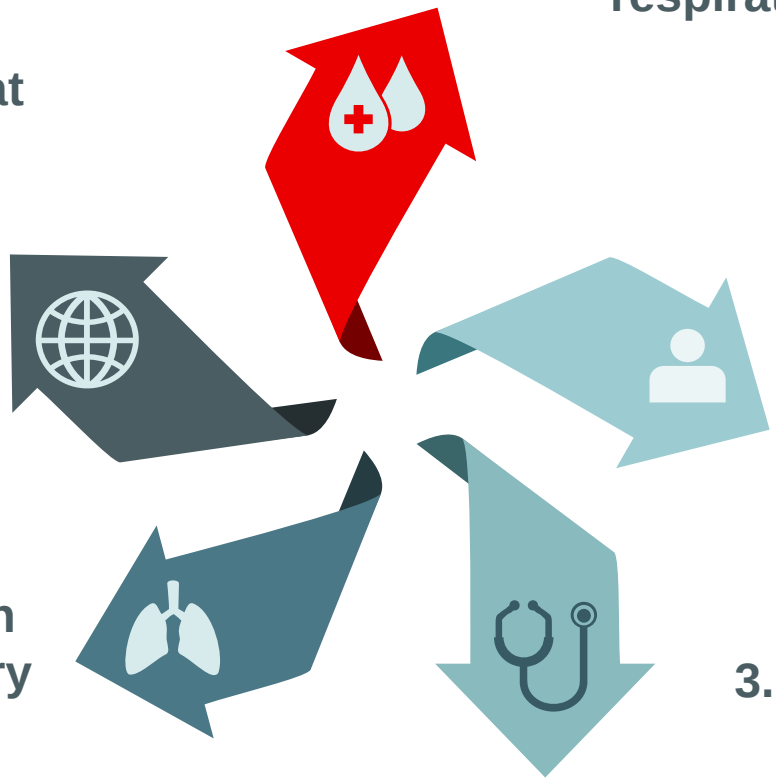
1. COVID-19 is transmitted through respiratory droplets & contact routes

2. Can affect any age group but is more severe in elderly patients

3. Medical staff are at a higher risk of getting the disease

4. COVID-19 spares no major organ
Most commonly involves respiratory and nervous systems

5. COVID-19 is a pandemic that had caused several social consequences



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[1] Source: Merck manual professional version.L.Brenda Tesini.Common cold,Upper respiratory infection;URI;CORYZA.[internet].[cited June 2020].Available from:https://www.merckmanuals.com/professional/infectious-diseases/respiratory-viruses/coronaviruses-and-acute-respiratory-syndromes-covid-19-mers-and-sars
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