

Ethical Challenges of Autopsy, Embalming, and Body Donation in the Context of Corona Virus Disease-19 Pandemic

Anupama Mahajan¹, Rajeev Kumar Chaudhary², Baljit Singh Khurana³

ABSTRACT

Corona virus disease-19 (COVID-19) is an acute respiratory illness caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) that emerged in the month of December 2019 in Wuhan, Hubei province, China and has continued to spread to include over 100 countries. Most frequently, transmission is from symptomatic individuals with COVID-19 via respiratory droplets produced during sneezing and coughing, from infected fomites, and in some cases, stools have tested positive for COVID-19 RNA. The complete clinical picture of COVID-19 is not fully known. Illnesses have ranged from very mild (loss of taste or smell) to severe pneumonia resulting in death. Eighty percent of deaths were among adults >65 years and older, with severe outcomes in people 85 years and older. There is minimum risk of COVID infection from a dead body to health workers who follow standard precautions while handling the body. Embalming of COVID-19-infected dead body should not be allowed. In the absence of definitive treatment for COVID-19, many anatomists have questions about the impact of coronavirus pandemic on body donation. In the present scenario, anatomists need not to accept the probable/suspected/confirmed COVID-19-infected dead bodies through voluntary donation. Major challenges in the context of COVID-19 include a lack of safe, effective vaccine, and uncertainty regarding the pathogenesis, immunity, and transmission of the disease. Except symptom abolition supportive treatment, currently there is no specific drug to treat the coronavirus, although some specific antiviral drugs (remdesivir) are under the clinical trials. Nowadays, strategies are focused on accelerating the path to produce an effective and safe vaccine to curtail the morbidity and mortality associated with pandemic of SARS-CoV-2.

Keywords: Autopsy, Body donation, COVID-19, Embalming.

AMEI's Current Trends in Diagnosis & Treatment (2020): 10.5005/jp-journals-10055-0092

INTRODUCTION

Corona virus disease-19 (COVID-19) is an acute respiratory illness caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) that emerged in the month of December 2019 in Huanan seafood market in Jianghan district, Wuhan, Hubei province of China and has continued to spread to include over 100 countries.¹ Viruses are named coronaviruses because of the presence of crown-like spikes on their surface. Main subgroups of coronavirus are alpha, beta, gamma, and delta. Seven coronaviruses that can infect human beings are 229E, NL63, OC43, HKU1, SARS-CoV (causes severe acute respiratory syndrome), MERS-CoV (causes Middle East respiratory syndrome), and SARS-CoV-2 (causes coronavirus disease). On March 11, the COVID-19 outbreak was announced as pandemic by World Health Organization (WHO).²

Transmission

Most frequently, transmission of SARS-CoV-2 occurs during close contact with symptomatic individuals through respiratory droplets via sneezing or coughing, aerosol-generating medical procedures, and from infected fomites. To date, no report has been published regarding transmission through urine or feces.³ The incubation period (time between the exposure and onset of symptoms) is usually between 2 days and 14 days but can be as long as 24 days.⁴

Severity

The complete clinical picture of COVID-19 is not fully known. Illnesses have ranged from very mild (loss of taste or smell) to severe pneumonia resulting in death. Eighty percent of deaths were among adults >65 years and older, with severe outcomes in people 85 years and older. People suffering from cancer, asthma, obesity, diabetes, and hypertension are at higher risk of developing complications due to coronavirus infection leading to death.³

¹Department of Anatomy, Sri Guru Ram Das Institute of Medical Sciences and Research, Amritsar, Punjab, India

^{2,3}Department of Forensic Medicine, Sri Guru Ram Das Institute of Medical Sciences and Research, Amritsar, Punjab, India

Corresponding Author: Anupama Mahajan, Department of Anatomy, Sri Guru Ram Das Institute of Medical Sciences and Research, Amritsar, Punjab, India, Phone: +91 9815733321, e-mail: anupamasgrd@yahoo.com

How to cite this article: Mahajan A, Chaudhary RK, Khurana BS. Ethical Challenges of Autopsy, Embalming, and Body Donation in the Context of COVID-19 Pandemic. AMEI's Curr Trends Diagn Treat 2020;4(1): 46–50.

Source of support: Nil

Conflict of interest: None

Standard Precautions for Transfer of COVID-19 Dead Body from Hospital to Mortuary

The healthcare workers must follow the standard infection prevention control guidelines while handling the coronavirus-infected dead bodies.² These standard precautions minimize the chances of COVID infection in healthcare workers while handling the dead body. These precautions include^{5,6}

- Antiseptic hand washing before and after interaction with the body.
- Use of appropriate personal protective equipment (PPE) including eyewear, gloves, and N95 mask. If there is a risk of splashes from the body secretions, face shield should be used.
- Mechanically clean and disinfect the instruments of the hospital (endoscope, laparoscope, arthroscope) used on the patient.

- Remove all the catheters, tubes, and drains on the dead body.
- Use 1% sodium hypochlorite for disinfection of wounds resulting from removal of catheters and tubes and impermeable material should be used for dressing.
- Sharps, such as intravenous catheters, must be handled in a safe manner. To dispose them, use a sharp container.
- To prevent leakage of body fluids, plug the nasal and oral orifices.
- Ensure that the dead body is fully sealed in a leak-proof plastic body bag and disinfect the exterior of the bag with 1% sodium hypochlorite.
- Wrap the body bag housing the dead body with a mortuary sheet and 1% sodium hypochlorite must be used to decontaminate the exterior of the bag.
- Attach the appropriate warning tag indicating COVID-19 on the outside of the body bag and transfer the body to the mortuary.
- All used linen should be put in the biohazard bag.
- Rules of biomedical waste management must be followed in disposal of all medical wastes.
- After transferring the body to the mortuary, the concerned health worker will remove the waterproof apron carefully, then will remove the overshoes, gown and gloves, rubber boots without touching with hands and will perform hand hygiene. Head cover and mask will be removed from behind the head.
- All surfaces like floor, door handles, bed side table, railings, and I/V stand should be disinfected with 1% sodium hypochlorite solution.
- Minimum number of support staff should be involved in the autopsy and only those who are directly involved in the procedure should be allowed in the autopsy room.
- During aerosol-generating procedures, additional respiratory protection is needed as the lungs and other organs may still contain live virus.
- Mortuary must be kept clean and lighting in the mortuary must be adequate.
- Perform autopsy in a properly ventilated room with at least 160 L/s/patient air flow or negative pressure rooms with at least 12 air changes per hour and controlled direction of air flow while using mechanical ventilation.⁸
- Use of an oscillating bone saw should be avoided in for confirmed or suspected cases of COVID-19. If an oscillating saw is to be used then attach a vacuum shroud to contain aerosols or a hand saw with a chain-mail glove may be used.⁹
- To minimize the sharp injuries, round ended scissors, blunt ended PM 40, or heavy-duty blades to be used.
- One body cavity at a time should be dissected.
- Unfixed organs must be stabilized with a sponge on a table and then should be sliced.
- Needles should not be resheathed after fluid sampling.
- Collection of nasopharyngeal, oropharyngeal, and lung swab from each lung for testing SARS-CoV-2 is recommended.
- Follow the established infection prevention control practices to autoclave the used equipment.
- After completion of autopsy, use 1% sodium hypochlorite to disinfect the body. Place the dead body in a leak-proof transparent body bag of not less than 150 µm and lock properly using nylon cable zip ties to avoid spillage of any fluid.
- Exterior of the dead body bag should be decontaminated with 1% sodium hypochlorite and allow to air dry to reduce the risk of infection to the staff transporting the dead body.
- Human coronavirus can remain infectious for 9 days on the surfaces. The virus has been detected after up to 72 hours in experimental conditions. So, cleaning the environment is necessary. Autopsy table to be disinfected as per standard protocol. For disinfection and decontamination of the vehicle used for transporting the body from hospital to mortuary or crematorium, use 1% sodium hypochlorite.
- Mortuary staff should ensure that good liaison is maintained between themselves and relatives of the individual who collect the dead body for cremation.

Embalming

Embalming of the COVID-19-infected dead body should not be allowed.

Standard Precautions for Autopsy on COVID-19 Body in Mortuary

An autopsy (postmortem examination/necropsy) is a surgical procedure that consists of a thorough examination of the body of a dead person by dissection to determine the cause of death. There are four types of autopsy—medicolegal (to find the manner and cause of death), clinical (to diagnose a particular disease), anatomical (performed by the students for study purpose), and virtual [performed by utilizing magnetic resonance imaging (MRI) and computed tomography (CT)]. Death due to COVID-19 is a non-medicolegal case. Autopsies on COVID-19 dead bodies should not be performed to shield the staff from exposure to infection.⁷ However, if autopsy is to be carried out due to some reasons then the team should be well trained in infection prevention control practices.

- Mortuary staff handling COVID body for washing, shaving, and tidying the hair of the body should observe standard precautions (wearing appropriate PPE, face shield, autopsy gloves, N95 mask, and long boots with shoe covers). During periods of limited supplies, the N95 should be reserved for medical procedures concerned with aerosol generation.
- Dead body must be stored in a cold chamber at a temperature of approximately 4°C.
- Immunosuppressed persons and those of more than 60 years of age should avoid direct interaction with the dead body.
- Autopsy should be performed by a doctor, usually a pathologist who perform diagnostic tests after taking samples from the deceased to determine the cause of death.

Standard Precautions for Cremation of COVID-19 Body

It is essential that the potential risk of infection is explained to the funeral workers and advise them to follow the standard precautions of hand hygiene before and after handling the dead body, water-repellent gown, plastic apron over water-repellent gown, use of gloves, and flat-fold or duckbill masks that fit closely over the nose, cheeks, and chin of the wearer.

- At the crematorium, avoid the large gatherings as a social distancing measure. According to the guidelines of Union Health Ministry updated on May 5, 2020, only 20 persons can attend the last rites of the deceased person.
- Viewing in funeral procession and hygienic preparation are not allowed.
- The dead body should not be removed from the body bag. Unzipping the face end of the body bag may be allowed for the

relatives to see the body for the last time but the staff should take the standard precautions.

- Hands quickly pick up the viruses if present on the surface. Once contaminated, hands can transfer the virus to the face from where the virus can reach inside the body. So, funeral workers are advised not to touch their nose, eyes, or mouth to avoid infection.
- It is a common myth that person who have died of a communicable disease should be cremated, but this is not true. Cremation is a matter of cultural choice.¹⁰ However, for complete elimination of chances of infection, cremation should be preferred *in situ* in zipped body bag in electric or gas crematorium. If the burial of body is requested by the family members, then it is recommended that the body is buried in a thick, air tight coffin, and placed at the depth of 4 to 6 feet. The area above and adjacent to the grave should be cemented immediately as an additional precautionary measure. The grave must be marked and required precautions should be taken to avoid scavenging by animals.
- Religious rituals, such as reading from religious scripts, sprinkling holy water, and any other last rites that do not require touching of the body, can be allowed but kissing, hugging, and bathing of the body should not be allowed.
- The ash does not pose any risk and can be collected by the relatives for religious immersion.
- Children, immunosuppressed, and persons more than 60 years of age should not directly interact with the body.
- Funeral ceremonies not involving the burial should be postponed as much as possible.
- Those participated in placing the body in the grave or on the funeral pyre should wear long-sleeved fluid resistant gown, gloves, mask, and wash hands and clothes with soap once the burial is completed.
- Clothing of the deceased should be machine washed at 60°C to 90°C (140–194°F) with hot water and laundry detergent. If machine washing not possible then linens can be soaked in hot water and soap in a large container and use a stick to stir. Then, the linens must be soaked in 0.05% chlorine for 30 minutes, finally rinsed with clean water and allowed to dry in sunlight.¹¹
- The dignity of the dead bodies, their cultural and religious traditions, and the sentiments of the families should be respected and protected throughout.

Body Donation

With the growing concerns regarding the COVID-19 pandemic, many anatomists have questions about the impact on body donation.

Body donation is defined as the informed and free act of giving one's whole body after death for medical education and research.¹² The history of body donation can be traced back to the puranas. Rishi Dadhichi donated his bones using which a "Vajra" was created by the Gods. Using this weapon, "Vrutrasoor" a troublesome demon was killed.¹³ This may be considered as the first body donation in the world. Body donation is the major and preferred source of cadavers worldwide for studying the human anatomy by dissection. To avoid scarcity of the cadavers, International Federation of Associations of Anatomists (IFAA) in their Beijing Meeting in 2014 proposed the creation of an international body donation network to help the countries facing difficulties in setting up donation programs. Body donation is regulated by various acts according to each country

and is considered one of the modern expressions of solidarity. In India, the Maharashtra State Anatomy Act was the first anatomy act enacted in 1949 and now almost every state has its own anatomy act with variable differences under which unclaimed and donated bodies can be obtained legally for the purpose of dissection.¹⁴

Due to the ongoing COVID-19 pandemic, the Anatomical Education Program is making changes to only accept the preregistered medically screened donors. During this time of crisis, the program is unable to accept any donor who has passed away from or was under investigation for COVID-19 for an unknown period of time.¹⁵ The Epidemic Diseases Act was introduced by the British in 1897 to tackle the epidemic of bubonic plague that broke out in Mumbai.¹⁶ Starting in March 2020, the act was being enforced across India in order to stop the spread of COVID-19.¹⁷ The act is one of the shortest Acts in India, comprising just four sections. The first section describes all the title and extent, the second part explains all the special powers given to the state government and center to take special measures and regulations to contain the spread of disease. The third section describes the penalties for violating the regulations in accordance with Section 188 of the Indian Penal Code, i.e., 6 months' imprisonment or 1,000 rupees fine or both could be charged out to the person who disobeys this Act. The fourth and the last section deals with legal protection to implementing officers acting under the Act. Following coronavirus pandemic, on March 11, 2020, The Cabinet Secretary of India announced that all UTs and states should invoke the provisions of section 2 of the Epidemic Disease Act¹⁸ according to which all advisories being issued by the Ministry of Health welfare/UTs/state are enforceable.

In the present scenario, anatomists need to be more vigilant about COVID-19 guidelines before accepting the body through voluntary donation. Donors should be screened for the COVID-19 infection by different methods, such as history for symptoms suggestive of COVID-19 infection, epidemiological screening for travel and potential exposures, and nasopharyngeal/oropharyngeal/bronchoalveolar lavage samples for laboratory testing of COVID-19.¹⁹ The optimal approach to donor screening may change over time as more data accumulate but today for the body donation we should follow infection prevention guidelines in the context of COVID-19.

DISCUSSION

The pandemic of coronavirus disease caused by SARS-CoV-2 poses an extraordinary threat to food security, global public health, and socioeconomic stability.²⁰ Various control measures, such as physical distancing, washing of hands regularly with soap and water, using face mask, avoiding large gatherings, and refraining from smoking that harms the lungs, can help to reduce the spread of the disease. World Health Organization emphasizes the importance of frequent hand hygiene, environmental cleaning, maintaining social distancing, respiratory etiquette, and avoidance of unprotected contact with symptomatic patients in accordance with international guidelines developed by United Kingdom, Canada, and Australia. Controlled human challenge studies involve the deliberate exposure of healthy volunteers to the pathogens and such studies can be valuable for testing vaccines.^{21,22} A vaccine is a biological preparation that provides active acquired immunity to a particular infectious disease and is often made from weakened or killed forms of microbes, its toxins, or one of its surface proteins. The administration of vaccines is called vaccination which is the most effective method of preventing infectious diseases. Vaccines that have proven effective include the

influenza vaccine,²³ human papilloma virus (HPV) vaccine,²⁴ and chicken pox vaccine.²⁵ The WHO reports that licensed vaccines are currently available for 25 different preventable infections.²⁶ Pneumococcal vaccine does not provide protection against new coronavirus as the virus is so different that it needs its own vaccine. The vaccine AZD1222 (ChAdOx1nCoV-19) made using weakened version of a common cold virus that infects chimpanzees is given as a single-dose or two-dose administration regimen in further trials conducted by Oxford University's Jenner Institute.²⁷ According to trial results published in the *Lancet*, the vaccine resulted in a four-fold increase in antibodies to SARS-CoV-2 virus spike protein and elicited T cell immune response. There will be a phase 3 trial involving 30,000 people in the US, 2,000 in South Africa, and 5,000 in Brazil.²⁸ India's first indigenous COVID-19 vaccine BBV152 COVID or Covaxin (derived from a strain of SARS-CoV-2) initiated phase 1 clinical trials across the country on July 15, 2020.²⁹ There are 12 institutes where the trial for Covaxin will take place as per the Indian Council for Medical Research (ICMR) and these are located in New Delhi, Goa, Kanpur, Arya Nagar, Hyderabad, Kattankulathur, Gorakhpur, Nagpur, Belagavi, Rohtak, Visakhapatnam, and Patna. The global public health response to COVID-19 could be enhanced by safe, effective vaccines, reliable measures of correlates of immune protection and improved scientific knowledge regarding the pathogenesis and transmission of the disease.³⁰

CONCLUSION

The COVID-19 spreads mainly when people come in close contact with coronavirus-infected individuals and to break this chain of spread in India, Prime Minister gave a call of "Janata Curfew" on March 22nd followed by 21 days' lockdown during which government made the special COVID specialty hospitals, isolation wards, procuring ventilators, and PPE kits. On 5th April, another exercise "9 PM for 9 Minutes" Challenge was executed by prime minister to turn off lights and lit lamps for 9 minutes at 9 PM as a mark of unity to abolish the stress among the people due to the disease. As a part of disaster management, government launched Mobile app—AarogyaSetu for effective tracking of COVID-19-infected people, sealing off the Red Zones, and regular notifications are sent from Mygov.in. Indian Council for Medical Research is focused upon Bharat Biotech's COVID-19 vaccine and trying it to be launched by August 15, 2020. Vaccine failure results from ineffective route of administration, incomplete technology efficacy, failed cold chain storage, and distribution. Scientists all over the world are of the opinion that it would take 12 to 18 months to launch a vaccine for COVID-19. Nowadays, strategies are focused on accelerating the path to produce an effective and safe vaccine to curtail the morbidity and mortality associated with pandemic of SARS-CoV-2.

REFERENCES

1. AST. American Society of Transplantation. COVID-19 (Coronavirus): FAQs for Organ Donation and Transplantation, 11 March 2020 ed., Mt. Laurel, NJ: American Society Transplantation; 2020. p. 8. URL https://www.myast.org/sites/default/files/COVID19%20FAQ%20Tx%20Centers%202020.03.11_FINAL.pdf [accessed 30 March 2020].
2. World Health Organization: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>.
3. CDC: <https://www.cdc.gov/coronavirus/2019-nCoV/summary.html>.
4. Bai Y, Yao L, Wei T, et al. Presumed asymptomatic carrier transmission of COVID-19. *JAMA* 2020;323(14):1406–1407. DOI: 10.1001/jama.2020.2565.
5. WHO. World health organization. Infection prevention and control for the safe management of a dead body in the context of COVID-19: Interim guidance. 24 March 2020. 1st ed., Geneva, Switzerland: World Health Organization; 2020. p. 6. URL https://apps.who.int/iris/bitstream/handle/10665/331538/WHO-COVID-19-IPC_DBMgmt-2020.1-eng.pdf.
6. World Health Organization. (2020). Infection prevention and control during health care when COVID-19 is suspected: interim guidance, 25 January 2020 [https://www.who.int/publications-detail/infectionprevention-and-control-during-health-care-whennovel-coronavirus-\(ncov\)-infection-is-suspected-20200125](https://www.who.int/publications-detail/infectionprevention-and-control-during-health-care-whennovel-coronavirus-(ncov)-infection-is-suspected-20200125). (accessed March 22, 2020).
7. Government of India. COVID-19: Guidelines on Dead Body Management. 1st ed., New Delhi, India: Government of India, Ministry of Health and Family Welfare, Directorate General of Health Services (EMR Division); 2020. p. 7. URL: https://www.mohfw.gov.in/1584423700568_COVID19GuidelinesonDeadbodymanagement.pdf [accessed 30 March 2020].
8. Royal College of Pathologists (UK). (2020). Autopsy practice relating to possible cases of COVID-19 (2019 n Cov, novel coronavirus from China 2019/2020). <https://www.rcpath.org/uploads/assets/d5e28baf-5789-4b0f-acecfe370eee6223/fe8fa85a-f004-4a0c-81ee4b2b9cd12cbf/Briefing-on-COVID-19>.
9. Centers for Disease Control and Prevention. (2020). Interim guidance for collection and submission of post-mortem specimens from deceased persons under investigation (PUI) for COVID-19, February 2020. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-postmortem-specimens.html>. (accessed March 22, 2020).
10. Pan American Health Organization. Leadership during a pandemic: What your municipality can do. Tool 18: Management of dead bodies. https://www.paho.org/disasters/index.php?option=com_docman&view=download&category_slug=tool_s&alias=545-pandinflu-leadershipduring-tool-18&Itemid=1179, (accessed March 23, 2020).
11. World Health Organization. (2020). Water, sanitation, hygiene, and waste management for the COVID-19 virus. Interim guidance: 19 March 2020. https://apps.who.int/iris/bitstream/handle/10665/331499/WHO-2019-nCoV-IPC_WASH-2020.2-eng.pdf?sequence=1&isAllowed=y (Accessed March 22, 2020).
12. Rokade SA, Bahetee BH. Body donation in India: A review. *Int J Res Med Sci* 2013;1(3):173–177. DOI: 10.5455/2320-6012.ijrms20130814.
13. Ballala K, Shetty A, Malpe SB. Knowledge, attitude and practices regarding whole body donation among medical professionals in a hospital in India. *Anatomical Science Education* 2011;4(3):142–150. DOI: 10.1002/ase.220.
14. The Maharashtra Anatomy Act, (1949). Available at: <http://bombayhighcourt.nic.in/libweb/acts/1949.11.pdf> [Accessed 8 May, 2018].
15. COVID-19 Update: Anatomical Gift Program. Harvard Medical School, Suite 384 Longwood Avenue, Boston, Massachusetts 02115.
16. The 123-year-old law that India may invoke to counter coronavirus. *The Economic Times*. 2020-03-12. Retrieved 2020-03-12.
17. A 123-yr-old Act to combat Coronavirus in India; experts say nothing wrong. *Livemint, IANS*. 2020-03-14. Retrieved 2020-03-15.
18. To Combat Coronavirus, India invokes provisions of colonial-era Epidemic Disease Act: A look at what this means. *Firstpost* 12 March. Retrieved 2020-03-12.
19. Ravi KS, Dead body management in times of COVID-19 and its potential impact on the availability of cadavers for medical education in India. *Anatomical Sciences Education* April 2020 <https://www.researchgate.net/publication/34058501>.
20. Husain A, Sandstrom S, Greb F, Groder J, Pallanch C. COVID-19: potential impact on the world's poorest people. Rome: World Food Programme; 2020.
21. Jamrozik E, Selgelid MJ. Human challenge studies in endemic settings: ethical and regulatory issues. *Springer Briefs in Ethics* 2020, pp. 50–53.
22. Roestenberg M, Kamerling IMC, de Visser SJ. Controlled human infections as a tool to reduce uncertainty in clinical vaccine

- development. *Front Med* 2018;5:297. DOI: 10.3389/fmed.2018.00297.
23. Fiore AE, Bridges CB, Cox NJ. Seasonal influenza vaccines. *Curr Top Microbiol Immunol* 2009;333:43–82. DOI: 10.1007/978-3-540-92165-3_3.
 24. Chang Y, Brewer NT, Rinas AC, et al. Evaluating the impact of human papillomavirus vaccines. *Vaccine* 2009;27(32):4355–4362. DOI: 10.1016/j.vaccine.2009.03.008.
 25. Liesegang TJ. Varicella Zoster virus vaccines: effective but concerns linger. *Can J Ophthalmol* 2009;44(4):379–384. DOI: 10.3129/i09-126.
 26. World Health Organization, Global Vaccine Action Plan 2011-2020. Archived 2014-04-14 at the Wayback Machine Geneva 2012.
 27. Oxford COVID-19 Vaccine's first human trial shows promise, more phases underway. *Hindustan Times.com*. Health updated; 21 July 2020.
 28. Folegatti PM, EwerKJ, Aley PK, et al. Safety and immunogenicity of the ChAdOx1nCoV-19 vaccine against SARS-CoV-2: a preliminary report of a phase 1/2, single-blind, randomized controlled trial www.thelancet.com. 20 July 2020. DOI: 10.1016/S0140-6736(20)31604-4.
 29. India's first COVID-19 vaccine, Covaxin, undergoing trial: 10 updates. 21 July 2020.
 30. Gates B. Responding to COVID-19: a once-in-a-century pandemic? *New Eng J Med* 2020;382(18):1677–1679. DOI: 10.1056/NEJMp2003762.