
Viral Pandemics and Its Effect on General Public - A Review

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Abstract: The pandemic is an outbreak of disease which spreads across a particular region or regions. The key features of pandemic include wide geographic extension, disease movement, novelty, severity, high attack rates and explosiveness. It also involves minimal population immunity, infectiousness and contagiousness which helps us to understand what pandemics are and its effect on the public. Viral pathogens can transform quickly, which allows them to pass from wild animals to humans. These emerging diseases endanger human lives and have major socioeconomic impacts. The aim of the review is to know about the viral pandemics and its effect on the general public. Human behaviour and demographic factors significantly increase these risks, and the speed with which humans travel between continents can cause the runaway spread of pandemics. The literature review was carried from scopus and pubmed databases from 2000 till date. The viral pandemic disease and its effect on the general public is the outbreak of global scale. Children, older people, pregnant women and people with weakened immune systems are often affected by these pandemics. The cause, prevention and control of pandemics had been studied.

Keywords: Viral pandemics; Effects on public; SARS; MERS; Ebola virus; COVID-19; Swine flu.

INTRODUCTION

A pandemic is an episode of worldwide extents. It happens when a novel infection rises among the people. It causes serious sickness and is handily transmitted. The word pandemics originates from the Greek word *pan* signifying "relating to all humans" (Jackiewicz *et al.*, 2016). The Greek word *skillet* signifies "all", and the Greek word *evil spirit* signifies "individuals". A pandemic inlets and a lot more extensive topographical region, frequently around the world. A pandemic likewise contaminates significantly a greater number of individuals than plagues. A pandemic is typically brought about by another infection strain or subtype of the infection - an infection that isn't safe to people or has next to no invulnerability. On the off chance that resistance is powerless or non-existent the infection becomes unmistakably bound to spread the world over on the off chance that it rapidly gets transmissible to people. Pandemics commonly cause a lot higher quantities of passings too (Priyadharsini *et al.*, 2018a). There is a lot more noteworthy social insecurity, financial ruin and general wretchedness brought about by the pandemic disease (Collinson, Khan and Heffernan, 2015). A pestilence is when, expected inside a nation or part of a nation, the quantity of individuals who become contaminated increments. At the point when the contamination happens all the while in a few nations it at that point starts to change into a pandemic (Von Lubitz and Gibson, 2018). Much critical ailment flare-ups and pandemics have been recorded ever, including Swine influenza, SARS, Ebola infection, MERS, COVID-19.

The pandemic related emergencies have been related with colossal negative effects on wellbeing, economy, society, and security of national and worldwide networks. Also, they have caused huge political and social interruption. Proof recommends that the probability of pandemic has expanded over the previous century in view of expanded worldwide travel and incorporation, urbanization, changes in land use and more noteworthy abuse of the normal environment (Laxminarayan and Malani, 2011). Noteworthy strategy consideration has been centered around the need to distinguish and constrain rising episodes that may prompt pandemic and more noteworthy abuse of the normal environment (McMillen, 2016). During the pandemic all parts of economy, agriculture, (Shahzan *et al.*, 2019) manufacturing administrations, face interruption, conceivably prompting lack of merchandise and items and fast cost increment for staple products and monetary worry for family units, private firms and government. A continued, serious pandemic on the size of the 1918 flu pandemic would cause huge and enduring financial damage (Quinlan and Whiteside, 2007).

Individuals build up an irresistible illness model intended to give a probabilistic perspective on the quantity of passings that could result from a pace of conceivable and conceivable irresistible infection pandemic (Ashwin and Muralidharan, 2015). Logical comprehension from the scope of orders of virology, the study of disease transmission and attributes of flu and non flu developing irresistible sickness pandemic ('Pandemics', no date). The occasion set, comprising a few thousand situations. Ethical quality and dreariness rates per age partner are the yield for every occasion and for each displayed nation and nation area. Utilizing the irresistible sickness model and related data (Hays, 2005), two assorted situations were created and given the premise and stun to resulting monetary displaying was talked about in the past article. The pandemic speaks to a genuine danger not exclusively to the number of inhabitants on the planet yet in addition to its economy. The effect of financial misfortune can bring about unsteadiness of the economy. The effect is through direct cost, long haul trouble and roundabout expense (Taylor, 2019). Pandemic are for most ailment episodes that become far reaching because of the spread of human to human contamination. They have caused critical political and social disturbance. The need of research is to think about the pathogens of worldwide flood. The significance to diminish financial disturbance. To fill the information on general wellbeing and the monetary outbreak and to think about the circumstance. Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Deogade, Gupta and Ariga, 2018; Ezhilarasan, 2018; Ezhilarasan, Sokal and Najimi, 2018; Jeevanandan and Govindaraju, 2018; J *et al.*, 2018; Menon *et al.*, 2018; Prabakar *et al.*, 2018; Rajeshkumar *et al.*, 2018, 2019; Vishnu Prasad *et al.*, 2018; Wahab *et al.*, 2018; Dua *et al.*, 2019; Duraisamy *et al.*, 2019; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Gheena and Ezhilarasan, 2019; Malli Sureshbabu *et al.*, 2019; Mehta *et al.*, 2019; Panchal, Jeevanandan and Subramanian, 2019; Rajendran *et al.*, 2019; Ramakrishnan, Dhanalakshmi and Subramanian, 2019; Sharma *et al.*, 2019; Varghese, Ramesh and Veeraiyan, 2019; Gomathi *et al.*, 2020; Samuel, Acharya and Rao, 2020)

SWINE FLU

The viral pandemic pig influenza was brought about by H1N1 infection, 2009. It is otherwise called H1N1 influenza. It is called pig influenza, on the grounds that previously, individuals who got it had direct contact with pigs (Anderson *et al.*, 2020) The new infection developed and spread among individuals who had been close pigs (Chastagner *et al.*, 2019). It is brought about by the strain of flu infection and is normally influenced by pigs and polluted items and its spread through salivation, mucosa particles (Sharfstein, 2018) and individuals who wheeze and hack, contacting germs secured surfaces, as often as possible contacting eyes, nose and mouth (Hirpa, 2017). The individuals who are at high danger were kids under 5 years of age, individuals over 65 years old (Olsen, 2002; Bravo-Vasquez *et al.*, 2020). Youngsters and teenagers who are getting long haul ibuprofen treatment and who may be in danger for Reye's condition subsequent to being tainted with pig flu [18]. Reye's condition is a perilous illness (Pokorski, 2017) connected to Aspirin (M, Geetha and Thangavelu, 2019) utilized in youngsters and pregnant ladies and grown-ups and kids with interminable lung, heart, endocrine, blood, sensory system, neuromuscular or metabolic issues. Grown-ups and kids who have debilitated insusceptible frameworks and individuals in nursing homes and other long haul care offices. They are essentially equivalent to occasional influenza. It incorporates hack, fever, sore throat, running nose, body hurts, migraine, chills, weakness. It likewise causes difficult issues including pneumonia and lung contamination and other breathing problems ('UCSD Physician Discusses the 2009 H1N1 Swine Flu Virus, Symptoms and Prevention', 2009). Any it can make ailment like brevity of breath, extreme regurgitating, torment in stomach, dazedness or disarray. A portion of the antiviral medications that are utilized to treat occasional influenza likewise neutralize H1N1 virus. Oseltamivir, peramivir and zanamivir appear to work best, albeit a few sorts of influenza don't react to oseltamivir (Hanafi *et al.*, 2012). Anti-infection agents don't do anything for infections. Antibodies are utilized for anticipation. Likewise washing hands habitually and keeping away from contact with wiped out individuals can forestall disease. A great many people recuperate from H1N1 without broad clinical intervention (Tasian, 2011). Now and again in any case, a specialist may recommend an antiviral drug. These medications can abbreviate the length of indications and decrease their seriousness. People may need these drugs urgently if they have severe symptoms or complications or they are in the hospital or having a high risk of complication (Sen *et al.*, 2015). During the swine flu outbreak, uptake rates for protected behaviour and likely acceptance rate for vaccination were low ('Most people who died with swine flu were previously healthy', 2010). During this more than 200,000 people died. They closed the border lines of their countries. Staying at home makes them stressed and frustrated. Quarantine had been made, so the economic wealth of a country declined (Kumar, 2016)

SARS

The 2002-2004 SARS episode was a scourge including Severe Acute Respiratory Syndrome (SARS) brought about by coronavirus (Serradell, 2009). This episode was first distinguished in Foshan, Guangdong, China on november 2002. SARS - COV is believed to be a creature infection (Priyadharsini *et al.*, 2018b) from a questionable creature supply, maybe bats that spread to different creatures and first contaminated people in

China. Transmission was fundamentally from individual to person (Lal, 2010). It seems to have happened predominantly during the second seven day stretch of sickness, which relates to the pinnacle of virus and cases with serious ailment begin to disintegrate clinically. SARS - COV might be suspected in a patient who has any side effects including fever 30 degree celsius or higher, or either a background marked by contact with somebody with a conclusion (Girija *et al.*, 2019) of SARS inside the most recent 10 days or travel to any of the districts recognized by World Wellbeing Association as territories with late nearby transmission of SARS (Heymann, 2005). Side effects are influenza like indications and may incorporate fever, muscle torment, torpidity, hack, sore throat and other vague side effects. The main manifestation regular to all patients seems, by all accounts, to be a fever over 38 degree celsius (Kleinman and Watson, 2006). SARS may in the end lead to brevity of breath either direct popular pneumonia or optional bacterial pneumonia (*Respiratory Tract Infections—Advances in Research and Treatment: 2013 Edition*, 2013). The essential avoidance is segregation and isolation stays best. Other preventive measures incorporate wearing masks (Brookes and Khan, 2005), washing hands with cleanser and water or utilization of liquor based hand sanitizer. Use of disinfectants on the outside of fomites to expel infections. Maintain a strategic distance from contact with body liquids. Washing the individual things of somebody with SARS in hot or lathery water. Keeping kids with indications at home from school. Made basic cleanliness measures (Taylor, 2007). As SARS is a viral sickness, anti-infection agents don't have direct impact however they are utilized against bacterial optional disease. Treatment of SARS is basically steady with antipyretics, supplemental oxygen and mechanical ventilation varying. Antiviral meds are utilized just as high portions of steroids to decrease expanding of lungs. Individuals with SARS-COV must be secluded in negative weight rooms. Dread of getting the infection from expending contaminated wild creatures brings about open bans and decreased business for meat markets (Shaw, 2006). In excess of 770 individuals passed on because of SARS (Marickar, Geetha and Neelakantan, 2014; Vaishali and Geetha, 2018).

EBOLA VIRUS

Ebola hemorrhagic fever initially showed up in Zaire in 1976. The first flare-up of Ebola infection and scientists have recognized five strains, the initial four strains liable for high demise rates. The four Ebola are named as Zaire, Sudan, Tai woodland and Bundibugyo infection with zaire. Ebola infection being the most deadly strain (Smiline, Vijayashree and Paramasivam, 2018). The reason for Ebola hemorrhagic fever is Ebola infection contamination that outcomes in coagulation abnormalities including gastrointestinal dying, advancement of rash, cytokine discharge, harm to liver, and monstrous viremia that prompts harms to vascular cells that structure veins. As the monstrous viremia proceeds with coagulation factors are undermined and the microvascular endothelial cells are harmed or demolished bringing about diffuse draining inside and externally (Wilson, 2018). This uncontrolled draining prompts blood and liquid misfortune and can cause hypotensive stun that causes passing in numerous Ebola contaminated people. The hazard factors are travel to the territory with detailed Ebola contaminations. What's more, relationship with creatures is conceivably a wellbeing hazard factor as per the communities for malady control and avoidance. Fundamentally influences the medicinal services laborers and relatives and companions related with irresistible patients are at higher danger of getting the disease. Side effects of Ebola infection illness are vague and incorporate fever, cerebral pain, shortcoming, regurgitating, looseness of the bowels, stomach uneasiness or torment in midsection, diminished hunger and joint and muscle discomfort. Patients may create different side effects and signs, for example, rashes or red spots on the skin, eye redness, hiccups, sore throat, hacking or hacking up blood, heaving blood, chest torment, mental disarray, draining both inside and outside the body and trouble in gulping and breathing (Pratha, Ashwatha Pratha and Geetha, 2017). There is a counteraction immunization for Ebola infection. The most ideal approach to abstain from getting the malady is by not making a trip to territories where the infection is found. On the off chance that you are in a zone with Ebola infection is available, keep away from contact with bats, monkeys, chimpanzees and gorillas, since these creatures spread Ebola to individuals. Treatment incorporates a test serum that devastates contaminated cells. Specialists deal with liquids and electrolytes and oxygen, circulatory strain prescription, blood transfusion (Qureshi, 2016) and treatment for other viral diseases. The WHO has proclaimed an intensifying Ebola episode in the fair republic of Congo. In excess of 2,500 individuals have gotten sick and almost 1,700 have kicked the bucket.

MERS

The MERS otherwise called Middle East Respiratory Syndrome brought about by an infection called Middle East Respiratory Syndrome Coronavirus. First case detailed in Saudi Arabia in September 2012. The MERS COV started from bats, which then likely spread from tainted dromedary camels to people. The infection doesn't appear to pass effectively from individual to individual except if there is a nearby contact ('MERS outbreak', 2015). The contamination and complexities are bound to show up in more established grown-ups, individuals with wellbeing conditions, for example, diabetics, cardiovascular ailment, ceaseless lung malady, kidney ailment or cancer (Hsieh, 2015). Individuals with debilitated resistant frameworks such as the individuals who get chemotherapy or immunosuppressant medicine. The most well-known indications of MERS are fever, hack

and brevity of breath. Individuals may likewise have gastrointestinal issues, for example, looseness of the bowels, sickness or retching. Pneumonia is a typical complication. There have additionally been reports of organ disappointment connected with MERS, particularly kidney disappointment. Indications generally seem 5-6 days after introduction to the infection, however they may take 2-14 days to emerge. To diminish the danger of MERS-COV transmission, wellbeing specialists suggested. Oftentimes washing the hands with cleanser and water for at any rate 20 seconds one after another and maintaining a strategic distance from half-cooked meats and any food arranged in conditions that may not be sterile and washing leafy foods altogether. Announcing any speculated cases to nearby wellbeing specialists and limiting close contact with any individual who creates and ARI fever. Wearing covers (Shahana and Muralidharan, 2016) gloves additionally forestall the disease. As an examination clarifies, there is no fix or immunization for MERS ailment, yet they are under development. Oxygen treatment is utilized. A stay in an emergency unit and a mechanical ventilator to enable them to relax (Girija As and Priyadharsini J, 2019). During the MERS pandemic in excess of 850 individuals kicked the bucket. Individuals can not have the option to make a trip from one spot to another. There will be a breakdown of the financial status of a country (Li and Du, 2019).

COVID -19

In the middle of 2020, another infection started creating features everywhere throughout the world due to the phenomenal spread of transmission brought about by coronavirus in the city of Wuhan in China in 2019. Coronavirus are zoonotic. This implies they first create in quite a while before creating in people. For the infection to go from creatures to people, an individual needs to come into close contact with a creature that conveys the contamination (Girija, Jayaseelan and Arumugam, 2018). When the infection creates, it very well may be transmitted from individual to individual, through respiratory bead. Hack and wheeze additionally transmit the virus (M, Geetha and Seshadri, 2020) The infection may have been passed from bats to others either snakes or pangolins and afterward to people. Hazard will be higher without taking legitimate preventive measures, people live with somebody who has contractured the infection and who give home consideration to tainted people, youngsters age under 18 and people who have COPD and asthma, pregnant womens, serious corpulence and other lung illness (Saxena, 2020) and debilitated resistant systems. The side effects of COVID-19 are brevity of breath, having hack and gets progressively serious over quite a while, poor quality fever and step by step builds, weariness and normal side effects incorporate chills, sore throat, cerebral pain, loss of taste, loss of smell, and so forth,. At the point when the manifestations are extreme the individuals experience difficulty breathing, blue lips or face, disarray, unreasonable drowsiness (Selvakumar and Np, 2017). Most ideal approach to maintain a strategic distance from transmission is to stay away from or limit contact with individuals who show indications. Washing hands every now and again, forestalls gathering, ought not to contact face, nose, mouth and eyes. Remain at any rate 6 feet from people. Clean the articles utilized. Wear masks. There is no treatment explicitly affirmed for COVID-19 and no remedy for the contamination and the antibodies are under examination. Like different coronaviruses like SARS and MERS rewarded by overseeing symptoms ('COVID-19 Special Issue', no date). The meds given are antiviral or retroviral drugs. Utilizing mechanical ventilation, steroids are utilized. Shutting of fringes happens with the goal that individuals can not travel. Isolation made to quit spreading prompts mental and financial pressure or slowdown. By this COVID -19 in excess of 4,700 individuals passed on till walk 2020 (Singh and Neog, 2020) (Paramasivam, Priyadharsini and Raghunandhakumar, 2020). Our institution is passionate about high quality evidence based research and has excelled in various fields ((Pc, Marimuthu and Devadoss, 2018; Ramesh *et al.*, 2018; Vijayashree Priyadharsini, Smiline Girija and Paramasivam, 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai *et al.*, 2019; Sridharan *et al.*, 2019; Vijayashree Priyadharsini, 2019; Chandrasekar *et al.*, 2020; Mathew *et al.*, 2020; R *et al.*, 2020; Samuel, 2021)

CONCLUSION

The loss of habitats, the modification of natural environments, and more generally the decline in biodiversity are all factors in the spread of emerging infectious diseases. As a global community, it is crucial to take steps to reduce the risk of future viral pandemics. The virus affects the children and older people, also the people who are immunocompromised and pregnant women. The present coronavirus pandemic can be controlled by avoiding gatherings, wearing masks and gloves, washing hands frequently, avoiding touch face and having social distancing. Pandemic causes loss of human resources, economic slowdown, mental stress of people. Conserving and maintaining nature and the benefits it provides is essential for preserving our health and well-being.

REFERENCES

1. Anderson, T. K. et al. (2020) 'Swine Influenza A Viruses and the Tangled Relationship with Humans', Cold Spring Harbor perspectives in medicine. doi: 10.1101/cshperspect.a038737.
2. Ashwin, K. S. and Muralidharan, N. P. (2015) 'Vancomycin-resistant enterococcus (VRE) vs Methicillin-

- resistant *Staphylococcus Aureus* (MRSA)', *Indian Journal of Medical Microbiology*, p. 166. doi: 10.4103/0255-0857.150976.
3. Bravo-Vasquez, N. et al. (2020) 'Risk factors and spatial relative risk assessment for influenza A virus in poultry and swine in backyard production systems of central Chile', *Veterinary medicine and science*. doi: 10.1002/vms3.254.
 4. Brookes, T. and Khan, O. A. (2005) *Behind the Mask: How the World Survived SARS, the First Epidemic of the 21st Century*. American Public Health Association.
 5. Chandrasekar, R. et al. (2020) 'Development and validation of a formula for objective assessment of cervical vertebral bone age', *Progress in orthodontics*, 21(1), p. 38.
 6. Chastagner, A. et al. (2019) 'Bidirectional Human-Swine Transmission of Seasonal Influenza A(H1N1)pdm09 Virus in Pig Herd, France, 2018', *Emerging infectious diseases*, 25(10), pp. 1940–1943.
 7. Collinson, S., Khan, K. and Heffernan, J. M. (2015) 'The Effects of Media Reports on Disease Spread and Important Public Health Measurements', *PLOS ONE*, p. e0141423. doi: 10.1371/journal.pone.0141423.
 8. 'COVID-19 Special Issue' (no date). doi: 10.18231/j.covid.100.
 9. Deogade, S., Gupta, P. and Ariga, P. (2018) 'Effect of monopoly-coating agent on the surface roughness of a tissue conditioner subjected to cleansing and disinfection: A Contact Profilometric In vitro study', *Contemporary Clinical Dentistry*, p. 122. doi: 10.4103/ccd.ccd_112_18.
 10. Dua, K. et al. (2019) 'The potential of siRNA based drug delivery in respiratory disorders: Recent advances and progress', *Drug development research*, 80(6), pp. 714–730.
 11. Duraisamy, R. et al. (2019) 'Compatibility of Nonoriginal Abutments With Implants: Evaluation of Microgap at the Implant-Abutment Interface, With Original and Nonoriginal Abutments', *Implant dentistry*, 28(3), pp. 289–295.
 12. Ezhilarasan, D. (2018) 'Oxidative stress is bane in chronic liver diseases: Clinical and experimental perspective', *Arab journal of gastroenterology: the official publication of the Pan-Arab Association of Gastroenterology*, 19(2), pp. 56–64.
 13. Ezhilarasan, D., Apoorva, V. S. and Ashok Vardhan, N. (2019) 'Syzygium cumini extract induced reactive oxygen species-mediated apoptosis in human oral squamous carcinoma cells', *Journal of oral pathology & medicine: official publication of the International Association of Oral Pathologists and the American Academy of Oral Pathology*, 48(2), pp. 115–121.
 14. Ezhilarasan, D., Sokal, E. and Najimi, M. (2018) 'Hepatic fibrosis: It is time to go with hepatic stellate cell-specific therapeutic targets', *Hepatobiliary & pancreatic diseases international: HBPD INT*, 17(3), pp. 192–197.
 15. Gheena, S. and Ezhilarasan, D. (2019) 'Syringic acid triggers reactive oxygen species-mediated cytotoxicity in HepG2 cells', *Human & experimental toxicology*, 38(6), pp. 694–702.
 16. Girija, A. S. S. et al. (2019) 'Plasmid-encoded resistance to trimethoprim/sulfamethoxazole mediated by *dfrA1*, *dfrA5*, *sul1* and *sul2* among *Acinetobacter baumannii* isolated from urine samples of patients with severe urinary tract infection', *Journal of Global Antimicrobial Resistance*, pp. 145–146. doi: 10.1016/j.jgar.2019.04.001.
 17. Girija As, S. and Priyadharsini J, V. (2019) 'CLSI based antibiogram profile and the detection of MDR and XDR strains of isolated from urine samples', *Medical journal of the Islamic Republic of Iran*, 33, p. 3.
 18. Girija, S. A. S., Jayaseelan, V. P. and Arumugam, P. (2018) 'Prevalence of VIM- and GIM-producing *Acinetobacter baumannii* from patients with severe urinary tract infection', *Acta Microbiologica et Immunologica Hungarica*, pp. 539–550. doi: 10.1556/030.65.2018.038.
 19. Gomathi, A. C. et al. (2020) 'Anticancer activity of silver nanoparticles synthesized using aqueous fruit shell extract of *Tamarindus indica* on MCF-7 human breast cancer cell line', *Journal of Drug Delivery Science and Technology*, p. 101376. doi: 10.1016/j.jddst.2019.101376.
 20. Hanafi, S. et al. (2012) 'Evaluation of treatment with Oseltamivir during the 2009 H1N1 (swine flu) pandemic: the problem of incomplete clinical information', *Health information management: journal of the Health Information Management Association of Australia*, 41(1), pp. 31–35.
 21. Hays, J. N. (2005) *Epidemics and Pandemics: Their Impacts on Human History*. ABC-CLIO.
 22. Heymann, D. L. (2005) 'The International response to the outbreak of SARS, 2003', *SARS*, pp. 92–95. doi: 10.1093/acprof:oso/9780198568193.003.0012.
 23. Hirpa, E. (2017) 'Review on Swine Flu and Status of Swine Flu in Ethiopia', *International Journal of Vaccines & Vaccination*. doi: 10.15406/ijvv.2017.04.00077.
 24. Hsieh, Y.-H. (2015) '2015 Middle East Respiratory Syndrome Coronavirus (MERS-CoV) nosocomial outbreak in South Korea: insights from modeling', *PeerJ*, p. e1505. doi: 10.7717/peerj.1505.
 25. Jackiewicz, D. et al. (2016) 'APPLICATION OF MAGNETOELASTIC EFFECTS FOR STRESS ASSESSMENT AND RISK MITIGATION IN CONSTRUCTIONS', *Journal of Engineering Studies and Research*. doi: 10.29081/jesr.v2i12.32.
 26. Jeevanandan, G. and Govindaraju, L. (2018) 'Clinical comparison of Kedo-S paediatric rotary files vs

- manual instrumentation for root canal preparation in primary molars: a double blinded randomised clinical trial', *European Archives of Paediatric Dentistry*, pp. 273–278. doi: 10.1007/s40368-018-0356-6.
27. J, P. C. et al. (2018) 'Prevalence and measurement of anterior loop of the mandibular canal using CBCT: A cross sectional study', *Clinical implant dentistry and related research*, 20(4), pp. 531–534.
 28. Kleinman, A. and Watson, J. L. (2006) *SARS in China: Prelude to Pandemic?* Stanford University Press.
 29. Kumar, S. (2016) 'A Study of Outbreak of Swine Flu (H1N1) in North - West Zone of Rajasthan (Current Status - 2015)', *The Journal of the Association of Physicians of India*, 64(7), pp. 46–49.
 30. Lal, S. K. (2010) *Molecular Biology of the SARS-Coronavirus*. Springer Science & Business Media.
 31. Laxminarayan, R. and Malani, A. (2011) 'Economics of Infectious Diseases', *The Oxford Handbook of Health Economics*, pp. 188–205. doi: 10.1093/oxfordhb/9780199238828.013.0009.
 32. Li, F. and Du, L. (2019) 'MERS Coronavirus: An Emerging Zoonotic Virus', *Viruses*, p. 663. doi: 10.3390/v11070663.
 33. Malli Sureshbabu, N. et al. (2019) 'Concentrated Growth Factors as an Ingenious Biomaterial in Regeneration of Bony Defects after Periapical Surgery: A Report of Two Cases', *Case reports in dentistry*, 2019, p. 7046203.
 34. Marickar, R. F., Geetha, R. V. and Neelakantan, P. (2014) 'Efficacy of Contemporary and Novel Intracanal Medicaments against *Enterococcus Faecalis*', *Journal of Clinical Pediatric Dentistry*, pp. 47–50. doi: 10.17796/jcpd.39.1.wmw9768314h56666.
 35. Mathew, M. G. et al. (2020) 'Evaluation of adhesion of *Streptococcus mutans*, plaque accumulation on zirconia and stainless steel crowns, and surrounding gingival inflammation in primary molars: Randomized controlled trial', *Clinical oral investigations*, pp. 1–6.
 36. McMillen, C. W. (2016) *Pandemics*. Oxford University Press.
 37. Mehta, M. et al. (2019) 'Oligonucleotide therapy: An emerging focus area for drug delivery in chronic inflammatory respiratory diseases', *Chemico-biological interactions*, 308, pp. 206–215.
 38. Menon, S. et al. (2018) 'Selenium nanoparticles: A potent chemotherapeutic agent and an elucidation of its mechanism', *Colloids and Surfaces B: Biointerfaces*, pp. 280–292. doi: 10.1016/j.colsurfb.2018.06.006.
 39. 'MERS outbreak' (2015) *Chemistry & Industry*, pp. 47–47. doi: 10.1002/cind.798_18.x.
 40. M, G., Geetha, M. and Seshadri, L. N. (2020) 'COVID-19: A "Violent" pandemic for health care workers in India', *COVID-19 Special Issue*, pp. 32–40. doi: 10.18231/j.ijirm.2020.023.
 41. M, M. A., Geetha, R. V. and Thangavelu, L. (2019) 'Evaluation of anti-inflammatory action of *Laurus nobilis*-an in vitro study', *International Journal of Research in Pharmaceutical Sciences*, pp. 1209–1213. doi: 10.26452/ijrps.v10i2.408.
 42. 'Most people who died with swine flu were previously healthy' (2010) *Nursing Standard*, pp. 16–17. doi: 10.7748/ns.24.51.16.s21.
 43. Olsen, C. W. (2002) 'The emergence of novel swine influenza viruses in North America', *Virus Research*, pp. 199–210. doi: 10.1016/s0168-1702(02)00027-8.
 44. Panchal, V., Jeevanandan, G. and Subramanian, E. M. G. (2019) 'Comparison of post-operative pain after root canal instrumentation with hand K-files, H-files and rotary Kedo-S files in primary teeth: a randomised clinical trial', *European archives of paediatric dentistry: official journal of the European Academy of Paediatric Dentistry*, 20(5), pp. 467–472.
 45. 'Pandemics' (no date) SpringerReference. doi: 10.1007/springerreference_306441.
 46. Paramasivam, A., Priyadharsini, J. V. and Raghunandhakumar, S. (2020) 'N6-adenosine methylation (m6A): a promising new molecular target in hypertension and cardiovascular diseases', *Hypertension Research*, pp. 153–154. doi: 10.1038/s41440-019-0338-z.
 47. Pc, J., Marimuthu, T. and Devadoss, P. (2018) 'Prevalence and measurement of anterior loop of the mandibular canal using CBCT: A cross sectional study', *Clinical implant dentistry and related research*. Available at: <https://europepmc.org/article/med/29624863>.
 48. Pokorski, M. (2017) *Respiratory System Diseases*. Springer.
 49. Prabakar, J. et al. (2018) 'Comparative Evaluation of Retention, Cariostatic Effect and Discoloration of Conventional and Hydrophilic Sealants - A Single Blinded Randomized Split Mouth Clinical Trial', *Contemporary clinical dentistry*, 9(Suppl 2), pp. S233–S239.
 50. Pratha, A. A., Ashwatha Pratha, A. and Geetha, R. V. (2017) 'Awareness on Hepatitis-B vaccination among dental students-A Questionnaire Survey', *Research Journal of Pharmacy and Technology*, p. 1360. doi: 10.5958/0974-360x.2017.00240.2.
 51. Priyadharsini, J. V. et al. (2018a) 'An insight into the emergence of *Acinetobacter baumannii* as an oral pathogen and its drug resistance gene profile – An in silico approach', *Heliyon*, p. e01051. doi: 10.1016/j.heliyon.2018.e01051.
 52. Priyadharsini, J. V. et al. (2018b) 'In silico analysis of virulence genes in an emerging dental pathogen *A. baumannii* and related species', *Archives of Oral Biology*, pp. 93–98. doi: 10.1016/j.archoralbio.2018.07.001.

53. Quinlan, T. and Whiteside, A. (2007) 'Social and economic impact of the HIV pandemic', *The HIV Pandemic*, pp. 36–49. doi: 10.1093/acprof:oso/9780199237401.003.0003.
54. Qureshi, A. I. (2016) 'Treatment of Ebola Virus Disease', *Ebola Virus Disease*, pp. 159–166. doi: 10.1016/b978-0-12-804230-4.00011-x.
55. Rajendran, R. et al. (2019) 'Comparative Evaluation of Remineralizing Potential of a Paste Containing Bioactive Glass and a Topical Cream Containing Casein Phosphopeptide-Amorphous Calcium Phosphate: An in Vitro Study', *Pesquisa Brasileira em Odontopediatria e Clínica Integrada*, pp. 1–10. doi: 10.4034/pboci.2019.191.61.
56. Rajeshkumar, S. et al. (2018) 'Biosynthesis of zinc oxide nanoparticles using *Mangifera indica* leaves and evaluation of their antioxidant and cytotoxic properties in lung cancer (A549) cells', *Enzyme and microbial technology*, 117, pp. 91–95.
57. Rajeshkumar, S. et al. (2019) 'Antibacterial and antioxidant potential of biosynthesized copper nanoparticles mediated through *Cissua arnotiana* plant extract', *Journal of photochemistry and photobiology. B, Biology*, 197, p. 111531.
58. Ramadurai, N. et al. (2019) 'Effectiveness of 2% Articaine as an anesthetic agent in children: randomized controlled trial', *Clinical oral investigations*, 23(9), pp. 3543–3550.
59. Ramakrishnan, M., Dhanalakshmi, R. and Subramanian, E. M. G. (2019) 'Survival rate of different fixed posterior space maintainers used in Paediatric Dentistry - A systematic review', *The Saudi dental journal*, 31(2), pp. 165–172.
60. Ramesh, A. et al. (2018) 'Comparative estimation of sulfiredoxin levels between chronic periodontitis and healthy patients - A case-control study', *Journal of periodontology*, 89(10), pp. 1241–1248.
61. *Respiratory Tract Infections—Advances in Research and Treatment: 2013 Edition* (2013). ScholarlyEditions.
62. R, H. et al. (2020) 'CYP2 C9 polymorphism among patients with oral squamous cell carcinoma and its role in altering the metabolism of benzo[a]pyrene', *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology*, pp. 306–312. doi: 10.1016/j.oooo.2020.06.021.
63. Samuel, S. R. (2021) 'Can 5-year-olds sensibly self-report the impact of developmental enamel defects on their quality of life?', *International journal of paediatric dentistry / the British Paedodontic Society [and] the International Association of Dentistry for Children*, 31(2), pp. 285–286.
64. Samuel, S. R., Acharya, S. and Rao, J. C. (2020) 'School Interventions-based Prevention of Early-Childhood Caries among 3-5-year-old children from very low socioeconomic status: Two-year randomized trial', *Journal of public health dentistry*, 80(1), pp. 51–60.
65. Saxena, S. K. (2020) *Coronavirus Disease 2019 (COVID-19): Epidemiology, Pathogenesis, Diagnosis, and Therapeutics*. Springer Nature.
66. Selvakumar, R. and Np, M. (2017) 'COMPARISON IN BENEFITS OF HERBAL MOUTHWASHES WITH CHLORHEXIDINE MOUTHWASH: A REVIEW', *Asian Journal of Pharmaceutical and Clinical Research*, p. 3. doi: 10.22159/ajpcr.2017.v10i2.13304.
67. Sen, S. et al. (2015) 'Management of swine flu (H1N1 Flu) outbreak and its treatment guidelines', *Community Acquired Infection*, p. 71. doi: 10.4103/2225-6482.166066.
68. Serradell, J. (2009) *Sars*. Infobase Publishing.
69. Shahana, R. Y. and Muralidharan, N. P. (2016) 'Efficacy of mouth rinse in maintaining oral health of patients attending orthodontic clinics', *Research Journal of Pharmacy and Technology*, p. 1991. doi: 10.5958/0974-360x.2016.00406.6.
70. Shahzan, M. S. et al. (2019) 'A computational study targeting the mutated L321F of ERG11 gene in *C. albicans*, associated with fluconazole resistance with bioactive compounds from *Acacia nilotica*', *Journal de Mycologie Médicale*, pp. 303–309. doi: 10.1016/j.mycmed.2019.100899.
71. Sharfstein, J. M. (2018) 'The Swine Flu of 1976', *Oxford Scholarship Online*. doi: 10.1093/oso/9780190697211.003.0004.
72. Sharma, P. et al. (2019) 'Emerging trends in the novel drug delivery approaches for the treatment of lung cancer', *Chemico-biological interactions*, 309, p. 108720.
73. Shaw, K. (2006) 'The 2003 SARS outbreak and its impact on infection control practices', *Public Health*, pp. 8–14. doi: 10.1016/j.puhe.2005.10.002.
74. Singh, M. K. and Neog, Y. (2020) 'Contagion effect of COVID -19 outbreak: Another recipe for disaster on Indian economy', *Journal of Public Affairs*. doi: 10.1002/pa.2171.
75. Smiline, A. S. G., Vijayashree, J. P. and Paramasivam, A. (2018) 'Molecular characterization of plasmid-encoded blaTEM, blaSHV and blaCTX-M among extended spectrum β -lactamases [ESBLs] producing *Acinetobacter baumannii*', *British Journal of Biomedical Science*, pp. 200–202. doi: 10.1080/09674845.2018.1492207.
76. Sridharan, G. et al. (2019) 'Evaluation of salivary metabolomics in oral leukoplakia and oral squamous cell carcinoma', *Journal of oral pathology & medicine: official publication of the International Association of*

- Oral Pathologists and the American Academy of Oral Pathology, 48(4), pp. 299–306.
77. Tasian, S. K. (2011) Swine Flu. The Rosen Publishing Group, Inc.
 78. Taylor, D. R. (2007) 'SARS: A Case Study in Emerging Infections. By Angela R McLean, Robert M May, John Pattison, and , Robin A Weiss. Oxford and New York: Oxford University Press. 132.00 (hardcover); 50.00 (paper). ix 133 p; ill.; index. ISBN: 0-19-856818-5 (hc); 0-19-856819-3 (pb). [Originating from a Royal Society Discussion Meeting first published in Philosophical Transactions of the Royal Society B.] 2005', *The Quarterly Review of Biology*, pp. 186–187. doi: 10.1086/519663.
 79. Taylor, S. (2019) *The Psychology of Pandemics: Preparing for the Next Global Outbreak of Infectious Disease*. Cambridge Scholars Publishing.
 80. 'UCSD Physician Discusses the 2009 H1N1 Swine Flu Virus, Symptoms and Prevention' (2009) SciVee. doi: 10.4016/11057.01.
 81. Vaishali, M. and Geetha, R. V. (2018) 'Antibacterial activity of Orange peel oil on Streptococcus mutans and Enterococcus-An In-vitro study', *Research Journal of Pharmacy and Technology*, p. 513. doi: 10.5958/0974-360x.2018.00094.x.
 82. Varghese, S. S., Ramesh, A. and Veeraiyan, D. N. (2019) 'Blended Module-Based Teaching in Biostatistics and Research Methodology: A Retrospective Study with Postgraduate Dental Students', *Journal of dental education*, 83(4), pp. 445–450.
 83. Vijayashree Priyadharsini, J. (2019) 'In silico validation of the non-antibiotic drugs acetaminophen and ibuprofen as antibacterial agents against red complex pathogens', *Journal of periodontology*, 90(12), pp. 1441–1448.
 84. Vijayashree Priyadharsini, J., Smiline Girija, A. S. and Paramasivam, A. (2018) 'In silico analysis of virulence genes in an emerging dental pathogen *A. baumannii* and related species', *Archives of oral biology*, 94, pp. 93–98.
 85. Vishnu Prasad, S. et al. (2018) 'Report on oral health status and treatment needs of 5-15 years old children with sensory deficits in Chennai, India', *Special care in dentistry: official publication of the American Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry*, 38(1), pp. 58–59.
 86. Von Lubitz, D. K. J. E. and Gibson, C. (2018) *Pandemics: The Nature of an Emerging Global Threat*. CRC Press.
 87. Wahab, P. U. A. et al. (2018) 'Scalpel Versus Diathermy in Wound Healing After Mucosal Incisions: A Split-Mouth Study', *Journal of oral and maxillofacial surgery: official journal of the American Association of Oral and Maxillofacial Surgeons*, 76(6), pp. 1160–1164.
 88. Wilson, R. (2018) *Epidemic: Ebola and the Global Scramble to Prevent the Next Killer Outbreak*. Brookings Institution Press.