American International University-Bangladesh (AIUB)

Publication on

SDG 3:
Good Health and Well-being

3 GOOD HEALTH AND WELL-BEING

Ensure healthy lives and promote well-being for all at all ages

SDG Activity Report on

SDG 3: Good Health and Well-being

Contents

University Activities

Faculty of Engineering (FE) organized a webinar titled "Terahertz technology applied in Microfluidics with lifesaving analysis in health industry"

The Faculty of Engineering (FE) at AIUB organized a webinar titled "Terahertz Technology applied in Microfluidics with life saving analysis in health industry" on Thursday, October 07, 2021 in Dhaka from 7:30 PM to 9:00 PM. The webinar was held on Zoom online platform and was joined by about 100 participants. Mr. Shahebul Hasan (Lecturer, EEE, AIUB) served as the moderator of the event. The webinar was inaugurated by Dr. ABM Siddique Hossain (Professor and Dean, Faculty of Engineering, AIUB). In his welcome speech, Prof. Hossain spoke about Japanese researchers' progress in studying human tissues on cell/molecular levels using Terahertz technology and the potential of such research for medical purposes.

The distinguished guest speaker of this webinar was prominent researcher Dr. Feroz Ahmed (Scientific Researcher, Okayama University, Okayama, Japan). At the start of his talk, Dr. Ahmed introduced the Advanced Electro-Measurement (AEM) Laboratory, which he is a part of and shared the contributions of AEM lab in developing biomedical engineering applications. Then, he offered a brief overview of Terahertz (THz) technology properties that make it suitable for spectroscopy and imaging and allow the detection of small water content fluctuations in chemical and biological substances like pH buffer solutions tissues and blood. Next, he discussed the practical necessity of visualization of flow of fluids through microflow channels and compared Terahertz Chemical Microscope (TCM) against conventional PSI and CCD camera methods. Dr. Ahmed also explained the comprising elements of TCM and its working principle, following up with a schematic demonstrating an experimental arrangement with TCM. In the latter half of the talk, the speaker provided the definition of Microfluidics and talked about their applications in experimental science and engineering where their micron level scale can be useful to capture cells, germs and nanoparticles. After sharing the 2D simulation result, Dr. Ahmed finally introduced the step-by-step fabrication process of Microfluidic chip on a sensing plate, going through Solidworks Isometric design, 3D printed structure, and the final chip made of PDMS (polydimethylsiloxane), and reported a good match between simulated and experimental results. He concluded the presentation with a summary of their current research work and future planned tasks.

After the end of the speech, there was a question-answer session where Dr. Ahmed responded to the questions raised by the audience. Dr. Toshihiko Kiwa (Professor, Faculty of Engineering, Okayama University, Okayama, Japan) from AEM lab also spoke a few words thanking the organizers and expressing interest in future collaborations. The closing remarks were provided by Dr. Mohammad Nasir Uddin (Senior Associate Professor, Head of the Graduate Program, Dept. of EEE). He expressed gratitude to Dr. Ahmed for his informative presentation and extended an invitation to him for future events organized by AIUB. The event was concluded by offering the

speaker a digital Certificate of Appreciation as a token of gratitude for sharing his valuable time and insight. Dr. Md. Abdur Rahman (Professor and Associate Dean, Faculty of Engineering, AIUB), Md. Abdul Mannan (Professor and Director, Faculty of Engineering, AIUB), Mr. Nafiz Ahmed Chisty (Associate Professor and Head In-Charge, Dept. of EEE, AIUB), and Mr. Md. Saniat Rahman Zishan (Associate Professor and Head, Dept. of CoE, AIUB) co-hosted the event.

A Webinar on 'Bringing Microbiology and Public Health under one Umbrella

Faculty of Business Administration, AIUB has arranged a Webinar on 'Bringing Microbiology and Public Health under one Umbrella: Breaking Barriers' that held on Sunday, 20 September 2020 at 4:00 pm. Dr. Samir Kumar Saha (Professor, Microbiology, Head, Diagnostic Division, Bangladesh Institute of Child Health, Dhaka Shishu Hospital) and Dr. Senjuti Saha (Scientist, Child Health Research Foundation, Bangladesh) were the Resource Speaker on the topic. A webinar started with the participants of Faculty members, Students of AIUB on the online platform of Zoom. Ms. Yesmin Sultana, Sr. Assistant Professor, Dept. of Marketing, FBA, AIUB coordinated the webinar.

Prof. Dr. Charles C. Villanueva (Vice President, Academics and *Dean, Faculty of Business, AIUB*) inaugurated the webinar by acknowledging the importance of Scientists, Researchers and Government's role in helping to cope up with the situation due to the pandemic COVID-19. He mentioned that practices and strategies, the other developing countries are following to address this pandemic situation and welcomed the speakers for their participation in the webinar.

During the speech, Dr. Samir Shaha mentioned that the core mission of CHRF, how to improve child health in Bangladesh and the regions, by facilitating appropriate policy decisions on treatment and preventions through research and advocacy. He has also mentioned how a sustainable model works for conducting high-quality research on infectious diseases in low-resource settings, particularly in a pandemic situation of SARS-Covid 19.

The another speaker Dr. Senjuti Saha, Scientist, Child Health Research Foundation, Bangladesh, shared her experience on leading decoding Genome of SARS-CoV2. She outlined that she and her organization believes that everyone across the world should have equal access to the practice and benefits of science. She further underscored that resilience and adaptability among Bangladeshis are high and it will help better in facing the challenges that beset the country. She also mentioned regrading Vaccination for different viral diseases and how BD can cope up with the present Covid-19 situation.

The webinar came to its end with a question answer session where the participants presented their queries. The resource speakers attended to the queries of the MPH students and other Faculty members. Lastly, Ms. Farheen Hassan (*Associate Professor, Director BBA program, FBA; and Additional Director, IQAC-AIUB*) conveyed her closing note and thus thanked the resource speakers and AIUB Management for arranging the webinar.

ARCHITECTURE ALUMNI INITIATES PROJECT "MUKTI-20"

COVID-19 is a noxious virus which has incarcerated our world. Because of this deadly virus mankind is going through one of the most challenging time in recent years. People are dying all over the world because of lack of preparedness and of limited resources. In such a crisis, two alumni of Department of Architecture, AIUB Md. Tauhidul Islam Rifat and Rahma Hassan (who graduated in 2015) using their professional knowledge and available resources came up with the idea of making a disinfectant chamber locally to help our country.. Currently Bangladesh has a shortage of Personal Protective Equipment (PPE) and medical chattels. The concept is to disinfect people 360 degrees in this chamber. Doctors and medical front liners can also easily disinfect their PPE inside this chamber and can carry on with their duty. A team of nine individuals with their expertise and professional knowledge worked together and came up with this project, named "MUKTI-20". The team led by Ar. Md. Tauhidul Islam Rifat and Ar. Rahma Hassan also consists of engineer Ahnaf Kafi (09 Batch, EEE Department, AIUB), pharmacist Jannat Tarin (current MPH Student, AIUB) ,Shihab-Uddin Sunny, Mithu Mohammad, Farhan Habib, engineer K M Khursheduzzaman Khan Levin and chemist Shonjoy. .

They have already consulted with DGHS for approval to install for a trial. After getting endorsement from all the authorities, they will go for the main production and installation. The targets are the hospitals dealing with Covid-19 patients, other general hospitals and in different public places such as bus terminal, rail station, police station, shopping malls, religious institutions along with other densely crowded places. They are currently working hard to raise funds to make it more efficient, portable and easy to install anywhere. They used local materials to make it more cost effective and easily available. Wastage can be minimized by using sensors thus making the whole process more efficient.

AIUB is proud that our students have taken such a great initiative to serve the country in her time of plight.

Hygiene Awareness Campaign 2020

In light of the growing global concerns of the novel Covid-19, the basic practices and awareness of hygiene has become of utmost importance, especially in Bangladesh, where culturally, usage of sanitizers and disinfectants are not that common in our day-to-day activities. With that in mind, the American International University – Bangladesh (AIUB) took on a collaborative initiative together with the proactive community of its student clubs. From the 8th of March 2020, the AIUB Social Welfare Club – 'Shomoy' ran a "Hygiene Awareness Campaign 2020", with the support of the AIUB Arts Club (AAC), AIUB Business Club (ABC), AIUB Computer Club (ACC), AIUB Community Engineering Students (ACES), AIUB Drama Club (ADC), AIUB Film Club (AFC), AIESEC in AIUB, AIUB Photography Club (AIUBPC), AIUB Oratory Club (AOC), AIUB Performing Arts Club (APAC), and the IEEE AIUB Student Branch. The campaign continued for almost 2 weeks, up until the university went virtual with online classes on the 20th of March 2020. Student volunteers from the clubs took up positions at the various entry points of the campus premises, on rotation throughout the day, where they ensured hand sanitization of every student and staff coming into the campus using alcohol-based hand rubs. They also provided everyone with information leaflets on the precautionary and prevention measures that should be taken to fight against the spread of the virus in the country, encouraging everyone to stay clean and safe amidst the pandemic. The combined efforts of all the student organizations not only aided the university with its numerous other initiatives in keeping the campus safe from transmission and contamination but instilled a strong sense of hygiene amongst the students and staff. The campaign has helped to develop a habit of cleanliness amongst everyone that will undoubtedly enable us, as an institution and a community, to overcome and prevail through these difficult times in the long run.

IEEE AIUB Student Branch organized a seminar on "Optical Fiber Sensing for Healthcare"

On 21st January 2020, IEEE AIUB Student Branch successfully organized a seminar titled "Optical Fiber Sensing for Healthcare" in collaboration with IEEE Engineering in Medicine and Biology Society, AIUB Student Branch Chapter and Faculty of Engineering, AIUB. The seminar was conducted by Ms. Nadia Afroze, *PhD Student, Optics and Photonics Research Group, Faculty of Engineering, University of Nottingham*.

The seminar was inaugurated by the opening remarks from Prof. Dr. A.B.M Siddique Hossain, *Dean, Faculty of Engineering, AIUB; Advisor, IEEE AIUB Student Branch* who talked about the importance of Optical Fibers and how its properties and structures have progressed significantly in recent times for the betterment of mankind. He discussed some of the useful properties of Optical Fibers along with its wide range of applications in recent times.

After that, the speaker Ms. Nadia Afroze took the stage and initiated the session by talking about Optical Fiber Sensors and its benefits compared to other sensors. She talked about a health issue known as Pressure Ulcers in details along with the sensor used for determining the presence of Pressure Ulcers. Later, she elaborately discussed the sensing mechanism, fabrication & calibration processes of such sensors. In addition, she discussed various environmental factors and health issues that cause variations on the performance of Optical Fiber CO_2 Sensors. The speaker ended the discussion with a question and answer session.

After that, Dr. Mohammad Hasan Imam, *Counselor, IEEE AIUB Student Branch; Advisor, IEEE Engineering in Medicine and Biology Society, AUIB Student Branch Chapter; Senior Assistant Professor, Faculty of Engineering, AIUB* delivered the concluding speech where he discussed about the wide range of applications of Optical Fibers in the Healthcare sector. He motivated the participants to consider Optical Fiber Systems for higher education due to its promising future. Later, Dr. Mohammad Hasan Imam presented a token of appreciation to Ms. Nadia Afroze. A group photo session was carried out which marked the end of the seminar. The seminar was graced by the presence of Ms. Tasnuva Tasneem, *WIE Coordinator and Motivator*, *IEEE AIUB Student Branch, Assistant Professor, Faculty of Engineering, AIUB* and Ms. Susmita Afroz, *Lecturer, Faculty of Engineering, AIUB*.

Distinguished Lecture Session titled "Development of a high Intensity Focal Ultrasound System for Treatment of Deep-Seated Brain Tumors" On 28th November 2019

On 28th November 2019, IEEE AIUB Student Branch in collaboration with IEEE Engineering in Medicine and Biology Society AIUB Student Branch Chapter, IEEE Bangladesh Section and Faculty of Engineering, AIUB organized a distinguished lecture session titled "Development of a high intensity focal ultrasound system for treatment of deep-seated brain tumors" at AIUB. The focus of the session was different ultrasound techniques used for advanced detection of Cancer and Tumor cells in the brain and other sensitive deep organs of the human body. The session was inaugurated by Dr. Mohammad Hasan Imam, Counselor, IEEE AIUB Student Branch; Advisor, IEEE EMBS AIUB Student Branch Chapter; Sr. Assistant Professor, Faculty of Engineering, AIUB where he gave an overview of IEEE AIUB Student Branch including different chapters those are associated with it, along with the achievements of this branch in recent years. Later, he discussed about the Engineering in Medicine and Biology Society (EMBS) chapter – its vision and the sectors that this chapter mainly focuses on. The session was conducted by Prof. Dr. V. R. Singh, Life fellow-IEEE, Associate Editor, IEEE-Transactions on Instrumentation and Measurement; Chair, IEEE Engineering in Medicine and Biology Society, Delhi National Physical Laboratory, where he shared his experiences with the participants. He discussed about Ultrasound imaging process for diagnosing human body abnormalities and the importance of using high and low power Ultrasound in Biomedical sector. He elaborately talked about various types of cancers and tumors as well as the techniques of diagnosing them successfully. Later, he talked about his research activities which include diagnostic scanners, therapeutic systems, safety standards and many more. In addition, he talked about the modern techniques for cancer diagnosis. He later introduced High Intensity focused Ultrasound technique for curing tumors and explained the ways it differs from other methods.

The closing speech was delivered by Prof. Dr. Md. Abdur Rahman, Advisor, IEEE AIUB Student Branch; Associate Dean, Faculty of Engineering, AIUB who talked about the importance of engineers for the betterment of humanity. He also talked about the gradual expansion of modern technologies and the necessities of using these technologies for successful treatment of human body. He concluded by thanking the honorable speaker and IEEE AIUB Student Branch for such an informative session. Later, Prof. Dr. Md. Abdur Rahman, Prof. Dr. Mohammad Abdul Mannan, Director, Faculty of Engineering, AIUB, Nafiz Ahmed Chisty, Department Head, EEE, Faculty of Engineering, AIUB, Md. Saniat Rahman Zishan, Advisor, IEEE AIUB Student Branch; Department Head, CoE, Faculty of Engineering, AIUB, Chowdhury Akram Hossain, Former Counselor, IEEE AIUB Student Branch; Sr. Assistant Professor, Faculty of Engineering, AIUB; Special Assistant, Office of Student Affairs (OSA) and Dr. Mohammad Hasan Imam presented a token of appreciation to the speaker Prof. Dr. V.R. Singh. The event was graced by the presence of faculty members of Department of EEE and CoE.

Seminar on 'Bioethics, Indigenous Knowledge and Global Public Health' Hosted by Department of Public Health

Department of Public Health Organized Seminar on 'Bioethics, Indigenous Knowledge and Global Public Health' on 21st November 2019. The key resource person of the seminar was Prof. Darryl Macer, President, American University of Sovereign Nations, Director; Eubios Ethics Institute (New Zealand, Japan, and Thailand) and Former UNESCO Regional Adviser. Professor Macer and his team have spent the day engaged in an interactive session with MPH students and faculties.

Prof. Anke Weisheit, AUSN Visiting Professor of Traditional Medicine, Chair Innovation & Business Management, Pharm-Bio Technology and Traditional Medicine Centre (PHARMBIOTRAC), Mbarara University of Science and Technology (MUST), Mbarara, Uganda have presented a paper on 'Establishment of a Traditional Medicine Centre and Hub for Entrepreneurship in Uganda.'

Prof. Ravichandran Moorthy, Ph.D., AUSN Visiting Professor of Strategic Studies & International Relations; Professor, National University of Malaysia (UKM), Malaysia; President, Asian Bioethics Association discussed on 'Universities as Hubs for Promotion of Human Security and International Relations'

Dr. Tahera Ahmed, Former Acting Chief, SRHR, UNFPA, disserted her Ph.D. thesis on 'Awareness and Need of Life Skills Education among Young People in Bangladesh' and Dr. Shahanaz Chowdhury, Associate Professor, Bangladesh University of Health Sciences talked about his work on' Perceptions on Health Insurance among Consumers in Bangladesh.'

Prof. Dr. Charles C. Villanueva, Vice President Academics, Dean; Faculty of Business Administration, Director; IQAC, AIUB, Prof Dr. Tazul Islam, Dean; Faculty of Arts and Social Sciences and Prof. Dr. Neaz Ahmad, Advisor, Department of Public Health glorified the session with their presence.

Seminar on 'Breast Cancer Awareness and Perspective in Bangladesh'

On Wednesday, 26 November 2019, the Blue Sky Charitable Foundation (BSCF) organized a Seminar on 'Breast Cancer Awareness and Perspective in Bangladesh' in the AIUB Auditorium.

Mr. Md. Mosharraf Hossain Bhuiyan, ndc, Senior Secretary, Internal Resource Division and Chairman, National Board of Revenue (NBR) was present as the Chief Guest of the seminar. Dr. Carmen Z Lamagna, Vice Chancellor, AIUB delivered her speech as the special guest. The seminar was chaired by Ms. Ayesha Siddiqua Shelley, Additional Commissioner of Taxes, Founder and Chief Adviser of The Blue Sky Charitable Foundation (BSCF). Dr. Sathi Khanom, Breast Cancer Specialist, The Blue Sky Charitable Foundation (BSCF) and Residential Surgeon, Mohanogor General Hospital presented the keynote of the seminar. Ms. Rubana Kafi Jharna, Adviser, BSCF delivered her speech as Panel Expert and Prof. Dr. Charles Villanueva, Vice President, Academics and Dean, Faculty of Business Administration AIUB delivered the vote of thanks at the end. AIUB Students, Faculty members and officials were present in the audience.

Dr. Carmen welcomed the NBR Chairman at AIUB and appreciated the efforts of BSCF for organizing a seminar on such a timely topic on one of the most relevant health issues. In her speech she also highlighted how breast cancer is not just a worry for females; but it affects male health and mentality as well. Dr. Sathi later presented an illustrated PowerPoint presentation on some relevant statistics, cause, awareness, detection, prevention and treatments of Breast Cancer in the country. Ms. Shelley informed the audience about BSCF's dedication in spreading the awareness of Breast Cancer in Bangladesh. She also expressed her vision of establishing a specialized Breast Cancer Hospital in the country. The panel expert Ms. Rubana expressed the current scenario of breast cancer in the country; how it effects not only a patient, also a family.

In his speech as the chief guest, Mr. Md. Mosharraf Hossain Bhuiyan acknowledged the efforts on BSCF in the field of Breast Cancer awareness. He also informed his affiliation with AIUB for long time and appreciated AIUB's successful contribution in the growth of country's higher education. He advised the students on two most important human attributes for ultimate success – honesty and dedication.

IEEE AIUB Student Branch organized the seminar titled "Success in Student Life & Engineering Ethics" through Meditation for Good Health and Well Being

On 23rd September 2019, IEEE AIUB Student Branch successfully organized a seminar on "Success in Student Life and Engineering ethics" in collaboration with Quantum Foundation at American International University – Bangladesh. The goal of the seminar was to inspire the young leaders of the generation towards meditation and present to them the harmful delicacies of today's society, which many of us enjoy and are getting addicted to unconsciously. The event was hosted by Mashrur Sakib Choyon, *Event Designer, IEEE AIUB Student Branch; Quanteer, Quantum Foundation*. In the beginning, he presented the usefulness of meditation and briefly explained the activities of Quantum Foundation and their work. After that, he demonstrated the consequences of being addicted to smartphones with a video clip and explained the harmful effects of using famous social apps too much.

Later, the chief guest and speaker, Mr. Pranjit Lal Shil, *Organier, Quantum Foundation* started the main session by stating two laws of life: Law of Attraction and Law of natural return. He shared his words of wisdom by portraying different motivational and interesting stories. He also explained how our thought process attracts whatever we think subconsciously and turn them into reality and how we can use the most powerful biological super-computer 'Brain' to achieve success. He encouraged the young leaders to never give up on their dreams and keep pursuing their engineering career for the betterment of society and the ones living in it. Mr. Pranjit advised the students to always stay in honest path to achieve peace and prosperity in life. The speaker also encouraged the attendees to avoid using smartphones for a prolonged period in a day and concentrate more on their real-life activities to reach their goal in life. Finally, he mentioned the usefulness of meditation in life. He then concluded his session with a short video which summarized the event and in details showed the movements of Quantum Foundation and their various activities which aided a lot of professionals in their daily life.

Lastly, Dr. Md. Hasan Imam, *Counselor, IEEE AIUB Student Branch; Senior Asst. Professor, Faculty of Engineering, AIUB* took the stage and discussed the constant dilemmas and obstacles of student life as well as the hurdle an engineer faces in the job sector. Then he concluded the event by presenting a token of appreciation and certificates to the chief guest and speaker. The event was graced by the presence of Kawshik Shikder, *Motivator, IEEE AIUB Student Branch; Advisor, IEEE MTTS AIUB SB Chapter; Asst. Professor, FE, AIUB.*

MEDICAL CAMP FOR AIUB FAMILY

On Sunday, 23 June 2019, the Department of Public Health organized a day-long Medical camp at the AIUB premise for AIUB students, Teachers, Officials and Staff. The Medical Camp was arranged in collaboration with the Universal Medical College and Hospital. More than two hundred fifty students, teachers, and staff received medical assistance from the Medical Camp in the form of BP/BMI checkup, Diet/ Nutrition Consultation, Eye Checkup, Primary Dental Care, Blood Sugar test and General Medicine Consultation.

The program was inaugurated by Professor Dr. Charles C. Villanueva, Vice President, Academics and Dean, Faculty of Business Administration, Professor Dr. Tazul Islam, Dean, Faculty of Arts and Social Sciences and Professor Dr. A. N. Neaz Ahmad, Advisor, Department of Public Health.

Dr. Carmen Z. Lamagna, the honorable Vice Chancellor, AIUB glorified the medical camp with her presence. Later, Dr. Carmen Z. Lamagna and Dr. Ashis Kumar Chakraborty, the Managing Director of Universal Medical College and Hospital discussed on the possibilities of future collaboration between two organizations.

The Medical Camp was coordinated by Ms. Monidipa Saha, Lecturer and Coordinator of the Department of Public Health with the assistance of 'AIUB Social Welfare Club - Shomoy.'

Campaign for Good Health and Well-being by MPH Students

A day-long field trip to Kashempur Upazila Health Complex, Gazipur was organized for the students of Master of Public Health on February 24, 2019. The field observation was organized to orient students with the health care system available at the grassroot level of Bangladesh. Later the students visited the Effluent Treatment Plant (ETP) of Delta Group of Industries on the same day to observe and assess its waste management system and safety measures of the factory workers.

Officials from the Community Health Center guided the students through their facilities and explained various aspects of their service. They explained issues like the type and number of clinic's patients, common treatments it provides, the referral systems, the training and development programs of the clinics, etc. There are approximately 12,815 clinics across the country that provide medical service to the patients free of cost. These are aided by the Government and Non-Government Organizations. Besides providing regular treatments, the Union Health Complexes (UHCs) organize weekly health sessions to raise awareness about Health, sanitation and basic diseases. UHC represent 31% of the government health sector. This underlines the importance of this service in the context of Bangladesh.

After the clinic visit, students toured the Delta Group of Industries Treat Plant to know about its purification process and safety measures of its workers. This is one of the first ever plants in the country to process industrial sludge before disposing those to rivers. Respective personnel from the factory explained the entire process as well as the protective measures taken for workers who are engaged with waste management.

The field trip was arranged and supervised by Prof. Dr. A N Neaz Ahmed, Advisor, MPH Program and Dr. Kapil Ahmed, Adjunct Faculty, MPH Program. They expressed their interest to organize more similar visits on a regular basis as these provide students with wonderful opportunities to relate the real scenario with the theoretical lessons they get in the classrooms. The Department of Public Health gratefully acknowledges the generous support of AIUB management for making the program a grand success.

Faculty Research and Publication

4P Model for Dynamic Prediction of COVID-19: a Statistical and Machine Learning Approach

Author: Md. Mortuza Ahmmed et al.

Brief Description:

Around the world, scientists are racing hard to understand how the COVID-19 epidemic is spreading and growing, thus trying to find ways to prevent it before medications are available. Many different models have been proposed so far correlating different factors. Some of them are too localized to indicate a general trend of the pandemic while some others have established transient correlations only. Hence, in this study, taking Bangladesh as a case, a 4P model has been proposed based on four probabilities (4P) which have been found to be true for all affected countries. Efficiency scores have been estimated from survey analysis not only for governing authorities on managing the situation (P(G)) but also for the compliance of the citizens ((P(P)). Since immune responses to a specific pathogen can vary from person to person, the probability of a person getting infected ((P(I)) after being exposed has also been estimated. And the vital one is the probability of test positivity ((P(T)) which is a strong indicator of how effectively the infected people are diagnosed and isolated from the rest of the group that affects the rate of growth. All the four parameters have been fitted in a non-linear exponential model that partly updates itself periodically with everyday facts. Along with the model, all the four probabilistic parameters are engaged to train a recurrent neural network using long short-term memory neural network and the followed trial confirmed a ruling functionality of the 4Ps.

Source: https://link.springer.com/article/10.1007/s12559-020-09786-6

Direct and indirect effects of COVID-19 on maternal and child health in Bangladesh

Author: Md. Mortuza Ahmmed et al.

Brief Description:

Bangladesh has been going through incremental trend of GDP growth rates for a long time. The GDP is the key aspect to measure the economic growth of a country. But the current world wide pandemic due to the COVID-19 hardly affects the world's economy as well as Bangladesh. The present lockdown make the wheel of the industries uncertain. The main source of the GDP of this country is ready made garment sector which has been shut down since mid of March 2020. Already 20 billion of cancellation of foreign order makes the situation worse. Also, the foreign remittance has been decline dramatically due to the loss of jobs of Bangladeshi workers in foreign countries. The overall economic situation declines in this country due to the COVID-19 which has

huge impact on the health care system especially in maternal and child health. In this paper, the economic situation of Bangladesh before and during the COVID-19 has been shown. Also, how the COVID-19 would affect the condition of maternal and child health across the country directly as well as indirectly through the GDP has been discussed.

Source: https://www.tandfonline.com/doi/abs/10.1080/09720510.2020.1833465

Disparities in Maternal and Newborn Health Interventions in Bangladesh: Evidence from the latest Demographic and Health Survey
Author: Md. Mortuza Ahmmed et al.

Brief Description:

Maternal and newborn healths are two important aspects of public health in a country. The objective of this study is to reveal the disparities in maternal and newborn health interventions the with respect to relevant socio-economic and demographic variables. Data from the Bangladesh Demographic and Health Survey (BDHS) - 2017 has been utilized to serve the purpose. The selection of variables has been done applying Grossman's model for Bangladesh viewpoint. Graphical analysis and frequency distributions have been constructed not only to see the patterns and trends of selected variables from 1995 to 2018, but also to reveal the required disparities among the variables. Urban mothers as well as their children have been found to be comparatively in safer health conditions than the rural ones. Visible variations have also been observed across different divisions in the country. The inequity ratios between women in the richest and poorest wealth quintiles have already reduced to the targeted level of the fourth Health Nutrition and Population Sector Program (HPNSP) taken by the government. Mothers with secondary or higher education have been found to be in better health conditions along with their newborns than mothers with primary or no education. Other than few exceptions, the likelihood of maternal and newborn health interventions has been found to be decreasing with age and increasing with birth order. Further research is needed to detect the roots of these inequalities so that effective initiatives could be taken by the government to reduce them and ensure improved maternal and newborn health status. Otherwise, the objective of an excellent initiative of the government like the HPNSP-2017 would not be accomplished.

Source: https://www.journal.atmph-specialissues.org/abstract.php?article_id=8533

COVID-19 and Demographic Perspectives: Evidence from Bangladesh, India, Pakistan, and Sri Lanka

Author: Md. Mortuza Ahmmed et al.

Brief Description:

Like many other parts in the world, many South Asian countries are currently experiencing the sternness of the unprecedented coronavirus disease 2019 (COVID-19) despite collaborative efforts taken by the respective governments under the umbrella of the South Asian Association for Regional Cooperation (SAARC). All of them have espoused obligatory policies including social distancing measures and lockdown to control the epidemic. In this paper, various demographic aspects of selected South Asian countries involving Bangladesh, Pakistan, India and Sri Lanka prior to the arrival of COVID-19 have been studied. In addition, the trends of COVID-19 cases in these countries along with death rates, recovery rates, sex and age distributions of the detected positive cases have been analyzed. Furthermore, the probable demographic consequences of COVID-19 in these South Asian nations have been discussed. Data from a number of sources have been utilized for the analytical purpose of the study. Finally, some recommendations are given for the corresponding authorities working in relevant sectors in these South Asian countries.

Source:

https://www.oeaw.ac.at/fileadmin/subsites/Institute/VID/PDF/Conferences/2020/COVID19/Posters/3.5_mortuza.pdf

Prospective Impacts of COVID-19 on Fertility and Mortality Rates in Bangladesh

Author: Md. Mortuza Ahmmed et al.

Brief Description:

Background: Bangladesh is presently facing the austerity of the unique coronavirus disease 2019 (COVID-19) despite various steps taken by the government including social distancing measures and lockdown to curb the epidemic.

Objective: To assess the probable effects of COVID-19 on fertility and mortality rates in Bangladesh.

Methods: Data from the Sample Vital Registration System 2018 (SVRS) have been used for analytical purpose. Pearson's correlation coefficients along with test of associations have been

performed using SPSS (Statistical Package for Social Science). Statistical significance has been determined as p-value ≤ 0.05.

Results: Statistically significant strong positive correlation between TFR and MMR and strong negative correlation between vaccination coverage and child mortality rate have been found. GDP is the key feature to assess the economic growth of a nation. A highly significant regression coefficient of - 0.73 specifies that one-unit decline in GDP would result in 0.73 unit rise in MMR on average. So, as the COVID-19 existence extends in the country, the GDP will incessantly drop leading into greater threat of maternal mortality. A highly significant regression coefficient of - 0.83 specifies that one-unit decline in GDP would result in 0.83 unit rise in CMR on average. Henceforth, the elongating COVID-19 existence in the country would result in unremitting GDP decline leading into higher hazard of child mortality.

Conclusion: Results of this study have presented an overview regarding the possible impacts of COVID-19 on fertility and mortality rates in Bangladesh. The status of fertility and mortality rates has been on improving trends before COVID-19 arrival, but COVID-19 would hold back the improvement for sure. Effective measures must be adopted and implemented immediately to safeguard maternal and child health for future.

Keywords: TFR, MMR, CMR, GDP, COVID-19.

Source: https://www.facebook.com/watch/live/?ref=watch_permalink&v=433330331038936

Covid-19: Myths and Some Possible Arguments in Favors or in Contradictions
Author: Dr. Ashraf Uddin et al.

Brief Description:

COVID-19 has reached to an unimaginable height with several heterogeneous affect on the society and on our regular lives with respect to personal, social, mental, emotional, and economical parameters. To date, most of its physiognomies are not well-known to scientists and researchers. Several studies are being developed round the year to clearly understand the features of the disease. In addition, the lack of authentic information regarding corona virus has led to misinformation and myths in the society. However, myths and misconceptions do not remain myths when people start believing those by hearts despite any strong scientific backing. This study explores such trendy myths with possible arguments and facts. Myths widespreaded in the developing countries as well as mentioned by the World Health Organization (WHO) are critically analysed in this study. Precisely, the study also reveals the risks or gains attained by practicing those myths to fight COVID-19 pandemic. Total 17 COVID-19 related myths have been critically analysed to infer 3 major hypotheses by this study. Finally, the study concludes that legal

steps and mass awareness campaigns against or for those myths must be introduced immediately to combat corona virus outbreak. To mention that, when the paper is being written, April-May, 2020, the world is suffering by the devastating Covid-19 pandemic as well as no vaccine or medicine has yet been invented. Furthermore, the paper may help the fellow researchers to deal with the similar diseases with similar symptoms.

Source: http://ijmshr.com/uploads/pdf/archivepdf/2021/IJMSHR_231.pdf

Major challenges in combating epidemics like COVID-19 in the developing countries
Author: Dr. Ashraf Uddin et al.

Brief Description:

Source: On the rise of the COVID-19epidemic, the developing countries have been struggling severely due to heterogeneous challenges. This paper aims to identify those challenges and to find possible causes to help future disease control and management especially during such epidemics. The challenges are not straight forward rather these are results of inadequate medical facilities, disruptive mismanagement in the government ecosystem, financial strength, social problem and the list goes on. This paper is based on report, data and other studies from various sources. We observed that many problems are inter-linked and mainly results of lower economy. Some other problems like political issues, lack of awareness, superstitions are inherited social problems. This paper also discusses about the root causes which create and stimulate the problems. For the ongoing identified problems some precautions have been advised.

Source: http://ijmscrr.in/index.php/ijmscrr/article/view/113/78

Effect on human health by residues of commonly used pesticides in vegetables cultivation
Author: Prof. Dr. S. Mosaddeq Ahmed et al.

Brief Description:

People in Bangladesh are over scared for toxicity of vegetables & fruits because of the educational level of the farmers is not up to the mark, farmers apply pesticides randomly on agricultural fields without maintaining pre-harvest intervals and dose. The aim of this work was to study dissipation pattern of some pesticides in some vegetables kept at room temperature which represent market condition and to identify and quantify pesticides applied on some vegetables. By interviewing the farmers three commonly used pesticides; cypermethrin, chlorpyrifos and fenvalerate were sprayed in the farmer's fields of the western part of Bangladesh. Samples were extracted by QuEChERS method, cleaned-up by adsorption chromatography technique, and analyzed by GC-ECD. Recoveries were found to be between 87-

107% with RSD lower than 10% at three spiking levels. Matrix matched calibration curves were linear for all the analytes with r2 ≥ 0.99. LODs were found to be 0.01 mg/kg for cypermethrin and 0.002 mg/kg for both of fenvalerate and chlorpyrifos. The samples of same cultivar's variety were purchased from the markets of Savar, Mymemsingh and Cumilla. Our finding showed only the presence of cypermethrin in tomato but the values were below MRL and no pesticide residue was found in eggplant.

Source: http://ajse.aiub.edu/index.php/ajse/article/view/68

Effect on Human Health by Residues of Commonly Used Pesticides in Vegetables Cultivation

Author: Dr. Mohammad Tariqul Islam et al.

Brief Description:

Abstract—People in Bangladesh are over scared for toxicity of vegetables & fruits, because the educational level of the farmers is not up to the mark. Farmers apply pesticides randomly on agricultural fields without maintaining pre-harvest intervals and dose. The aim of this work was to study dissipation pattern of some pesticides in some vegetables kept at room temperature which represent market condition and to identify and quantify pesticides applied on some vegetables. By interviewing the farmers, three commonly used pesticides; cypermethrin, chlorpyrifos and fenvalerate were sprayed in the farmer's fields of the western part of Bangladesh. Samples were extracted by QuEChERS method, cleaned-up by adsorption chromatography technique, and analyzed by GC-ECD technique. Recoveries were found to be between 87-107% with RSD lower than 10% at three spiking levels. Matrix matched calibration curves were linear for all the analytes with r2 ≥ 0.99. LODs were found to be 0.01 mg/kg for cypermethrin and 0.002 mg/kg for both of fenvalerate and chlorpyrifos. The samples of the same cultivar's variety were purchased from the markets of Savar, Mymensingh and Cumilla. Our finding showed only the presence of cypermethrin in tomato but the values were below MRL and no pesticide residue was found in eggplant.

Source: http://ajse.aiub.edu/index.php/ajse/index

Coping Strategies of University Students during Social Isolation for Covid-19 Pandemic in Bangladesh

Author: Samia Shabnaz et al.

Brief Description:

This paper identifies and analyses the university students' coping strategies due to social isolation during the COVID-19 pandemic. The research work undertakes three studies to empirically test

and validate a multidimensional measure that can be used to identify ways university students have coped during the pandemic. The three-study process involves qualitative interviews to extend the issues identified within the literature, followed by two studies using principal component analysis and confirmatory factor analysis; each using separate samples (409 for study 1 and 346 for study 2), to test the reliability and validity of the proposed eight dimensional 26-item scale. Data from university students of Bangladesh was collected using a 5 point Likert scale. Data entry and analysis were done with the statistical software SPSS version 20. The article is unique as it has identified factors which are applicable to cope with the stress resulting out of social isolation during Covid-19 pandemic in Bangladesh. The factor study included factors and statements from numerous studies in addition to contributing few of its own. The study will benefit mental health practitioners, counselors and academicians to develop strategies by understanding students' perspective to intervene and guide them so as to enhance their mental health condition.

Source: http://arfjournals.com/ijabms

Sources of Stress and Coping Strategies of University Students During Covid-19 Pandemic
Author: Samia Shabnaz et al.

Brief Description:

This study seeks to explore the sources of stress and identify the coping strategies employed by university students during the Covid-19 pandemic in Bangladesh. Methodology: The study uses an online self-administered structured questionnaire to collect data from 409 university students through snowball sampling. Descriptive statistics, Cronbach's alpha, and cross-tabulation were used for the data analysis. Findings: The paper highlights the significant sources of stress and related coping strategies. It identifies that males are more stressed than females in isolation and financial uncertainty. Moreover, with respect to coping strategies, it is observed that females use some coping mechanisms (household chores, completing assignments, personal hygiene, relaxation exercises, learning new skills, destroying things, screaming and crying) more than their male counterparts. Value: To help ensure sound mental health conditions, this study benefits psychologists, counselors and academicians to develop strategies for university students to cope with the stress during Covid-19 pandemic.

Source: https://ajbe.aiub.edu/index.php/ajbe/issue/view/ajbe172

COVID-19: Risk Analysis in South Asia with Respect to Europe and North America
Author: Dr. Kamruddin Nur et al.

Brief Description:

Coronavirus Disease 2019 (COVID-19) was identified in late 2019 and world health Organization (WHO) declared as a pandemic on March 11, 2019. World top researchers, physician and pharmacists are trying to find out remedy but it is still in research phase. COVID-19 spread through the air by coughing or sneezing also depends on environment. In this paper, our main goal is to COVID-19 threat analysis in South Asian people based on their habits, culture, consciousness etc. compare to Europe and North American culture. The research work is formulated in three steps. First, we formulate a dynamic infection transmission model by considering the fertility rate, mortality rate, transmission rate, and cure rate of the COVD-19 caused death rate as variables. Second, we define the variables of the model based on the census of south Asia. Finally, we analyze the threat that COVID-19 can cause to the population of crowded country likes Bangladesh, India etc. in south Asia.

Source: https://ajse.aiub.edu/index.php/ajse/article/view/19

Covid-19: Myths and Some Possible Arguments in Favors or in Contradictions
Author: MD. MANZURUL HASAN et al.

Brief Description:

COVID-19 has reached to an unimaginable height with several heterogeneous affect on the society and on our regular lives with respect to personal, social, mental, emotional, and economical parameters. To date, most of its physiognomies are not well-known to scientists and researchers. Several studies are being developed round the year to clearly understand the features of the disease. In addition, the lack of authentic information regarding corona virus has led to misinformation and myths in the society. However, myths and misconceptions do not remain myths when people start believing those by hearts despite any strong scientific backing. This study explores such trendy myths with possible arguments and facts. Myths widespreaded in the developing countries as well as mentioned by the World Health Organization (WHO) are critically analysed in this study. Precisely, the study also reveals the risks or gains attained by practicing those myths to fight COVID-19 pandemic. Total 17 COVID-19 related myths have been critically analysed to infer 3 major hypotheses by this study. Finally, the study concludes that legal steps and mass awareness campaigns against or for those myths must be introduced immediately to combat corona virus outbreak. To mention that, when the paper is being written, April-May, 2020, the world is suffering by the devastating Covid-19 pandemic as well as no vaccine or medicine has yet been invented. Furthermore, the paper may help the fellow researchers to deal with the similar diseases with similar symptoms.

Source: http://ijmshr.com/uploads/pdf/archivepdf/2021/IJMSHR_231.pdf

করোনা, হার্ড ইম্যুনিটি এবং বাংলাদেশ বাস্তবতা (Corona, Hard Immunity and Bangladesh Reality)

Author: Md. Anwarul Kabir et al.

Brief Description:

হার্ড ইম্যুনিটি বলতে 'শক্ত রোগ প্রতিরোধ ক্ষমতা' বোঝায় না। ইংরেজিতে herd শব্দের অর্থ 'ভেড়ার পাল'। ভেড়ার পালের মতোন ছেড়ে দাও সবাইকে, যারা শক্ত-সামর্থ্য এবং প্রচণ্ড রোগপ্রতিরোধ ক্ষমতার অধিকারী তারাই প্রকৃতি এবং রোগজীবাণুর সাথে যুদ্ধ করে শেষটায় টিকে থাকবে। মোদ্দা কথা 'survival of the fittest' বা যোগ্যতমরাই শেষটায় টিকে থাকবে এটিই হার্ড ইম্যুনিটির মূলমন্ত্র।

কোন একটি সমাজে কোন ভাইরাস দ্বারা হার্ড ইম্যুনিটি পর্যায়ে যেতে হলে সেখানকার অন্তত ৭০ থেকে ৮০ ভাগ মানুষকে সংক্রমিত হতে হবে এবং এক পর্যায়ে ভাইরাস তেমনভাবে কাউকে সংক্রমণ করার সুযোগ পাবে না। হার্ড ইম্যুনিটি অর্জন করা যায় দুভাবে। প্রথমত ভ্যাকসিনেশন বা সেই ভাইরাসের প্রতিরোধী টিকা প্রদানের মাধ্যমে এবং দ্বিতীয়ত ভাইরাসটি দ্বারা সবাইকে সংক্রমিত হওয়ার আবহ সৃষ্টি করে দিয়ে। যেহেতু করোনার টিকা উদ্ভাবন এখনো সুদূর পরাহত, এ মুহূর্তে হার্ড ইম্যুনিটি অর্জন করতে চাইলে আমাদেরকে দ্বিতীয় পন্থাকেই বেছে নিতে হবে।

মহামারির এই ক্লান্তিলগ্নে পৃথিবীর সিংহভাগ দেশই করোনা নিয়ন্ত্রণে বিশ্ব স্বাস্থ্য সংস্থার নির্দেশনা মানছে না, কিংবা বলা যেতে পারে তাদের পক্ষে মানা সম্ভব হচ্ছে না। বিশ্ব স্বাস্থ্য সংস্থার নির্দেশনা- করোনাকে পরাভূত করতে এবং প্রাণহানি কমাতে হলে করোনা টেস্টের হার বাড়িয়ে সংক্রমিত ব্যক্তিবর্গকে নিরাময় না হওয়া পর্যন্ত সঙ্গনিরোধ করে রাখতে হবে এবং সেইসাথে দেশটিকে পুরোপুরি লকডাউনে রাখতে হবে সংক্রমিত রোগীর সংখ্যা মুষ্টিমেয় না হওয়া পর্যন্ত। কমিউনিস্ট দেশ ভিয়েতনাম, কিউবা, উত্তর কোরিয়া, চিন এবং কল্যাণকামী রাষ্ট্র নরওয়ে, নিউজিল্যান্ড বিশ্বব্যাংকের নির্দেশনা মোতাবেক প্রতিরোধ কার্যক্রম চালিয়ে করোনা নিয়ন্ত্রণে ইতোমধ্যেই সাফল্য অর্জন করেছে। সৌদি আরবও বিশ্ব স্বাস্থ্য সংস্থার নির্দেশনা মোতাবেক কঠোর লক ডাউন তথা জনগণের চলাফেরা নিয়ন্ত্রণের জন্য সান্ধ্যআইন জারি করেছে। আশা করা যায় তারা অচিরেই এর সুফল পাবে। তবে যুক্তরাষ্ট্রসহ ইউরোপের শীর্ষ পুঁজিবাদী দেশগুলো (যেমন যুক্তরাজ্য, জার্মান, ফ্রান্স, সুইডেন, স্পেন, ইতালি) বিশ্ব স্বাস্থ্য সংস্থার নির্দেশনা অনুযায়ী চলছে না। এইসব দেশগুলো ইতোমধ্যেই করোনায় প্রাণনাশের সংখ্যা অসংখ্য হওয়া সত্ত্বেও লকডাউন তুলে দিয়ে হার্ড ইম্যুউনিটির পথে হাঁটার সিদ্ধান্ত নিয়ে ফেলেছে। এ বিষয়ে তাদের যুক্তি, করোনার কারণে দীর্ঘ মেয়াদে অর্থনীতির চাকা থামিয়ে রাখলে পরবর্তীতে যে আর্থিক ধস নামবে তা সামাল দেওয়া তাদের পক্ষে সম্ভব হবে না। মূলত পুঁজিবাদী বিশ্বে রাষ্ট্রের হাতে যথেষ্ট পরিমাণ টাকা কিংবা সম্পদ সঞ্চিত থাকে না যা দিয়ে দেশের জনগণকে খাদ্য নিরাপত্তা দেয়া সহ অপরাপর মৌলিক চাহিদা মিটিয়ে মাসের পর মাস চালাতে পারবে। সত্যিকার অর্থে পুঁজিবাদী দেশগুলোতে টাকা বা সম্পদের প্রায় নব্বই ভাগের মালিক সংখ্যালঘু ধনিকশ্রেণি এবং মুনাফালোভী এই শ্রেণি জনকল্যাণে টাকা ব্যয়করণের কথা ভাবতে পারে না। অধিকন্তু লকডাউনের কারণে ব্যবসা-বাণিজ্যে তাদের যে 'লোকসান' হচ্ছে তা তারা মেনে নিতে পারছে না। বস্তুত এরাই সরকারগুলোকে বাধ্য করছে লকডাউন তুলে দিয়ে হার্ড ইম্যুনিটি নীতি গ্রহণ করতে।

উপমহাদেশের দেশগুলোতে এখন চলছে লুটেরা পুঁজিপতিদের আধিপত্য। লকডাউনের কারণে এই সব মুনাফালোভী লুটেরা পুঁজিবাদী গোষ্ঠী তাদের আপাত আর্থিক ক্ষতি যে কোন মূল্যেই পুষিয়ে নেওয়ার জন্য তৎপর। বাংলাদেশে পোশাক কারখানায় মালিকদের ভূমিকা আমার এ বক্তব্যের সাক্ষর বহন করে। করোনা সংক্রমণ যখন ক্রমান্বয়ে বেড়েই চলছে সে মুহূর্তে পোশাক শ্রমিকদের জীবনের তোয়াক্কা না করে তারা সরকারকে কারখানাগুলো খুলে দিতে বাধ্য করেছে। শুধু তাই নয়, সরকার ঘোষিত 'সাধারণ ছুটি'-তে অনুপস্থিতির কারণে তাদের প্রাপ্য বেতনের একটি ভাগ তারা কর্তন করেছে। অধিকন্তু সরকারের প্রতিশ্রুতি শ্রমিকদের জন্য প্রদেয় আর্থিক প্রণোদনা আত্মসাৎ করার জন্য মালিকপক্ষ উদগ্রীব হয়ে রয়েছে।

পুঁজিপতি তথা ধনিকশ্রেণি ভাবছে হার্ড ইম্যুনিটিতে তারা বেঁচে যাবে যেহেতু তারা দেহের ইম্যুনিটি বাড়াতে যথাযথ পুষ্টিকর খাদ্য গ্রহণ করতে পারে, ব্যয়বহুল পিপিই ব্যবহার করতে পারবে, এবং একান্তই যদি সংক্রমিত হয়ে পড়ে তাহলে তারা অর্থের জোরে উচ্চতর চিকিৎসা নিয়ে সুস্থ হয়ে উঠবে। এ প্রসঙ্গে ভারতের স্বনামধন্য লেখক ও সোশ্যাল এক্টিভিস্ট অরুন্ধতীর রায় বলেছেন হার্ড ইম্যুনিটির মূলমন্ত্র 'survival of the fittest'-কে ধনিক শ্রেণিরা ' survival of the richest' করে তুলবে।

তবে বাংলাদেশের করোনা সংক্রমণ এবং এর প্রতিক্রিয়া পর্যবেক্ষণ করলে অরুন্ধতীর আশংকা কতোটুকু সত্য হবে তা নিশ্চিত করে বলা যায় না। এদেশে এখন পর্যন্ত করোনায় কিংবা করোনার লক্ষণ নিয়ে যারা মারা গেছেন তাদের উল্লেখযোগ্য একটি অংশ মধ্যবিত্ত থেকে উচ্চবিত্ত শ্রেণিরই অন্তর্গত। আনুপাতিকহারে নিম্নবিত্ত তথা গরীব মানুষ যারা পুষ্টিকর খাদ্য খাওয়ার সুযোগ কম পায় তাদের রোগ প্রতিরোধ ক্ষমতা কম থাকার কথা। এ বিবেচনায় দেশে সংখ্যাগুরু নিম্নবিত্তের মানুষদের মৃত্যুর হার অনেক বেশি হওয়ায় কথা ছিল। কিন্তু বাস্তব চিত্র ভিন্নতর। তাৎক্ষণিক পরিসংখ্যানে প্রতীয়মান হয় যে সংখ্যা অনুপাতে করোনা কিংবা করোনা লক্ষণে নিম্নবিত্তের মৃত্যুর হার ততো বেশি নয়। এর কার্যকারণ সম্ভবত জীবিকার কারণে দৈনন্দিন জীবনে এদের কায়িকশ্রমে অংশগ্রহণ, যা রোগ প্রতিরোধ ক্ষমতা বৃদ্ধির সহায়ক। এছাড়া খেটেখাওয়া মানুষেরা প্রকৃতির খুব কাছাকাছি থাকায় তাদের দেহে এক ধরণের

প্রাকৃতিক রোগপ্রতিরোধ ক্ষমতা জন্ম নেয় যা তাদের করোনা প্রতিরোধে সাহায্য করেছে। তবে একথা উল্লেখ করা প্রয়োজন যে নিম্নবিত্তদের পক্ষে সঙ্গতকারণে করোনা আক্রমণ রোধে সামাজিক দূরত্ব রক্ষা করা সম্ভব হবে না, তারা করোনায় সংক্রমিত হবে অনেক বেশি, তবে সহজে কাবু হবে না তাদের প্রাকৃতিক রোগ প্রতিরোধ ক্ষমতার কারণেই। একই সাথে এটাও উল্লেখ করা প্রয়োজন, এদের মাঝেই করোনা সংক্রমিত হবে উচ্চহারে এবং কার্যত এরা করোনার বাহক হয়ে অন্যদেরকে সংক্রমিত করবে।

ব্যতিক্রমকে নিয়মের ব্যত্যয় হিশেবে বিবেচনা করলে মধ্যবিত্ত থেকে উচ্চবিত্ত শ্রেণির জনগোষ্ঠীকে কায়িক শ্রম করতে হয় না এবং এদের বেশিরভাগই যথাযথ শরীর চর্চা করে থাকে না। এছাড়া কার্যক্ষেত্রে এবং বাসস্থানে এই দুই শ্রেণির মানুষের বেশিরভাগ প্রকৃতির খোলামেলা আবহাওয়ায় থাকার সুযোগ পায় না, বরং বেশিরভাগ সময়ই এরা শীতাতপ নিয়ন্ত্রিত বদ্ধঘরে সময় অতিবাহিত করে। এর ফলশ্রুতিতে এই দুই শ্রেণির লোকের প্রাকৃতিক ইম্যুনিটি জন্ম নেয়ার সুযোগ ঘটে না। তাই করোনায় আক্রান্ত হলে তাদের শারীরিক অবনতি এবং মৃত্যুর আশঙ্কা অনেক বেশি হবে বলে ধারণা করা যায়। আরেকটি বিষয় উল্লেখযোগ্য, বয়স্কলোক, যাদের রোগ প্রতিরোধ করার ক্ষমতা খুবই কম এবং যারা ইতোমধ্যেই নানা ঘাতকরোগে আক্রান্ত (যেমন ক্যান্সার, হৃদরোগ, ডায়াবেটিস, কিডনিব্যাধি ইত্যাদি) করোনায় আক্রান্ত হলে এদের মৃত্যুর ঝুঁকি সবচেয়ে বেশি।

উপমহাদেশে এবং বিশেষ করে বাংলাদেশে হার্ড ইম্যুনিটি প্রসঙ্গে আরও একটি বিষয় আলোচনা করা প্রাসঙ্গিক। বিশেষজ্ঞদের অভিমত উপমহাদেশে সংক্রমিত করোনা চীন, আমেরিকা, কিংবা ইউরোপ থেকে ভিন্নতর। মিউটেশনের কারণে এদের জিনগত পরিবর্তনে মানবদেহে এরা তুলনামূলক মারাত্মক আঘাত কম হানবে। তাই যদিও জাতিসংঘের গোপন নথিতে বাংলাদেশে কনভিড-১৯ তে ২০ লাখ লোক মারা যাবে বলে আশংকা করা হয়েছে, বাস্তবে এই সংখ্যা হয়তো অনেক কম হবে। আমার ধারণা এই সংখ্যা ১০ থেকে ১৫ হাজারের মধ্যে সীমাবদ্ধ থাকবে।

Source: https://www.sylhettoday24.news/news/details/Column/100099

Automatic quantification of HER2 gene amplification in invasive breast cancer from chromogenic in situ hybridization whole slide images

Author: Hossain Md Shakhawat et al.

Brief Description:

Human epidermal growth factor receptor 2 (HER2), a transmembrane tyrosine kinase receptor encoded by the ERBB2 gene on chromosome 17q12, is a predictive and prognostic biomarker in invasive breast cancer (BC). Approximately 20% of BC are HER2-positive as a result of ERBB2 gene amplification and overexpression of the HER2 protein. Quantification of HER2 is performed routinely on all invasive BCs, to assist in clinical decision making for prognosis and treatment for HER2-positive BC patients by manually counting gene signals. We propose an automated system to quantify the HER2 gene status from chromogenic in situhybridization (CISH) whole slide images (WSI) in invasive BC. The proposed method selects untruncated and nonoverlapped singular nuclei from the cancer regions using color unmixing and machine learning techniques. Then, HER2 and chromosome enumeration probe 17 (CEP17) signals are detected based on the RGB intensity and counted per nucleus. Finally, the HER2-to-CEP17 signal ratio is calculated to determine the HER2 amplification status following the ASCO/CAP 2018 guidelines. The proposed method reduced the labor and time for the quantification. In the experiment, the correlation coefficient between the proposed automatic CISH quantification method and pathologist manual enumeration was 0.98. The p-values larger than 0.05 from the one-sided paired t-test ensured that the proposed method yields statistically indifferent results to the reference method. The method was established on WSI scanned by two different scanners. Through the experiments, the capability of the proposed system has been demonstrated.

Source: https://www.spiedigitallibrary.org/journals/journal-of-medical-imaging/volume-6/issue-4/047501/Automatic-quantification-of-HER2-gene-amplification-in-invasive-breast-cancer/10.1117/1.JMI.6.4.047501.full

Application of whole tissue imaging by Micro-computed tomography for the evaluation of Endoscopic Submucosal dissection specimens 3

Author: Hossain Md Shakhawat et al.

Brief Description:

Background: The precise pathological diagnosis of endoscopic submucosal dissection (ESD) specimens is essential in determining subsequent therapy. However, the current pathological diagnosis involves the evaluation of two-dimensional images of cross-sections of resected specimens, which only evaluates a small part of the tumor. Micro-computed tomography (micro-CT) can non-destructively provide three-dimensional reconstructed whole specimen imaging. The aim of this study was to clarify whether micro-CT was able to provide sufficient pathological information in the evaluation of ESD specimens. Methods: We scanned fresh or formalin-fixed ESD specimens for 10 to 15 minutes using a custom-made micro- CT scanner (Nikon Metrology NV, Leuven, Belgium) after staining them with 10% iodine for 60 to 180 seconds. All paraffin blocks after making slides stained with hematoxylin-and-eosin were also subjected to micro-CT scanning. Reconstructed imaging data were visualized and analyzed using Dragonfly (Object Research Systems Inc, Montreal, Quebec, Canada). We evaluated the extent of the lesion and the presence of the lesion at the resection margin by correlating the reconstructed images obtained from fresh or formalin-fixed specimens with those from Whole Block Imaging (WBI) and whole slide imaging (WSI). Results: A total of 9 ESD specimens [1 gastric intramucosal cancer, 3 colorectal (1 intramucosal, 2 submucosal) cancer, and 5 colorectal adenomas] were scanned by micro-CT. The matching cross- section slices between the WSI, the fresh specimen, and the WBI are shown in Figure 1. All reconstructed micro-CT images allowed for clear visualization of tissue structure, differentiation between tumor and non-tumor tissue, and the presence of the lesion at the resection margin with the same findings observed on the WSI. However, the micro-CT image of the fresh specimen failed to detect the site of submucosal invasion in one case of submucosal-invasive cancer. The WBIs were able to detect the extent of submucosal invasion in more detail and three-dimensional than WSI. Conclusions: Our results suggest that a combination of whole tissue imaging by micro-CT and conventional histology could provide a more accurate diagnosis of ESD specimens. For clinical application, it is desirable to improve the visibility of fresh and formalin-fixed specimens.

Source: https://www.pathologyinformatics.org/docs/12_Hirotsugu_Sakamoto_PROP32310581-Pathology_Informatics_Summit_2021_ESD_51.pdf

A feasibility study in the automated quantification of HER2 gene amplification in breast cancer using chromogenic in situ hybridization whole slide images

Author: Hossain Md Shakhawat et al.

Brief Description:

Background: HER2 gene amplification is seen in up to 20% of breast cancers (BC). HER2 is a predictive and prognostic biomarker in BC and accurate assessment of the HER2 status is essential. Advantages of CISH compared to FISH include use of a light microscope, appreciation of morphology and lower cost; however, manual evaluation is labor intensive and time consuming. We aim to study the practicality of automated quantification of HER2 CISH on whole slide images (WSI). Design: Thirty-five cases of invasive or metastatic BC with prior IHC and/or FISH testing were randomly selected to include Groups 1 and 5 FISH cases categorized by the 2018 ASCO/CAP guidelines. Subsequent manual assessment by dual-probe CISH was performed and categorized as Groups 1 to 5. CISH slides were scanned at 40x (0.13 um/pixel) by P250 and P1000 3DHistech (Hungary). Regions of interest (ROI) containing invasive cells were manually annotated and analyzed with SHIMARIS PACQ V1.2 (in-house application) for automated enumeration of CISH probes and HER2 status classification. The manual CISH results were compared to the automated CISH results. Results: Automated evaluation was performed on 35 cases, including 26 (74%) excisions/mastectomies, and 9 (25%) biopsies. 28 cases were primary diagnoses, and 7 were metastases/recurrences. The mean age was 55 years old (range 30-83). Histologic subtype was: 28 (80%) ductal, 6 (17%) mammary, and 1 (3%) classic lobular. Of 27 cases with a documented grade, 15 were poorly, 1 moderate-poorly, 10 moderately, and 1 was well differentiated. Automated CISH was concordant with manual CISH in 33/35 (94%) cases (Table 1). One case had a HER2/CEP17 ratio of 2.00 and HER2 copy number (CN) per nuclei of 4.92 by manual, representing a borderline case for Group 1 or 4, and 1.72 ratio and 4.21 HER2 CN (Group 4) by automated CISH. Another case showed a 3.46 ratio and 7.95 HER2 CN by manual (Group 1), and 3.19 ratio and 3.87 HER2 CN by automated CISH (Group 2). This case showed overlapping of nuclei, occasional tissue section folding, and weak CEP17 signal. (Table presented) Conclusions: We have demonstrated the feasibility of automated HER2 CISH evaluation. Automated HER2 CISH has excellent concordance with manual CISH. Careful assessment of ROI, tissue processing, and signal intensity is necessary and emphasizes the importance of morphologic correlation in CISH. Further study in the automated platform could provide clinical efficiencies and may enable automated analysis in other tumors (i.e. gastric) using HER2 prognostication.

Source: https://www.cochranelibrary.com/central/doi/10.1002/central/CN-02132945/full

Statistical analysis of meteorological parameters for the spread of COVID-19 in Japan

Author: Hossain Md Shakhawat et al.

Brief Description:

It has been widely hoped yet contentious that the variation in meteorological parameters will either slow or fast the spread of COVID-19. Hence, this study aimed to observe the relation between five meteorological parameters (temperature, humidity, wind speed, air pressure, sunshine hours) and the escalation of COVID-19 cases. We compiled a daily dataset including 12,898 confirmed positive cases (CPC) (https://www.stopcovid19.jp/), average temperature, average relative humidity, average wind speed, average air pressure, and sunshine hours (http://www.data.jma.go.jp/obd/stats/etrn/index.php) for top six prefectures infected with COVID-19 in Japan: Tokyo, Osaka, Kanagawa, Saitama, Hokkaido, and Chiba separately during the period of February 1st to June 30th, 2020. At first, we measured the correlation of each parameter with the CPC and found a low correlation for all (for all cases: Pearson correlation statistic $< \pm 0.20$; Fig. 1a). Then, we utilized PCA (principal component analysis) and t-SNE (t-distributed stochastic neighbor embedding) methods to visualize the linear and non-linear relationships, respectively, between the parameters and the CPC. For this purpose, the CPC was categorized as "Low spread" if it was less than 11, otherwise as "High spread". The data dimension was reduced to two for visualization. The t-SNE was optimized with a perplexity of 30, learning rate of 200 and in 100 iterations. No differentiating pattern was observed between the categories in PCA (Fig. 1b) and t-SNE (Fig. 1c) to associate the parameters in the spread of COVID-19. Lastly, the multivariate regression analysis was performed to predict the CPC for a day in which all the predictors failed to show their significance (R Square 0.008) of contribution in the model. The results of our experiments suggest that there is no association between the five meteorological parameters and the spread of COVID-19. This study did not consider other meteorological, climatological, and environmental parameters such as ultraviolet exposure at the surface, precipitation, air quality. Hence, further studies with a longer follow-up period and wider meteorological parameter range are warranted.

Source: https://www.researchgate.net/profile/Md-Islam-fahim/publication/342957099_Statistical_analysis_of_meteorological_parameters_for_the_spread_of_COVID-19_in_Japan/links/5f0f1f5e299bf1e548b71bb6/Statistical-analysis-of-meteorological-parameters-for-the-spread-of-COVID-19-in-Japan.pdf

Assessment of HER2 amplification in invasive breast cancer from CISH using digital and computational pathology

Author: Hossain Md Shakhawat et al.

Brief Description:

Background: HER2 gene amplification is seen in up to 20% of breast cancer and has prognostic and therapeutic indications. Fluorescent in situ hybridization (FISH) and chromogenic in situ hybridization (CISH) are the standard assays to determine the HER2 amplification status, the latter utilizing a bright-field microscope. CISH is evaluated by counting at least 20 cancer nuclei manually according to the American Society of Clinical Oncology (ASCO)/College of American Pathologists (CAP) guidelines. However, this process is time prohibitive. The purpose of this study is to develop an automated system to quantify the HER2 amplification status by CISH whole slide images (WSI), utilizing digital image analysis techniques. Technology: A model was created to mirror the ASCO/CAP HER2 guidelines. It detected singular (non-overlapping) nuclei and identified HER2 and chromosome enumeration probe 17 (CEP17) signals per nuclei from the annotated regions. The method utilized color unmixing and machine learning techniques for nuclei detection. HER2 and CEP17 signals were detected based on RGB intensity and counted for each nucleus where CEP17≥2 and HER2>CEP17. Methods: Patient specimens diagnosed with invasive breast carcinoma with prior immunohistochemistry (IHC) and FISH analysis were randomly selected. Subsequent manual assessment of CISH was performed. CISH whole slide images were generated at 40x (0.13 um/pixel) by the P250 3DHistech scanner. Subspecialty breast pathologists annotated regions containing invasive tumor cells. Then, the developed model quantified 20 nuclei with the highest differentiation values (HER2-CEP17). Finally, HER2 status was determined based on the HER2/CEP17 ratio. Additionally, another 20 nuclei were quantified if the ratio was =>1.8 and <=2.2. Results: The proposed method was compared with manual CISH counting in terms of HER2/CEP17 ratio for 13 cases. The correlation coefficient was 0.97, which indicates the efficacy of the proposed method to quantify HER2 amplification automatically. Table 1 (next page) shows the HER2 status of 9 positive and 4 negative cases by IHC, FISH, manual CISH, and automatic CISH quantification. Conclusions: The proposed methodology has a high concordance with manual quantification. In the future, cancer regions will be detected automatically using deep learning. The final system will enable automatic cancer detection followed by the automatic quantification of HER2 amplification.

Source:

https://s3.amazonaws.com/pathologyinformatics.org/2019/Wednesday/SA_Shakhawat.mp4

Automatic quantification of HER2 amplification in invasive breast cancer using chromogenic in situ hybridization (CISH) and computational pathology

Author: Hossain Md Shakhawat et al.

Brief Description:

Background & Objectives: HER2 gene amplification has prognostic and therapeutic indications in breast cancer. Fluorescent in situ hybridization (FISH) and CISH are the standard assays to determine the amplification status. CISH is evaluated by counting at least 20 cancer nuclei manually, according to the American Society of Clinical Oncology (ASCO)/College of American Pathologists (CAP) guidelines. However, this process is time prohibitive. We propose a system to quantify the HER2 amplification status automatically from CISH whole slide images (WSI) using computational pathology Methods: Breast pathologists annotated tumour regions from CISH WSI at 40x (0.13 um/pixel).We detected singular nuclei using machine learning from annotations, then HER2 and CEP17 signals based on RGB intensity. Our model mirrors the ASCO/CAP guidelines. We assessed CEP17≥ nuclei where 2 and HER2>CEP17, then quantified 20 nuclei with highest (HER2-CEP17) differentiation values. Finally, the HER2 ratio status was determined as amplified if HER2/CEP17 ≥2.0 or nonamplified if <2.0. Additionally, another 20 nuclei were quantified if the ratio was ≥1.8 and ≤2.2. Results: We randomly selected 13 patient specimens that were diagnosed with invasive breast carcinoma with prior immunohistochemistry and FISH. Then quantified the 13 cases using the proposed method which

included 9 positive and 4 negative cases. Results of the proposed automatic quantification were compared with pathologists manual CISH counting. The correlation coefficient between the manual and automatic CISH ratio was 0.97 which indicates the efficacy for the proposed method. Conclusion: The proposed method has a high concordance with manual quantification. In the future, invasive cancer regions will be detected using deep learning and the final system will enable automatic annotation of cancer regions followed by the automatic quantification.

Source: http://cpo-media.net/ECP/2019/Congress-Presentations/1587/-Unlicensed-Hossain_Automatic%20HER2%20quantification_ECP%202019.pdf

The Art and Artists in the Time of the Catastrophe

Author: MD. NIAZ MAJUMDAR et al.

Brief Description: Here ART not only just mean drawing, painting or sculpture. I mean "all kinds of creative art" and it includes various creative activities mainly through painting, sculpture, film, literature, poetry, theater, music (including journalism) etc. and their personal or collective contribution to any major crisis.

Heartbeat Sensor System for Remote Health Monitoring
Author: Wardah Saleh et al.

Brief Description:

This paper portrays a heartbeat sensor system with a database connection to the hospital which would be part of a project called heartbeat sensor for the hospital management with database connection. The database stores the entire details of the patient which enables the doctor to monitor the patient accordingly via the web app. The heartbeat sensor device with a database links to the hospital network is beneficial to patients and the community where the introduction of such a device can reduce the risk of the patient as well as save hospital bills, waiting time and reduce hospital traffic. Wireless sensors for heart rate and body temperature are incorporated in the proposed health monitoring program but this paper focuses only on heartbeat sensors for hospital management with a database communication system. Arduino is the primary element that is convoluted in this project. This paper highlights the sensor health monitoring system which establishes a selection model for sensor automation to find the least informative, cost-effective sensor component and builds an energy-efficient, automated detection scheme based on the sensor selective method.

Source: https://www.ijcaonline.org/archives/volume174/number15/31755-202192103

A Deep Learning Approach to Smart Refrigerator System with the assistance of IoT
Author: Shahrin Chowdhury et al.

Brief Description:

Smart refrigerator refers to refrigerators that are capable of taking decisions without human interactions. It takes decision with the help of sensors as perception medium and software as the logical decision maker. The main challenge set for this work was to make it cost efficient so that anyone can own this smart refrigerator. As a result this work focuses on developing a smart refrigerator which uses minimum amount of sensors to perceive its surroundings and maximum efficiency from software to make up for the lack of sensors and intelligent decision making. Also this work uses convolutional neural network architecture and transfer learning technique, Inception V3 pre-trained model to detect the items present in the refrigerator and make a decision. It shows faster precision performance with less consumption of other resources. This work mainly focuses on developing a theoretical model of proposed refrigerator which will automate our daily refrigerator activity with a small demonstration of the proposed model with developing a CNN model that can detect food. This paper describes the work process in detail followed by found result and future improvements.

Source: https://dl.acm.org/doi/10.1145/3377049.3377111

Design and Implementation of a Smart Surveillance and Automation System for Patients
Author: Nafiz Ahmed Chisty et al.

Brief Description:

Patient negligence and harassment have become a common phenomenon now-a-days. To reduce this incident "Smart Surveillance and Automation system for patient" have been built. The system's aim is to provide the patient security while maintain the patient's privacy as well as provide an automated bed at a cheap price. This surveillance system starts recording once it detects a face and it also has a facial expression recognition system installed that recognizes the caregiver's expression. This feature can detect up to seven expressions (anger, disgust, happy, sadness, being surprised, fear and neutral). This feature allows this system to also be a performance evaluator if desired by the person hiring the caregiver. This surveillance system is built with the technology of Computer vision. Python language and its library such as numpy, keras has been used to program the detection of face and facial expression. This system also starts recording the audio if the system cannot detect a face but detects a loud noise. To provide further security it also has a panic button that can alert the patient's relative that he is in danger. The bed that is also a part of the system can move its upper side to provide comfort for the patient. This automated bed should ease some pressure on the caregiver as the patients can do the movement with the bed by themselves. As this is a prototype model further development is needed to add new feature in order to improve this systems efficiency and fortify the security provided by the system.

Source:
http://ecc.journalspub.info/index.php?journal=JPECC&page=article&op=view&path%5B%5D=1374

Effect on Human Health by Residues of Commonly Used Pesticides in Vegetables Cultivation
Author: Dr. Farzana Khalil et al.

Brief Description:

People in Bangladesh are over scared for toxicity of vegetables & fruits because of the educational level of the farmers is not up to the mark, farmers apply pesticides randomly on agricultural fields without maintaining pre-harvest intervals and dose. The aim of this work was to study dissipation pattern of some pesticides in some vegetables kept at room temperature which represent market condition and to identify and quantify pesticides applied on some vegetables. By interviewing the farmers three commonly used pesticides; cypermethrin, chlorpyrifos and fenvalerate were sprayed in the farmer's fields of the western part of Bangladesh. Samples were extracted by QuEChERS method, cleaned-up by adsorption chromatography technique, and analyzed by GC-ECD. Recoveries were found to be between 87-107% with RSD lower than 10% at three spiking levels. Matrix matched calibration curves were

linear for all the analytes with r2 ≥ 0.99. LODs were found to be 0.01 mg/kg for cypermethrin and 0.002 mg/kg for both of fenvalerate and chlorpyrifos. The samples of same cultivar's variety were purchased from the markets of Savar, Mymemsingh and Cumilla. Our finding showed only the presence of cypermethrin in tomato but the values were below MRL and no pesticide residue was found in eggplant.

Source: https://ajse.aiub.edu/index.php/ajse/article/view/68

On body E-shaped patch antenna for Biomedical Application

Author: Sujan Howlader et al.

Brief Description:

An E-shaped micro strip patch antenna is designed and analyzed in this paper which operates in MICS (402.0-406.0MHz) band. The Performance has been observed on a body of human phantom model as well as in free space with different conducting material for the designed antenna. The height of this antenna is taken 1.5mm from the ground plane. At resonance frequency of 405 MHz the S11 parameter is obtained in free space is -23.26dB for conducting material of aluminum and -17.96dB is measured on human phantom body at 405 MHz of resonance frequency. FR4 is used as substrate material. The Specific Absorption Rate (SAR) is found to be 0.3562 W/kg by placing the antenna on human phantom model. VSWR and directivity has been analyzed also.

Source: http://section.iaesonline.com/index.php/IJEEI/article/view/516

A Design of an IoT based Smart Home with Auto Sanitization System

Author: Sujan Howlader et al.

Brief Description:

Internet of Things (IoT) is the connection between devices by the use of the internet. IoT conducts logical operations by which data is transmitted and processed in the cloud. Structural improvement and modernization are required. This paper focuses on advancing IoT technology by creating an automated sani-tization device that could have been used to protect health by sanitizing the home's inner surface. Smart homes with auto sanitization can be a blueprint for reducing the transmission rate of COVID-19. It can also be an example of a cost-effective and time-saving approach to have a clean, comfortable, and happy liv-ing life. Smart home with an auto sanitization system had proposed a fog disin-fection machine, NodeMCU, Arduino Uno, and various sensors to create the pro-totype. This device can be used on the internet via a mobile application from anywhere in the world.

Source: https://smartcom.sched.com/event/inxg/a-design-of-an-iot-based-smart-home-with-auto-sanitization-system?iframe=no

Proof-of-Familiarity: A Privacy-Preserved Blockchain Scheme for Collaborative Medical Decision-Making

Author: MD. MEHEDI HASSAN ONIK et al.

Brief Description:

The current healthcare sector is facing difficulty in satisfying the growing issues, expenses, and heavy regulation of quality treatment. Surely, electronic medical records (EMRs) and protected health information (PHI) are highly sensitive, personally identifiable information (PII). However, the sharing of EMRs, enhances overall treatment quality. A distributed ledger (blockchain) technology, embedded with privacy and security by architecture, provides a transparent application developing platform. Privacy, security, and lack of confidence among stakeholders are the main downsides of extensive medical collaboration. This study, therefore, utilizes the transparency, security, and efficiency of blockchain technology to establish a collaborative medical decision-making scheme. This study considers the experience, skill, and collaborative success rate of four key stakeholders (patient, cured patient, doctor, and insurance company) in the healthcare domain to propose a local reference-based consortium blockchain scheme, and an associated consensus gathering algorithm, proof-of-familiarity (PoF). Stakeholders create a transparent and tenable medical decision to increase the interoperability among collaborators through PoF. A prototype of PoF is tested with multichain 2.0, a blockchain implementing framework. Moreover, the privacy of identities, EMRs, and decisions are preserved by two-layer storage, encryption, and a timestamp storing mechanism. Finally, superiority over existing schemes is identified to improve personal data (PII) privacy and patient-centric outcomes research (PCOR). View Full-Text

Source: https://www.mdpi.com/2076-3417/9/7/1370

Covid-19: Myths and Some Possible Arguments in Favors or in Contradictions

Author: MD. MEHEDI HASSAN ONIK et al.

Brief Description:

COVID-19 has reached to an unimaginable height with several heterogeneous affect on the society and on our regular lives with respect to personal, social, mental, emotional, and economical parameters. To date, most of its physiognomies are not well-known to scientists and researchers. Several studies are being developed round the year to clearly understand the features of the disease. In addition, the lack of authentic information regarding corona virus has led to misinformation and myths in the society. However, myths and misconceptions do not remain myths when people start believing those by hearts despite any strong scientific backing. This study explores such trendy myths with possible arguments and facts. Myths widespreaded in the developing countries as well as mentioned by the World Health Organization (WHO) are critically analysed in this study. Precisely, the study also reveals the risks or gains attained by

practicing those myths to fight COVID-19 pandemic. Total 17 COVID-19 related myths have been critically analysed to infer 3 major hypotheses by this study. Finally, the study concludes that legal steps and mass awareness campaigns against or for those myths must be introduced immediately to combat corona virus outbreak. To mention that, when the paper is being written, April-May, 2020, the world is suffering by the devastating Covid-19 pandemic as well as no vaccine or medicine has yet been invented. Furthermore, the paper may help the fellow researchers to deal with the similar diseases with similar symptoms.

Source: http://ijmshr.com/uploads/pdf/archivepdf/2021/IJMSHR_231.pdf

Blockchain in Healthcare: Challenges and Solutions
Author: MD. MEHEDI HASSAN ONIK et al.

Brief Description:

The main challenge in distributing electronic health records (EHRs) for patient-centered research, market analysis, medicine investigation, healthcare data mining etc., is data privacy. Handling the large-scale data and preserving the privacy of patients has been a challenge to researchers for a long period of time. On the contrary, blockchain technology has alleviated some of the problems by providing a protected and distributed platform. Sadly, existing electronic health record (EHR) management systems suffer from data manipulation, delayed communication, and trustless cooperation in data collection, storage, and distribution. This chapter discusses the current issues of healthcare data privacy and existing and upcoming regulations on this sector. This chapter also includes an overview of the architecture, existing issues, and future scope of blockchain technology for successfully handling privacy and management of current and future medical records. This chapter also presents few blockchain solutions that advocate the future research scopes in healthcare, big data, and blockchain.

Source: https://www.sciencedirect.com/science/article/pii/B9780128181461000088

Infrared Sensor Controlled Wheelchair for Physically Disabled People
Author: Nadia Nowshin et al.

Brief Description:

The advancements in the automation of wheelchairs have been a major topic of research over the last few decades. Automated wheelchairs have many features such as gesture control, obstacle avoidance, automatic speed control but the control of wheelchairs using Infrared sensors and sending mobile message through a push button on the chair has yet to be seen. In this paper, the design of an automated wheelchair for people suffering from total or partial paralysis is presented. This wheelchair design allows self-control using an Infrared Sensor and a

microcontroller (Arduino Uno) based circuitry with emergency message transmitting systems. This design will not only prevent stress on the body during movement in all four directions but will also be accessible by low income households. From an environmental aspect, this eco-friendly design utilizes solar PV technology to charge the 12 V battery that powers the motors of the wheelchair. There is always a concern of safety for paralysis patients, so this design includes a GSM based emergency system that allows a message to be sent to the user's emergency contacts. The entire setup is done through a normal wheelchair with DC motors and a control unit consisting of IR sensor, Arduino Uno, GSM module, buzzer, relay and a 12 V battery with a solar PV charging unit with a charge controller.

Source: https://link.springer.com/chapter/10.1007/978-3-030-02683-7_60

Association of maternal obesity with fetal and neonatal death: Evidence from South and South-East Asian countries

Author: Rezwanul Haque et al.

Brief Description:

Background

Obesity prevalence is increasing in many countries in the world, including Asia. Maternal obesity is highly associated with fetal and neonatal deaths. This study investigated whether maternal obesity is a risk factor of fetal death (measured in terms of miscarriage and stillbirth) and neonatal mortality in South and South-East Asian countries.

Methods

This cross-sectional study pooled the most recent Demographic and Health Surveys (DHS) from eight South and South-East Asian countries (2014–2018). Multivariate logistic regression was deployed to check the relationships between maternal obesity with fetal and neonatal deaths. Finally, multilevel logistic regression model was employed since the DHS data has a hierarchical structure.

Results

The pooled logistic regression model illustrated that maternal obesity is associated with higher odds of miscarriage (adjusted odds ratio [aOR]: 1.26, 95% CI: 1.20–1.33) and stillbirths (aOR: 1.46, 95% CI: 1.27–1.67) after adjustment of confounders. Children of obese mothers were at 1.18 (aOR: 1.18, 95% CI: 1.08–1.28) times greater risk of dying during the early neonatal period than mothers with a healthy weight. However, whether maternal obesity is statistically a significant risk factor for the offspring's late neonatal deaths was not confirmed. The significant association between maternal obesity with miscarriage, stillbirth and early neonatal mortality was further confirmed by multilevel logistic regression results.

Conclusion

Maternal obesity in South and South-East Asian countries is associated with a greater risk of fetal and early neonatal deaths. This finding has substantial public health implications. Strategies to prevent and reduce obesity should be developed before planning pregnancy to reduce the fetal and neonatal death burden. Obese women need to deliver at the institutional facility centre that can offer obstetrics and early neonatal care.

Source: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0256725

Willingness to receive COVID-19 vaccination among adults with chronic diseases in the Kingdom of Saudi Arabia

Author: Rezwanul Haque et al.

Brief Description:

Background

People with chronic conditions such as cancer, kidney disease, lung disease, diabetes, dementia, obesity, and heart conditions are at elevated risk of developing severe complications, and are thus at greater risk of death due to COVID-19. The COVID-19 vaccine is an effective measure to manage the pandemic as it prevents severe illness and death. Nevertheless, many people are hesitant to receive the COVID-19 vaccine due to fear of its side effects. The aim of this study was to identify the risk and protective factors of accepting COVID-19 vaccination among Saudi Arabian people with chronic diseases.

Methods

This study extracted data from an online cross-sectional self-reported questionnaire conducted on the acceptability of a COVID-19 vaccine in Saudi Arabia in December 2020. The study included a sample of 521 adults who self-reported that they had chronic diseases. Multivariable regression analyses were employed to identify the factors associated with accepting COVID-19 vaccination in Saudi Arabia. The estimates were adjusted for confounding variables, including socio-demographic factors.

Results

Among the sampled participants of Saudi adults with chronic diseases, approximately 52% indicated that they were willing to accept the COVID-19 vaccine. Participants had higher willingness to accept the vaccine if they received the seasonal influenza vaccination in the past [odds ratio (OR): 2.179; 95% confidence interval (CI): 1.222–3.888], reported high or very high levels of concern about contracting COVID-19 (OR: 2.426; 95% CI: 1.209–4.867), or believed in mandatory COVID-19 vaccination (OR: 84.848; 95% CI: 37.651–191.207). Participants had lower willingness to be vaccinated if they had a history of vaccine refusal (OR: 0.211; 95% CI: 0.088–

0.504). Among the socio-demographic factors, being male (OR: 2.153; 95% CI: 1.007–4.603), having a postgraduate degree (OR: 2.408; 95% CI: 0.985–5.886), and being unemployed (OR: 2.780; 95% CI: 0.876–8.827) were associated with an increased willingness of receiving the COVID-19 vaccine.

Conclusions

The findings of this study demonstrate that willingness to receive COVID-19 vaccination among Saudi Arabian adults with chronic conditions is low. Therefore, further policy measures are required to manage COVID-19–related infections and the death toll.

Source: https://www.sciencedirect.com/science/article/pii/S1876034121002203?via%3Dihub

New Algorithm For Detection of Spinal Cord Tumor using OpenCV
Author: Raihan Uddin Ahmed et al.

Brief Description:

The spinal cord, one of the most sensitive and significant parts of the human body, lies protected inside the spine (the backbone) and contains bundles of nerves. Any minor problem in the spinal cord can cause debilitation of internal and external functions of the human body. One of the complications in the spinal cord is tumor - abnormal growth of tissue. In this project, we present a new algorithm based on OpenCV to detect spinal cord tumors from MRI sagittal image without human intervention. The new algorithm can detect tumor-like substances adjacent to the spinal cord. Tests carried out on spinal cord MRI images 33 cervical spinal images showed approximately 90.91% of accuracy rate in detecting tumors.

Source: https://computerresearch.org/index.php/computer/article/view/1853

Covid-19: Myths and Some Possible Arguments in Favors or in Contradictions
Author: MD. SIYAMUL ISLAM et al.

Brief Description:

COVID-19 has reached to an unimaginable height with several heterogeneous affect on the society and on our regular lives with respect to personal, social, mental, emotional, and economical parameters. To date, most of its physiognomies are not well-known to scientists and researchers. Several studies are being developed round the year to clearly understand the features of the disease. In addition, the lack of authentic information regarding corona virus has led to misinformation and myths in the society. However, myths and misconceptions do not remain myths when people start believing those by hearts despite any strong scientific backing. This study explores such trendy myths with possible arguments and facts. Myths widespreaded

in the developing countries as well as mentioned by the World Health Organization (WHO) are critically analysed in this study. Precisely, the study also reveals the risks or gains attained by practicing those myths to fight COVID-19 pandemic. Total 17 COVID-19 related myths have been critically analysed to infer 3 major hypotheses by this study. Finally, the study concludes that legal steps and mass awareness campaigns against or for those myths must be introduced immediately to combat corona virus outbreak. To mention that, when the paper is being written, April-May, 2020, the world is suffering by the devastating Covid-19 pandemic as well as no vaccine or medicine has yet been invented. Furthermore, the paper may help the fellow researchers to deal with the similar diseases with similar symptoms.

Source: http://ijmshr.com/uploads/pdf/archivepdf/2021/IJMSHR_231.pdf

A Dual Band UWB antenna for WCE Systems
Author: Farhadur Arifin et al.

Brief Description:

In this paper, a compact ultra-wideband (UWB) antenna is designed for Wireless Capsule Endoscopy (WCE) systems by applying several miniaturization and bandwidth enhancement techniques. The antenna is designed on Roger RT5880 as a substrate having $\varepsilon r = 2.2$ and thickness of 0.254 mm. The volume of the optimized antenna is only 28.9 mm 3 . The performances of the antenna are investigated inside a homogeneous human muscle layer. The -10 dB $S 11$ bandwidth for the first band is from 5.72 GHz to 6.26 GHz and for the second band is from 8.12 GHz to 8.58 GHz. It shows omnidirectional radiation patterns. Maximum power of 24 mW can be set as input to the proposed antenna in order to comply with the IEEE C95.1-2005 safety standards.

Source: https://ieeexplore.ieee.org/document/8889127

Design and evaluation of modified circular wearable ultra-wideband antenna
Author: Farhadur Arifin et al.

Brief Description:

The wearable antenna is a planar antenna made of textile materials as the substrate. Several frequency bands have been assigned for wearable antennas such as Industrial Scientific Medical (ISM) having frequency range from 2.4 GHz to 5.8 GHz and Ultra-Wide Band (UWB) having frequency range 3.1 GHz to 10.6 GHz. In recent days, Ultra-Wide Band antennas are widely used because of their low transmission power requirements and high data rate. The major challenge for designing a wearable antenna is to attain a broader bandwidth of a compact textile antenna

having high radiation efficiency. The main object of this paper is to design and to analyze UWB antennas with different textile materials. The optimum antenna has a compact size of 27 × 31 mm 2 with a thickness of 1.75 mm. From all substrate materials, the antenna with ARLON-AD 320 show higher bandwidth and the antenna with FERRO A6M exhibits highest radiation efficiency. This proposed antenna can be exploited for personnel activities in remote areas and risky environments or in health monitoring purposes.

Source: https://ieeexplore.ieee.org/document/8644115

Predicting Spread, Recovery and Death Due to COVID-19 using a Time-Series Model (Prophet

Author: Prof. Dr. Dip Nandi et al.

Brief Description:

The world is facing its biggest challenge since 1920 due to spread of COVID-19 virus. Identified in China in December 2019, the virus has spread more than 200 countries in the world. Scientists have named the virus as Novel Corona Virus (belongs to SARS group virus). The virus has caused severe disruption to our world. Educational institutions, financial Services, government services and many other sectors are badly affected by this virus. More importantly, the virus has caused

Impact of Prolonged Isolation from the campus on the mental health of the students during Covid-19 pandemic

Author: Dr. Afroza Nahar et al.

Brief Description:

Abstract—There is a strong etiological connection between human psychology with the surroundings. A pandemic can create a huge negative impact on humans. This impact can be both physical and mental. With the outbreak of Covid-19 pandemic all the stimulus in life has been stopped. It left an adverse impact on the students, too. All kinds of educational institutions are closed, and classes are going online. This paper focuses on the psychological impact on the students as a result of being detached from campus oriented educational and other activities. A survey has been conducted on the students to find out their psychological impact during this situation where many students participated. It is revealed that prolonged isolation and segregation from normal campus activities has created mental trauma in the young minds of the students.

Support Vector Machine based Stress Detection System to manage COVID-19 pandemic related stress from ECG signal

Author: Dr Mohammad Hasan Imam et al.

Brief Description:

This study represents a detailed investigation of induced stress detection in humans using Support Vector Machine algorithms. Proper detection of stress can prevent many psychological and physiological problems like the occurrence of major depression disorder (MDD), stress-induced cardiac rhythm abnormalities, or arrhythmia. Stress induced due to COVID-19 pandemic can make the situation worse for the cardiac patients and cause different abnormalities in the normal people due to lockdown condition. Therefore, an ECG based technique is proposed in this paper where the ECG can be recorded for the available handheld/portable devices which are now common to many countries where people can take ECG by their own in their houses and get preliminary information about their cardiac health. From ECG, we can derive RR interval, QT interval, and EDR (ECG derived Respiration) for developing the model for stress detection also. To validate the proposed model, an open-access database named" drivedb" available at Physionet (physionet. org) was used as the training dataset. After verifying several SVM models by changing the ECG length, features, and SVM Kernel type, the results showed an acceptable level of accuracy for Fine Gaussian SVM (ie 98.3% for 1 min ECG and 93.6% for 5 min long ECG) with Gaussian Kernel while using all available features (RR, QT, and EDR). This finding emphasizes the importance of including ventricular polarization and respiratory information in stress detection and the possibility of stress detection from short length data (ie form 1 min ECG data), which will be very useful to detect stress through …

Source:
https://scholar.google.com/citations?view_op=view_citation&hl=en&user=N2DHysAAAAAJ&sortby=pubdate&citation_for_view=N2DHysAAAAAJ:4DMP91E08xMC

Design of an Automated Non-Invasive Electromechanical Ventilator with Feedback Mechanism

Author: Dr Mohammad Hasan Imam et al.

Brief Description:

In medical care, ventilation provides a vital life support function for patients suffering from chronic breathing disorders or unable to breathe for themselves. Control system that delivers oxygen to such patients are still underdeveloped and mostly causes discomfort rather than easing the pain. This paper proposes the design and simulation of a noninvasive electromechanical ventilator that is capable of generating automatic feedback response based on respiratory rate (RR) and oxygen saturation (SPO 2) measurement. The automated response system can provide effective inspiration to expiration ratio of a patient for different levels of SPO 2 and RR with 3%

error rate. The domain of automatic response of the mechanism ranges over 1:2 to 1:4 of inspiration to expiration ratio of a patient for different levels of SPO 2 and RR. The algorithm develop to measure RR is based on the ECG signal where number of R-peaks …

Source:

https://scholar.google.com/citations?view_op=view_citation&hl=en&user=N2DHysAAAAAJ&sortby=pubdate&citation_for_view=N2DHysAAAAAJ:mVmsd5A6BfQC

Design of a Compact Simple Structured Dual-band Patch Antenna for Wireless On-body Medical and Sports Devices

Author: Dr Mohammad Hasan Imam et al.

Brief Description:

This paper targets to design a suitable on-body patch antenna at recommended frequency ranges for body-related communications. The Strongest key features of this antenna are its simplest structure, which will help to avoid fabrication complexity, compact size, dual-mode band and decent bandwidth (0.937GHz). The total volume of the antenna is only 338mm 3 . The antenna's radiating patch and full-ground were created with copper, and low loss material ROGER R03006, having dielectric constant of 6.5 and loss tangent of 0.0035, was selected for the substrate. At on-body condition, the antenna's resonance frequencies were recorded at 0.43306GHz ISM (Industrial, Scientific and Medical) band and 5.4899GHz Ultra-wideband. Throughout the study, several mandatory parametric analyses of the antenna through CST MICROWAVE STUDIO SUITE 2020 were done to be ensured that it is practically …

Source:

https://scholar.google.com/citations?view_op=view_citation&hl=en&user=N2DHysAAAAAJ&sortby=pubdate&citation_for_view=N2DHysAAAAAJ:M3ejUd6NZC8C

Design of a Line Following Wheelchair for Visually Impaired Paralyzed Patient

Author: Dr Mohammad Hasan Imam et al.

Brief Description:

Wheelchair is an integral part of life for movement of disabled people especially if they are also visually impaired. These patients need assistance to move the wheelchair, even if they need to move on from one room to another room in an indoor environment or inside house. A manual wheelchair is not very useful for this category of patient without any caregiver. Therefore, this paper aims the design and implementation of a low-cost Arduino based line following and mobile control prototype of automated wheelchair for assisting the move of these people in an indoor environment. The pathways were so designed that the wheelchair can follow two lines - a white

line and a black line. The white line will guide the wheelchair to the drawing room and the black line will guide the wheelchair to the washroom without the support of any caregiver. A Bluetooth based remote control system has been designed for people who …

Source:
https://scholar.google.com/citations?view_op=view_citation&hl=en&user=N2DHysAAAAAJ&sortby=pubdate&citation_for_view=N2DHysAAAAAJ:4TOpqqG69KYC

Design of a low-cost Hand Gesture Controlled Automated Wheelchair
Author: Dr Mohammad Hasan Imam et al.

Brief Description:

Design and implementation of a low-cost hand gesture controlled automated wheelchair-using Arduino based microcontroller and Node MCU is presented in this paper. The main focus of this study is to control the wheelchair with the movement of the hand-wrist movement. Besides hand gestures, the wheelchair can also be controlled via Bluetooth technology. If any problem occurs during the hand gesture control, Bluetooth technology can help to control the wheelchair through assisting person. The design also has some additional features such as tracking the location of the wheelchair through GPS from anywhere of the world and emergency switching system to send messages to the assisting person through sensor-based network. Arduino Mega, Arduino Nano, NODE MCU, MPU 6050 Gyro sensor, Sonar Sensor, GPS Module, GSM Module, HC-05 Bluetooth Module, nRF Transceiver, and relay-based H-Bridge …

Source:
https://scholar.google.com/citations?view_op=view_citation&hl=en&user=N2DHysAAAAAJ&sortby=pubdate&citation_for_view=N2DHysAAAAAJ:kNdYIx-mwKoC

Emotional State Analysis Using Handheld Portable ECG Device
Author: Dr Mohammad Hasan Imam et al.

Brief Description:

Emotional states affect human performance in their daily life as well as their workplaces. Sustained negative emotions like sadness causes long term depression which ultimately leads to cardiovascular diseases and induce suicidal tendencies. Therefore, emotion analysis is important for analyzing human behavioral pattern and well-being. Bio signal based emotional state/affect analysis is getting popularity due to availability of portable bio signal recorders like EGC, EEG etc. In this paper we tried to investigate the changes that take place in ECG waveforms due to certain changes in a person's emotional states (i.e. happiness, sadness and anger). ECG signals from 7 subjects of duration of 1 min were recorded with a portable FDA cleared ECG device (Kardia

mobile designed by AliveCor) by applying audiovisual stimulus and the HRV parameters were calculated for analyzing the pattern of changes in that HRV …

Source:

https://scholar.google.com/citations?view_op=view_citation&hl=en&user=N2DHysAAAAAJ&sortby=pubdate&citation_for_view=N2DHysAAAAAJ:MXK_kJrjxJIC

Design of an Arrhythmia Detection System Using Wearable PPG Sensor

Author: Dr Mohammad Hasan Imam et al.

Brief Description:

Any abnormality in the heart rhythm from the normal range is called arrhythmia. It may be due to lower or faster heart rate and the reason of other severe phenomena like Atrial and Ventricular fibrillation which are the most severe arrhythmias. Most of the cardiovascular deaths occurs due to arrhythmogenesis. Therefore, continuous heart rate monitoring is critical for patients who are in the high risk of cardiac events like the patients who have previous heart attacks. ECG based devices are commonly used for this type of monitoring. However, ECG recording needs placement of ECG electrodes and needs at least two limbs for recording. Chest leads ECG are sometimes uncomfortable for continuous monitoring. Therefor. PPG sensors are getting popularity for measuring heart rate as it can easily recorded from only fingertip or earlobe and does not require any adhesive gels. Considering the situations, we proposed a …

Source:

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Early detection of kidney disease using ECG signals through machine learning based modelling

Author: Dr Mohammad Hasan Imam et al.

Brief Description:

This paper introduces the idea of detecting the presence of kidney disease through machine learning based classification modelling, by processing the patient's ECG signal. Recent studies and ongoing researches have showed that patients undergoing kidney problems start developing cardiac problems- scientifically known as the Cardio Renal Syndrome (CRS) which can lead to a sudden cardiac arrest in the last stages of their disease. Since cardio-vascular diseases and the chronic kidney disease is inter-related, this model can be used for patients undergoing cardio-vascular problems to determine whether their kidneys have been effected or not. If the Chronic Kidney Disease (CKD) can be diagnosed at an earlier stage, it may give the patient some time to

help reverse the disease or at least slow its progression by taking necessary medical steps. For this model, digitized ECG data was collected from open …

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Design of a biosignal based stress detection system using machine learning techniques
Author: Dr Mohammad Hasan Imam et al.

Brief Description:

This study represents a design of a detection system of stress through machine learning using some available bio signals in human body. Stress can be commonly defined as the disturbance in psychological equilibrium. Stress detection is one of the major research areas in biomedical engineering as proper detection of stress can conveniently prevent many psychological and physiological problems like cardiac rhythm abnormalities or arrhythmia. There are several bio-signals available (i.e. ECG, EMG, Respiration, GSR etc.) which are helpful in detecting stress levels as these signals shows characteristic changes with stress induction. In this paper, ECG was selected as the primary candidate because of the easily available recording (i.e. several mobile clinical grade recorders are available now in the market) and ECG feature extraction techniques. Another advantage of ECG is that respiratory signal information …

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Heart disease detection by using machine learning algorithms and a real-time cardiovascular health monitoring system
Author: Dr Mohammad Hasan Imam et al.

Brief Description:

Cardiovascular diseases are the most common cause of death worldwide over the last few decades in the developed as well as underdeveloped and developing countries. Early detection of cardiac diseases and continuous supervision of clinicians can reduce the mortality rate. However, accurate detection of heart diseases in all cases and consultation of a patient for 24 hours by a doctor is not available since it requires more sapience, time and expertise. In this study, a tentative design of a cloud-based heart disease prediction system had been proposed to detect impending heart disease using Machine learning techniques. For the accurate detection of the heart disease, an efficient machine learning technique should be used which had been

derived from a distinctive analysis among several machine learning algorithms in a Java Based Open Access Data Mining Platform, WEKA. The proposed algorithm was validated using two widely used open-access database, where 10-fold cross-validation is applied in order to analyze the performance of heart disease detection. An accuracy level of 97.53% accuracy was found from the SVM algorithm along with sensitivity and specificity of 97.50% and 94.94%respectively. Moreover, to monitor the heart disease patient round-the-clock by his/her caretaker/doctor, a real-time patient monitoring system was developed and presented using Arduino, capable of sensing some real-time parameters such as body temperature, blood pressure, humidity, heartbeat. The developed system can transmit the recorded data to a central server which are updated every 10 seconds. As a result, the doctors can visualize …

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An Indoor Navigation System for Visually Impaired People Using a Path Finding Algorithm and a Wearable Cap

Author: Dr Mohammad Hasan Imam et al.

Brief Description:

This paper represents the design and implementation of an indoor based navigation system for visually impaired people using a path finding algorithm and a wearable cap. This development of the navigation system consists of two modules: a Wearable part and a schematic of the area where the navigation system works by guiding the user. The wearable segment consists of a cap designed with IR receivers, an Arduino Nano processor, a headphone and an ultrasonic sensor. The schematic segment plans for the movement directions inside a room by dividing the room area into cells with a predefined matrix containing location information. For navigating the user, sixteen IR transmitters which continuously monitor the user position are placed at equal interval in the XY (8 in X-plane and 8 in Y-plane) directions of the indoor environment. A Braille keypad is used by the user where he gave the cell number for …

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Monitoring Patients during Neurorehabilitation Following Central or Peripheral Nervous System Injury: Dynamic Difficulty Adaptation

Author: Dr Mohammad Hasan Imam et al.

Brief Description:

Brain injuries including stroke often require extensive cognitive and physical rehabilitation. Active mental engagement and a positive emotional state are prerequisites for optimal learning in the rehabilitation of stroke patients. Stroke often affects aspects of gait requiring balance and gait therapy using robot-assisted devices. Cardiovascular diseases, genetic vascular abnormalities, infectious diseases, trauma, anoxia, and other conditions can result in central or peripheral nervous system injury. The majority of patients in stroke rehabilitation suffer from diffuse and complex comorbidities including but not limited to cardiovascular disease. The use of technology in stroke rehabilitation raises many questions around the design and the user experience. The virtual environmental task (VET), which sets the exercise or gait and balance requirements, can be viewed on monitors with auditory information projected from …

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Adaptive EEG Beamformers with Realistic Finite Difference Head Models

Author: A N M Shahebul Hasan et al.

Brief Description:

Electroencephalography (EEG) has been used widely to record electric potentials at electrodes placed on the scalp. Beamformers have been used in electromagnetic source imaging to find back from these potentials the neuronal dipole current sources that produce them. An MRI image with a resolution of 1 mm is used to provide detailed anatomical information for the construction of a realistic head model. The governing Poisson's equation is solved using a finite difference method. The rectangular grid used in the finite difference approach is compatible with the one used in an MRI image, leading to straightforward structural modeling. Both scalar and vector beamformers are considered in the study. Two metrics, namely the localization error and full width at half maximum, are used to compare the performance of six beamformers. Results for a 128-electrode system with additive Gaussian noise demonstrate that the scalar minimum variance beamformer gives the best overall performance for single-source reconstruction.

Source: 10.23919/ACES48530.2019.9060649

Reduced order method for finite difference modeling of cardiac propagation

Author: A N M Shahebul Hasan et al.

Brief Description:

Efficient numerical simulation of cardiac electrophysiology is crucial for studying the electrical properties of the heart tissue. The cardiac bidomain model is the most widely accepted representation of the electrical behaviour of the heart muscle. The bidomain model offers fast cardiac potential variation, which can lead to high computational cost due to the required large grid sizes and small time steps. In this paper, the complexity of the finite difference approximation of the bidomain equations is reduced with the model order reduction technique. Proper orthogonal decomposition, a projection-based algorithm, is used to efficiently approximate the original high fidelity cardiac bidomain model with a low-dimensional system of equations. The low-dimensional basis functions are computed first from the 'snapshots,' which contain the solutions of the full-order system for different temporal and spatial parameters. Galerkin projection of the original cardiac bidomain system onto the subspace of the reduced order basis functions reduces the size of the linear system. Numerical results confirm the efficiency of the proposed reduced order modeling technique, reducing the simulation time by a factor of 9.54, while maintaining an RMS error of 0.769 mV between the original full order solution and the reduced order POD solution.

Source: https://doi.org/10.1515/cdbme-2020-3028

Effect on human health by residues of commonly used pesticides in vegetables cultivation

Author: Dr. Mohammad Mahbub Rabbani et al.

Brief Description:

People in Bangladesh are over scared for toxicity of vegetables & fruits, because the educational level of the farmers is not up to the mark. Farmers apply pesticides randomly on agricultural fields without maintaining pre-harvest intervals and dose. The aim of this work was to study dissipation pattern of some pesticides in some vegetables kept at room temperature which represent market condition and to identify and quantify pesticides applied on some vegetables. By interviewing the farmers, three commonly used pesticides; cypermethrin, chlorpyrifos and fenvalerate were sprayed in the farmer's fields of the western part of Bangladesh. Samples were extracted by QuEChERS method, cleaned-up by adsorption chromatography technique, and analyzed by GC-ECD technique. Recoveries were found to be between 87-107% with RSD lower than 10% at three spiking levels. Matrix matched calibration curves were linear for all the analytes with $r2 \geq 0.99$. LODs were found to be 0.01 mg/kg for cypermethrin and 0.002 mg/kg for both of fenvalerate and chlorpyrifos. The samples of the same cultivar's variety were purchased from the markets of Savar, Mymensingh and Cumilla. Our finding showed only the presence of

cypermethrin in tomato but the values were below MRL and no pesticide residue was found in eggplant.

Source: https://ajse.aiub.edu/index.php/ajse/article/view/68

করোনাভাইরাস কি বাতাসে ছড়াতে পারে?

Author: Dr. Mohammad Mahbub Rabbani et al.

Brief Description:

চীনের উহানে গত ডিসেম্বরে করোনাভাইরাস প্রথম শনাক্তের পর এখনও ভাইরাসটি সম্পর্কে বিজ্ঞানীরা নিশ্চিত করে কিছুই বলতে পারছেন না। করোনাভাইরাস আক্রান্ত রোগীর চিকিৎসায় কার্যকরী ঔষধ বা করোনাভাইরাস প্রতিরোধের জন্য ভ্যাকসিন এখনও আবিষ্কার হয়নি। ভাইরাসটির বৈশিষ্ট্য, ছড়ানোর গতিপ্রকৃতি, জড় এবং জীবদেহে সক্রিয়তা কাল ইত্যাদি বিষয়ে সুস্পষ্টভাবে জানতে আরও বেশ কিছুদিন সময় লাগবে। ফলে ভাইরাসটির সংক্রমণ নিয়ন্ত্রণেই জোর দেওয়া হচ্ছে বেশি আর সেজন্য নিরাপদ সামাজিক দূরত্ব বজায় রাখতে বলা হচ্ছে এবং ঘরে থাকতে বলা হচ্ছে। সাধারণ মানুষকে সাবান বা হ্যান্ড স্যানিটাইজার দিয়ে ঘন ঘন হাত জীবাণু মুক্ত করতে এবং মাস্ক পরতে বলা হচ্ছে। স্বাস্থ্যসেবা কাজে জড়িত ব্যক্তিদের সুরক্ষা পোশাক পরতে বলা হচ্ছে। উদ্দেশ্য হচ্ছে, করোনাভাইরাস কোনোভাবেই যেন নাক, মুখ কিংবা চোখ দিয়ে মানুষের শ্বাসযন্ত্রে প্রবেশ করতে না পারে। ভাইরাসটি বায়ুবাহিত (airborne) কিনা কিংবা আপাতদৃষ্টিতে সুস্থ মানুষের কাছ থেকে ছড়াতে পারে কিনা এসব বিষয়েও স্পষ্ট করে কিছুই বলা হয়নি। আজকের আলোচনায় এই দুইটি বিষয়ে আলোকপাত করা হবে।

বিশ্ব স্বাস্থ্য সংস্থা থেকে ভাইরাসটি বায়ুবাহিত (airborne) নয় বলা হলেও ভাইরাসটি যে বায়ু (air) দ্বারা ছড়াতে (spread) পারে বা বায়ুতে ছড়িয়ে (dispersed) থাকতে পারে তা বিজ্ঞানের সাধারণ জ্ঞান দিয়ে ব্যাখ্যা করা যায়। সংশ্লিষ্ট কয়েকটি বিষয়ে আলোকপাত করলে ভাইরাসটির বাতাসের মাধ্যমে ছড়ানোর বা সংক্রমিত হওয়ার প্রক্রিয়াটা পরিষ্কার হবে বলে মনে করি। একই সাথে সামাজিক দূরত্ব বজায় রাখা এবং ঘরে থাকার কারণও বুঝা যাবে।

অ্যারোসল (aerosol): সাধারণভাবে যেকোনো ভারি পদার্থ (matter) অভিকর্ষজ বলের প্রভাবে ভূপাতিত হয়। কিন্তু অপেক্ষাকৃত ভারি "কণা" (particles/droplets) তরল পদার্থ বা গ্যাসের মধ্যে ঝুলন্ত (suspended) থাকতে পারে। গ্যাসের মধ্যে তরল বা কঠিন পদার্থের কণা ঝুলে থাকলে তাকে অ্যারোসল (Aerosol) বলে। যেমন কঠিন ধুলাবালি এবং তরল জলীয় বাষ্প (কুয়াশা) বাতাসে ভেসে বেড়ায়। এই দুইটিই অ্যারোসল। আর এ কারণেই করোনাভাইরাস আক্রান্ত ব্যক্তি থেকে রেস্পিরেটরি ড্রপলেট বা হাঁচি-কাশির ফলে বের হওয়া জলকণাকে (Droplets) অ্যারোসল বলা হচ্ছে।

ট্রাজেক্টরি (Trajectory): কোনো একটি বস্তু সময়ের সাপেক্ষে শূন্যে যে বক্রপথ অতিক্রম করে তাকে ট্রাজেক্টরি বলে। যেমন, আপনি কৌণিকভাবে ওপরের দিকে একটি ঢিল ছুড়লেন। ঢিলটি খানিকটা সময় শূন্যে ভেসে ভেসে বক্রাকার পথে সামনের দিকে এগিয়ে যাবে (flight path) এবং এক সময় ভূপাতিত হবে।

হাঁচি (Sneeze): মানুষ যখন হাঁচি দেয় তখন নাকি তার শরীরের সমস্ত অঙ্গ-প্রত্যঙ্গ হাঁচি দেওয়ার কাজে জড়িয়ে পড়ে। যাই হোক, হাঁচি কী তা বলার অপেক্ষা রাখে না। দুটি তথ্য এখানে উল্লেখযোগ্যঃ হাঁচির গড় গতিবেগ ঘন্টায় প্রায় ১০০ মাইল। আর প্রতিবার হাঁচিতে ১ লক্ষাধিক ড্রপলেট (তরল কণা) ১০০ মাইল/ঘন্টা বেগে ছড়িয়ে পড়ে।

এবার আসুন আমরা উপরের তথ্যগুলো মিলিয়ে দেখি। কেউ যদি হাঁচি দেয় তবে তা হাঁচির গতিবেগের (speed) কারণেই একটা উল্লেখযোগ্য বক্রাকার দূরত্ব (ট্রাজেক্টরি/flight path) পর্যন্ত এগুবে। বলা হয়ে থাকে সেটা ২৮ ফুট পর্যন্ত হতে পারে। লক্ষাধিক ড্রপলেটের মধ্যে সবার আকার (size) এবং ভর (mass) এক সমান হবার কথা নয় (unequal size distribution)। ফলে কিছু ড্রপলেট ট্রাজেক্টরি পথ অতিক্রম করে মাটিতে পড়ে যাবে। অপেক্ষাকৃত হালকা ড্রপলেটগুলো কুয়াশার মত বাতাসে অনেকটা সময় ভাসতে থাকবে (suspended)। এখানে হাঁচির সাথে বেরিয়ে আসা জলকণাগুলো অ্যারোসল-এর মতো আচরণ করবে। তখন যদি বাতাসের বেগ থাকে (wind flow) তবে সে আরও অনেকটা দূরত্ব অতিক্রম করতে পারে। এই সময়কালের মধ্যে ড্রপলেট সমৃদ্ধ বাতাসের (air) মধ্যে কেউ অবস্থান করলে বা ওই এলাকার মধ্যে দিয়ে কেউ হেটে গেলে তার গায়ে ড্রপলেটগুলো লেগে যেতে পারে। এ কারণেই করোনাভাইরাসের সংক্রমণ এড়াতে আক্রান্ত ব্যক্তি থেকে কম করে হলেও দুই মিটার বা প্রায় ছয় ফুট দূরে থাকতে বলা হয়। এতটা দূরত্বে থাকলে ট্রাজেক্টরি বা অ্যারোসলের মধ্যে সরাসরি পড়ে যাওয়া এড়ানো সম্ভব। অন্যদিকে আপাতদৃষ্টিতে জনশূন্য স্থানে আক্রান্ত ব্যক্তির হাঁচি-কাশি থেকে নিঃসৃত অ্যারোসল (যে ড্রপলেটগুলো বেশ খানিকটা সময় বাতাসে ভাসতে থাকবে) বাতাসে ভেসে

থাকতে পারে। কেননা, করোনাভাইরাসের গড় সাইজ হচ্ছে ১২০ ন্যানোমিটার। ফলে হাঁচি থেকে নিঃসৃত জলকণা বাতাসে উবে (vaporized) গেলেও ভাইরাসটি বাতাসে ভেসে থাকতে পারার কথা। কারণ তার চেয়ে ভারি এবং আকারে বড় ধুলাবালিও কিন্তু বাতাসে অনেকক্ষণ ভাসতে থাকে। তাছাড়া করোনাভাইরাসের গায়ে থাকা স্পাইকগুলো (spikes) তাকে বাতাসে ভাসতে সাহায্য করার কথা। তাই এই অ্যারোসলের স্পর্শ এড়াবার জন্য মাস্ক পরতে হয়, গ্লাভস পরতে হয়। তবে ট্রাজেক্টরি (বক্রাকার পথ) এবং অ্যারোসল দুটোকেই এড়িয়ে চলার জন্য উত্তম উপায় হচ্ছে ঘরের চার দেয়ালের মধ্যে থাকা।

অন্যদিকে কোনো প্রকার লক্ষণ না থাকলেও করোনাভাইরাস যে কারও শরীরে থাকতে পারে। সাম্প্রতিক সময়ে করোনাভাইরাস পজিটিভ এমন অনেক রোগীর ক্ষেত্রে লক্ষণ দেখা যায়নি। আক্রান্ত ব্যক্তির শরীরে লক্ষণ দেখা দেওয়া, না দেওয়া, অনেকগুলো বিষয়ের উপর নির্ভর করতে পারে। একটু সাধারণ জ্ঞান খাটালে তার কার্যকারণ বুঝা যায়। ভাইরাস শরীরে ঢুকলেই শরীরের নিরাপত্তা বাহিনী, অ্যান্টিবডি তাকে আক্রমণ করে দমাতে চেষ্টা করে। যার শরীরের রোগ প্রতিরোধ ক্ষমতা যত শক্তিশালী করোনাভাইরাস তার শরীর থেকে তত দ্রুতই হারিয়ে যায় অর্থাৎ আক্রান্ত ব্যক্তিকে এই ভাইরাস কাবু করতে পারে না এবং তার শরীরে ভাইরাসজনিত লক্ষণ দেখা দেওয়ার কথা নয়। শরীরের রোগ প্রতিরোধ ক্ষমতার মাত্রার উপর ভিত্তি করে কারও শরীরে লড়াই করে ভাইরাস এক সময় নিষ্ক্রিয় হয়ে যায়, কারও শরীরে কয়েকদিন যুদ্ধ চলে, লক্ষণ দেখা যায় এবং এক সময় সেরেও যায়। আবার কারও শরীর ভাইরাসের সাথে যুদ্ধ করে টিকতে পারে না, লক্ষণ প্রকট হয় এবং বাহির থেকে তাকে সাপোর্ট দেওয়ার প্রয়োজন হয় এবং এক সময় সেরে উঠে। আবার কেউ কেউ সেই সাপোর্ট দেওয়ার পরেও ভাইরাসের সাথে যুদ্ধ করে পেরে ওঠে না এবং অবশেষে মারা যান। এই হচ্ছে মোটামুটি লক্ষণ দেখা যাওয়া না যাওয়ার অবস্থা।

ধরুন কারও শরীরে ভাইরাস আছে, অ্যান্টিবডির সাথে যুদ্ধ চলছে কিন্তু লক্ষণ এখনও দেখা দেয়নি। এই অবস্থায় অন্য কেউ তার সংস্পর্শে এলে তারও করোনাভাইরাস দ্বারা সংক্রমিত হওয়ার সম্ভাবনা থেকে যায়। আর এ কারণেই সামাজিক দূরত্ব বজায় রাখা উচিত, লক্ষণ নেই তেমন কারও সাথেও মেলামেশা করা উচিত নয়। সর্বোপরি লক্ষণ নেই তেমন ব্যক্তি বাইরে থেকে আক্রান্ত ব্যক্তি কর্তৃক নিঃসৃত অ্যারোসল গায়ে মেখে আসেননি তা তো নিশ্চিত করে বলা যাবে না। তাই নিজেকে নিরাপদে রাখার উত্তম উপায় হচ্ছে ঘরে থাকা, একান্তই বাইরে যেতে হলে মাস্ক, গ্লাভস পরে থাকা, দ্রুত কাজ সেরে ঘরে ফেরা এবং ঘরে এসে প্রথমে সাবান দিয়ে হাত ধুয়ে, পরিধেয় কাপড়সহ ভালভাবে গোসল করা।

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যে হারায় শুধু সে-ই জানে

Author: Dr. Mohammad Mahbub Rabbani et al.

Brief Description:

গেল কয়েকদিন ধরে করোনাবাইরাস সংক্রমণ দ্রুত গতিতে বেড়ে চলার কারণে সরকার 'কঠোর লকডাউন' দিতে বাধ্য হলো। আক্রান্তের সংখ্যা প্রতিদিন সাত হাজারের বেশি আর দৈনিক মৃত্যু তো বৈশাখের প্রথমদিন ১০০ ছুঁয়েছে। করোনা পরিস্থিতি সামাল দিতে সরকারের দেশব্যাপী এক সপ্তাহের জন্য লকডাউন ঘোষণা দিয়েছে। পাশাপাশি সংক্রমণ নিয়ন্ত্রণে সরকার ১৮ দফা নির্দেশনা জারি করেছে। কিন্তু কে শুনে কার কথা। লকডাউনের খবর জেনেই মানুষ ঈদের ছুটি উদযাপনের মতো গ্রামের বাড়ি বেড়াতে গিয়েছে। ফলে স্থল ও জল পথের সবখানে মানুষের উপচেপড়া ভিড় হয়েছে। স্বাস্থ্যবিধি যথাযথভাবে মানা হয়নি। সামাজিক দূরত্ব বজায় রাখা ও স্বাস্থ্যবিধি মানার সুবিধার্থেই সরকার যেখানে লকডাউনের মতো পদক্ষেপ নিয়েছে সেখানে গ্রামমুখী মানুষের ঢল সরকারের গৃহীত সব পদক্ষেপকেই বাধাগ্রস্ত করে দিচ্ছে।

জনগণের সহযোগিতা না থাকলে সরকারের একার পক্ষে করোনা পরিস্থিতি নিয়ন্ত্রণ করা কোনভাবেই সম্ভব নয়। এ সহজ বিষয়টা আমরা কেন বুঝিনা? স্বাস্থ্যবিধি যথাযথভাবে কেনো মানছিনা? কেন সরকারী নির্দেশনা পালন করছিনা? সরকার, করোনা বিশেষজ্ঞ, ইসলামী চিন্তাবিদ, সমাজকর্মী, সাংবাদিকসহ সচেতন মানুষেরা নিয়মিত পত্রপত্রিকা ও টেলিভিশনসহ সোস্যাল মিডিয়ায় বারবার সাবধান করার পরেও আমাদের বোধোদয় কেন হচ্ছে না? এর প্রধান কারণ হচ্ছে, নিজে কিংবা পরিবারের কেউ আক্রান্ত না হওয়া পর্যন্ত, পরিবারের কেউকে না হারানো পর্যন্ত আমরা করোনার ভয়াবহতা অনুভব করতে পারি না। কারণ, যে হারায় শুধু সেই জানে করোনাভাইরাস কী জিনিস, কতটা ভয়ংকর এবং কী হারিয়েছে!

পয়লা এপ্রিল বিডিনিউজ টোয়েন্টিফোর ডটকমে প্রকাশিত একটি প্রতিবেদনের শিরোনাম হচ্ছে "মাস্কের সঙ্গে শত্রুতা কোথায়" । মাস্ক না পরার কুযুক্তি এবং করোনা সংক্রমণের ব্যাপারে সাধারণ মানুষের ভুল ধারণা, উদাসীনতা ও বেপরোয়া মনোভাবের করুণ চিত্র উক্ত প্রতিবেদনে উঠে এসেছে। প্রতিবেদন থেকে মানুষের চিন্তাধারা জেনে অনেক বেশি অসহায় লাগছে। মনে হচ্ছে সরকার

যত কঠোর পদক্ষেপই নিক না কেনো জনগণ তাতে সহযোগিতা না করলে কোন পদক্ষেপই সফল হবে না। আমাদের চিন্তাধারার এমন দৈন্যতা চলতে থাকলে পরিস্থিতি কোথায় গিয়ে দাঁড়াবে তা কল্পনারও অতীত। লেখার শেষার্ধে সাধারণ মানুষের ধারণাগুলোর ওপর প্রাসঙ্গিক আলোচনা করা হয়েছে।

এ সময়ের কয়েকটা অভিজ্ঞতা শেয়ার করলে ভুক্তভোগী আর "এখনও আক্রান্ত হননি" তেমন মানুষদের চিন্তার বা অনুভূতির তফাৎটা পরিষ্কার হবে।

ক. কারিগরি শিক্ষা অধিদপ্তরের এক কর্মকর্তা তার করোনাভাইরাসে আক্রান্ত বাবাকে বাঁচানোর অনেক চেষ্টা করেছেন। এ হাসপাতাল থেকে ও হাসপাতালে অনেক দৌড়েছেন। শেষপর্যন্ত আইসিইউ জোগাড় করতে পারলেও তার বাবাকে বাঁচাতে পারেননি। একই সময়ে তার পরিবারের আরও ৩ জন করোনা আক্রান্ত হয়েছেন! বাবাকে চিরবিদায় জানিয়ে এখন তিনি তার মাকে নিয়ে ব্যস্ত আছেন। তিনি কতটা দুঃসময় সময় পার করছেন সেটা কেবল তিনিই জানেন।

খ. কয়েকদিন আগে পরিচিত একজন ফোন করেই হাউমাউ করে কাঁদতে লাগলেন। কী হয়েছে জানতে চাইলে বললেন, করোনাভাইরাস আক্রান্ত হয়ে কিছু বুঝে উঠার আগেই তার বাবা মারা গেছেন, পরিবারের সবাই আক্রান্ত হয়েছেন। ছেলে বাবাকে দাফন করতে পর্যন্ত যেতে পারেনি। এমন খবর জেনে তাকে কী শান্তনা দেওয়া যায়! শান্তনা দেওয়ার কোন ভাষা আছে?

গ. পরিচিত এক ভদ্রলোক কিছুদিন আগে তার পরিবারের করোনাভাইরাসে আক্রান্ত চার জনকে একসাথে নিয়ে একই হাসপাতালে দীর্ঘদিন চিকিৎসা করিয়েছেন, একাই সব কিছু সামলেছেন। তিনি তখন কতটা অসহায় বোধ করেছেন তা অন্য কারও দ্বারা অনুমান করা সম্ভব নয়। সৌভাগ্যের বিষয় এই যে, দীর্ঘদিন হাসপাতালে থেকে সবাই সুস্থ হয়ে বাড়ি ফিরেছেন।

ঘ. অনেক বন্ধু এবং পরিচিত জনদেরকে ফেইসবুকে স্ট্যাটাস দিতে দেখি, "আপা/ভাই/মা/বাবা, শেষ বেলায় একটা জিনিসই তো চেয়েছিলে, একটা আইসিইউ! দিতে পারিনি, ক্ষমা করে দিও।" কিংবা "করোনা আক্রান্ত হয়ে বাবা আইসিইউতে, মা হাসপালে ভর্তি, ভাইবোন বাসায় আইসোলেশনে আছেন, দোয়া চাই!" এসব ফেইসবুক স্ট্যাটাস পড়ে মন্তব্য করার ভাষা হারিয়ে ফেলি।

ঙ. আমি নিজেই করোনাভাইরাসের নিষ্ঠুর থাবার ভুক্তভোগী। মায়ের চেহারা সব সময় চোখের সামনে ভাসে। হাসপাতালের দিনগুলো আমাকে অনেক পীড়া দেয়। করোনা আক্রান্ত হয়ে মা যখন হাসপালে ভর্তি ছিলেন তখন পরিবারের অন্য তিন সদস্যও করোনা পজিটিভ। করোনার কারণেই আমাদের মা মার্চের শুরুতে আমাদের ছেড়ে চলে গেছেন। যেহেতু আমি মাকে হারিয়েছি সেহেতু আমি জানি বেদনাটা কেমন। কী পরিমাণ অসহায় লাগে তখন! যে হারায় শুধু সেই জানে কষ্ট কতটা তীব্র।

করোনা সংক্রমিত হয়ে অসুস্থ হওয়া আর অন্য যেকোন রোগে অসুস্থ হওয়ার মধ্যে আকাশ পাতাল ব্যবধান। একইভাবে অন্য কোন রোগে কেউ মারা যাওয়া আর করোনাভাইরাসে আক্রান্ত হয়ে মারা যাওয়ার মধ্যেও অবর্ণনীয় পার্থক্য। এই পার্থক্যের ভয়াবহতা ভুক্তভোগী ছাড়া অন্য কেউ বুঝবে না, বোঝা সম্ভবও না, বুঝতে চায়ও না। কারণ, ভাইরাস আক্রান্ত ব্যক্তি সামাজিকভাবে বিচ্ছিন্ন থাকায় তার বা তার পরিবারের কষ্ট কাছ থেকে দেখার সুযোগ অন্যদের হয় না। অন্যদিকে নিজে আক্রান্ত না হওয়া পর্যন্ত কষ্টটা কেউ অনুধাবন করতে পারে না। আপনজনের স্বাভাবিক মৃত্যুতেও মানুষ শোকাতুর হয় কিন্তু পরিবার করোনা আক্রান্ত হলে এবং আপনজনকে হারালে মানুষ যে অসহায় হয়ে পড়ে তার কষ্টটা অসীম, ভাষায় প্রকাশ করার মতো না। করোনা আক্রান্ত হয়ে অসহায় হয়ে না পড়লে কেউ বুঝতে পারে না অসহায়ত্ব আসলে কী! করোনা ভাইরাসের সবচেয়ে ভয়ংকর বৈশিষ্ট্য হচ্ছে তা দ্রুত ছড়ায় এবং একটা পরিবারের অনেককেই একসাথে আক্রান্ত করে। ফলে পরিবারের যে ব্যক্তিটি অপেক্ষাকৃত সুস্থ কিংবা এখনও আক্রান্ত হননি, সবার চিকিৎসাসহ যাবতীয় দেখভালের দায়িত্বটা পড়ে তার উপর। আত্মীয় স্বজনেরা চাইলেও তখন আশানুরূপ সহযোগিতা করতে পারেন না সামাজিক দূরত্ব বজায় রাখার স্বার্থে এবং আক্রান্ত হওয়ার ঝুঁকির কারণে। অন্য কোন কারণে কেউ অসুস্থ হলে সবাই তাকে হাসপাতালে নিয়ে যায়, মারা গেলে সবাই মিলে দাফন করেন। কিন্তু করোনা আক্রান্ত হলে সাধারণ কেউ আক্রান্ত ব্যক্তিকে ধরেন না, এগিয়ে আসেন না, আসা সম্ভবও না। হাসপাতালগুলো রোগী ভর্তি করতে কোভিড প্রটোকল অনুসরণ করে ফলে বেড পাওয়া, আইসিইউ পাওয়া অনিশ্চিত হয়ে পড়ে, আত্মীয় স্বজনকে পাশে পাওয়া যায় না। আর এইযে সবকিছু একা সামলানো, এটাই অসহায়ত্ব। সমুদ্রের পানিতে ভেসে থেকেও খাবার পানি না পাওয়ার মত অসহায়ত্ব!

আপনি যদি ভুক্তভোগী হন তবেই বুঝতে পারবেন কষ্টটা কোথায়। সবচেয়ে কষ্টের ব্যাপার হচ্ছে প্রিয়জনের শ্বাসকষ্টের দৃশ্য দেখা। এটা সহ্য করার মতো নয়। শ্বাস নিতে কষ্ট হওয়া ব্যক্তিটি যখন আপনার চোখের সামনে শ্বাস নেওয়াই বন্ধ করে দেয় তখন এর চেয়ে কষ্টের, অসহায়ত্বের দৃশ্য পৃথিবীতে দ্বিতীয়টি আছে বলে মনে হয় না। করোনা আক্রান্ত বলে কিংবা নতুনভাবে আক্রান্ত হওয়ার ভয়ে অসুস্থ বা মুমূর্ষু প্রিয়জনকে জড়িয়ে ধরে কাঁদতেও পারবেন না। মৃত্যুর আগে হয়তো আপনার প্রিয়জন আপনার চেহারাটা দেখতে চেয়েছিলেন, হয়তোবা তিনি আপনার দিকে তাকিয়েও ছিলেন কিন্তু আপনার মুখে মাস্ক, ফেইস শিল্ড বা পিপিই থাকায় আপনার মুখটাও তিনি ঠিকমতো দেখতে পাননি। এমন অবস্থায় না পরলে কারও দ্বারা বোঝা সম্ভব নয় করোনা আক্রান্ত রোগী সাথে থাকা বা প্রিয়জনকে হারানো কতটা কষ্টের এবং অসহায়ত্বের। আমাদের চারপাশে ঘটে যাওয়া এমনসব ঘটনা জানার পরেও আমরা কেন স্বাস্থ্যবিধি মেনে চলিনা? মাস্ক পরতে, ভ্যাক্সিন নিতে আমরা এত অনাগ্রহী কেন?

শুরুতেই উল্লেখিত প্রতিবেদনে উঠে আসা বিভিন্ন জনের মন্তব্য পড়ে বার বার মনে হচ্ছিলো, আমরা এত বোকা বা গোঁয়ার কেন? ভুক্তভোগীর অভিজ্ঞতা জেনে, প্রতিদিনের আক্রান্তের ও মৃত্যুর উর্ধ্বগতি জেনেও লোকজন কোন বিবেচনায় বলে, "করোনা-টরোনা কিছু না, আল্লাহ ভরসা, যা হবার হবে, রিক্সাওয়ালার করোনা হয়না, যারা এসির মধ্যে থাকে তাদের করোনা হয় কিংবা সৃষ্টিকর্তার ওপর যাদের ভরসা নেই তারাই মাস্ক নিয়ে টানাটানি করে"?- এসব কেমন কথা!

সৃষ্টিকর্তার উপর পূর্ণ বিশ্বাস তো নবী-রাসূলদেরও ছিল, কিন্তু তারা কি অসুস্থ হননি? আমাদের মহানবী হযরত মোহাম্মদও (সা.) তার জীবদ্দশায় অসুস্থ হয়েছিলেন। সেখানে আমরা নিজেদেরকে যত বড় ঈমানদারই মনে করি না কেন, করোনাভাইরাস বা অন্য কোন অসুখই আমাদেরকে রেহাই দিবে না। অগাধ বিশ্বাস থাকলেই করোনা আক্রান্ত হবেন না- এমন গ্যারান্টি আপনাকে কে দিল? যারা মারা গেছেন তাদের অধিকাংশই তো ধর্মপ্রাণ মুসলমান। করোনাভাইরাসের সংক্রমণ থেকে নিজেকে, নিজের পরিবারকে এবং প্রতিবেশিকে নিরাপদে রাখার প্রয়োজনীয়তা এবং ধর্মীয় দৃষ্টিতে মহামারীকালে করণীয় সম্পর্কে প্রতিদিন আলেম ওলামাগণ বিভিন্ন গণমাধ্যমে কথা বলছেন, পত্রপত্রিকায় নিয়মিত লিখছেন, ইমামগণ মসজিদে বয়ান করছেন। এর পরেও আমরা বিশ্বাসের দোহাই দেই কোন যুক্তিতে?

মাস্ক না পরার অজুহাত হিসেবে গরম লাগা, ঘেমে যাওয়া, শ্বাস নিতে কষ্ট হওয়া- এসব যুক্তি দিচ্ছেন অনেকে। বাংলাদেশ গ্রীষ্মমণ্ডলীয় অঞ্চলে হওয়ায় আমাদের দেশের বাতাসে আর্দ্রতা বেশি। ফলে মাস্ক পরে থাকতে অস্বস্তি লাগা অস্বাভাবিক নয়। কিন্তু মাস্ক না পরার কারণে আক্রান্ত হলে এর চেয়ে অনেক বেশি কষ্ট কি হবে না? আপনার সামান্য কষ্ট করার অনাগ্রহের কারণে আপনার মাধ্যমে আপনার নিজের, পরিবারের বা অন্য কেউ আক্রান্ত হলে তখন কী কষ্টটা আরও বেশি হবে না? আর "করোনা হলে এমনিও হবে,ওম্নিও হবে, মাস্ক পরে কি আর আটকে রাখতে পারব"- বলেন কোন যুক্তিতে? মাস্ক পরে কেন করোনাভাইরাস সংক্রমণ আটকাতে পারবেন না? করোনা কি এমনিতেই হয়? মাস্ক পরে তাকে শরীরের ভিতরে ঢুকতে না দিলে এমনি-অমনি কোনমতেই আপনার করোনা হবে না। মাস্ক পরলে, স্বাস্থ্যবিধি মানলে- আক্রান্ত হওয়ার আশঙ্কা অনেকগুণ কমে যায়। ফলে নিজে নিরাপদে থাকা যায়, পাশাপাশি পরিবারকেও সুরক্ষা দেওয়া যায়। জগতে কোন কিছুই এমনি এমনি হয়না। এসির মধ্যে আছেন নাকি রোদের মধ্যে আছেন- ভাইরাস সংক্রমণের সাথে তার কোন সম্পর্ক নেই। সম্পর্ক কারো রোগ প্রতিরোধ ক্ষমতার সাথে। আপনার রোগ প্রতিরোধ ক্ষমতা বেশি থাকলে আপনি হয়তো আক্রান্ত হবেন না। কিন্তু আপনার গায়ে লেগে থাকা ভাইরাস অন্য কারও গায়ে ছড়াবে না এ নিশ্চয়তা কোথায় আছে?

অনেকে আবার অনেক সাহস দেখান। নিজের শারীরিক শক্তি, যৌবন বা তারুণ্যের কারণে করোনা সংক্রমণকে পাত্তাই দেন না। ভাইরাসের সংক্রমণের সাথে আপনার শারীরিক সক্ষমতার বা পেশার সম্পর্ক খুব কমই আছে। শারিরীক সক্ষমতা আর রোগ প্রতিরোধ ক্ষমতা ও কো-মর্বিডিটি এক নয়। আপনার রোগ প্রতিরোধ ক্ষমতা বেশি থাকলে আপনি লক্ষণবিহীনভাবেও আক্রান্ত হতে পারেন, কিংবা আক্রান্ত নাও হতে পারেন। রিক্সাওলার করোনা আক্রান্তের সংখ্যা হয়তোবা কম (আসলেই কম কিনা এ ব্যাপারে এখনও গবেষণালব্ধ নির্ভরযোগ্য তথ্য নেই), কিন্তু শক্তিমান আপনি কিংবা সুরক্ষিত (!) রিক্সাওয়ালা ভাইরাসের বাহক হয়ে অন্যের কাছে ভাইরাস ছড়াতে পারেন।

আপনার পরিবারের রোগ প্রতিরোধ ক্ষমতা কম এমন সদস্য আপনার দ্বারাই আক্রান্ত হতে পারেন। বাহক ব্যক্তি দিব্যি ঘুরে বেড়াচ্ছেন, কিন্তু পরিবারের বয়োজ্যেষ্ঠ সদস্যকে আক্রান্ত করে হারিয়েছেন এমন ঘটনাও ঘটেছে। আমাদের মনে রাখা উচিত, মহাবীর আলেকজান্ডার মাত্র ৩২ বছর বয়সে জ্বরে আক্রান্ত হয়ে মারা গিয়েছিলেন। আপনি কোথাকার কোন পালোয়ান যে আপনাকে ভাইরাস আক্রমণ করতে পারবে না? সুঠাম দেহের অধিকারী আমার নিজের পরিচিতই অনেক বন্ধু/আত্মীয় আছেন যারা করোনাভাইরাসে আক্রান্ত হয়ে এখনও কোঁকাচ্ছেন, কেউ কেউ মারাও গেছেন। আপনি আপনার শরীরের সব দুর্বলতা জানেন?

অনেকে আবার গোঁয়ার্তুমি করে বলেন, "মরলে মরে যাবো।"! কেন রে ভাই? প্রথমত, করোনা আক্রান্ত হয়ে মরে যাবার মতো আত্মঘাতী বেপরোয়া সিদ্ধান্ত আপনি নিতে পারেন না। দ্বিতীয়ত, আপনার নিজের জেদের ফলাফল যাই হোক, আপনার অবহেলার কারণে পরিবারের এবং চারপাশের মানুষের জীবনকে হুমকির সম্মুখীন আপনি করতে পারেন না। আপনার এমনটা করার অধিকার নেই।

আমরা সবাই সচেতন না হলে, বিশেষজ্ঞদের পরামর্শ ও সরকারি নির্দেশনা না মানলে এমন পরিস্থিতি তৈরি হবে যে আইসিইউ সাপোর্ট তো দূরের কথা, হাসপাতালেই জায়গা পাওয়া যাবে না। রাস্তাঘাটে পড়ে পড়ে মরতে হবে। তবে খুব সম্ভবত এমন পরিস্থিতে না পড়া পর্যন্ত আমরা পরিস্থিতির ভয়াবহতা অনুভব করতে পারবো না। ভুক্তভোগীর বেদনা অনুভব করার চেষ্টা আমাদের করা উচিত। সরকারি নির্দেশনা, বিশেষজ্ঞদের পরামর্শ ও স্বাস্থ্যবিধি মেনে করোনা পরিস্থিতি নিয়ন্ত্রণে সবাই সবাইকে সহযোগিতা করা উচিত। বেঁচে থাকলে বাড়িতে বেড়াতে যাওয়া যাবে, মাস্ক না পরেই হাওয়া খেতে বেরোনো যাবে, সামাজিক ও ধর্মীয় অনুষ্ঠানাদি আরও জমকালোভাবে আয়োজন করা যাবে। করোনা আক্রান্ত হয়ে নিজে কষ্ট অনুভব করে এবং প্রিয়জনকে হারিয়ে বেদনাবিধুর হওয়ার মাধ্যমে আর কেউকে যেনো করোনার ভয়াবহতা ও অসহায়ত্ব অনুভব করতে না হয় এ কামনাই করি।

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করোনাভাইরাস, সামাজিক দূরত্ব ও ঘরে থাকার বৈজ্ঞানিক ব্যাখ্যা

Author: Dr. Mohammad Mahbub Rabbani et al.

Brief Description:

করোনাভাইরাসের সংক্রমণ থেকে বাঁচতে হাত ধোয়ার গুরুত্ব অনেক। কিন্তু এই মহামারি প্রতিরোধের জন্য সামাজিক দূরত্ব বজায় রাখার প্রশ্নটি কেন এলো? লকডাউনের মতো কঠোর পদক্ষেপই বা কেন নিতে হয়? ঘরে থাকাটাই কেন এত গুরুত্বপূর্ণ হয়ে উঠল?

প্রথমত, করোনাভাইরাস সম্পর্কে বিজ্ঞানীরা এখনো নিশ্চিত করে কিছুই বলতে পারছেন না। সব কিছু জানতে আরো বেশ কিছুদিন সময় লাগবে, বোঝা যাচ্ছে। তাই প্রথমে নিজের সাধারণ জ্ঞান থেকেই আমার মনে হয়েছে করোনাভাইরাস বাতাসে ছড়াতে পারে (possible)। কিন্তু বিষয়টি একটু ভিন্ন রকম। সংশ্লিষ্ট কয়েকটি পরিভাষার ওপর আলোকপাত করলে ছড়ানোর প্রক্রিয়াটি পরিস্কার হবে বলে আশা করি। একই সঙ্গে সামাজিক দূরত্ব বজায় রাখা এবং ঘরে থাকার কারণও বুঝা যাবে।

করোনাভাইরাস বাতাসে ছড়ায় অর্থ এই নয় যে বাতাসের (wind) মাধ্যমে এক জায়গা থেকে অন্য জায়গায় প্রবাহিত হয় (airborne)। বিস্তারিত আলোচনার আগে আসুন সংশ্লিষ্ট কয়েকটি বিষয়ে আলোকপাত করি।

এরোসল (aerosol) : সাধারণভাবে যেকোনো ভারী পদার্থ (matter) অভিকর্ষজ বলের প্রভাবে ভূপাতিত হয়। কিন্তু অপেক্ষাকৃত ভারী 'কণা' (particles/droplets) তরল পদার্থ বা গ্যাসের মধ্যে ঝুলন্ত (suspended) থাকতে পারে। তরল পদার্থে কঠিন পদার্থ ঝুলে থাকলে তাকে বলা হয় সাসপেনশন (suspension)। আর গ্যাসের মধ্যে ঝুলে থাকলে তাকে বলে এরোসল (Aerosol)। এই কণাগুলো কঠিন পদার্থেরও হতে পারে, আবার তরল পদার্থেরও হতে পারে। যেমন তরকারির ঝোল (broth) যে মসলা ঝুলে (suspended) থাকে সেটা কঠিন পদার্থ, এটাকে সাসপেনশন (suspension) বলা যায়; কিন্তু দুধে যে চর্বি (fat) ঝুলে (suspended) থাকে তা ইমালশন (emulsion)। অন্যদিকে কঠিন ধুলাবালি (dust) এবং তরল জলীয় বাষ্পও বাতাসে ভেসে বেড়ায়, যেমন কুয়াশা। এই দুইটিই এরোসল (aerosol)।

ট্রাজেক্টরি (Trajectory) : কোনো একটি বস্তু সময়ের সাপেক্ষে শূন্যে যে বক্রপথ অতিক্রম করে তাকে ট্রাজেকটরি বলে। যেমন আপনি কৌণিকভাবে ওপরের দিকে একটি ঢিল ছুড়লেন। এটা বক্রাকার পথে সামনের দিকে আগাবে (flight path) এবং একসময় ভূপাতিত হবে। আপনার ঢিল বেশ খানিকটা সময় শূন্যে ভেসে ভেসে সামনের দিকে এগিয়ে যাচ্ছিল।

হাঁচি (Sneeze) : মানুষ যখন হাঁচি দেয় তখন নাকি তার শরীরের সব অঙ্গ-প্রত্যঙ্গ হাঁচির কাজে জড়িয়ে পড়ে। যাই হোক, হাঁচি কী তা বলার অপেক্ষা রাখে না। দুটি তথ্য এখানে উল্লেখযোগ্য। হাঁচির গড় গতিবেগ ঘণ্টায় প্রায় ১০০ মাইল। আর প্রতিবার হাঁচিতে এক লক্ষাধিক ড্রপলেট (তরল কণা) ১০০ মাইল/ঘণ্টা বেগে ছড়িয়ে পড়ে।

এবার আসুন আমরা ওপরের তথ্যগুলো মিলাই। কেউ যদি হাঁচি দেয় তবে তা তার গতিবেগের (speed) কারণেই একটা উল্লেখযোগ্য দূরত্ব (ট্রাজেক্টরি/flight path) পর্যন্ত এগোবে। বলা হয়ে থাকে সেটা ২৮ ফুট পর্যন্ত হতে পারে। লক্ষাধিক ড্রপলেটের মধ্যে সবার সাইজ (size) এবং ভর (mass) এক সমান হওয়ার কথা নয় (unequal size distribution)। ফলে কিছু ড্রপলেট ট্রাজেক্টরি পথ অতিক্রম করে মাটিতে পড়ে যাবে। অপেক্ষাকৃত হালকা ড্রপলেটগুলো কুয়াশার মতো বাতাসে অনেকটা সময় ভাসতে থাকবে (suspended)। এখানে সে এরোসলের মতো আচরণ করবে। তখন যদি বাতাসের বেগ থাকে (wind), তবে সে আরো দূরত্ব অতিক্রম করতে পারে। এই সময়কালে ড্রপলেট সমৃদ্ধ বাতাসের মধ্য দিয়ে কেউ হেঁটে গেলে তার গায়ে ড্রপলেটগুলো লেগে যেতে পারে। এ কারণেই করোনাভাইরাসের সংক্রমণ এড়াতে আক্রান্ত ব্যক্তি থেকে কম করে হলেও দুই মিটার বা প্রায় ছয় ফুট দূরে থাকতে বলা হয় (এটা ট্রাজেক্টরি বা এরোসলের মধ্যে পড়ে যাওয়া এড়ানোর জন্য)। আর এরোসল (যে ড্রপলেটগুলো বেশ খানিকটা সময় বাতাসে ভাসতে থাকবে) এর স্পর্শ থেকে মুক্ত থাকার জন্যই ঘরের বাইরে যেতে বারণ করা হয়। এমনকি, পার্শ্ববর্তী বাসায় কেউ আক্রান্ত হলে কিংবা হওয়ার সম্ভাবনা থাকলে দরজা-জানালা বন্ধ থাকার প্রয়োজনও দেখা দিতে পারে। কারণ, আমাদের নগরগুলোর ভবনের দূরত্ব খুবই কম। তিন ফুটের চেয়ে কম দূরত্বেও অনেক ভবন রয়েছে।

করোনাভাইরাসের গতিপ্রকৃতি এখনো কেউ নিশ্চিতভাবে বলতে পারেন না। আক্রান্ত ব্যক্তির হাঁচির ড্রপলেট (Sneeze droplets) এড়িয়ে নিজেদের সুরক্ষার জন্যই আমাদের নিরাপদ দূরত্ব বজায় রাখা উচিত এবং ঘরে থাকা উচিত। করোনাভাইরাস বাতাসে ছড়ায় (spread out) বা বায়ুবাহিত (airborne) কি না তা এখনো কেউই নিশ্চিত নই, তবে বাতাসে ছড়িয়ে (suspended) থাকতে পারে বলে মনে হয়।

যাঁরা মনে করেন করোনাভাইরাসসমৃদ্ধ জলকণা হাঁচি দেওয়ামাত্রই মাটিতে পড়ে যাবে, তাঁদের কাছে এতক্ষণে বিষয়টি পরিস্কার হওয়ার কথা। করোনাভাইরাসের গড় সাইজ হচ্ছে ১২০ ন্যানোমিটার। এই সাইজের কোনো কণা দ্রুতই মাটিতে পড়ে যাবে বলে মনে হয় না। কারণ তার চেয়ে ভারী ধুলাবালি বাতাসে অনেকক্ষণ ভাসতে থাকে। তবে মনে রাখতে হবে, এই ব্যাখ্যাও চূড়ান্ত নয়। কারণ

করোনাভাইরাসের কেমিক্যাল এবং ফিজিক্যাল প্রপার্টিজ এখনো মানুষের অজানা। ফলে সামাজিক দূরত্বের আওতা আরো বাড়তে পারে।

Source: https://www.kalerkantho.com/online/miscellaneous/2020/04/18/900465

UWB Microwave Imaging for Non-Invasive Anomaly Detection in Human Lung and Possible Application in COVID-19 Diagnosis: A Review

Author: Tahseen Asma Meem et al.

Brief Description:

In this paper an overview of the general process and important design factors of UW B Microwave Imaging is given for medical purposes, and the feasibility of its application in the context of COVID-19 detection is discussed in brief. The recent research into COVID-19 detection using other imaging technologies are reviewed for the sake of comparison, and the research limitations for employing UWB imaging for the same goal with acceptable results are identified.

Source: https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9331250

The Impact of Packaging and Labeling Elements on the Rural Consumers' Purchase Decision for Skincare Products in Bangladesh

Author: Stanley Sumon Rodrick et al.

Brief Description:

Differences in socio-economic conditions, demographics, and infrastructural variances in the rural markets create substantial variances in the consumption patterns compared with the urban markets. As per a report of the World Bank, about 63 percent of the population resides in Bangladesh's rural areas as it constitutes a bigger market for the consumption of different products. The researchers envision identifying the impact of packaging and labeling elements in the decision-making evaluation for different skincare products. The research exploration comprises of four objectives, i.e., perception and attitude towards packaging and labeling elements for the rural consumers, measuring the relative impact based on the demographical changes, determining the sensitivity towards branding elements and communication portrayed, and the ability in identifying the original skincare products in comparison with the copy products in the rural markets. The researchers conducted surveys in the Mymensingh, Netrokona, Jamalpur, and Sherpur Districts of the greater Mymensingh Division of Bangladesh. A total of 390 responses were selected based on the non-probability sampling frame. The target sample age group was chosen between 13 to 54 years. Researchers developed a questionnaire in combination with close-ended questions along with simple dichotomies. For analyzing the outcomes, the researchers have applied a statistical method of the "Z-test" Technique. The researchers identified that the packaging and labeling of skincare products influence rural

consumers' behavior. Different promotional strategies and trade marketing activities are recommended based on the findings, reinforcing the rural consumers' acceptance of skincare products.

Source: https://abd88079-bdc5-4274-9638-f3715aab13b0.filesusr.com/ugd/ed8b62_165294ab4ada46049f8a8e956fa18167.pdf

The Use of Promotional Tools in Enhancing Consumers' Awareness towards the purchase of Agro-based Products from the Modern Retail Outlets

Author: Stanley Sumon Rodrick et al.

Brief Description:

The necessity of modern retailing practices regarding marketing and sales of agro-based products in Bangladesh has resulted in enormous growth over the last few years. Therefore, this study explored the significance of promotional tools and benefits in growing young consumers' awareness of agro-based products marketed by modern retail outlets in Dhaka city. It examined how these outlets have applied various tools of promotions to create awareness and transform consumers' choice into purchase intention. Non-probability sampling especially convenience sampling technique was applied and around 260 responses were utilized to gather and analyze the reliable data. The data was collected using "survey" and secondary information was utilized to support the data. Responses were analyzed statistically with SPSS 20.0 using both descriptive and factor analysis tools. The findings showed that the significance of promotional tools and offers applied by these physical outlets are used to create awareness among the youths in Dhaka city is somewhat satisfactory. Consumers are having their highest priority towards the "Mobile and Telemarketing" tool whereas "Online and Social Media" tool received priority after the mentioned one. Therefore, the researchers opined that information about the effectiveness of these tools could enable modern retail outlets in Dhaka city to foster their competitiveness, ensure their long-term survival and boost their sales.

Source: https://ajbe.aiub.edu/index.php/ajbe/article/view/37/38

Evoked response activity eigenmode analysis in a convoluted cortex via neural field theory

Author: Dr. Kamrun Nahar Mukta et al.

Brief Description:

Neural field theory of the corticothalamic system is used to explore evoked response potentials (ERPs) caused by spatially localized impulse stimuli on the convoluted cortex and on a spherical cortex. Eigenfunctions are calculated analytically on the spherical cortex and numerically on the

convoluted cortex via eigenfunction expansions. Eigenmodes on a convoluted cortex are similar to those of the spherical cortex, and a few such modes are found to be sufficient to reproduce the main ERP features. It is found that the ERP peak is stronger in spherical cortex than convoluted cortex, but in both cases the peak decreases monotonically with increasing distance from the stimulus point. In the convoluted case, cortical folding causes ERPs to differ between locations at the same distance from the stimulus point and spherical symmetries are only approximately preserved.

Source: https://journals.aps.org/pre/abstract/10.1103/PhysRevE.102.062303

Neural Field Theory of Evoked Response Potentials in a Spherical Brain Geometry
Author: Dr. Kamrun Nahar Mukta et al.

Brief Description:

Evoked response potentials (ERPs) are calculated in spherical and planar geometries using neural field theory of the corticothalamic system. The ERP is modeled as an impulse response and the resulting modal effects of spherical corticothalamic dynamics are explored, showing that results for spherical and planar geometries converge in the limit of large brain size. Cortical modal effects can lead to a double-peak structure in the ERP time series. It is found that the main difference between infinite planar geometry and spherical geometry is that the ERP peak is sharper and stronger in the spherical geometry. It is also found that the magnitude of the response decreases with increasing spatial width of the stimulus at the cortex. The peak is slightly delayed at large angles from the stimulus point, corresponding to group velocities of 6–10 ms-1. Strong modal effects are found in the spherical geometry, with the lowest few modes sufficing to describe the main features of ERPs, except very near to spatially narrow stimuli.

Source: https://journals.aps.org/pre/abstract/10.1103/PhysRevE.99.062304