

# The future of novel Coronavirus pandemic

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A virus is a submicroscopic infectious agent that needs living cells like humans, animals, plants and even other microorganisms including bacteria for budding. Viruses are much smaller than bacteria which contain DNA or RNA genome.

The zoonotic coronavirus infects humans through the respiratory route – nasal cavity via pharynx to lung tissue. The viruses bind with epithelial cells, the outer cover of the respiratory tract membrane, like flu viruses causing fever, throat pain, sneezing and coughing etc. The viruses are so contagious that they can spread up exponentially from an infected person to the next. Mostly respiratory droplets of infected people spread the infection to others by inhalation or by touching the particles fallen on the surface of objects (mouth, nose and eyes).

It is undeniable that, if nature is oppressed, they do not delay to repress. Changing food habits especially avoiding uncooked and undercooked foods, eating wild animals, killing and destroying ecosystems are the crucial factors in inviting the deadly attack of viruses. Even though



antiviral drugs are available for specific viral infections, but they have been found less effective in the treatment of this novel coronavirus disease.

The pandemic of novel coronavirus has changed the entire world even in this modern age. Lifestyle, health hygiene, healthcare facilities and healthcare industries etc. are the cornerstones of the wellbeing of the world ahead. Information technology contributed

tremendously in contact tracing people in some countries like South Korea. Molecular diagnostic platforms and polymerase chain reaction (PCR) technology laid its commendable footprint above all.

Medical scientists say, to eradicate the viral disease only effective vaccines can be the strongest of all weapons, and hence, the giant biotechnology companies of the world are working relentlessly. The entire

world is waiting for the light from the darkness of coronavirus. The question is, will they be able to meet the demand of the whole world? Probably not, as they will meet their own need first and there is nothing wrong here if so. But what are the lessons for the rest of the world and the developing countries like Bangladesh?

Now is the moment to make factual decisions by the government and private entities,

how they can start building a robust weapon to fight against this invisible enemy. Real-Time Reverse Transcriptase Polymerase Chain Reaction (rRT-PCR) has become widely popular these days due to its significant specificity and accuracy in the detection of this tiny organism. Apart from viral detection, there are many more diseases that need this PCR technology too. Establishment of molecular diagnostic laboratories, point of care DNA sequencing facilities and manufacturing of molecular diagnostic kits, etc. are pivotal factors for disease detection in the future. Genome sequencing of novel coronavirus on Bangladeshi population is highly desirable to know the pattern and pathogenicity of the virus.

One day this pandemic will end, but we cannot ascertain that another mighty one will not come. There are millions of bacteria and viruses that remain out of the research loop. Molecular diagnostic industries and biotechnology companies can contribute immensely against those diseases ahead of us to make the world ready to tackle them.

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## DID YOU KNOW?

### Social isolation linked to more severe COVID-19 outbreaks

Regions of Italy with higher family fragmentation and a high number of residential nursing homes experienced the highest rate of COVID-19 infections in people over age 80, according to a new study published recently in the open-access journal PLOS ONE.

Italy has been one of the countries most affected by the COVID-19 pandemic. Researchers have speculated that this is due to Italy's age demographics as well as the connectedness of the older and younger generations and high rate of intergenerational contact. If true, this would suggest that regions with larger households would have more severe COVID-19 outbreaks in older adults.

Across Italian regions, the COVID-19 incidence rate ranged from 0.27% to 4.09% of the population being affected. The mean number of household members ranged from 2.02 to 2.58; the percentage of one member households ranged from 28.5 to 40.9; and percentage of COVID-19 cases that occurred in people over age 80 ranged from 4.3 to 23.6.

A model that reflected the percent of the population over age 80, days since 50 cases were registered, percentage of nursing home beds in the total population, and mean number of household members was best able to predict the COVID-19 incidence among older people in each region, with an adjusted R-squared value of 0.695 (p<0.001). A lower mean number of household members and higher number of nursing home beds was associated with more COVID-19 cases in older adults.

The study was limited by the fact that age-specific infection rates were not available and the number of COVID-19 tests varied enormously by regions.

## HEALTH bulletin



### Increasing number of lost pregnancies linked to higher risk of developing diabetes

New research published in Diabetologia (the journal of the European Association for the Study of Diabetes [EASD]) shows that the higher the number of pregnancy losses a woman has, the higher her risk of developing type 2 diabetes (T2D).

The study identified 24,774 women with T2D and selected 247,740 controls without diabetes. Women who had experienced 1, 2 or 3 pregnancy losses had an 18%, 38% and 71% higher risk, respectively, of developing T2D as compared to ever-pregnant women with no pregnancy losses. Women who had never been pregnant had a 56% increased risk of developing T2D compared to women who had been pregnant with any number of losses from zero upwards. Similar results were found after adjustment for obesity and gestational diabetes.

The authors suggest that women with three or more pregnancy losses could have their blood sugar profile more frequently monitored so that lifestyle advice can be offered to lower their risk and interventions can be applied early if diabetes develops.

## Novel coronavirus mutation and genome sequencing

DR JAGODISH CHANDRA GHOSH

The recent pandemic caused by the novel coronavirus (SARS-CoV-2) has caused the death of about 365,000 people throughout the world so far. The novel coronavirus responsible for coronavirus disease (COVID-19) has much genomic similarity (about 80%) with severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV) that spread throughout the world in 2002-2003 and 2012 respectively.

The novel coronavirus is an RNA virus that has undergone multiple mutations including mutation in the genomic (gene) protein. One of the characteristics of an RNA virus is its high potential for mutation and adaptability to environmental changes.

Mutation of a virus can bring changes in their character including their infectivity, virulence and pathogenesis. Knowledge about mutations helps plan the management in general including the selection of the tests for its identification, treatment procedure and invention/production of vaccines.

In the regional planning strategy for the overall management of COVID-19, mutation related information of the virus should be taken into account along with the guideline provided by the World Health Organisation. For example, one particular group of drugs may not be similarly effective on a particular strain of the virus. For

innovation of the most effective vaccine, it is essential to take the different strains into account.

Mutation related changes can be determined by genomic sequencing and by comparing with a standard. Genome sequencing had been performed by many countries. Recently genome sequencing of the novel coronavirus had been done in Bangladesh for the first time. It is now important to perform genomic sequencing with much more patient samples and with particular attention by taking samples from hot spot areas for COVID-19 in the country.

Recent research detected some hotspots of mutation in the SARS-CoV-2 virus genome. Researchers found that the Asian, European, American and Russian strains coexist regarding the attack in any particular region or country. It is also observed that the mutation in one country or

region is different from that of other countries and regions. Researcher Esteban Domingo mentioned in an article that too frequent and rapid mutation of the virus might decrease or extinct the infectivity of the virus. If such a situation occurs it may obviate human beings from this present dangerous situation.

Many aspects of COVID-19 are still unknown and research is ongoing. Production of vaccines is in the trial phase but quite a long time may be needed for its commercial use. COVID-19 exposes the poor health service status of many countries. Regions, countries and researchers need to be even more proactive for research on COVID-19 and other emerging and re-emerging diseases that have ceased millions of lives throughout the world in the past decades.

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### Mental health of medical personnel working with COVID-19 patients

Medical personnel treating coronavirus cases in China have higher rates of anxiety and other mental health symptoms than the general population, according to a new study published recently in the open-access journal PLOS ONE.

The healthcare providers surveyed scored higher on scales of somatisation (experiencing physical symptoms of psychiatric conditions), obsessive-compulsive symptoms, anxiety, phobic anxiety and psychoticism compared to a national average (p<0.05). They also scored lower on a scale of interpersonal sensitivity (p<0.01).

The researchers identified several factors that predicted mental health status (p<0.05), including whether a clinician had worked in Hubei province, their level of concern that they had been infected, and their age. However, the study is limited in that it did not directly compare doctors working with COVID-19 patients to doctors not working with COVID-19 patients.

The authors add: "The overall mental health status of medical personnel responding to new coronavirus pneumonia is generally higher than that of the norm group in China. The results of this study should contribute to measures to alleviate the psychological pressures on medical personnel dealing with the new coronavirus epidemic in China."



## HOW TO HOME QUARANTINE

The home quarantined person should:



Stay in a well-ventilated single-room preferably with an attached toilet



Needs to stay away from elderly people, pregnant women, children



Restrict his/her movement within the house



Under no circumstances attend any social/religious gathering



Wash hand frequently with soap and water or with alcohol-based sanitizer



Avoid sharing household items like dishes, glasses, cups, utensils, towels, bedding



Wear a surgical mask at all time. The mask should be changed every 8-8 hours

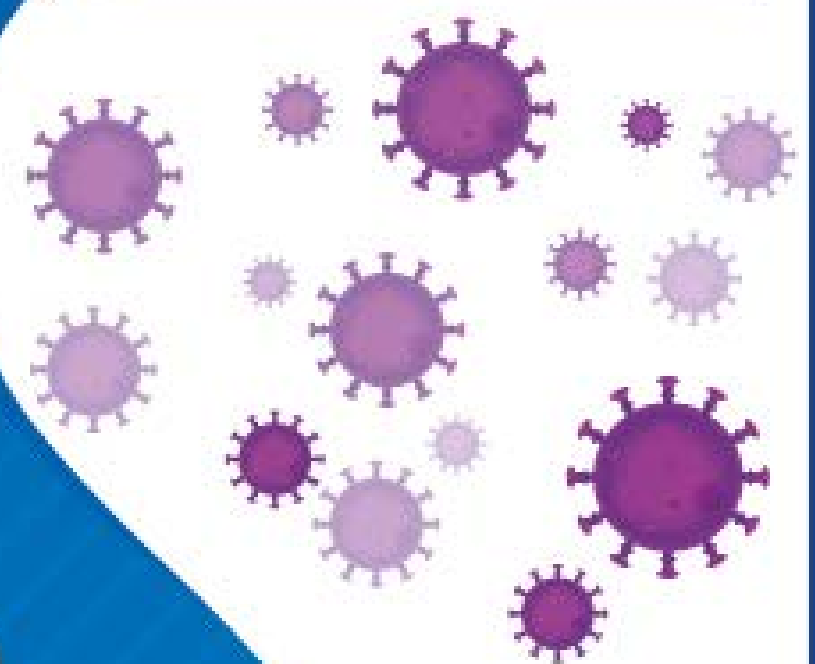


Dispose off used mask in a closed bin and bin should also be handled responsibly



If symptoms appear, he/she should immediately inform the nearest health centre

### COVID-19 OUTBREAK



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