

Eye on Science planet

A YEAR LIKE NO OTHER:
Self-Reflection





Winter and Spring 2021
Year 14, Issue 1

Cultural Outreach Sector
Educational and Promotional
Publications Unit (COPU)

Editor-in-Chief and
Head of COPU
Maissa Azab

Resident Editors
Sara Khattab
Hend Fathy
Esraa Ali

Freelance Editors
Inas Essa
Fatma Asiel
Jailane Salem
Mariam Elsayed

Language Revision
Perihan Fahmy

Design Team
Faten Mahmoud
Maha Sherin

Special Thanks
Dr. Omar Fikry
Mohamed Khamis
Nadine Elsarrag

CONTACT US:

- ✉ copu.editors@bibalex.org
- 🌐 www.bibalex.org/SCiplanet
- 📘 SCiplanet
- 📷 sciplanet.magazine
- 💬 SCiplanet_COPU

Letter from the Editor-in-Chief

SURVIVING THE PANDEMONIUM

By: Maissa Azab



Life during a global pandemic has certainly been a harrowing experience. We have all collectively and suddenly come face-to-face with one of the scariest facts of life; a fact that most of us usually ignore, which is that life is completely unpredictable. Indeed, at any moment, it can suddenly come to a screeching halt, be turned upside-down, or simply end. Yet, far from despairing; this revelation is in fact a singular opportunity for a renaissance.

Most, if not all of us are well aware of serious outbreaks that have caused global scares in recent decades; the avian flu, swine flu, and Ebola, immediately come to mind. None of these, however, have been as devastating as the last truly terrifying pandemic, which occurred almost exactly a century ago: the Spanish flu. One of the deadliest pandemics in human history, in two years, it infected one-third of the world's population at the time, killing somewhere between 20 million and 50 million people.

Ignoring the certainty of life's uncertainty, and although fully aware that deadly pandemics have occurred over and over again, the majority of the current population had not given this fact much thought. Even with recent scares mentioned above, nothing much in our lifestyle changed; we continued to charge through life taking it for granted. To be completely honest, many scientists tried to warn us, but as the proverb goes: "Out of sight, out of mind". To put it more bluntly, most of us naively thought that, for sure, with all the scientific and technological advancements of modern age, nothing could blindside us!

How wrong were we? Since early 2020, we have been throttled and humbled in every way possible. Everything and everyone have become a threat to us; we too, have become a threat to others. Many died, many were hospitalized, many suffered greatly on the short- and long-terms, many got really sick, many got mildly sick, many did not get sick at all but somehow transferred the infection to others, many endured physically but agonized psychologically, and many lost their livelihood. The pandemic has been, and frankly still is, a punishing pandemonium.

Of course, for those who have lost loved ones, there is not much consolation to see or feel amidst this calamity. For the millions who have survived physically and the vast majority who suffered psychologically, whether they have fallen ill or not, finding solace in the simple things has become of the essence. For lack of a better expression, the "lucky" ones have seen a silver lining in all of it, rediscovering themselves, getting in touch with their true inner needs and priorities in life.

Having gone through the turmoil of the past 18 months and as we continue to fight to forge ahead in pursuit of the light at the end of the tunnel, SCiplanet editorial team has decided to take refuge in optimism. Exceptionally, this year, we are publishing the four issues of SCiplanet printed magazine in two combined issues. In these exceptional issues, not only are we seeking silver linings and good news, but we are revamping ourselves as well. We are also introducing a potential new addition to the SCiplanet family; that would be the SCiplanet Kids Annex, which targets children aged 8–12 years old. The Annex aims to intrigue the youngsters with science and get them excited about it through fun stories and activities.

We hope that, in addition to giving you some insight about a diversity of relevant science topics, this issue and the next inspire you to seize the unique opportunity we have on hand to dig deep and aim high. More importantly, we hope you stay optimistic and safe.

IN THIS ISSUE



Read more articles in
SCIplanet online on the

COVID-19 PANDEMIC

In late 2019, a new coronavirus outbreak emerged, giving rise to the coronavirus disease (COVID-19) pandemic. The articles under this theme tackle the pandemic's latest news and implications on our everyday life, in addition to providing some useful tips to stay safe and cope with this exceptional event.



4 Fearing the End of the Nightmare

20 Tampering with Nature and the Rise of Pandemics

8 Boosting Immunity to Fight COVID-19

22 PODD: An Innovative Solution to Disease Outbreaks

10 The Priceless Giveaways of 2020

24 Food Supply Chains: From Crisis to Opportunity

14 Applications We Found Important

26 The Farthest COVID-19

15 A Lockdown Generation: Remote-Learning Lessons and Practices

27 A Busy Agenda for Mars!

28 German Inventions that Changed the World

16 Artistic Relief

30 Science Fun Time

19 Mental Health and the Pandemic





FEARING the End of the NIGHTMARE:

Q&A WITH DR. ISLAM HUSSEIN

By: Esraa Ali

Last year, we have been through so much that I would have never thought there would be a debate about the need for a vaccine or about its benefits. I thought the pain and agony of sickness and loss that almost every house has experienced are sufficient to seek vaccination as soon as it is introduced, not to raise mass fear-mongering campaigns. In March 2021, *SCiPlanet* conducted a poll to know people's views on getting COVID-19 vaccine. Out of 96 participants, 27% were pro-vaccination, 28% rejected it, and 45% were hesitant; at the same time, several world countries have nearly completed vaccinating their citizens! I wondered, do we really fear the end of this nightmare, or do we just fear the unknown? On 5 April 2021, we conducted an interview with Virologist Dr. Islam Hussein, Principal Investigator at Microbiotix Inc., USA, and founder of *ViroVlog* channel, to respond to the most prominent fears we detected.

Can COVID-19 vaccines alter human DNA or lead to death?

Rumours claiming that Messenger RNA (mRNA) vaccines, such as Pfizer and Moderna vaccines, can change DNA are amongst the most ridiculous misconceptions because it has to do with the basics of molecular biology. Imagine all of the material within a cell (the cytoplasm) as an apartment without any inner walls, except one room (the nucleus), which has a door that cannot be passed without a key and only from the inside to the outside. Inside this room, a copy of the DNA genes carrying the same code and known as mRNA is made then moves outside in search of the ribosome (a cell component) to decipher it into a spike protein—similar to the one on the virus's outer surface—to strengthen immunity. After this process, the code is immediately broken; its duration inside

the cell ranges from a few seconds to a few minutes, then it disappears completely. As such, it does not affect the genes; it is a very simple process.

As for the unusual thromboembolic events, a few weeks ago, blood clots were reported in Europe in people who had received the AstraZeneca vaccine; this had a domino effect in European countries. In this period, the reported cases in all Europe have amounted to about 25–30 cases only, out of 17 million people. The cases are quite rare; still, the vaccine was paused for a while to conduct further studies. Although England was one of the most European countries to widely distribute the vaccine—about twice as high as the European Union combined—it did not report any similar cases. The vaccine manufacturer and the European Medicines Agency (EMA) announced, after careful revision and investigation, in a press conference that there was no increase in blood clotting incidences in people whether they received the vaccine or not—the estimated number of thromboembolic events in Europe is about 100,000 cases annually. Similarly, some scientific papers stated that thromboembolic events occur at a rate of one in every 1,000 cases annually worldwide; a rate that increases with age. The number of cases is, therefore, not shocking or indicative of an increase related to vaccination. The media, unfortunately, widely spread such a rumor based on intimidation although the World Health Organization (WHO) and physicians from the International Society on Thrombosis and Haemostasis (ISTH) have stated that there is no need to worry and that there is no problem related to blood clotting.

The EMA announced that there is no indication that vaccination has caused these conditions, although it is difficult to deny the matter in light of the available information now; however, the benefits of the vaccine outweigh any possible rare risks. It explained that most of the cases reported so far have occurred in women under the age of 55 years, which is likely to happen among this age group even without receiving the vaccine; so far, no clear reason has been identified to explain this phenomenon. After this conference, European countries resumed the use of the vaccine, and some announced that they would give it only to people above 65 years old, who would benefit more than those at younger ages. Likewise, they have now started monitoring apparent cases. For example, Britain has monitored 20 cases, but so far, based on currently available data, it cannot be concluded that the vaccine has led to the occurrence of blood clots. It is just a matter of correlation, but it does not necessarily mean causation. This is very rare and requires further studies. It is not correct to neglect the benefits of a cheap and easy-to-transmit vaccine; we would be mistaken to focus on a risk rate of one in a million versus a virus that kills 2–3% of those infected. We should not get carried away by a subject that is still being studied and so far has no causal relation.

Does the development and launching of COVID-19 vaccines in a relatively short period mean a possibility of skipping any scientific research steps?

This is not true. The vaccines were released at a faster rate than usual, but this does not mean that they did not undergo known experimental steps. We found ourselves in a crisis with no luxury to deal normally with the matter, and saving most lives in a relatively short time became a necessity. Any vaccine undergoes three experimental stages, but this time the rate of each was accelerated; they are usually conducted at a very slow rate for several reasons. First, the lack of the necessary funding to conduct these experiments at the cost of millions of dollars; however, in this case, governments paid billions and pharmaceutical companies modified their definition of gain and loss. Before any decision, they used to make multiple calculations related to profit; during the pandemic, that concept changed, as they could not focus on profit while facing high death rates that impacted all sectors. Money, thus, was no longer the traditional obstacle.

The availability of the human factor to test the vaccine also contributed to the acceleration of this process. Under normal circumstances, even if the funds were available, testing the vaccine on enough cases might take months and years. During the pandemic, we have millions of infections, so the four-month trial took only two months. Time was another available element for *Medicines Regulatory Authorities* during the pandemic; they even worked during their sacred holidays, as they raced against time. The vaccines fulfilled all these stages, and were listed for emergency use after their safety was assured. Launching the vaccine then was of utmost importance and urgency; now, we are trying to find out the issues that would have made us wait,

such as is it safe for children and pregnant women? How long does the immunity last? All these were luxury questions during an escalating pandemic and would have consumed much time to answer them first.

We cannot also overlook the fact that most of the techniques upon which the vaccines are based have a long history dating back to the 1990s. The pandemic has just accelerated the usage of the outputs of previous research efforts. The information about other viruses, such as MERS, enhanced our knowledge; for example, the immunogenicity of the spike protein. The accumulated knowledge has made things much better; if this virus was brand new, things would have been much more difficult and slower, so that was our good fortune.

Is it possible that current vaccines do not work with new virus mutations?

Work on vaccines started as soon as we knew the genetic code of the virus; with time, a mutation occurred in the virus, which is normal in all viruses. As vaccines were released, the mutation in the virus contributed to its rapid spread; more importantly, variants that gave it the ability to evade the immune responses triggered by the vaccines. Three basic mutations emerged; the first in England, and does not affect the immune response much, but contributes to the speed of the virus spread. The other two mutations emerged in South Africa and Brazil; they reduce the ability of antibodies to bind to the mutated virus and neutralize it, a state that we desire from the immunity triggered by the vaccines. However, the current situation entails a decrease in the effectiveness of the vaccine but not its total loss. One of the most prominent advantages of these vaccines is that they induce very strong immunity. If we desire more antibodies to fight the virus, we are still within the protection range, but we have not reached the zero state of being unprotected from the variant. It is not correct to wait for the virus to mutate while we are in a race against it, and have to beat it.

We have to reduce the virus spread rate because the more it is transmitted, the more mutations emerge. This will only happen by applying the precautionary measures that we have memorized by heart, and by starting to distribute the vaccines at a very fast pace to cover the largest possible number of people. Vaccine providers have also started developing modified versions for stronger immunity against this mutation that are now experimented and expected soon. With some vaccines, such as mRNA, these modifications are as easy as replacing a wheel pin; we cannot say, thus, that we have completely failed. We have lost a battle, but the war is still going and we will finish it.

Do these vaccines protect us from the COVID-19 only, or do we acquire immunity against other viruses too, such as the seasonal influenza?

This is not true; the two illnesses are caused by different viruses, and the immunity triggered by their vaccines is different, so we cannot substitute one for another.



How long does the immunity provided by the COVID-19 vaccination last?

We can know the duration if we go to the future; this virus dates back one year and a few months only. Yet, all current studies assume that it may last for "at least" six or eight months as it is expected to last longer, but we do not have sufficient information and time to reach a solid answer. We must not pay attention to such an issue as much as we need to focus on receiving the vaccine to protect ourselves and our families in the first place, leaving other matters to gradually emerge over the course of time.

Why do we need two doses? Do we become more vulnerable to infection in the period between them?

The need for two doses is nothing new; the immunity response is activated very strongly when it is exposed to the same stimulus twice within a short period of time. The first dose provides primary immunity; the immune system activates and produces antibodies that the immune cells are alert to. If the body is exposed to the same stimulus after a short period, a secondary immune response occurs and is tens of times stronger than the first and lasts longer. After the first dose, a partial protective immunity response appears with up to 50%–60% protection—in best cases 70%—after the second dose, immunity reaches its peak at 90% protection.

Getting exposed to the virus after receiving the first dose is possible, but the chances of infection are much weaker. However, if this occurs, the patient shows much lighter symptoms as a result of forming partial immunity, and it becomes much like putting a drop in an ocean. That is why we advise those taking the first dose to maintain their health and adhere to all precautionary measures until the second dose; they must adhere to social distancing because we are not all vaccinated at the same time. Some people become protected while others do not; in such a case, those protected do not show any symptoms, but could transmit the virus to others. With the spread of the vaccines, we reach a community immunity by covering 70–80% of people; we witness a gradual improvement with less pressure.

Can vaccine ingredients trigger allergic reactions?

The vaccine is not recommended only for people allergic to one of its components, and their number ranges between approximately 2–4 per million, which is very rare. The majority of allergies are related to mRNA vaccines, because they contain a compound frequently used in cosmetics, such as shampoo and toothpaste. Some people have antibodies against this harmless substance; when they take the vaccine, an allergic reaction may occur. Are there any reported death cases? The answer is "No"; all people developed allergies were immediately treated. Therefore, everyone receiving the vaccine is advised to sit for 15 minutes, which is the period necessary for this reaction to occur in the form of immediate flushing for example, in which case said person receives the necessary medication to mitigate this effect. If I have to choose between allergy and COVID-19, I will definitely choose allergy.

What is your comment on physicians who advise their patients not to receive the vaccine, such as the elderly, pregnant and breastfeeding women, and those with certain medical conditions?

It is unfortunate; at times, these doctors do not not summon all of their medical information, which is basic science. The elderly are a priority because their health problems make them more vulnerable to infection; on the other hand, for people at younger ages, the vaccine is their safest option. As for pregnant and breastfeeding women, so far, there are no problems that prevent them from receiving the vaccine. While testing any vaccine, it is customarily not tested primarily on pregnant women and we do not approach such categories until it is certain that the vaccine is safe. Yet, EMA permits do not prevent pregnant women from receiving the vaccine, because it does not contain a live virus. Pregnant women cannot take live attenuated vaccines, and there is no vaccine against the coronavirus containing a live virus. The vaccine itself is very fragile and breaks down within minutes, as stated earlier; it does not enter the bloodstream to reach the placenta, so the risk on pregnant women is almost zero. The vaccines were tested first on animals; some were pregnant and did not show any complications. Likewise, some participating women in the trials got pregnant during that period by chance. Upon following up on their conditions, thank God, so far, they have not had any health problems. On the other hand, complications as a result of infection among these groups are much higher than others, so the vaccine is their safest option too.



Do the antibodies acquired from infection eliminate the need for vaccine?

The majority of coronavirus-infected cases have shown slight symptoms, and about 80% were cured after home isolation only; however, the immunity response with such minor infections is weak and does not last for a long time. A notable study in Denmark, for example, stated that the protection rate for people over 65 years old after a second infection was less than 50%, indicating that immunity based on natural infection is not strong; it is worth mentioning that the greater the age, the less the protection. Studies conducted on people who received one dose found that they reach the same stage of immunity as if they had taken two; whoever was infected with the virus and took a dose of the vaccine three months later is like someone who received two doses. Some countries have, thus, begun to set up a system due to insufficient doses by providing one dose for those infected beforehand, while vaccinating others who have never been infected before and have less immunity. It is worth noting that there is no harm on whoever took the two doses and was previously infected. We, certainly, need to vaccinate everyone because the immunity caused by infection varies among people; the vaccine's effect is measurable and forms an almost equal immunity response among them, as opposed to infection, to which some have a stronger response than others. We aim to achieve a strong immunity response and protection to a certain degree in everyone, which can only be achieved through vaccination.

What is your advice to those who object to receiving a specific type of vaccine?

"Eat what is placed in front of you"; the best vaccine is the one that ends up on your shoulder, it is not a time to be selective. All vaccines provide protection that is close to 100% against the virus, compared to those who develop severe complications or die. We must deal with the situation in a better way till the end of the crisis.

In conclusion, do you think that getting vaccinated against the coronavirus is controversial or settled?

It is settled and I do not mind any questions or concerns. You have the right to ask and understand, and we cannot force anyone to do anything. The value of this step is that people protect themselves, their families, close people, and the society as a whole; that decision does not only affect them, but affects everyone as well. Throwing garbage in the middle of the street is not a personal freedom; it harms others as well. If you are fortunate enough to have good health, you may pose danger on your grandfather, grandmother, or any family member who has lower chances of immunity. I welcome all questions on this topic at any given opportunity or on social media, and I do not mind analyzing any rumor in details to understand and reach the correct conclusion. Your decisions do not only affect you negatively; they affect others as well. Know the correct information and build your decision on a correct basis.

I advise everyone to seek information from the the right sources and not to rely solely on the media and public opinion. We have to do our homework, know the correct information, and be assured that people will ultimately take the correct decision. Summing up, I ask everyone to register for vaccination. Those hesitant or refuse to register, or have any reservations on long periods of waiting or any other objections, I advise them that the issue is intolerable. I was ready upon registration to get any date soon and travel any distance to get vaccinated. I hope everyone deals with the vaccine issue with this mentality.

SCIplanet extends its gratitude to the respectable scientist Dr. Islam Hussein, who was generous in clarifying this matter despite his intensely busy schedule. We also invite you, dear reader, to verify your information by addressing specialists. It is your right to understand, just as it is your duty to protect your society.



BOOSTING IMMUNITY TO Fight COVID-19

Ever since the World Health Organization (WHO) declared COVID-19 a pandemic in March 2020, people have been eager to protect themselves against this new virus. Besides wearing face masks, face shields, gloves, and practicing social distancing, they started to search for the best ways to improve their health and boost their immune system. Some people have resorted to using herbs and alternative medicines or natural remedies, others have been consuming dietary supplements, while some have been keen to adjust their diets.

Dietary Supplements vs. Food

It is true that there are some medical conditions that require receiving dietary supplements to make up for the nutrients the body fails to absorb. For example, in some types of anemia, the body cannot absorb vitamin B12; to manage this, vitamin B12 shots are prescribed. Pregnant women also require more folate so they need folic acid supplements. Even when you have a common cold, it is recommended to take vitamin C supplements.

Amidst the outbreak, pharmacies were emptied from all immunity boosting supplements, as people thought they were the perfect shield against the coronavirus. However, supplements should not replace all the nutrients and benefits of consuming food. Moreover, supplements cannot be taken without a certain dose, because according to some studies, their excessive intake are related to some health issues. When consuming these supplements, the body keeps the needed nutrients and usually the excess nutrients are disposed of. Water-soluble vitamins, such as vitamin C

and all vitamins B, are easily excreted from the body; on the contrary, fat-soluble vitamins, such as vitamin A, vitamin D, and vitamin E, are stored in the body's tissues.

Given that fat-soluble vitamins can stay longer in the body, consuming high doses can lead to toxicity and undesirable side effects. High amounts of vitamin D supplements can raise blood calcium levels, which can lead to organ damage, in addition to weight loss, loss of appetite, and irregular heartbeat. High dosage of vitamin E supplements may interfere with blood clotting, causing hemorrhages and hemorrhagic strokes. Even though vitamin C can be easily excreted through urine, receiving huge doses of it, just like what happened during the beginning of the pandemic, can cause some issues, such as diarrhea, nausea, vomiting, heartburn, abdominal cramps, and headache.

Sadly, many people do not follow healthy diets so they resort to dietary supplements to compensate the deficiency. However, the vitamins and minerals found in food sources are easier to absorb

By: Sara Khattab

than those in supplements. What are the best foods, vitamins, and minerals that can help us build up a healthy immune system and fight COVID-19?

Vitamin C is the most powerful vitamin in building up the cells of the immune system; it enhances the ability of the immune system to protect the body from viral and bacterial infection. This vitamin can help reduce the severity and duration of infections, especially upper respiratory tract infections and common colds, since it acts as a natural antihistamine and anti-inflammatory. For adults, the recommended daily amount of vitamin C is 65–90 mg.

Of course, once you hear vitamin C, the first thing you think about is citrus fruits. It is true that citrus fruits, such as oranges, lemon, and grapefruits, are rich in vitamin C; however, there are other fruits and vegetables that are also rich in vitamin C. Surprisingly red bell peppers contain more vitamin C than citrus fruits; tomatoes also have a high concentration of vitamin C—one medium-size tomato has more than 16 milligrams of vitamin C.



Eating an orange or a cup of chopped red bell peppers will give you the needed daily dosage of vitamin C.

Broccoli is another important source of vitamin C; however, there are many other reasons to add broccoli to your diet. Researchers claim that broccoli and other cruciferous vegetables, such as cabbage, cauliflower, and brussels sprouts, help boost immunity because they contain the antioxidant sulforaphane, which combats free radicals and prevent you from getting sick. Another superfood is spinach; not only because it is rich in vitamin C, but it also contains folate that helps the body make new cells and repair DNA. Just like broccoli, it is recommended to slightly cook spinach or eat raw to get the most of their nutritional benefits.

Another infection fighter is vitamin A, which is in animal foods, such as fish, meat, and dairy products, and from plant carotenoids, such as carrots, sweet potatoes, and pumpkin. These vitamin A rich foods act as antioxidants that fight cell damage and inflammation. Vitamin E also plays an important role in fighting off infections; it is critical in how the immune system works. Nuts, specifically almonds, are the best food containing this vitamin, in addition to other healthy fats. Consuming half a cup of almonds daily is enough to cover the body's needs of vitamin E, which is 15 mg.

Your body also needs zinc for the production of new immune system cells; it protects tissue barriers in the body and helps prevent some diseases from attacking the body. Many studies proved that the mineral zinc can protect against respiratory tract infections. Legumes, including chickpeas, beans, and lentils, contain a great amount of zinc; it is also present in lean meat, poultry, and fortified cereals. The recommended daily amount of zinc is 8 mg for women and 11 mg for men.

Garlic is not only a taste boosting ingredient in cooking, it also has antiseptic and antifungal properties, since it is packed with important nutrients, including vitamins B1, B6, and C, in addition to iron and phosphorous. In ancient history, garlic was only used for



its medicinal properties. When chewing garlic raw, its main compound called alliin turns into allicin, which quickly then converts to sulfur containing compounds providing their medicinal properties that help the white blood cells that fight viruses. They also stimulate your liver to produce detoxifying enzymes to filter toxins out of your body.

Since Ancient Times, mushrooms were used to treat infections and diseases; there are many types of mushrooms that have medicinal properties. They can also boost immunity since they are loaded with important nutrients, such as selenium, which is an antioxidant that strengthens the body in its fight against bacteria, viruses, and cancer cells. Mushrooms also contain vitamins B riboflavin and niacin, which play an important role in building a healthy immune system.

Another beneficial natural remedy is ginger, which has anti-inflammatory properties; it is used to fight illnesses, ranging from infections to digestive problems. Gingerol, the active component of ginger, has the ability to lower inflammation in the body, which is often caused by infections. Drinking hot ginger with honey and lemon is a good remedy to soothe your sore throat.

Other ways to boost the Immune System

Besides maintaining a balanced diet packed with the important immunity boosting nutrients, there are some other recommendations that may help improve your overall health and eventually improve the immune system. First of all, you have to have a good sleep; around 7-8 hours daily. Lack of

sleep will leave you tired and stressed, which may prevent your body from functioning properly, which in turn will impact the immune system. Avoid smoking; smoking directly affects the immune system and smokers are more prone to be infected by COVID-19. Try to exercise regularly; even if just a daily walk for 30 minutes. Light exercise helps release toxins from the body and helps in destressing. Regular exercising also helps in improving metabolism, which is related to the immune system.

At the end, we must bear in mind that consuming healthy diets or dietary supplements, or maintaining a healthy lifestyle will not prevent us from being infected by COVID-19, and it will not cure us either. This is only a way of many ways to help our frontline defense soldier, the immune system, to perform better in order to fight any disease.

References

- bbc.com
- healthline.com
- mayoclinic.org
- medicalnewstoday.com
- webmd.com





By: Inas Essa

Needless to say, the past year was never to be expected and a very hard one for the whole of humanity on different levels and aspects. It was a year the like of which had never been seen before by the millennials and Generation Z; a year where many suffered and succumbed to adversity, while others strived to surmount and find opportunities amidst hardship.

First was the shock, then the need to search for coping mechanisms that could help, the thing that was not easy at all, but a must. Many of us tried to find solutions by looking back at similar incidents that had happened before to try to foresee and predict what would happen. However, there was chaos everywhere as a result of the infodemic; the reality of the situation looked much more complex than that.

It was evident that the whole world was spinning, so were we. Finally, there was no way to get out of this dilemma but to sit still, take a deep breath, relax, and reflect on what has been happening. Neither the feverous beginning, nor the vague upcoming is a good time to reflect on what is happening; during both, your vision would not be clear.

Through such difficult times and situations, our responses vary greatly, which is normal since each one of us has their own experiences, personality traits, fears, and viewpoints that make them the person they are. Yet, this year has brought an extremely important principle to center-stage; a principle that helps us overcome adversities and carry on: Resilience.

Resilience is an incomparable principle that can guide you during dark and foggy times; it opens your eyes to the possibility of going on and thriving. It is the savior that helps you handle the bitterness of loss, trauma, grief, etc.

What is Resilience?

Psychologists define resilience as the process of—trauma, adversity, threats, and other stressors—bouncing back and recovering, becoming even stronger than before. This process involves a hidden personal growth. Although these events and stressors might have a strong impact on your life, they do not have to determine the outcome of it; they do not define your life.

Psychologists indicate the personality traits of a resilient person as being open to new experiences and challenges, socially integrated, adaptable, and optimistic. They stress that resilient people have some traits in common, such as holding positive views

of themselves and their abilities, having self-control, viewing themselves as fighters rather than victims, scoring high on the emotional intelligence scale, and managing emotions.

Succumb or Surmount?

In the face of disasters or hardships, people are divided into two categories. On the one hand, there are those who become unable to handle it and succumb under the heavy emotional load by viewing them as obstacles. On the other hand, there are those who succeed in this hard process; they have the ability to overcome hardships, becoming even stronger, and consider them as opportunities to grow. However, what determines that? It is resilience.

Resilient people have the ability to cope and recover from problems; whether it is related to relationships, work, or global adversities such as COVID-19, for example. Rather than falling into despair, they use coping strategies that help them overcome and face such problems. This does not mean that they do not feel the stress or anxiety



resulting from these situations; it means that they can handle that and emerge stronger than before, as their mental outlook allows them to work through such heavy feelings and recover.

On the other hand, people who lack resilience become easily overwhelmed by heavy challenges by using unhealthy coping mechanisms. They become disappointed and unable to move on from these setbacks; as a result, they experience more psychological distress.

Am I Resilient?

To know if you have this personality trait or not, you can go through your journal of last year for example and reflect on hard situations you went through and how you responded to them. Do you find that resilience has defined your actions and reactions, or not?

If "Yes", good for you; if "No", no problem! Experts indicate that you can develop resilience any time in your life, because it is a personality trait that involves behaviors, thoughts, and actions. The most important point to keep in mind is that it takes time and intention; it does not happen overnight or out of the blue.

The Resilience Manifesto

To cultivate the good outcome of resilience, you should exert effort in building it through the following seven extremely important steps:

1. Connect with trustworthy and compassionate people who would help and support you and validate your feelings.
2. Take care of your mental and physical health, as this healthy lifestyle would help you adapt to stressors and reduce the toll of mental turmoil during hard times.
3. Find purpose in your life, which can be achieved by moving towards your goals, which should be realistic and divided into achievable small accomplishments. It can also be by helping others, which would foster self-worth and empower you to mature your resilience.

4. Look for opportunities of self-discovery and appreciate the growth in your personality that occurs because of overcoming struggles and hardships. This does not mean eliminating vulnerabilities you experienced; you should acknowledge them and notice the increase in the sense of self-growth.
5. Embrace healthy thoughts and do not exaggerate obstacles; keeping things in perspective and not catastrophizing difficulties is a very essential part of building resilience.
6. Focus on what you can do, and eliminate things far from your control; this will help improve your sense of control and resilience.

7. Finally, learn from your past and highlight the moments in which you could effectively respond to hard situations to discover your strengths.

References

Raphael Rose "From stress to resilience", TEDx Talks (Youtube)
apa.org
developingchild.harvard.edu
verywellmind.com



How to Deal with Uncertainty

The second important lesson 2020 has taught us is strongly linked to our brain's work; it is the importance of building tolerance for uncertainty. First, let us know what is incorrect with our handling uncertainty, and why our brain tries by all means to avoid it.

The Brain Processes and Predicts

Neuroscientists indicate that our brain craves certainty and has hunger for information as a top priority to survive; besides, it tries to avoid uncertainty, as it generates a pain or threat response in the limbic system. Why does this happen?

Well, when you face a situation without information about it, your brain detects something is wrong and this affects your ability to focus on other issues. That is because the brain has a very strict rule in this case: gaining information is rewarding and the lack of it is threatening. It does not require information to only react to this current situation; predicting what happens next is also very important for it, and to reach this state, it needs to feel certain and avoid ambiguity.

For example, when you hear something, your brain tends to hear and

predict what should come next; when this craving for certainty is met, you gain the sensation of reward. On the other hand, during situations you cannot predict the outcome of or what would happen next, an alert goes to the brain to pay more attention, and it works as if facing a threat.

Ambiguity, Information Acquisition, and Dopamine

A 2005 study recognized that just a little ambiguity on its own lights up the amygdala, which plays an important role in controlling emotion and behavior, and is best known for processing fear. The more ambiguity, the more threat response, and the less reward response there was in the ventral striatum, which has an important role in decision-making and reward-related behavior.



Scientists also indicate that our brains seek information for the sake of it; even if it does not make us more effective or adaptive, it reduces the sense of uncertainty, and this is what the brain needs.

Another study conducted by researchers at the University of California, Berkeley (UC Berkeley) Haas School of Business, has found that information acquisition has the same dopamine-producing reward effect on the brain as money and food. It also indicates that, sometimes, we may seek information about something just to know, without the intention to respond. This is because, we humans are naturally curious beings; we seek to learn and explore new things even if they do not have such great benefit for us. A widespread example could be scrolling down social media without searching for something in particular, just gaining random information.

What about the uncertainty COVID-19 has imposed on us?

This period has cast ambiguity and an inevitable kind of uncertainty on almost all aspects of our lives. Even running after the circulating information to be assured about what is going on and predict what would happen has come to no avail. Suddenly everything has got out of our control, leaving us stressed, fearful, with no signal to direct us.

Even though every one of us responds differently to uncertainty; all of us have a limit to what we can endure. The first step that 2020 has taught us about dealing with uncertainty is to accept it, which would help us get through such foggy times and move forward with fewer bad consequences.

The handling of Uncertainty Manifesto

This manifesto is divided into two parts. The first is about a method known as "stability rocks"; a process or practice that adds something reliable to your life when it feels like things are going out of control to restore balance. These

stability rocks can be embodied in your routines and rituals, such as:

1. Waking up at the same time every day.
2. Eating regular meals.
3. Going to bed at the same time.
4. Exercising every morning.
5. Reaching out to a friend.

After freeing some space and reserving energy for practical practice of dealing with uncertainty, here is the second part:

6. Turn ruminating into problem-solving by acting over the things you can control. For example, instead of worrying about the spread of the virus, take precautions and care about hygiene and follow the instructions.
7. Face up to your emotions and do not try to suppress them, because dealing this way would make you more vulnerable to depression and burnout.
8. Try to identify your uncertainty triggers and you will find many of them are self-generated through excessive worrying.
9. Focus on the present, on the very moment. Uncertainty can leave you hopeless in the face of your fears and worries about the future, and paralyze you from taking action to overcome a problem.
10. Recognize your achievements, no matter how big or small they are. You just need to take time to reflect on and be proud of your accomplishments.

References

au.reachout.com
bbc.com
helpguide.org
medicalnewstoday.com
neurosciencenews.com
nhs.uk
psychologytoday.com

The Importance of Valuing Time



"Time is Money" is a well-known saying that highlights the importance of valuing time and not spending it on trifles. When we put this saying into practice, it seems that it is not that easy in the face of this distraction-packed world. Ironically, while some people tend to strive for earning money, they do not pay the same attention to valuing their time and making the most of it.

2020 put us face-to-face with the challenge of using our time wisely since we have been granted a big chunk of it that was consumed before in long meetings, getting stuck in traffic, etc. This has been an excellent opportunity to make the most of it, but were we good keepers and users?

Not sure about the answer yet? To know how valuing time could be of unmatched importance, let us have a look at a society in which time is the currency and the thing that keeps someone alive.

In Time

In the American science fiction movie *In Time*, currency is not banknotes; it is time. The inhabitants of the society stop aging at 25, and each one has a clock on their arm that counts down how long they have to live. When they run out of time, they die. Every minute, second, and even a fraction of second is of extreme importance to be used in the correct way and not to be wasted.

This imaginary society is not far away; we lived in it during the past year when we were granted time. Some could make use of it, while others could not deal with it wisely and let it slip between their fingers.

In the movie, wasting time leads to death; that simple. As such, dealing with time requires real caution; the idea is further stressed when the protagonist's friend gives him an additional ten years, one for each year of their friendship, and advises him not to waste them, as a precious gift not to be blown away.

Not lacking it, but managing it

During lockdown, the main problem that emerged was not the lack of time, but how to manage it wisely to get the most of it; otherwise, we would be in big trouble. The problem is not necessarily in the concept, but in the faulty execution; the concept of time-management has become even more strongly needed, as well as keeping an eye on the way we spend our time to enhance our lives.

Time management could be defined as the process of organizing and planning how to divide your time between specific activities, and to get more done in less time. It is very possible that you have heard of the concept of working smarter, not harder, which has been widely spread; this can relate to time management.

Time management also helps you decide which things are important and urgent to be done right now, and what is not a priority. Perhaps it is not that easy while put into practice in the beginning, but it will save you a lot of energy and effort afterwards, and will make your life easier. Experts divide time management into three major

parts: prioritizing tasks and activities, controlling procrastination, and managing commitments.

The Time Management Manifesto

1. Prioritize tasks by making a list of all of them for the day or week, and label them as urgent, important, or not important. This also includes the "No" response to things that you do not want to do or find them not a priority at the moment.
2. Control procrastination as the more you put a task off, the more you would feel stressed, especially if this task is important. This would require structuring your time (daily/weekly/monthly); more importantly, break down large tasks into small feasible ones and create short-term deadlines, which would help you meet the long-term ones.
3. Manage commitments and keep in mind that "busy does not mean productive"; choosing what to spend your time on would save you load and stress, and you would feel the limits of your time expanding. This could be achieved by letting go of useless commitments and taking responsibility for the urgent and important ones.
4. Keep track of your time to make the appropriate adjustment. This can be accomplished by using a mobile application or writing down what you do and tasks you work on in a notebook, then get back to it to know how you did.
5. Use a to-do-list; it will help you stay focused and motivate you as you become able to see what you have achieved, and what remains.



You might also be interested in reading

THE SILVER LINING OF NEGATIVE EMOTIONS

Throughout our lives, we experience and encounter situations that trigger positive and negative emotions deep inside. Nevertheless, negative emotions tend to stick to us more than positive ones do, so it would be better to know how to deal with them in order not to keep carrying on slivers of bad decisions and memories.



References

en.wikipedia.org

forbes.com

healthlinkbc.ca



Now, this is a good time to embrace the precious giveaways 2020 has brought us!

APPLICATIONS

WE FOUND IMPORTANT

By: Fatma Asiel

Visiting family and friends is dangerous

A main hardship of lockdown around the world has been not being able to visit one's family and friends; such gatherings pose danger for the visitor and the visited. It has indeed been harsh not to meet our loved ones; but, some applications have made it possible.

Shopping online

Buying and storing consumable commodities and medications to avoid going out was an unwise act; it would eventually cause an economic problem and commodity shortages. A logical alternative to this was resorting to online shopping.

Below are some of the applications that turned out to be useful in 2020

1. Meeting applications

These are applications that provide the ability for virtual audio-visual meetings; they have been used by millions around the world for professional, social, and educational purposes. These applications can be used through computers, mobile phones, and tablet devices. The most famous examples are Zoom, Skype, and Google Meet.

2. Task organization software

These applications are used to organize tasks of work teams, with no need for E-mail messages or long conversations. They enable

you to create a platform for each project, invite only those involved to join, easily assign tasks to them, and update task status as in-process, ongoing, or done. Famous examples include Trello and Slack.

3. Online shopping applications

Although online shopping applications are nothing new, they have been widely used during the pandemic due to lockdown. These applications have made it easier for one to shop for consumable commodities, medications, and other products from home. Restaurants, pharmacies, and other shops have launched their own applications to facilitate online ordering.

4. Cash wallets

Most banks adopted electronic cash wallets that enable their carriers to transfer and receive money, withdraw cash from ATMs, pay bills, shop online, and enjoy other time-and-effort-saving services.

Year 2020 was a no-ordinary year; it was an opportunity to explore the world and use new applications that enrich our electronic literacy. The optimal use of such applications could indeed solve many challenges we have faced due to lockdown.

References

accuprosys.com
corrata.com
resources.owllabs.com

A Lockdown

The complete or even partial lockdown has not been an easy or familiar experience; it was certainly the first for the current generation. Adults perceived it with physical comfort tainted with anxiety, the youths were reluctant, and the children were full of curiosity and defiance. How has the lockdown affected the future generations positively?

Remote learning

The decision to suspend education in most world countries was inevitable due to the severity of the outbreak of the coronavirus; although its dangers were not proven then on children, the risks of school gatherings made them out of question. Finding alternatives to traditional education and written exams became a necessity, and remote-learning was the best option.

"Remote learning" or "distance learning" as a term appeared in 1999, while the concept itself has been applied since the nineteenth century as some training courses and educational curricula were mailed to students; now, it refers exclusively to online learning. It has spread since the beginning of the twenty-first century



We do not realize that our use of mobile phones and tablets is limited until we discover more fascinating options, applications, and settings. Partial and full local lockdowns in most countries have urged us to find practical and effective solutions in different aspects of life.

Going to work is no more a necessity

Do you know that many employees and workers have realized during the pandemic that they wasted much time and effort before it? Why not manage their tasks and run their businesses online from home? It was not logical to be locked down at home during an open-ended crisis without getting work done; this would eventually affect production and economy as a whole. As such, many businesses adopted the idea of working remotely online. The idea in itself is not new; yet, it was not common, specially in Arab countries.



Generation:

REMOTE-LEARNING Lessons and Practices

through open online course platforms, whether free, paid, or supported by major world universities; yet, the expansion targeted primarily adults, and children only received little online training.

When education was suspended in schools, there was a need to put things in perspective. Attention was focused primarily on children, who need more explanation and application than university students or graduates. As such, after remote learning was a secondary option for some adults, it has become essential for young children and university students; it opened up different horizons to educate and learn.

Likewise, Internet usage was not limited to curricular learning, but also to other activities. After the lockdown, not only schools closed their doors, but also libraries, clubs, and entertainment venues, and the Internet became the only means of entertainment. Rather than spending long times on screens playing electronic games or watching videos, some parties have adopted the idea of remote

entertainment too. Sports coaches were also keen to resume training children remotely, even for warm-ups, to keep them fit during lockdown.

Have the kids really benefited from this experience?

The benefits of this unique experience, no doubt, are numerous. If this “technology generation” was aware of using and dealing with the Internet, electronic devices and applications smoothly, the interaction was limited to certain aspects; playing, watching videos, or even using social media. Yet, how many of them were aware of using that technology in different purposes, such as searching for information or using interactive educational platforms?

After activating the remote learning experience, children noted many other uses of computers and tablets they had been unaware of. The time spent on the screen is no longer for entertainment only; they noted other purposes these technologies were basically invented for. The experience revealed to children different

perspectives, and introduced them to different applications and technologies for communication and education together.

Positive aspects

There are several positive aspects of remote learning, especially for young age groups; for example:

- **Flexibility in time and repetition:** If the child relies on videos or recorded lessons to recall the lessons, this is indeed an advantage. It provides a flexibility by watching the educational material at any time, and repeating it more than once to remember the information more easily.
- **Ease of use:** Students can easily use the educational platforms or meeting applications, in case of online lessons, or simply watch the videos, in case of recorded lessons. The designers of these applications and platforms have made sure they are user-friendly for adults and children as well.
- **Saving time, effort, and money:** A lot of time is wasted when going to or from schools, especially in large and crowded cities, in addition to the physical effort spent during that transportation process, and the expenses spent in the educational process in general. Remote learning actually saves time, effort, and a large proportion of the expenses as well.

Negative aspects

Despite the positive aspects, there are others that are negative and cannot be ignored. Health organizations and entities concerned with

children's mental health do not recommend long screen-time for children; however, remote learning forced children to spend long hours using tablets and computers—not to mention their entertainment time!

If we assume that there are children in some less privileged regions who cannot own any of these devices that have become the only means of learning, they will not be capable to keep pace with their peers.

In addition, several studies have shown that direct learning can greatly impact young children's ability to learn, especially those with Attention Deficit Hyperactivity Disorder (ADHD).

Conclusion

This generation will definitely be different from its predecessors. It is the technology generation, who will not use it in the future only to play and entertain, but also to learn, train, exercise, and work. The lockdown is not bad at all, but rather has positive aspects for adults and children; it has helped children explore new horizons they knew nothing about before.

References

academia21.com
efrontlearning.com
nytimes.com
theschoolrun.com



Artistic Relief

By: Maissa Azab

Beyond the agony of the pandemic, the experience of confronting life's utter uncertainty, compounded with extended periods of lockdown, has been a once-in-a-lifetime opportunity to pause and re-examine our lives and ourselves. The journey of self-discovery and possibly re-invention takes different forms depending on each person's character, interests, life-experience, among other factors. For some people, like me, this journey most likely includes art in one form or the other.

The human drive to create and engage with the arts is unique. Historically, humans have been visually expressive; the cave of the hands, *Cueva de las Manos*, in Argentina is an example of early visual expression. Estimated to date back to 7300 BCE, the sea of overlapping hands provides a lens into the past and builds a connection with our stone-age ancestors.



Art has long been one way of coping with tragedy and uncertainty. In times of crisis, people like to see their experience mirrored through another medium, especially art; we also find comfort having our emotions validated.

In times of social disaster and plague, art helps us understand reality; more importantly, it brings psychological relief and comfort.

In Renaissance artwork reflecting on the plague, there were relatively few images in the sense of people suffering or of dead bodies; the art tends to be more hopeful. Today, in social media memes, videos, and stories, people are giving hope and encouragement to each other to overcome what we are going through; it is certainly the same human psychological experience.

Globally, we have turned to art engagement as a source of comfort and strength during the COVID-19 pandemic. There are now a multitude of ways to experience the arts virtually, to connect more deeply with current issues and events. In a time when we cannot see friends and family as much as we used to, some have struggled to find the right ways to stay connected. Sure, video chats and virtual events were fun at first, but with the passing of time, high-tech communication solutions have started to lose their

luster. Participating in and viewing art makes us connect to a more universal human experience. Be it art-making at home, public murals, watching and listening to plays and music, or new-found interests in culinary arts, art is an expression of what it means to be human.



COVID-19 artwork on Square Anne Frank (Tournai, Belgium). Artist: ADN (Yannick Dorpe)

Finding Peace through Our Inner Artist

Art therapy manager Tammy Shella has seen how creativity can ease stress and help people process the heaviness they are dealing with; creating art can help nurture the inner artist and find some peace. "We all draw; it is a natural form of expression, and expressing ourselves visually is human nature. Sometimes, it is hard for us to say things because the verbal side of your brain and the visual side of your brain are two different paths. For example, post-traumatic stress is stored in the nonverbal areas of our brain; that is why people who

have PTSD (Post-Traumatic Stress Disorder) are triggered by things like sights, smells, colors, or sounds that remind them of the trauma that occurred. In their case, talking about the event will not always bring up the trauma; because of that, just talking about things will not necessarily help them heal," says Shella.

"When you are creating art, whether it is writing in a journal, singing, or making a card, you are getting into what is called a 'flow state'. Psychologist Mihaly Csikszentmihalyi, one of the cofounders of positive psychology, describes flow state as a period of optimal attention. During this time, you are in the zone and completely focused on the task at hand. You are not worried about the time, bodily sensations, or any other needs. And working on your creation can be quite euphoric."

Personal Perspectives

I reached out to two of my colleagues who have become dear friends to gain a more personal perspective on the matter of art on hand. Like me, they have both dedicated a great portion of their careers to science engagement and they are both great art-lovers and true believers of the integral role the arts play in human life in general and in engaging the public in science and scientific thinking in particular.

Art reminds me that I should not escape; it helps me remember and empathize.

I first talked to Shireen Sabanegh, an independent museum management expert with over a decade of experience in museum programming and strategic planning. I asked her what role art has played in her life prior to the pandemic; she told me **it makes her a happier person**. She said it has always been a source of joy, beauty, and comfort in her life; one of the things she missed most when the lockdown began was public art experiences.



How has the pandemic affected your life and career?

This is a very hard question to answer; I ask myself every day what have I gained from this forced situation and what have I lost? The pandemic has proved to me that change can happen fast and overcome any obstacles, so resistance to change is a waste of time. It has also forced me to look inwards and rediscover myself.

When you are used to working in an office from 9:00 am to 5:00 pm you really struggle when that routine is taken away from you. I am currently freelancing, which requires a lot of self-discipline, and unlike the security of a stable job, when freelancing you are always searching for new opportunities and putting yourself out there.

What role has art played in your life and career if applicable throughout 2020? Has it helped you, and how?

Art is part of who I am. I spent hours with art as a child and the love for art just grew and evolved with me over the years. Reflecting on my professional career, art has certainly been at the center of every role! From my first job as a junior designer at a marketing agency to my Deputy Director and Head of Exhibit Design at the Children's Museum, Jordan. Even today, as a freelance Museum Consultant, when working on scientific topics, there is always an element of art and design involved in the process.

Art helps me process my thoughts, fears, interests. I would not say it is my escape; I find the word escape as a temporary solution for a situation. Art reminds me that I should not escape; it helps me remember and empathize. I am thankful for my interest and love of art; it has helped me through this pandemic and reminded me every day that there is more to humanity than panicking over a pandemic.

What has generally changed in your view of life, personally and professionally, and what are you looking forward to, or hoping for, as the pandemic subsides?

On a professional level, I am more curious than I ever was! There is so much to learn and rethink after the pandemic. We all need to rediscover the familiar, and in some cases challenge the acceptable.

In a nutshell, I am more patient with myself and more focused; the pandemic has helped me understand that less is more. Being able to focus on one task/job is a luxury; above all, being healthy is a blessing and having stability in your life is not to be taken for granted.

I am looking forward to going back to museums, theaters, galleries and meeting my friends and family without fear or anxiety. I also miss hugging everyone!



The arts give us freedom to explore, feel, dismantle, reassemble, explain, and express things in a different way.

I also talked to Samar Kirresh, who has a BSc in Biology and Medical Technology and an MA in Science Education. She has a hands-on experience in research, science festivals, designing interactive science activities, as well as designing and implementing public collaborative science art experiences with public. She also has private art projects.

What role has art played in your life and your career?

The scope of my research and work has always combined art and science, as I have constantly been intrigued by and passionate about both equally. I personally view art and science as a single thinking space; they have always intertwined in my interests since I was a child. I still have a box of dried plants from my childhood home's garden, and I recall experimenting with tomato seeds as a child.

I eventually chose to academically study science, but I am a self-learner of visual arts and also a maker; I actually have my own tinkering space at home. The arts provide us with a different lens of looking at things and serve

as a protection within the educational process where facts are presented rigidly; the arts give us freedom to explore, feel, dismantle, reassemble, explain, and express things in a different way.

What role has art played in your life and career if applicable throughout 2020? Has it helped you, and how?

During the pandemic, I took a long break from work, as interaction with the public was prohibited; I saw it as an opportunity to take time to re-discover and work on myself. I believe that one should take the time to explore interests outside one's career; this new knowledge eventually helps with one's professional endeavors.

During this break, I opened a workshop at home and started to study different art forms, particularly printing; I also went back to drawing and painting after so many years. The arts need time and the pandemic gave it to me. As a result, I have returned to work full of enthusiasm, energy, and new knowledge and ideas to implement; if we could have visitors now, I would be doing tons of workshops. It will all feed into designing new concepts and art-science public engagement experiences to present and research.

What has generally changed in your view of life, personally and professionally, and what are you looking forward to, or hoping for, as the pandemic subsides?

I am happy to have rediscovered and reconnected with the artist inside me; developing my artistic skills has been revitalizing. I also got to interact with other artists online, and discover new resources and ideas.

I cannot wait to go back to connecting with people in person. I have a much better view of what is interactive and how we can be interactive, especially after so much



time online. We should give people the tools to interact with their environment and the simple resources available for everyone to enjoy time on their own or with family.

Art allows us to examine what it means to be human, to voice and express, and to bring people and ideas together. As we contemplate the new normal life of post-COVID-19, we must clearly see what needs to change in our pre-COVID-19 life. What we put our energy into now will affect what our future looks like. This is a time to value the arts; whether big or small, they create wellness in our day-to-day lives by helping us process our lives individually and allowing us to come together collectively. Art allows us to communicate from afar, generating positivity, appreciation, and hope.

References

- artworkarchive.com
- college.columbia.edu
- health.clevelandclinic.org
- romeroip.com



Mental Health and the Pandemic

By: Jailane Salem



Many are predicting the rise of mental health problems in a post-COVID world, and several news outlets have been publishing articles about an oncoming mental health tsunami in the wake of the pandemic; but why exactly are they saying this? To understand the reasons behind these predictions, examining some of the sectors of society and the mental pressures they were under will help explain why they are coming to these conclusions.

COVID-19 ravished the health of populations across the globe, and as many people became sick and needed medical care, the medical system came under immense pressure. At the beginning of the pandemic, medical protocols were not well-established, and there was a lot of contradictory information being circulated. Doctors and nurses were at the frontlines fighting this contagious disease; not only were they battling an unknown disease, they were also worried about catching it themselves and transmitting it to their own families. Similarly, everyone working in hospitals or medical facilities; the heightened stress and fear that they had to deal with must have been challenging, and as waves of the disease keep coming, they barely have a moment of respite.

Lockdowns led to business, school, and college closures. Parents found themselves having to juggle work and their children's educational needs. If the parents still had to go out to work, then they were faced with the issue of who will take care of the kids when they were out. If the parents ended up working from home, then finding a balance of doing their own work and taking care of their kids at the same time was no easy task to achieve. On top of that, some parents were faced with uncertainty in regards to their own job security and therefore their financial security, which is a lot of stress to deal with, in and of itself.

Children and adolescents also had their lives upended. In their formative

years, they have been deprived from the social interactions that help them in their development. Being asked to adapt to online learning was no walk in the park, while an alternative that at least offers them the opportunity to keep learning, is no substitute for face-to-face education. This complete upheaval to their lives can cause great damage and can lead to students falling behind. Parents are also under immense stress because they worry about their children.

People who were already dealing with mental illnesses were also impacted by the pandemic. For some who have Obsessive Compulsive Disorder (OCD) or agoraphobia, the current state of the world could exacerbate their condition. Some could not access the services that would have helped them navigate the "new normal" due to the pandemic. Access to mental health services is difficult in most places and not always widely available; add to that the socio-economic divide that exists between countries and within societies, which leaves many people without help.

The different scenarios of how people were and are affected mentioned above is but the tip of the iceberg. The fear, uncertainty, and conditions we are living in can lead to anxiety and depression. It can affect people without them fully grasping that they are experiencing poor mental health. For example, anxiety can manifest in several forms, such as insomnia or trouble sleeping, being hyper-alert for extended periods of times,

having intrusive thoughts, experiencing chest and throat pain, and an inability to focus, just to name a few. If people do not recognize these symptoms as ones of anxiety then they will not seek the help they need to resolve, manage, or lessen their anxiety.

In its effort to highlight the importance of mental well-being, WHO launched a service through WhatsApp where people can have access to a guide that can help them de-stress that works by sending the word "breathe" to +41 79 893 18 92. Dr. Tedros Adhanom Ghebreyesus, WHO Director-General, said "mental health needs must be treated as a core element of our response to and recovery from the COVID-19 pandemic [...] A failure to take people's emotional well-being seriously will lead to long-term social and economic costs to society".

The words of Dr. Tedros should be heeded; with all the added stressors of living during a pandemic and economic downturn, people's mental states are adversely affected. While many worry about the financial recovery of the world post-COVID, the recovery of our mental wellbeing should also be at the forefront if we want our societies to heal from the trauma that is the COVID pandemic.

References

bbc.com
english.alarabiya.net
freepik.com
newstatesman.co
who.int



TAMPERING WITH NATURE AND THE RISE OF PANDEMIC

By: Jailane Salem

In recent memory, no disease has had such a vast effect on the entire human population as COVID-19 has. While diseases have come and gone, and others have come and stayed, what many of those have in common with the one currently ravishing the human population is that they originated in animals. It is estimated that two-thirds of human infectious pathogens—that we know of so far—have emerged from animals, and a large number of them specifically from wildlife. Many have looked at the bat as the culprit of what is happening in the world, and countless memes have been circulated online making light of that idea; however, this oversimplification of the matter does a disservice to all. It is critical that people understand the larger implications at play, which have given rise to the current and previous pandemics.

Our relationship with nature is something that we need to examine to truly understand how pandemics come to be. Often we compartmentalize environmental issues and view them with a detached stance. For example, the burning of forests, and therefore, destruction of biodiversity and ecosystems taking place in South America and South-East Asia is of no concern to citizens here in Egypt. However, this is not true; what happens in one corner of the globe is going to reverberate around the world. Think of it as a domino effect.

Pathogens usually have bad reputations; they are recognized for causing infectious diseases, and they also give a bad reputation to the organisms that carry them. However, they do not always have a detrimental effect and are important in maintaining biodiversity and ecosystems. While pathogens can be harmful to some hosts, they can also be beneficial to others. It is all a delicate dance that occurs in nature; problems arise when humans interfere with it and commence to stomp on nature's toes.

It is believed that the threat of disease outbreaks is higher in tropical regions, where forests and natural areas—previously untouched and rich with biodiversity—are altered. Human activities that alter the natural landscape can include: establishing settlements, livestock farming, oil and gas extraction, logging, mining, or plantation development. When these activities occur, it spells out the loss of biodiversity, as well as brings humans into increased contact with wildlife. This in turn gives rise to more opportunities where disease spillover can and does occur.

Not all pathogens have the potential to cause pandemics; some can transmit to people from animals, but that is where it stops, such as rabies. Others can be transmitted from an animal, but survive in human populations through human to human transmission. While some viruses have existed harmlessly and

co-evolved with their host animals in nature, the threat is when humans become hosts for these previously harmless viruses. This can occur through the destruction of natural habitats and the handling and consumption of wildlife, which gives way to unpredictable consequences. What may have been a harmless pathogen in an animal, can easily turn deadly in a human.

Urbanization is one of the factors leading to deforestation and loss of biodiversity. It is estimated that over five billion people will be living in urban areas by 2030; land allocated to urbanization is projected to triple from those of the beginning of this millennium. It is to be expected that many of those newer urbanized areas will be in the Global South. In many underdeveloped areas with little resources, the repercussions of these expansions could prove problematic.

In 2015, WHO published "Connecting Global Priorities: Biodiversity and Human Health: A State of Knowledge Review" in which it was stated that, "urban demography presents variable socioeconomic trends, with a significant population globally (≥800 million people) residing in urban slums, with limited access to sustaining resources and sanitation". This limited access to food and sanitation is an issue; not only is sanitation key to controlling and preventing disease outbreaks, but in remote areas where there is a lack of an

available domestic food supply, people tend to turn to hunting and wildlife consumption. This increases the risk of a zoonotic disease spill-over; due to the nature of urban settings.

Another reason for land-clearing and deforestation is the creation of pastures for livestock grazing and farming feed crops. Some of those areas are on the periphery of forests or wetlands where there is an increased chance of contact between the farmed animals, farm workers, and wildlife. The conditions of some livestock productions are a perfect setting for the spread of disease.

We have already witnessed many occurrences where livestock had to be culled to prevent the spread of diseases beyond our control. This is due to, according to the WHO publication, “high animal density, confined living quarters, and antimicrobial use” which has enabled “rapid pathogen spread and evolution, especially among genetically similar breeds or immune-suppressed animals”. Due to its potential role as an intermediary host for zoonotic disease transmission from wildlife to humans, the location of intensive livestock farming must be studied carefully.

There has already been instances where this unfortunate series of events took place when the Nipah virus made the jump from bats, to farmed pigs, and then to humans. Fruit bats of the Pteropodidae family are the natural host of the Nipah virus; in 1998, the first recognized outbreak of the Nipah virus took place in Malaysia, but it was in 1997 that the chain of events actually started.

In Malaysia's neighboring country Indonesia, a significantly large area of a rainforest was burned to make way for agriculture. The bats that resided in this area no longer could find sustenance since the trees no longer produced the fruit it used to feed on. This led some of the fruit bats to migrate to Malaysia where some settled in orchards near a pig farm; soon after, pigs residing in the area started falling sick, and in 1998, the Nipah outbreak emerged in humans. The WHO publication states that “human

infections resulted from direct contact with sick pigs or their contaminated tissues. Transmission is thought to have occurred via unprotected exposure to secretions from the pigs, or unprotected contact with the tissue of a sick animal”. Since that first outbreak, others have occurred in places, such as Bangladesh, India, and Singapore.

It is believed that the virus jumped from bats to pigs through the consumption of fruit contaminated with bat saliva from a fruit tree. Due to the nature of the pig farm conditions—including a high volume of pigs packed together closely—it created ideal conditions for the disease to be transmitted from pigs to humans that worked closely tending to the pigs. This led to an encephalitis and respiratory disease in humans, causing over 100 deaths. The Nipah virus is currently on the WHO top ten viruses in terms of priority for research due to its epidemic potential.



Who is the culprit?

Seems like bats are quite the reservoir for deadly viruses, but if we examine why disease spillovers keep happening, it is either because bats have been displaced from their natural habitats of rich forests or they have been harvested and ended up finding their way into a wet market. In both cases, it is human interference and environmental mismanagement that is the culprit. These animals are extremely important to the ecosystem since they help pollinate more than 500 plant species, as well as keep insect populations in check, which in turn play an important role in disease control. For example, they eat mosquitoes which helps reduce the spread of malaria. Due to our mishandling, they end up causing

great damage; not only to human health, but disease outbreaks cause economic damage as well.

The Nipah virus outbreak “was estimated to cost USD 550–650 million in South–East Asia, including costs incurred for control measures, the financial impact to swine industry, and loss of employment”, according to WHO. The Nipah virus is not the only one that has cost us a lot of money; every disease outbreak has a great detrimental effect on the health of our economies. From MERS, SARS, Zika, bird flu (Avian), swine flu, and of course COVID-19, all have had similar financial impact.

In an article for the World Economic Forum website, Jeremy Schwab states that “significantly reducing transmission of new diseases from tropical forests would cost, globally, between USD 22.2–30.7 billion each year” and “the COVID-19 pandemic will likely end up costing between USD 8.1–15.8 trillion globally—roughly 500 times as costly as what it would take to invest in proposed preventive measures.” It then seems as a no brainer to prioritize preventive measures starting now to avoid another global catastrophe, such as the one we are living in! It is only a matter of time until a new disease emerges and steals the spotlight, “every year, two new viruses are estimated to transfer from animals to humans,” Schwab adds.

As Andy MacDonald, disease ecologist at the Earth Research Institute of the University of California, Santa Barbara, has said “it is pretty well established that deforestation can be a strong driver of infectious disease transmission . . . It is a numbers game: The more we degrade and clear forest habitats, the more likely it is that we are going to find ourselves in these situations where epidemics of infectious diseases occur”.





While preventive measures, such as slowing down deforestation and putting a stop to wildlife trade and consumption, are important, these measures will not work unless the issue is looked at as a whole. Any plan needs to be holistic; it needs to include considerations for why deforestation is occurring in the first place. There are economic and cultural factors at play, many people depend on hunting and trading in wild animals for their livelihoods. These issues must be factored into any preventive plan that is to be put in place by governments and the global community for it to have lasting and beneficial effects.

Time and time again, nature has shown us how interconnected we all are. How we went from patient zero in China, to suddenly, the whole world being under lockdown, should serve as a poignant example of that. An event in a far-away place does not exempt us from feeling the consequences of said event. It would behoove us to take note of the lesson nature is teaching us at this moment and act accordingly.

References

bbc.com
nationalgeographic.com
nature.com
reuters.com
scientificamerican.com
theguardian.com
weforum.org
who.int
Image: Ionescu Bogdan/Fotolia

PODD



AN INNOVATIVE SOLUTION TO DISEASE OUTBREAKS

We all had to move swiftly to adapt to the new normal. Working from home was made easier by the existence of digital platforms where colleagues could easily connect together and work as a team; albeit remotely. Those same platforms were also used by educational organizations to ensure their students continued learning. The virtual world is what has made the COVID pandemic unlike any other humanity has experienced. This has highlighted the importance of having a technological infrastructure that is already in place and ready for use at a moment's notice.

While many in the lay public have not given much thought to pandemics and infectious diseases and their ability to hinder lives, that is not the case for certain sections of society. Virologists, epidemiologists, workers in the public health sector—to name a few—have been working on tracking, researching, and curing infectious diseases. From time to time, we would hear about emerging diseases and watch news reports about their devastating impact, but for the most part it used to feel far removed from our reality—and how things have changed! The most notable recent scares were when swine flu and Avian flu reached us; we were on the defense, reacting to a situation. However, many were and are working on creating innovative technology and tools in order to detect outbreaks early on and therefore help contain the outbreak before it turns into an epidemic or pandemic.

Many of the epidemics that have occurred have been the result of viruses making the jump from animals to humans.

There are many hotspots around the world where people and domestic farm animals come into close contact with wildlife, which is where zoonotic viruses can make the jump. Farm animals are quite susceptible to harboring infectious diseases that can wipe out entire farms if left untreated for too long. One of the problems that can arise is that many farmers do not have access to veterinary help when they need it. People living in remote areas are specifically more at risk at being at the center of a virus outbreak that could damage their livestock, livelihood, and even lives.

As we have all experienced, speed and action are of the essence when it comes to handling infectious disease outbreaks. Early detection can spare us all a lot of trouble, to put it lightly. Given how the current COVID pandemic is said to have originated in a wet market in Wuhan, China, one can wonder if the outcome could have been different if someone had noticed that an animal or animals were exhibiting signs of being unwell and perhaps acted to isolate those animals for testing.

Can epidemics and pandemics be stopped if surveillance systems are set up in at risk hotspots around the world? It would be useful to highlight a pioneering project that was introduced in Thailand in 2014 and which turned villagers living in remote areas into first responders to disease outbreaks.

The Opendream's pilot project, entitled PODD—Participatory Onehealth Disease Detection—is “on surveillance and control of zoonotic diseases that could possibly infect humans and cause

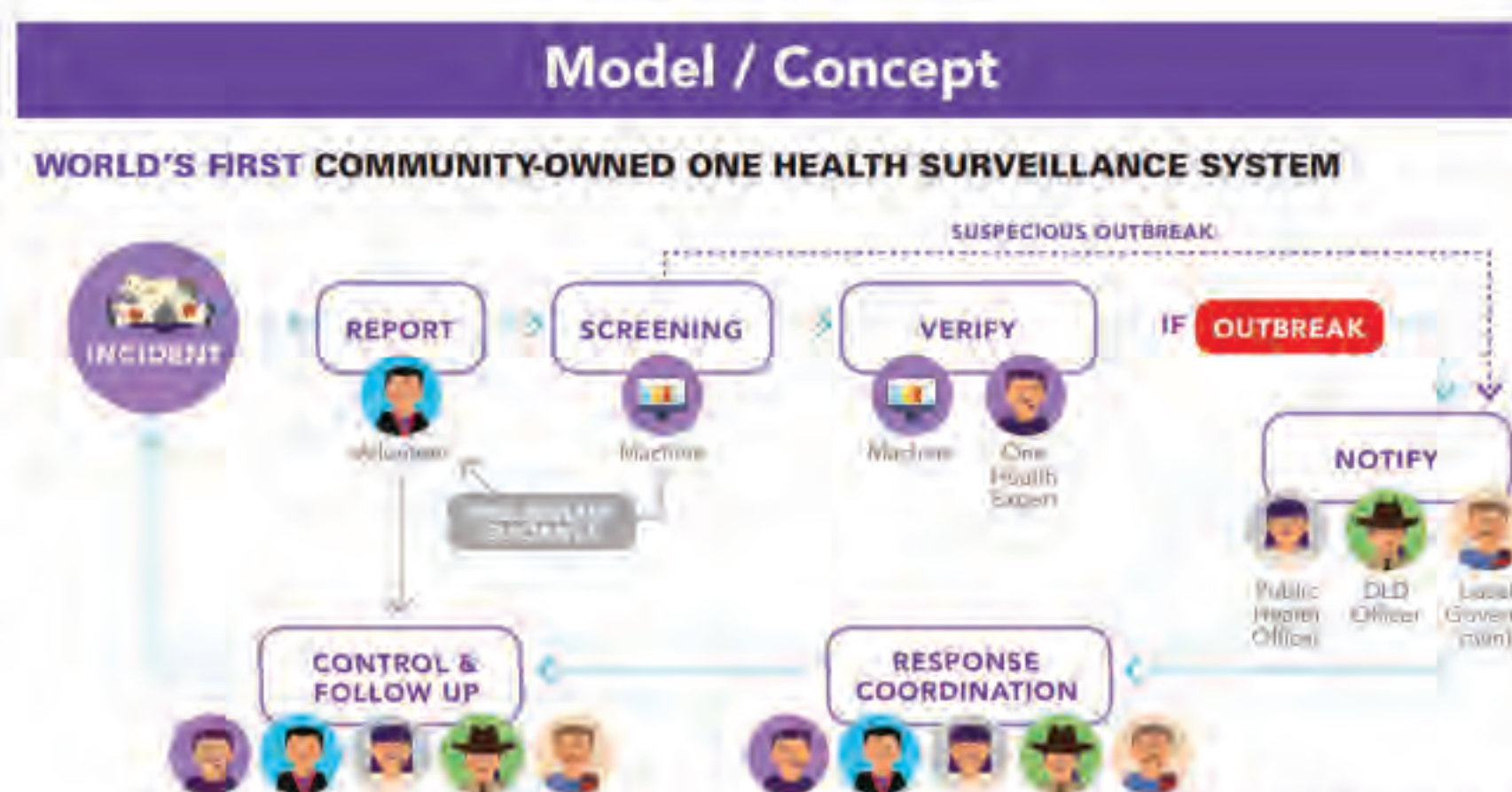
economic losses to villagers". It aims to involve the communities who are at risk of disease outbreaks and provide them with an easy-to-use resource that connects them to the appropriate services and authorities who can help. The goal is to break the chain of zoonotic disease transmission before it jumps into humans and spreads beyond control. In doing so, it significantly lowers the damaging impact outbreaks can have on health and the economy.

PODD is a collaborative project that involves people from numerous disciplines. These include "veterinary science professors from Chiang Mai University, provincial livestock officers, public health officers, health professionals, economists, political scientists, provincial government officers, and volunteers;" according to Opendream. This variety goes to show how no one entity can tackle such an issue on their own. All of those involved are connected through an application that was designed by programmers from Opendream, who believe that the power of the Internet and communication technologies can change the world". Through them, the PODD was able to set up the platform that allows volunteers to interact with specialists in real time.

Who then are the volunteers and what exactly do they do?

The volunteers come from all walks of life; they are farmers, mechanics, housewives, food stall owners, to name a few. They attend seminars where they are provided with smart phones and are trained on how to use the PODD application and taught how to recognize sickness in animals. If they see a sick animal, they take a picture of it, and are guided through the application to input more details about its condition. For example, they could provide the age, exhibited symptoms and how many other animals died or are sick in the vicinity.

This process takes 3–4 minutes, and the information is sent via Wi-Fi to vets and researchers in the nearest city. There is also an option of filling the forms offline on the application, until the volunteer has access to Wi-Fi and can send in their form. Vets and researchers who receive the forms can then contact the volunteers



Source: www.opendream.co.th

and let them know what course of action is suitable. They can tell the volunteers how to nurse the sick animal or whether it needs to be put down and buried. If the case seems more volatile, then they themselves pay a visit in order to determine the nature of the disease and whether more drastic actions need to be taken or not.

The pictures that are taken and sent in through the app are embedded within their GPS coordination. This way, those at the receiving end can easily locate any potential outbreak and map out any patterns that would indicate a spread of a disease. This ability of collecting real time data is crucial in pandemic prevention.

In 2004, there was an outbreak of Avian flu in Thailand that led to 60 million chickens being culled; if the outbreak was detected at its inception, this could have been avoided. This is why volunteers are happy to help in the fight against disease outbreaks, because they know the cost of the damages on their livelihood, as well as their health. This is reflected in the increasing numbers of volunteers, which went from 600–2,000 people. It is through their effort that "in the first 34 months since the launch of the PODD system, a total of 75 outbreaks had been successfully stopped from spreading". By being part of the solution, communities can take over the reins and be a great resource in pandemic prevention. It also allows researchers and governmental entities to have a wider reach, giving them access to remote areas that are often neglected or underserved.

PODD has gained attention from other organizations that are also

attempting to find solutions for disease outbreaks; since it is an open source program, others have replicated the system to much success. For example, it has been applied in Indonesia and Tanzania to detect and monitor outbreaks of rabies, foot-and-mouth disease, and malaria.

While this system of disease surveillance is key in the fight against pandemics, it relies on mobile coverage and access to smartphones, which are things that can be hard to find in some developing nations. It becomes key then to advocate for the development of infrastructure that would allow people to be able to use such services and tools. After all, many remote tropical areas are hotspots for disease outbreaks; providing the people living at those frontiers with the knowledge and ability to report any suspicious illnesses will be of benefit to those communities, and in turn the whole world.

If more people have access to PODD and similar applications, we can easily have a head start on containing disease outbreaks and preventing a bigger catastrophe from unfolding. As we have seen, having an existing technological infrastructure can be of great help because when faced with a problem it is easier to use already existing solutions, rather than waste time building them from scratch.

References

- BBC News: Thailand's Disease Detectives (YouTube)
- bbc.co.uk
- opendream.co.th
- pbs.org



FOOD SUPPLY CHAINS:

FROM CRISIS TO OPPORTUNITY

By: Hend Fathy

According to the United Nations (UN), 26.4% of the world population have been affected by moderate or severe food insecurity in 2018; more than 800 million people in the developing world suffer from chronic undernutrition. Although the food produced globally can feed the whole world's population, the problem lies in the enormous amount of food loss and waste, in addition to the very unequal distribution of food. One-third (1.3 billion tons) of all the food produced is either lost or wasted.

Global efforts have begun as early as 1978, when the Food and Agriculture Organization (FAO) established the Action Programme for the Prevention of Food Losses in 1978, which ran until the early 1990s. Then, Zero Hunger has come second of the 17 UN Sustainable Development Goals—named in 2015—to serve as an international call for action.

Food Loss vs Food Waste

To better view the problem, it is important to differentiate between food loss and food waste. Lost food, on the one hand, is the food that spoils before reaching the retail markets or the final consumer. Food loss indicates problems in food production processes, policies, or markets. Wasted food, on the other hand, refers to the food that retailers and/or consumers throw away. It is more of a behavioral problem that has to do with our habits, often taking place during gatherings and ceremonies, as well as in restaurants and hotel settings.

Needless to say, food losses are more common in developing countries while food waste is more pronounced in developed ones. According to Thomas Colin Campbell Center for Nutrition Studies, the United Kingdom wastes 32% of purchased food (about 6.7 million tons), whereas in Africa, 25% to 50% of food is lost right after harvest. Now, let us focus on losses that occur along the food supply chain, and how to address them.

Food Supply Chains

A supply chain refers to an entire system of operations, people, and organizations involved in transporting a product from the place where it is made to the final customer. Although each product or service has its own unique sequence of supply chain, a typical one would include the following actors: the input supplier, the producer, the distributor, the

wholesaler, the retailer, and the final costumer. These actors perform different processes such as storage, processing, transportation, packaging, etc.

As such, the food supply chain refers to how food is transported from farms to end up on our plates, including the different stages, actors, and processes that food goes through along this journey. We can distinguish two types of food supply chains; one for fresh products as fruits and vegetables, and the other for processed ones such as canned and packed foods and dairy products.

The first stage of a typical food supply chain is production, where the actors are farmers, and the processes include planting seeds, irrigation, fertilization, pest control and harvest. Then comes the post-harvest stage, where farmworkers work on packing and loading crops in preparation for transportation. The third stage is transportation, where carriers and agents transport food products either to wholesale markets, or factories for further processing, or exporters facilities. Afterwards, food products are transported again from these stations to the retail markets, and eventually reach the final consumer.

Post-Harvest Losses

In general, post-harvest losses correlate to inefficient management of supply chains. Technological advancements play a key role in minimizing the losses, and that is why most losses occur in the less-advanced countries. Now, let us view two examples of food loss across the supply chain.



Grains are considered the most durable—or non-perishable—crops, compared to tubers, fruits, and vegetables. They include cereals and legumes, and constitute a major food source. Wheat, rice, and maize alone contribute more than half of all calories consumed by human beings.

Storage is a key stage in the grain crops supply chain as they often require storing for long periods. Around 15% of the global grains production is lost mainly due to inefficient storage at poorly constructed granaries. In poorer regions, they can be even stored in farmers' houses under unfavorable conditions, leading to huge losses. Grains can also be lost to physical spillage during handling and transportation. In developed countries, non-perishable crops losses are very low.

Things are quite different for perishable horticultural crops, such as fruits and vegetables. Although the loss rate is higher in both developed and developing countries, it occurs due to different reasons. For example, failing to meet cosmetic or quality criteria set by importers and retailers would cause a percentage of losses in the developed countries. About 10% only of fruits and vegetables are lost between farm and retail market in the UK.

On the other hand, according to the UN, up to 50% of fruits and vegetables produced in developing countries are lost at early stages of the supply chain. These losses occur for diverse reasons, including applying primitive harvest techniques that may bruise fruits, the lack of efficient packing houses, transportation without transit packaging, and the lack of temperature-controlled supply chains, the cold chains.

Minimizing the Loss

Minimizing lost food is directly linked to designing more efficient supply chains. This could range from procedures as simple as gentler handling of products, to full-digitally-controlled supply chains.

It all starts at the field, where modern technologies can be utilized to monitor crops and predict the best harvest time according to the purpose; be it exportation or direct selling to wholesalers. One such technology is the system developed by the Egyptian scientist Nashwa El-Bendary; the system won the UNESCO–ALECSO Award for creativity and technical innovation for young researchers in the Arab World 2014, and the L'Oréal-UNESCO "For Women in Science" Levant & Egypt fellowship 2015.

Other than that, utilizing temperature-controlled storage and transportation facilities can preserve food for significantly longer periods. Some advanced cold-chain containers can be controlled remotely to monitor temperature and humidity levels. However, according to the Global Cold Chain Alliance, less than 10% of all perishable foods in the world are refrigerated while moved across the supply chain.

Moreover, an efficient food chain would track supply and demand data, to prevent over production and the potential resulting losses. Advanced chains allow different players to monitor this data digitally to act accordingly and take prompt actions to avoid spoilage of products.

It is worth mentioning that Egypt has launched a huge ambitious project known as "The National Project of Grain Silos" a few years ago, which entailed the construction of 50 silos in 17 Egyptian Governorates, with a storage capacity

of 1.5 million tons. The silos are fully controlled using the latest technologies. They are operated by well-trained staff to maintain optimum storing conditions and precisely control the inputs and outputs according to demand. According to statements of a highly-ranked governmental official, the project has saved over one million tons of grains annually, which is equal to one-tenth of the country's annual consumption.

Another significant model to highlight is what is known as a closed-loop supply chain. In such a model, potential losses of a certain supply chain are fed back into another chain to capture its value. For example, misshapen products are directed for processed food facilities, inedible parts are directed for other industrial applications, while unavoidable losses can be directed to the bio-energy sector, and so on, and so forth.

Minimizing the Waste

On a side note, let me talk briefly about decreasing food waste, which you my dear reader can directly take part in and give you some valuable tips.

- It all starts at shopping. Prepare a list of your actual needs before shopping, buy rational quantities of fragile food products, and do not give in to offers.
- Never throw away food. Preserve food from going bad through proper storage and preservation techniques; regularly check your fridge; and turn your leftovers into new meals. Also, note that irregular shaped fruits and vegetables are as delicious and nourishing as regular shaped ones.
- If you live in the countryside, or in a house with a garden or backyard, think of home-based biogas units, which can turn organic wastes into free clean energy.
- Serve smaller portions in plates, and refill if you need more. Also, a better way of welcoming your guests would be frequent offering of small portions instead of forcing big portions on their plates.
- Last but not least, always remember that sharing is caring, and give food you will not consume or recycle to the needy.

Decreasing food loss and waste does not only imply increased food supplies to the world, but also carries lots of other benefits. Think of the virtual values involved in food production; human labor, water footprint, carbon footprint, and land use. Actors and stakeholders involved in the chain would benefit financially as well. Farmers would not lose income on food they could not sell, and transporters would not waste the fuel used for transporting food that spoils as it travels. Enhancing food supply chains is indeed the key to turn an urgent crisis into a promising opportunity.

References

- Ghamrawy, M. 2019. "Food Loss and Waste and Value Chains – Learning Guide". Cairo, FAO.
- Julian Parfitt, Mark Barthel and Sarah Macnaughton, 2010. Food waste within food supply chains: quantification and potential for change to 2050 *Phil. Trans. R. Soc.* B3653065–3081.
- americanexpress.com
civildaily.com
fao.org
freepik.com
gcca.org
nutritionstudies.org
sdgs.un.org
sis.gov.eg



The Farthest

COVID-19

By: Mariam Elsayed

In December 2020, COVID-19 was able to reach the farthest continent, Antarctica. The story began after a visit from a ship carrying supplies to the Chilean Bernardo O'Higgins research station with three subclinical COVID-19 carriers. After three days, 36 Chileans were tested positive for the disease; they were isolated and monitored by health authorities in Magallanes regions trying to manage and decrease the risk of the spread.

Scientists concerned with wildlife studies became very worried about the wildlife in Antarctica from different points of view. This is because most research stations in Antarctica are found near wildlife populations to facilitate studying, handling, and examining animals well. Although COVID-19 is a zoonotic disease that came from an animal source, just as many other Coronavirus species, the presence of infected people around animals may cause reverse zoonosis, allowing the virus to jump from humans to new animals that are not tested for COVID-19 yet.

If we take a look back on the studies scientists conducted on different animals in previously infected countries, we will observe that animals' susceptibility to the virus varies according to their species. These studies ensured that mink, felines, dogs, and ferrets were infected by COVID-19, but they reacted differently towards it. For example, adolescent cats tested positive, got sick, and recovered after a while. On the other hand, dogs were more resistant to the virus. Antarctica does not have these species of animals, but it has a wide range of others. It contains half the seals found in the world, millions of seabirds, 45% of the

world's penguins, and 17% of the world's whales and dolphins.

As a result, scientists tried to create computer simulations and records to reach a prediction for those animals' susceptibility to the virus. Those predictions were made according to the makeup of the animals' genetic receptors to the virus. They found out that whales and dolphins are highly susceptible to infection compared to seals and birds living there. On the other hand, its effect on the ecosystem stability is still unknown, as the animals are not tested for the virus yet, and its real effect is unknown too.

In order to learn more about the wildlife in Antarctica, scientists have to get very close to those animals to examine them well, and discover their lives, habits, and susceptibility to different diseases. Unfortunately, this made them one of the main sources for spreading COVID-19 among those animals, even more than the tourists who may not get that close to them.

Tourists are the second reason for the spread of COVID-19 in Antarctica, as about 80,000 tourists visited it between October 2019 and April 2020 when COVID-19 had begun to spread. Tourists could be the source of transmission of several types of microbes through their clothes and luggage, if they were not disinfected.

Our main goal now is preventing COVID-19's transmission to Antarctica's wildlife, so our first guideline is to decrease human-to-human transmission by taking some simple precautions, such as wearing face masks, maintaining at least two meters distance between each other, avoiding close contact with sick people, and socializing outdoors while avoiding large gatherings. We all have seen how one visitor can be carrying thousands of different types of microbes

and how one tiny unseen micro-organism can turn the world upside down. As a result, we need to make sure that the virus will not jump to new animals to decrease the opportunity of its development to a new and more virulent species.

The second guideline is preventing human-to-animal transmission, especially from people who get very close to animals as they are considered the main source of infection. First, scientists should be the only ones to handle and get very close to animals in order to examine them. They should be wearing protective clothes and use well disinfected equipment and instruments. Second, visitors and tourists from all over the world should be tested for COVID-19 then kept in quarantine for 14 days. They should be wearing clean and disinfected clothes when they visit the animals. A distance of at least five meters should be kept from the animals to minimize the possibility of infection spread.

The virus nature depends on its propagation and development; if it has the opportunity to spread and propagate within humans, it would be unstoppable. What we need to do now is to keep attacking the virus, prevent its transmission among us; like us, animals are amazing creatures that have a vital role in the ecosystem so we must keep them safe as well.

References

dw.com
nationalgeographic.com
theconversation.com





By: Dr. Omar Fikry
Head, Planetarium Section,
BA Planetarium Science Center

We see our Red neighbor glowing in the sky, hoping it would be our safe refuge as life on Earth faces increasing potential extinction threats, either due to a natural disaster—such as an impact event—or a man-made disaster. This is how decision makers in the countries racing to study Mars and search for life evidence on it think. As early as the first attempts to explain the existence of dry water canals on the surface of Mars in the 1960s, the Red Planet has aroused mankind's curiosity. On the other hand, some have criticized conducting much research and spending much money on Mars exploration. Let us shed some light on what is taking place and what the scientists are searching for on Mars. More than 46 automated space missions have been launched to the Red Planet between 1960s and February 2021, when three spacecrafts succeeded to reach it. No other planet in the Solar System has received such a number of missions. This is for four reasons that have remained unchanged since the beginning of the exploration, paving the way to send humans to live on Mars.

The first reason is trying to find evidence of potential life forms on Mars, be it even germs or fungi. This evidence was found on a meteorite found in 1983; proved to be from Mars, it contained bacteria fossils that go back to over 4.5 billion years.

The second reason is the potential of finding water under the crust of Mars. This, too, was confirmed, in addition to

the existence of polar ice caps on the planet and considerable amounts of water vapor in its atmosphere.

The third reason is the attempt to understand the puzzling geological formation of Mars. The unique curvy canals strongly suggest that rivers used to run on its surface in the past, and scientists want to understand why they disappeared.

The fourth reason is the confusing atmosphere, which is believed to have resembled that of Earth at some point; again, scientists need to understand what happened to it. How did the pressure level drop over 150 times compared to that of Earth? How do temperatures shift between -80 degrees and 10 degrees? Furthermore, there are winds, hurricanes, and a heterogeneous magnetic field.

Someone might ask: Why should we concern ourselves with such things? A straightforward answer would be as follows: if Venus represents the past of Earth, Mars represents its future. In other words, some day, Venus will be like Earth, and Earth will be like Mars. That is why we need to understand what has happened to Mars, to be able to predict what could happen to our planet. Scientists have not and will not stop at sending automated exploration missions; there are suggestions and serious plans to send humans to Mars. The latest three missions to find their way to Mars are part of the scheme to get there.

The Emirati Hope Probe aims specifically to study the ratios of oxygen and water vapor in Mars' atmosphere. It is equipped with a highly-accurate camera and a spectrometer that instantly analyzes data on different levels of the atmosphere. As for the American Perseverance Rover, it has landed on the surface of Mars to study carefully selected areas, near the dry rivers cliffs. Additionally, a helicopter carries the rover from one place to another on Mars, increasing the opportunities to find evidence of life. The announced aim of China's Tianwen-1, which also reached Mars in February 2021, seems more ambitious than the other two projects. China aims to find places suitable for building camps for humans. Yes, dear reader, it is searching for areas where the geology, after treatment, can allow for cultivation.

As for projects aiming to send humans to Mars, they are so close, probably by 2030s or 2040s maximum. The reason why they are taking so long lies in their complexity, high risks, and high costs of sending humans there. Currently, there are two suggested options for sending humans to Mars: travelling without return, or traveling and returning. Both options entail exciting details that go beyond sending automated missions. Yet, our article ends here, and we invite you to know more in the upcoming issue of *SCIplanet* magazine, Summer/Autumn 2021.

If Venus represents the past of Earth, Mars represents its future.



GERMAN INVENTIONS

THAT CHANGED THE WORLD



The Germans have provided humanity with many inventions that changed the world in different fields of theoretical and applied sciences. We cannot find any invention—such as the car, television, telephone, or computer—that is not associated with the name of a German institute or inventor. It is no wonder that Germany is called the “Land of Inventors”. Germany has been, and still is, at the forefront of all countries that prioritize scientific research based on experience and practical application in various fields of science and knowledge.

In Germany, hundreds of universities, research centers, and institutes provide the priority to the applied aspect of research; the Government also allocates a huge budget for research and invention purposes. Moreover, there is a continuous increase in the number of those working in the field of science and scientific research, in addition to an increase in the number of patent applications, which poses futuristic innovative prospects in a country that is capable of innovation and creativity. Youth from all over the world, wishing to study or reside in Germany for scientific research purposes, also benefit from this.

“Germany, the Land of Inventors—the Scientific Research Project” Exhibition

The Goethe-Institut, in cooperation with the Max Planck Society and Fraunhofer, has dedicated for the Land of Inventors, Germany, a special exhibition entitled “Germany: the Land of Inventors—the Scientific Research Project”. The Exhibition introduces important German inventions that have rocked the world in various scientific fields, such as the telephone, computer, or car; all are German inventions that changed the world. Germany also registers more than 30,000 patents per year; thus, ranking third worldwide. The exhibition presents pioneering inventions from Germany; at the forefront of these inventions are the historical discoveries, particularly, forward-looking innovations with an orientation towards the future. The focus is on both historical discoveries and pioneering innovations.

The Exhibition presents interesting quotes from famous figures that lead to seven fields, which are informatics, medicine, energy, transportation, communications, optics, and materials. Small exhibitions are allocated for each field and have their own wall for displaying photos, explanatory texts, and pictograms; besides some interactive elements that encourage positive participation and interaction, in addition to films and listening stations presented with the exhibits. At the center of the exhibition, the visitor receives some information about studying and researching in Germany.

Exhibition Venues

“Germany, the Land of Inventors—the Scientific Research” Exhibition is a touring exhibition that has been held for several years in tours in all Goethe Institutes around the world. This Exhibition mainly attracts youth, whose age ranges 15–25 years old, and are enrolled in schools and universities. The Exhibition is available in both German and the language of the country in which the Exhibition is held. The BA hosted this Exhibition in the Planetarium Science Center ALEXploratorium, from 17 March – 7 April 2021; its content was presented in both German and Arabic. Many school students and individuals from Alexandria visited the Exhibition, and they also participated in an introductory workshop on the contents of the Exhibition in an interactive way.



References

dw.com

freepik.com

goethe.de

مركز

القبة السماوية

العلمي

THE PLANETARIUM
SCIENCE CENTER

العلم للجميع! SCIENCE FOR ALL

Available Planetarium Shows

Seven Wonders; 30 min.

Kaluoka'hina: The Enchanted Reef; 33 min.

Stars of the Pharaohs; 35 min.

Oasis in Space; 25 min.

Great Barrier Reef; 42 min.

The Secrets of Gravity; 45 min.

Space Flight (Live Show); 45 min.

The Future by Airbus; 27 min.

Enlightened Mind; 19 min.

The Planetarium operates from Sunday to Thursday (except Tuesday), and offers three shows per day. For schedule and fees, please visit the PSC website.

ALEXploratorium

Discovery Zone

**Opening Hours and Guided Tours
Schedule**

From Sunday to Thursday (except Tuesday):
10:30, 12:30, and 14:30

Tuesday: 10:30

Entry Fees: EGP 10.- (EGP 5.- for students)

The Bibliotheca Alexandrina Planetarium Science Center (PSC) invites its visitors to spend a day of fun learning, where they can enjoy amazing scientific shows that cover a diverse variety of scientific fields and are suitable for a wide range of groups at the **Planetarium Theater**.

Visitors can also enjoy tours of the **History of Science Museum**, which highlights scientific discoveries throughout three eras: Pharaonic Egypt, Hellenistic Alexandria, and the Golden Age of Islam.

Moreover, visitors can enjoy a collection of interactive exhibits that targets children and adults, workshops, **DVD** and **3D** shows at the **ALEXploratorium** as well as shows at the **12D Theater**.

+ (203) 4839999; Exts.: 2350, 2351

WhatsApp: +(2) 01012307772

+ (203) 4820464

psc@bibalex.org

www.bibalex.org/psc

BAPSC



Planetarium
Science Center
مركز القبة السماوية العلم

There is nothing more precious than quality family time. You can play family games in any occasion using simple household supplies, or none at all! Adding to the fun you will have; it will help you boost your science knowledge. You can also follow our pages on social media for more quizzes.

Two facts and a myth




Each player states three interesting or surprising science-related statements; only two can be facts. After discussion, see if the other players can guess which one was incorrect then the player reveals it. Can you guess the myth in each of the following statements?

1. Art and Patents

- a) In 2002, screen legend Marlon Brando patented a drum-tuning system that uses a single tuning lever instead of series of bolts around the drum head.
- b) In 1993, the King of Pop Michael Jackson patented a method creating an anti-gravity illusion, with Michael Bush and Dennis Tompkins.
- c) In 1942, Hollywood star Audrey Hepburn with her friend George Antheil, patented the basis for all modern wireless communications.



2. Animals

- a) Rats have the ability to laugh when being tickled.
- b) Bats and flying squirrels are the only flying mammals in the world.
- c) Octopuses have three hearts and nine brains.



3. Astronomy

- a) There are more stars in our galaxy than trees on Earth.
- b) It is impossible to burp in space because of the absence of gravity.
- c) One day on Venus is equal to 117 days on Earth.



ANSWERS REVERSED

1. (c: Hedy Lamarr)
 2. (b: Bats only)
 3. (a: More trees than stars)

HOW TO JOIN OUR EDITORIAL TEAM

We are constantly looking for contributions by distinguished specialists and freelance editors, who wish to fulfill their passion for science and deploy their writing talents. If you are interested, kindly send us your CV and an abstract of 100 words maximum, covering a recent scientific topic, to copu.editors@bibalex.org. Scan the code below and read more on our editorial guidelines.



The Bat Effect



I really need to find my lost slipper, but if I stood up, I would lose face and spill the popcorn because I am supporting the table with my foot. What a beautiful fish hanging on the window! What?! I am starting to see things; I think I need to eat and come back.



Illustrated by: Mohamed Khamis

Comic Caption Contest

Before publishing each printed issue of *SCIplanet*, we post on our social media pages a comic in need of a caption. The contest duration is two weeks, during which readers aged 12 years old and above can post or send their caption suggestion(s) in Arabic or English; each of 50 words or less for the featured comic. From each contest, our editorial team selects one winner, whose caption and name are published here.