

VACCINES ARE NOT THE ONLY SOLUTION TO PROTECT AGAINST INFECTIOUS DISEASES

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Abstract

In the era of Covid-19 when the whole world is struggling to fight the pandemic, most countries were caught unprepared. The implementation of infection prevention on a large scale was crucial. To improve our immunological status to become more resistant to inflammation, we have to follow what scientists already know – right now the immunization of people should be sped up as much as possible. People should also be immunized against influenza and pneumococcal since all of these cause lung inflammation. Additionally, adults as well as children should be immunized against other diseases according to the immunization schedule. Secondly, for years, we acknowledged that some other prevention methods work substantially to protect us against multiple diseases. We know how to prevent successfully hypertension, diabetes type 2, obesity, inactivity, smoking and alcohol bingeing, which make people more vulnerable to debilitating chronic inflammation inside their bodies. The fact is that we know the risk factors which make the above mentioned diseases, and we know how to avoid them, which is already well documented in hundreds of papers. The preventive programme should be delivered to the public as urgently as possible. A healthy diet and physical activity can boost positive immunological response and protect people in many ways against many infectious diseases including Covid-19 or lessen their impact.

Key words: vaccines, Covid-19, prevention, diet, physical activity

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Introduction

Despite the meticulously prepared plans for combating human disasters [1], when epidemics or pandemics strike large amounts of people on the planet, we have so often seen a less scientific response but rather a politically motivated one, creating chaos from the beginning. And that is why anxiety, stress, and depression are taking their toll. Additionally, when not experts but politicians try to force their will upon a crisis situation, distrust and division among people widen. This political approach not the medically based scientific one instead is confusing enough and has negative consequences on many levels of management. Additionally, when people are being disconnected from each other, keeping social distances, having many lockdowns, creating deeper loneliness, all of this makes us more vulnerable to other diseases or the worsening of pre-existing conditions: hypertension, obesity, addiction to drugs and alcohol, violence, as well as mental health problems [2].

Updating the most medically accurate information domains fast with the highest credibility will be the most

effective path for crisis management [1, 2]. Coping with epidemics/pandemics on a large scale, we need the most trusted experts from health institutions, on epidemiology, infectious diseases; veterinary, diet, police, fire and military, religious, as well as psychology, to be very responsible for prevention or treatment [3] (Tab 1).

Tab. 1: Special team to control epidemic/pandemic



The United Nation has ensured health crises management as a priority, advises the strengthening capacity at all levels of management, and supports the nations all around the world to better manage the global health crises (Tab 2).

Tab. 2: Command system on all levels to manage the crises



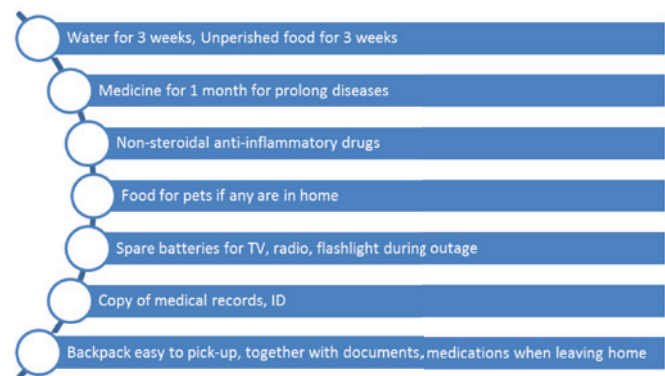
Actual information in the public domain should be very quickly distributed and should be honest and trustworthy [4]. If not, gossip and disbelief will circulate faster in societies and undermine the main effort to stop human disasters.

After hundreds of outbreaks and epidemics in the modern era, assessments were made many times, planning was refined and improved to such details which allow us to better manage the health crises now and in the future [5]. Prevention, treatment and recovery after an epidemic/pandemic, like Covid-19 need huge community engagement and a lot of education among health care workers and civilians. The most important point is the knowledge and experience of medical health care workers and their preparedness in the fields like biology, chemistry and radiology. Nothing should be performed experimentally during any health crises like an epidemic or pandemic. Before another eventual pandemic we have to perform first, some kind of simulation, exercising, organizing, staffing, and creating additional medical settings. After that we need practice and drills and try to prepare the whole society for the eventual future biological, chemical or radiological events. The outstanding professionals should deliver publicly a step-by-step plan to mitigate crises management [6]. Experts should first assess the situation on all levels, starting from national and ending at the lowest level of society organizations as local communities [7]. Preparing a step-by-step plan to mitigate health crises should involved many teams and allow them to be as close as possible to the communities, and try to do everything to explain the real situation to people. There should also be at minimum one annual training, some kind of practice with various health crises situations. Better preparedness should bring better outcomes and less severe consequences during a real epidemic. At minimum every year, our disaster preparedness plans should be checked and if needed corrected, updated, or better designed and kept close to actual scientific reports [8]. The same way, procedures should be checked,

and if needed corrected to limit the impact on health crises management.

Time is crucial for implementing an operational plan as early as possible when crises have already started. People should feel some kind of security, from the beginning of the disaster. When the threat of an epidemic is occurring, experienced health managers with the best medical knowledge should take the rein to implement exact procedures, plans and show the seriousness of the crises. Society should not be ashamed of weaknesses like shortages of medical staff, insufficient treatments or telling people that outcomes from a pandemic can be very serious due to widespread illness. With high infection and fatality rates as the lasting SARS-CoV-2 pandemic, all sectors of essential services have been impacted, not only health care, but there can be problems with water, food, energy as well. Some part of population is much more vulnerable, like overcrowded homes, low income people, the disabled, migrants and refugees. They need more economic support, as daily critical goods (Tab 3).

Tab. 3: What every person needs during any kind of disasters



In a pandemic like SARS-CoV-2 the whole world population needs day by day some different help adequate to the situation.

History teaches us about the negative impacts of pandemic on human health but also gives us some solutions to resolve the severity of the epidemic or illness and how to cooperate domestically and internationally to diminish the pandemic devastation to human lives. In the last decades, like never before, millions have been moving around the world, able to travel in a few days from one continent to the another. Easy travel is positive and essential to communicate between nations, exchange the knowledge and trade goods as well as establish friendships. On the other hand, easy travel creates the possibility of spreading unintentionally contagious microorganisms as fast as the planes take off and land from one country to another. It is noteworthy that not only people are responsible for the spread the contagious illnesses but also animals, birds and any kind of transportation that in short times cross borders, and can infect humans (Tab 4).

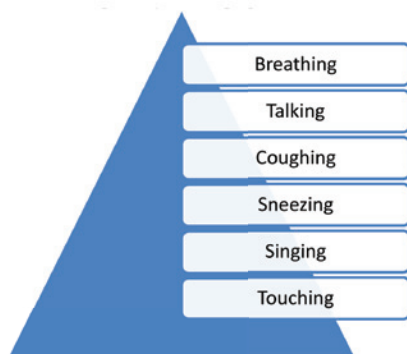
Tab. 4: Control strategies of SARS-CoV-2



Mixing large groups of people spreads influenza (Spanish flu in 1918-1919), Asian flu in 1957-1958, Hongkong flu in 1968-1969), SARS, tuberculosis, plague, and HIV/AIDS [9]. Most infectious diseases are of animal origin and without proper epizootic surveillance, like controlling animals trade, reducing over-crowded farms and other measures, contagious diseases easily spread from animals to humans, particularly from susceptible animals [10]. Human populations are always at risk of catching diseases from animals. Avian influenza, swine fever, bovine spongiform encephalopathy are examples of how easy microorganisms can jump and change between species.

An example of an animal derived disease is the recent outbreak of Covid-19, caused by SARS-CoV-2. At the end of 2019, it was spreading fast around the globe and was declared a pandemic on March 11, 2020 by the World Health Organization [11, 12]. Covid-19 is a zoonotic disease spread between people mostly by respiratory droplets, from one person to another. As a new disease not well protected by the human immunological system and without proper treatment Covid-19 has created havoc around the world because so many people are becoming infected, and the older generation is affected most severely (Tab 5).

Tab. 5: Pathways for SARS-CoV-2 spreading between people



Covid-19 treatment and prevention took time between assessing the disease to implementing policies, and some drastic measures as lockdowns of the most of the economy, or closing

schools were necessary. At the start of Covid-19 it was not easy to implement isolation wards in hospitals, convince people to properly wear face masks, keep at least two meters distance apart, compel hand hygiene - washing with soap and water or disinfecting hands more frequently and thoroughly than usual. As we know right now, comorbidities such as cardiovascular diseases, chronic lung diseases, diabetes and obesity have a devastating impact on patients when they become infected and sickened by SARS-CoV-2, dying more frequently than healthier people. The SARS-CoV-2 pandemic, stimulated the unprecedented development of vaccines, the use of old and new antiviral drugs, faster methods of detection of the virus among population, the implementation of contact tracing, obligatory mask wearing and other measures. In the SARS-Covid 19 pandemic the most difficult task is prevention. Health care workers are most vulnerable to becoming sick, particularly in emergency rooms and intensive care wards, where most pathogens accumulate.

Some countries spend less of their gross domestic product (GDP) on healthcare than others in the EU. In Poland that is less than 1,000 dollars per person in recent years. The present Polish expenditure on healthcare is one of the lowest in Europe [13]. In Poland the number of physicians per 1,000 inhabitants is the lowest in the European Union, and reaches 2.38, as compared to the average 8.4 doctors /1000 inhabitants in EU [14]. Despite some effort in Poland on healthcare, some bad habits are still unsolved such as smoking, affecting over 23% of the population, and binge drinking, where one in six adults regularly drinks heavily. Another problem is the epidemic of hypertension and obesity that is on the rise, and Polish experts predict than in 2035 every other person will have hypertension, and one third of population will be obese. The proportion of people with hypertension in Poland is higher than in the EU. In developed countries, family doctors are mostly responsible for chronic disease prevention, as a staple of human health but there is a higher mortality rate in Poland than in EU, and the unsolved prevention of chronic diseases creates big questions about longevity and the quality of life in Poland. A shortage of health care workers and high emigration of specialists, or a high number of uninsured people raise concerns, which create long uneasy access to specialists and hospitals. Patients with cardiovascular diseases or malignant cancers have to wait for months or years to be treated. Only heart attack patients can gain easy access to hospital in Poland but not for cancer and others urgent ailments. Many weak areas in the Polish health services need urgent improvement. For decades as many outbreaks and epidemics have already occurred, as well as natural disasters like flooding or hurricanes show the need for solutions. And now when the next pandemic strikes, the Polish healthcare system will have to cope with insufficient measures and with surging cases of ill patients [15].

During the prolonged outbreak of Covid-19, we were able to see the negative impact on people with other illnesses

who had not yet been infected with Covid-19 as well as the fast loss of property values on a large scale [16]. Probably, all countries, rich and poor, developed or underdeveloped have some kinds of health inequalities. There are mainly socio-economic problems or ethnic ones, where we have seen higher incidence of diseases. And the negative impact of the pandemic on other illnesses has been historically proven [17],

Some positive actions were taken by the European Center for Disease Control (ECDC) in the last decades, which include the fast responses to Avian flu (H5N1) 2005, swine flu (H1N1) 2009 and the Ebola outbreak in West Africa 2014, sending medical personnel and medical equipment [18]. The action taken by the European Center for Disease Control (ECDC) during the Covid-19 pandemic is continuing and strictly evaluated.

Analysis

Unexpected negative health events can occur any time (Tab 6), from local to global crises and from physical chemical to biological threats. We should be ready to prevent health crises in certain times and ensure communities how well we are prepared to respond to every health crises.

Tab. 5: Pathways for SARS-CoV-2 spreading between people



Each country knows their current epidemiological situation, what kind of illnesses they have, people's comorbidities, health care resources and infrastructure [6, 7]. In the last decades national and international health services have already processed hundreds analyses from different kind emergency situations in the world and provided essential information for political leaders and health care managers at all levels. The recent Covid-19 pandemic presents how vulnerable our health programs are and if our financial possibilities really provide the necessary resources and our prevention plans which are not an adequate response to an epidemiological disaster [1, 2].

Delayed information and misinformation about this new disease and how health services are going to respond makes the public domain mostly confusing. To avoid the above-mentioned mistakes, only trained persons together with medical experts will be the most trustworthy to explain adequately the epidemiological situation and convince people what kind

of preparation is needed. It demands specialists to be trained and rehearsed at a minimum of once a year [3, 4]. The health management existing guidance established by the WHO and most countries decades ago indicated point by point what should be done during epidemiological disasters. It was written for different levels of community from government sectors to local levels [1, 2]. The epidemiological procedures are ready to use and specify public communication and an estimation of an event, like illnesses, deaths or, financial possibilities [5]. The decisions concerning epidemic management should be made by outstanding experts (Tab 4) who take the main role to manage medical services and insure medical supplies. If needed, retired health care professionals could be asked to work part time, or doctors and nurses from others hospitals where the epidemic is located only in one part of the region. The quality of health care workers are crucial when surge of patients arrive in short time, overwhelming hospitals capacity. We have to know human resources prior to outbreaks and epidemics if resources will be able and add additional medical staff, including, if necessary, retirees to work probably partial-time [6].

Conclusion

Precise planning and predictions are the most important issues before encountering any biological, chemical or physical disaster [5]. Knowing the population well susceptibility, most vulnerable people, the disabled, the number of health care workers, allow us to controlling the situation more properly [7, 14]. Shortages of health personnel, the necessity to rotate staff, to manage essential services or potential personnel absenteeism need strong leadership to provide permanent human resources [7, 8]. In disasters like pandemics it is necessary to mobilize outstanding medical expert or others from different fields, from the beginning and create the best public relations, monitoring situation for short or long decision time [3]. We have two main ways to improve the efficacy of our actions before and during health crises:

- educating health care workers and
- educating communities [2, 6, 12, 16].

Medical personnel should have thorough knowledge of the details of causative agents as mostly they are viruses and bacteria and consider the best option for prevention and treatment. But the public should be informed on a daily basis how to deal with disease with the most important information. If there are air, food or other possibilities of transmission, anti bacterial and/or anti viral procedures should be introduced as soon as possible [12, 16].

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