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STABILIZING STEPS THE SECURITY OF HUMAN AND SOCIETY IN THE COVID-19 PANDEMIC

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Abstract

The research goal is to develop models for stabilizing human security during global pandemics. In order to develop effective measures to minimize the impact of the COVID-19 pandemic on the safety of Ukrainian citizens, it is necessary to conduct an in-depth analysis and modeling of the impact of quarantine measures. The research focuses on human security, digital inequality, employment issues, psychotherapeutic problems, and their impact on protection of the population. Cybersecurity tools are being developed to combat information manipulation and illegal e-commerce, and to protect patients' personal data. The COVID-19 pandemic creates an environment for the cybercrime development. Decreased vigilance among the population, anxiety disorders, work from home, and excessive load on the Internet lead to an increase in the flow of cybercrime. Companies that are engaged in the management of day-to-day operations in times of crisis do not pay due attention to the increased threats to information security that arise as a result of these exceptional circumstances. The research will use theoretical-analytical and practical models, method of analysis of hierarchies, computational method of economic research and development of methods for calculating human safety indicators, system oriented, inductive and deductive approaches to the interpretation of research results. To ensure stability in the state during a pandemic, it is necessary to take into account security of all segments of the population, transformation of the medical crisis into economic and digital ones. The research highlight is that to ensure economic stability and stabilization, return the system of all government chains to stable operation, it is necessary to take into account the security of all segments of the population. The research presented will be mathematical models and comprehensive recommendations proposed to help countries overcome the global crisis outcome.

Keywords: *Pandemic, Cybersecurity, Theoretical-Analytical and Practical Models, Social Security, Economic Stability.*

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1. INTRODUCTION

In just a few months, the coronavirus pandemic has blown up and played havoc on all spheres of human activity and on states in general, especially in the socio-economic domain. The coronavirus pandemic has led to unprecedented problems in the global economy, the effects of which governments of all nations, businesses of all levels from international corporations to private entrepreneurs, every single person around the world would experience over the next few years. And these consequences could be unpredictable as the pandemic continues. The impact of the COVID-19 pandemic on global processes is enormous and complex, and it is constantly increasing. From major disruptions to the global economy and to the breakdown of personal relationships; no country, business, community, a family or an individual has escaped its consequences. In addition to the direct impact of the virus on human health and safety, economic, social, demographic, environmental, behavioral, political and institutional responses to the pandemic have been and continue to be profound. Economics, alone or in conjunction with other disciplines, including systems analysis, has a key role to play in understanding, addressing, and mitigating the complex effects of the pandemic on human and societal security.

There is no doubt that the COVID-19 pandemic is a challenge to the European unity and another crash test for the European Union, Ukraine is associated which. Europe has been, and is likely to remain, one of the most COVID-19-infected regions in the world, and strong responses by national governments to the pandemic, through various strategies combining social distancing, quarantine and self-isolation, have led to an economic crisis at least twice as strong as crisis of 2009. In addition, economic recovery is likely to be slow due to depressed consumption and investment, and this will require a rapid redistribution of resources in both the labor and capital markets.

During the quarantine period, only grocery stores, pharmacies, gas stations and banks operated in Ukraine until the stages of its mitigation. In general, according to information released by the State Treasury Service of Ukraine, the budget received about 62.5% of the planned revenues. According to UN estimates, due to the economic crisis, more than 6 million Ukrainians may be below the poverty line. At the same time, families with small children and children who have only one parent are most affected. One of the few measures to overcome this crisis is to involve researchers in research papers to analyze trends and develop measures to overcome the economic downturn and ensure the health security of the most vulnerable groups suffering the pandemic and the subsequent economic crisis. For example, the US space agency

NASA has announced that it would fund four major research papers that will study the impact of the COVID-19 pandemic on society, from the economy to the problems of air pollution. Papers should shed light on the changes caused by the temporary absence of typical human activities. The Oxford University Center for Entrepreneurship has announced four papers to study the COVID-19 pandemic to be funded.

This is a paper to develop a non-invasive saliva test for COVID-19, which will improve testing capabilities and their effectiveness; development of a software application to support parents of babies; ObliviousAI research team paper to develop software for contact tracking and data protection; and the Crowdless paper, which analyzes the load of supermarkets and shops to help people avoid crowds and queues. The COVID-19 pandemic is making the whole world to think about human security, how to face the global challenges of real life in a new way, as quickly and effectively as possible. The use of factual data on the pandemic consequences by the state leadership, the study of support for response to the pandemic COVID-19 will contribute to adoption of scientifically sound decisions in the fields of economics, health, and information security. This, in turn, will ensure a more humane and equitable policy for all and will minimize the destructive impact of the pandemics on lowincome, vulnerable, disadvantaged groups. To stimulate the state's economy, the government proposed a program to save the economy only in two and a half months after the quarantine was introduced.

More than 90 developers took part in preparation of the program, including think tanks, business associations and individual companies. The program takes into account initiatives in the following areas: access to finance, access to markets, deregulation, modernization and development, and access to infrastructure.

In order to develop effective measures that would minimize the negative impact of coronavirus on the economy of Ukraine, it is necessary to conduct a thorough analysis of the socio- economic and security spheres in the context of quarantine and at various stages of its gradual mitigation.

2. LITERATURE REVIEW

In the research famous scientist Ravi P. Agarwal [1] firstly studies an SIR (susceptible-infectious-recovered) epidemic model without demography and with no disease mortality under both total and under partial quarantine of the susceptible subpopulation or of both the susceptible and the infectious ones in order to satisfy the hospital availability requirements on

bed disposal and other necessary treatment means for the seriously infectious subpopulations. Simulated numerical examples are also discussed related to model parameterizations of usefulness related to the current COVID-19 pandemic outbreaks. A true-mass action epidemic model with a typical bilinear incidence of the form is described in [2].

In scientific work [3] Edwin G. Tse and Dana M. Klug collates the key open science resources and initiatives currently available for COVID-19 research. The resources and initiatives highlighted in this article demonstrate the benefits of open science approaches and its potential to accelerate research timelines.

In scientific work [4] was created a simulation model to understand the effect of the starting day of community containment on the final outcome. This simulation shows that the early implementation of social distancing and reducing the number of contacts per day reduces the number of hospitalized cases, deaths and number of infected people. Furthermore, early relaxation of social distancing is associated with rebound increase in the number of active cases in the community.

The study [5] focuses on the modelling and the forecasting of COVID-19 spread in the most affected African continent, namely: Morocco, Algeria, Tunisia, Egypt and South Africa and for the sake of comparison two of the most affected European country are also considered, namely: France and Italy. To this end, an epidemiological SEIQRDP model is presented, which is an adaptation of the classic SIR model widely used in mathematical epidemiology.

Despite limitations, this report [6] provides a framework for tailoring communication messages that are empathetic, that amplify personal responsibility and responsibility to protect others, and that focus on perceived pressure to not wear a mask, all of which might persuade young adults to adhere to public health guidelines (e.g., wearing masks) that prevent the spread of COVID-19. Masks are an effective tool to prevent the spread of COVID-19, and current CDC guidance recommends universal masking to prevent SARS-CoV-2 transmission.

The paper [7] investigates the issues of the socio-economic impact of the pandemic.Social distancing, self-isolation and travel restrictions have lead to a reduced workforce across all economic sectors and caused many jobs to be lost. Schools have closed down, and the need for commodities and manufactured products has decreased. In contrast, the need for medical supplies has significantly increased. The food sector is also facing increased demand due to panic-buying and stockpiling of food products. In response to this global outbreak, we

summarise the socio-economic effects of COVID-19 on individual aspects of the world economy.

In paper [8], we consider how to address the devastation brought on the Canadian Economy from the covi19 pandemic. We conclude 9.5 million jobs could be created in a way that maximized the impact of government spending. Figure, well know from Astrotheology Math, are used to ensure the highest levels of job creation for the investment of $340 B CDN.

The main goal of the study is to provide sound recommendations for government management in the direction of social security. The article will focus on food security, digital inequality, employment, psychotherapeutic problems in the context of quarantine measures and their impact on public protection and education problems. In particular, a set of measures will be proposed to optimize supply chains and ensure human food security during a pandemic, to ensure a minimum income for the disadvantaged segments, including those who need support to use digital systems, to combat methods of information manipulation.

3. RESEARCH METHOD

It is planned to use both general scientific and special methods to solve the paper tasks. In particular, it is a systematic approach to analyze the structural transformation of the economy under the influence of the pandemic, as well as to analyze the international experience of institutionalization of the fight against the pandemic.

The paper will use theoretical-analytical and practical models, methods of mathematical statistics (in particular, cluster analysis, frequency analysis, index theory, trend analysis), methods of mathematical economics and econometrics (supply and demand analysis, regional and spatial analysis, global modeling, time series analysis), methods of economic cybernetics (system-oriented analysis of economics, theory of economic information, theory of control systems, simulation), network and program-target methods of planning and control, method of analysis of hierarchies, methods of systems analysis, method of computer mathematics. It is planned to use the research-papers of domestic and foreign scientists in the field of security, epidemiological control, and economy as the information base of the paper. The information and factual basis will be based on legislative and regulatory acts on human security, data from the State Statistics Service, official information of international organizations, as well as statistics of the World Health Organization (WHO).

In our article, we will build on real-world observations in assessing security quarantine measures, government financial and fiscal decisions, and health system performance during the

pandemic. We will also empirically study the impact of social exclusion and strict quarantine policies on economic performance, learning performance, media performance and human food security. As part of the article, we will specifically monitor vulnerable groups, such as low-income households who had financial difficulties in the past. Social surveys of schoolchildren, students and teachers will be conducted; the results will help us to determine the methods of protecting schoolchildren and students from deteriorating mental health during the quarantine, policies to support them and the impact of social isolation on the professional competencies of university graduates.

Model problem about the number of actively ill:

$$y' = (k_1 - k_2 - k_3)x$$

$$y = e^{(k_1 - k_2 - k_3)x}$$

Where k_1 is the rate of case, k_2 - coefficient of recovered, k_3 - coefficient of death.

If $k_1 >> k_2$ - there will be a sharp increase, if $k_1 << k_2$ - there will be a decline.

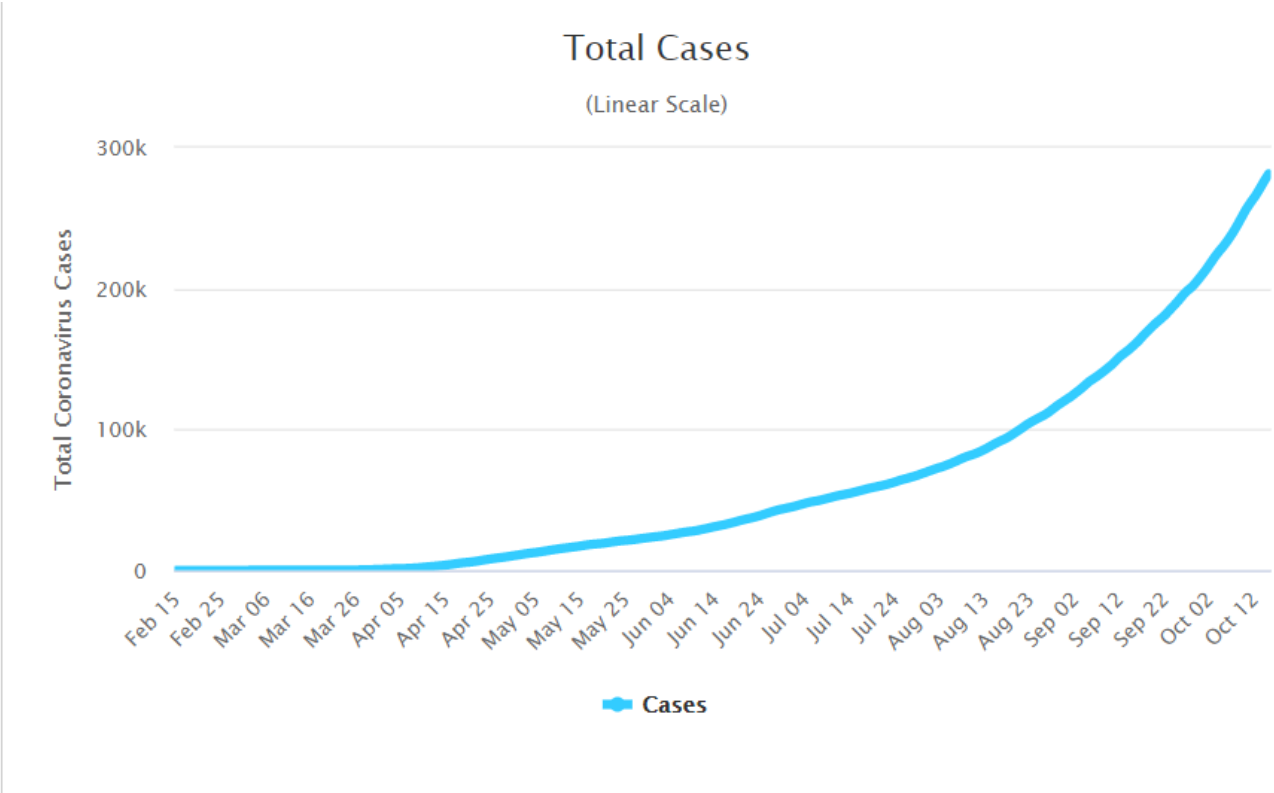

Figure 1. Total Coronavirus Cases in Ukraine

(developed by the authors)

The graph shows an exponential increase in the number of actively ill patients. As noted above, the purpose of our study was to study the effect of an increase in morbidity on the state of the economy and social security of a person (Figure 1).

We will also conduct in-depth interviews with university teachers and students. Thus, this article will provide a comprehensive analysis of how well public institutions are prepared for the pandemic challenges, and will help policymakers and practitioners to develop rapid solutions to overcome the crisis.

4. ANALYSIS

In order to develop effective measures to minimize the negative impact of coronavirus on the economy of Ukraine, it is necessary to conduct a thorough analysis of the socio-economic and security spheres during quarantine restrictions and various stages of their gradual mitigation. The paper highlight is that to ensure economic stability and stabilization, return the system of all government chains to stable operation, it is necessary to take into account the security of all segments of the population, because citizens pay 34% GDP in taxes and economic stability depends on their solvency.

Today, many citizens have been forced to terminate their employment or their wages have dropped significantly because employers have no income. Our paper defines the problem and suggests the way to overcome it. To reduce the spread of COVID-19 and stop the epidemic, global, national and local authorities need timely and up-to-date data and model forecasts to inform about prevention, control and distancing measures. Policymakers will also need data on behavioral and biomedical interventions during and after a pandemic to reduce the devastating effects, especially on the most disadvantaged segments.

Coronavirus is continuing its spread across the world, with more than 55,6 million confirmed cases in 189 countries and more than 1,3 million deaths (Figure 2).

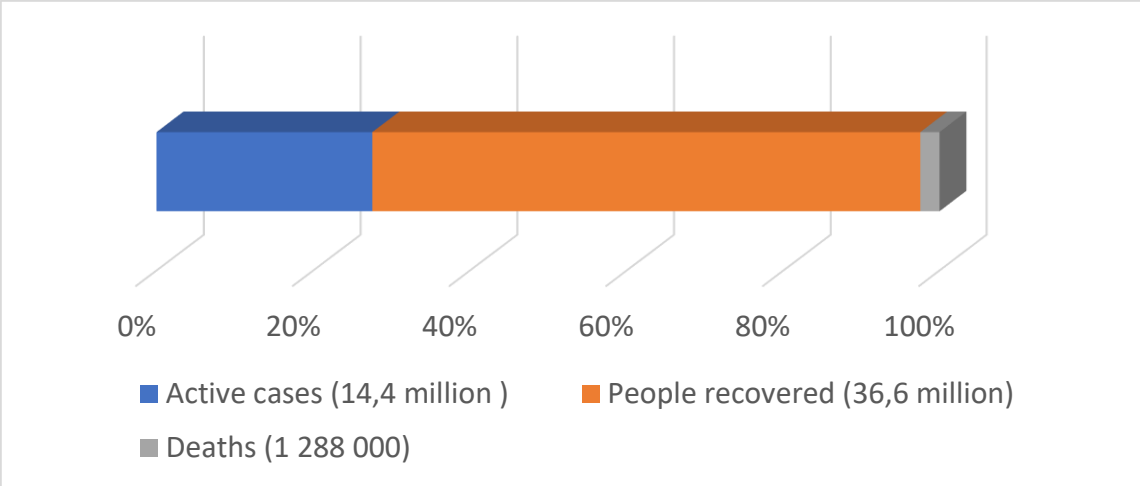

Figure 2. - Data on the spread of coronavirus around the world

(*developed by the authors*)

The virus is surging in many regions and some countries that had apparent success in suppressing initial outbreaks are also seeing infections rise again.

The composition and development of policy mixes throughout the different stages of the crisis as well as their effects on businesses and industries is another area that deserves attention. How developing countries tailor these measures today will affect their prospects for building resilient, inclusive and sustainable post-crisis industrialization in the future.

The COVID-19 pandemic creates an environment for the cybercrime development. Decreased vigilance among the population, anxiety disorders, work from home, and excessive load on the Internet lead to an increase in the flow of cybercrime. Companies that are engaged in the management of day-to-day operations in times of crisis do not pay due attention to the increased threats to information security that arise as a result of these exceptional circumstances [11, 12]. In particular, criminals may use health-related information about COVID-19. The deep concern of the population about these issues and the surrounding anxiety inevitably implies a decrease in the general vigilance of Internet users.

One of the paper tasks is to make proposals and even life hacks to prevent cheaters. Transformation of the medical crisis into an economic one, and its impact on the global economy requires a comprehensive analysis. The COVID-19 pandemic not only contributed to the growth of social isolation, but also to the closure of financial markets, corporate offices and cultural institutions. The rapid spread of COVID-19, and the difficult medical situation, has led to a decrease in the level of investment protection and dissatisfaction of investors and international trading partners. For companies, remote work is a risk factor to consider. The risk

of attacks on information systems, as well as on the network, which are in great demand for remote work, is significant. Access to confidential and financial information, document fraud scams, supply chain adjustments, including food supplies, increased network requirements caused by quarantine measures are all potentially serious consequences for the security system. In this context, competent authorities also need practical guidance on limiting cybersecurity risks to a man and society as a whole. Chattering is a big problem.

The paper also details and suggests ways to solve the following problems: -analysis of the continuity of supply chains for dairy products, meat, fresh fruits and vegetables to ensure food security. Study of the experience of primary food producers in adapting to quarantine measures and changing supply chains. Development of measures to optimize supply chains and ensure human food security during pandemics; - developing measures to ensure a minimum income for the disadvantaged population, including those who need support to use digital systems. Development of measures to assist employees in their return to work when quarantine measures are terminated. Research of digital tools and analytical tools based on artificial intelligence (AI) to improve epidemiological surveillance in Ukraine.

Analysis of the pandemic impact on the status of Ukrainian and foreign secondary and higher education: access to quality education, possible reform of school education with the transition to a mixed regime [13], etc.; -study of processes, ways of formation of (false) information about the COVID-19 pandemic and it flows through media platforms. Analysis of the impact of digital content to improve public health and limit the spread of the COVID-19 pandemic. Develop cybersecurity measures to combat methods of manipulating information and provide citizens with the means to verify the facts; - computer modeling of physiological factors that may be affected by quarantine (sleep patterns, social interaction, activities / physical exercises) and their impact on professional competencies and physical safety. Analysis of people's access to resources for distance learning, work and social interaction during quarantine activities.

We use recent data derived from UNIDO’s Index of Industrial Production (IIP) for our analysis of 49 countries representing around 87 per cent of world manufacturing value added (MVA). A comparison of IIP data (adjusted to take seasonal effects into account) for March 2020 vs December 2019 shows that approximately 81 per cent of countries have experienced a decrease in industrial production of 6 per cent on average. A comparison of data for April 2020 vs December 2019 reveals that industrial production fell by 20 per cent on average in 93 per cent of countries.

Firms in the textile, apparel and leather industries tend to anticipate the largest plunge in profits and jobs, while firms in the chemical, plastic and rubber industries expect below average decreases (Figure 3).

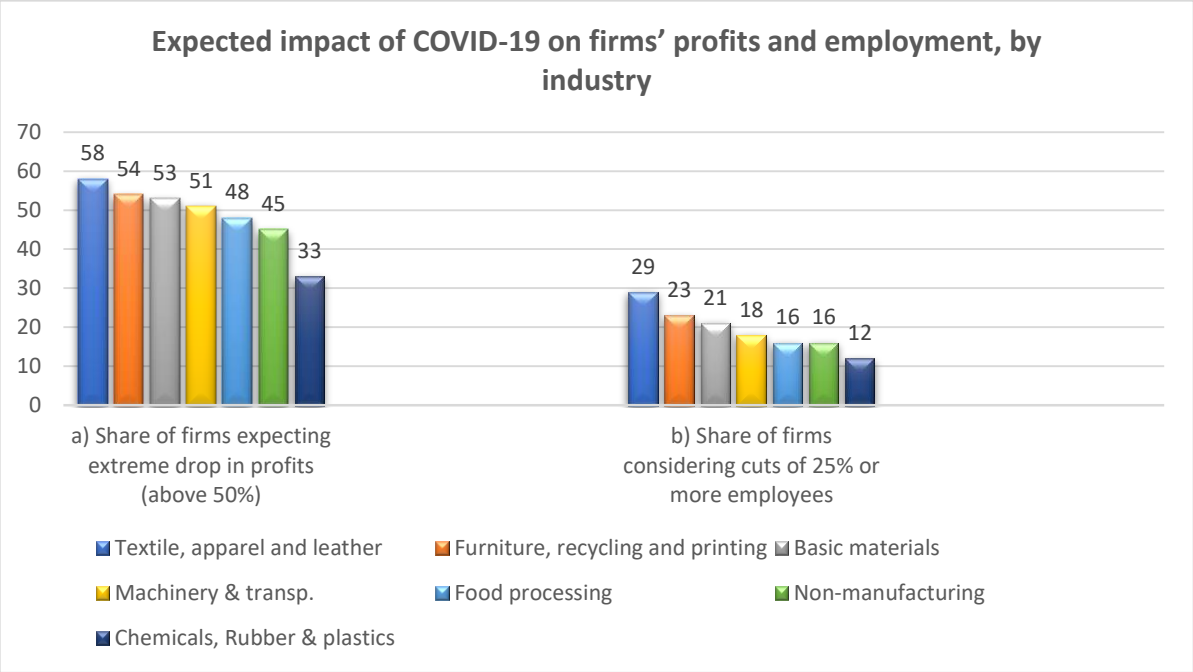

Figure 3. - Expected impact of COVID-19 on firms' profits and employment, by industry

(*developed by the authors*)

The basic materials industries also expect their profits and employment to be hit hard. In the furniture, recycling and printing industries, a large share of firms is anticipating a serious decline in profits (54 per cent), but only 16 per cent expect that they will be forced to announce drastic job cuts, which lies below the average share of firms included in the survey. Similar trends are observed in the machinery and transport equipment industries.The different expectations across firms arise from the very challenges they face. Two major challenges widely reported by firms are 1) the contraction in demand, and 2) the payment of wages. The most pressing problem in labour-intensive industries (such as textile and apparel) seems to be the payment of wages. The plunge in demand is a widespread concern among other industries. Firms in the textile and apparel industry are also particularly concerned about logistics problems, while upstream and downstream chain disruptions are deemed a more serious problem for firms in the chemical, rubber and plastic industries than for other industries.

A general conclusion that can be drawn from these results is that not all firms are affected by COVID-19 the same way. Differences are observed across countries, industries and firm size. The type of problems industries and firms face also differ across different firm types. It

follows that the policy responses implemented by governments to support firms in their recovery efforts should be tailored to account for these differences.

Dangerous actions in the context of the coronavirus pandemic are shown in Figure 4.

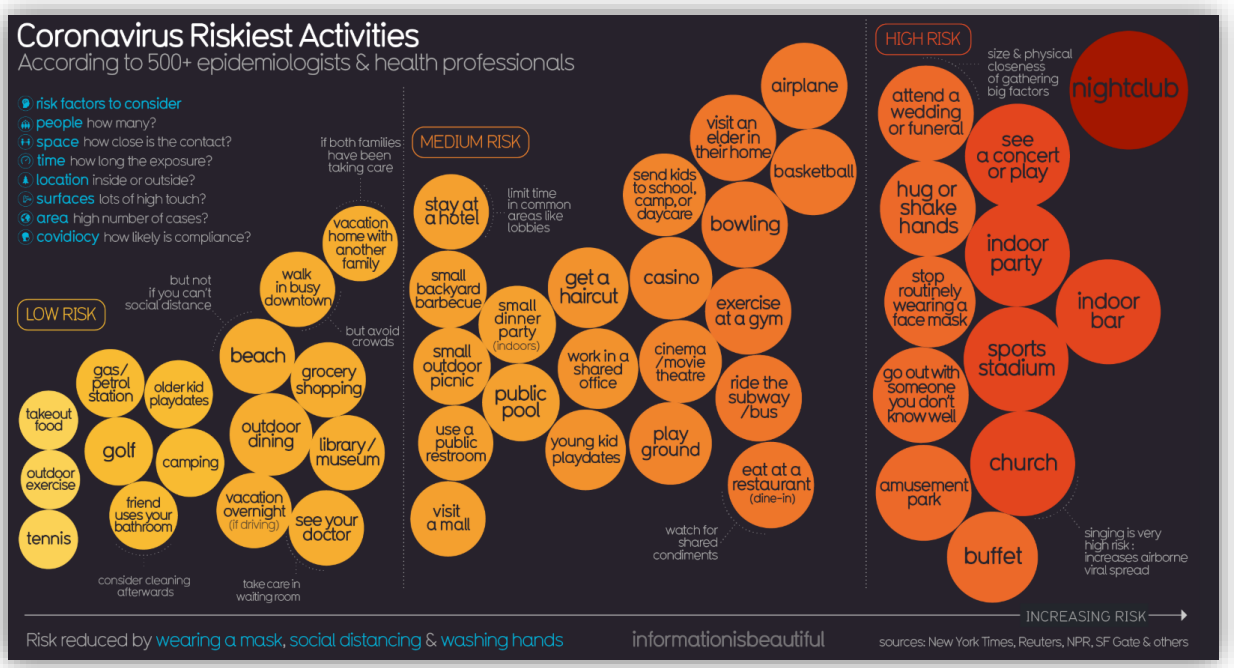

Figure 4. - Coronavirus Riskiest Activites [10]

5. MAIN RESULT OF RESEARCH

Recommendations to ministries and agencies on digital tools for epidemiological surveillance**):**

Step 1. To develop metrics for assessing food security during a pandemic using the method of hierarchy analysis;

Step 2. To develop a theoretical and analytical model of supply chains for dairy products, meat, fresh fruits and vegetables to ensure food security and action planning for food security in the event of a pandemic;

Step 3. To develop the paper website. Development of online questionnaires and conduction of social surveys and in-depth interviews with primary food producers;

Step 4. To analyze the functioning of markets and food delivery services and to develop a mechanism for providing children with micronutrient supplements for consumption at home under parental supervision during the quarantine;

Step 5. To develop a practical model of guaranteeing a minimum income for the disadvantaged population as required for the use of digital systems;

Step 6. To simulate priorities of employment of the population in the context of a pandemic on the basis of the constructed oriented graph of communications;

Step 7. To develop metrics for assessing the impact of the pandemic on the status of Ukrainian and foreign secondary and higher education using the method of hierarchy analysis;

Step 8. To analyze digital tools and analytics software based on artificial intelligence (AI) to improve the system of epidemiological surveillance in Ukraine.

Indicators: A practical model of guaranteeing a minimum income for the disadvantaged population as required for the use of digital systems, a model of a hierarchy of priorities for employment, recommendations to ministries and agencies on digital tools for epidemiological surveillance, a set of metrics for assessing the impact of the pandemic on the status of Ukrainian and foreign secondary and higher education.

Our research using a questionnaire survey of students showed concern about problem of distance learning coming to the fore.

6. DISCUSSION

The COVID-19 pandemic has demonstrated the vulnerabilities of the world's security and health systems, and the unequal opportunities that exist in our society. Although its profound impact on health practices, the economy and society as a whole has not yet been studied, this pandemic is not discriminatory and will affect everyone around the world in one way or another. However, past human security emergencies have shown that those most vulnerable and burdened by the pandemic are people living in poverty and crowded urban areas, especially pensioners, refugees, people with disabilities and disadvantaged people, as well as gender minorities.

7. CONCLUSION

A vaccine for Covid-19 isn't around the corner. Bringing vaccines to the market is a notoriously slow process and any potential vaccine will have to pass multiple stages of testing for safety and effectiveness. And once we know a vaccine is safe, we will also need to manufacture it at a scale high enough to use across the world. It's likely that any vaccine is around 18 months away.

Fearing a new recession and financial collapse, the government and society as a whole now require strong and smart leadership in health, business and information. Immediate measures should be taken to provide economic assistance and access to online resources for the disadvantaged population. A comprehensive plan for development of human food and information security, including sector plans and an ecosystem that stimulates digital resources, is also needed to overcome the effects of pandemics

Model assessment COVID-19 pandemic of its impact on human security and the economy can be useful for national and international institutions for planning quarantine measures, organizing public health services, and developing anti-crisis economic programs.

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