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Using electronic registries to study the COVID-19 pandemic and its consequences

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ABSTRACT

The article analyses systems of electronic information resources (registers and databases) in the field of the healthcare in different countries. Not only do such systems provide information to support the treatment of patients, but they also accumulate large amounts of statistics, thus enabling their qualitative operational analysis. Electronic health systems are particularly popular in the United States, and as regards Europe, in Denmark and Norway. These countries created good conditions for the efficient introduction of new electronic information resources that would store all the accumulated information about the COVID-19 pandemic. The aim of the article is to summarise information on the use of electronic registers and databases to create an information base for the study of the COVID-19 pandemic and its consequences in different countries, and to formulate proposals for the improvement of electronic health systems in Ukraine. On the basis of the results of their research, the authors propose a list of electronic registers that can significantly improve the analysis of both the course and the consequences of the coronavirus disease. The list includes: the register of immunisations, a specialised register of complications after the recovery from COVID-19, a register of tests for the presence of this disease or the recovery, etc., as well as a register of hospitalisation cases.

Key words: COVID-19 pandemic, system of electronic information resources, registers and databases of the healthcare system, electronic health records.

1. Introduction

The large amount of information that accumulates in health care systems needs to be systematized and provided with easy access to specialists for further use in medical practice. Such an opportunity is provided by electronic registers and databases of

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medical systems, which store huge amounts of information about patients. Actually, the so-called electronic health records (EHRs) are created to store and use this information, which allows information about each person from different registries to be collected together. The spread of the new virus has necessitated not only the processing of increased amounts of information to be used to treat patients (disease follow-up, use of certain drugs, vaccination, death registration), but also the creation of new and more active use of existing electronic information resources outside the purview of health care. These are, for example, systems for registration of businesses and vehicles, educational systems, information resources of pension and social funds, in which individuals and legal entities will be able to register and receive information remotely (Kayumova and Meunier, 2021). Thus, the pandemic, that is currently raging in the world, has accelerated the digitalisation of not only in the field of health care but also in other areas of society.

The aim of the article is to summarize information on the use of electronic registers and databases to create an information base for the study of the COVID-19 pandemic and its consequences in different countries and to develop proposals for its improvement in Ukraine.

The research methodology is based on the application of the following methods: system analysis – to determine the role and relationship of registers in the general health care system of each country and Ukraine in particular; scientific generalization and comparative analysis, which made it possible to group the studied registers and databases on the basis of common features and to identify similar international and national registration systems; research methods of complex systems (analytical and synthetic) – for the analysis of systems containing information related to the pandemic, in individual countries and international organizations, in terms of both the functional composition of these systems and their sufficient unification.

2. Electronic health information resources during the pandemic

As mentioned earlier (Gladun et al., 2021; Puhachova and Gladun, 2021), developed countries have formed systems of electronic information resources that cover various areas of state functioning and provide governments and inhabitants with the necessary information. In these countries, health care systems are the most advanced. At present, during the pandemic, they have become even more important, as they not only quickly provide the necessary information, which is constantly accumulating in large quantities, but also provide assistance in treating patients with COVID-19, and often allow tracking disease chains (virus carriers, who directly transmit it to others) for rapid response and interruption of these chains.

Health care systems usually have a number of specialized registers and databases that contain information about patients, diseases, vaccinations, medicines, medical staff and medical equipment, etc. Electronic medical records are the most convenient and widespread tool for registering information about patients in such systems, which is used in many developed countries, and in recent years – in Ukraine. This is especially important during the pandemic. EHRs provide an opportunity not only to obtain generalized information about each patient, but also to build scenario forecasts for the country / region on the growth or decline (the so-called waves) in morbidity, the course of the disease in different patient groups, complications, mortality based on information collected in the registers.

Particular researchers (Sudat et al., 2021; Madhavan et al., 2021; Satterfield et al., 2021), for example, described some problems with the use of electronic card information to study the spread of coronavirus in different US states and highlighted certain shortcomings inherent in EHR data. It is emphasized that the quality of data on the disease and the early deadlines for their registration significantly increase the effectiveness of crisis response. Data quality is critical to the success of the analysis (from the simplest to the most complex), and in the context of COVID-19, large-scale data sharing in the United States and around the world has played an important role in how medical systems responded to pandemics. It is the availability of electronic information resources that allows to quickly register information about diseases and treatments and share the results. The authors emphasize the usefulness of electronic registers, which store information about patients that can be used and scaled to improve clinical care, research and decision-making in health care.

Undoubtedly, the worst consequence of coronavirus disease is death, and the availability of as much information as possible about the course of the disease and the various factors that affect it (comorbidities, treatment, sex, age, etc.) helps to better predict treatment outcomes. And it is the availability of the necessary information in electronic registers which allows one to create a quality information base for the study, and the ability and ability to process this information are the main prerequisites for obtaining a reliable forecast. This is stated in the article (Schwab et al., 2021), the authors of which argue that the use of clinical prognostic models based on EHR information can help make better decisions about the treatment of patients. Researchers have introduced an early warning system for the incidence of COVID-19, which allows the risk of death associated with the disease to be assessed in advance. Thus, models are able to predict in advance which patients are at higher risk of dying, and can help provide appropriate resource priority for these individuals. In addition, as more observational data are collected, these models can be used to identify both new risk factors and interactions between existing factors, providing better understanding and opportunities for appropriate intervention.

The authors of the article (Estiri et al., 2021) argue that the ability to operate with large amounts of information allowed not only to predict death from COVID-19, but also to understand differences in risk factors (such as diabetes, cancer, lung disease, smoking) for different age groups. And the ability to calculate accurate risk assessments at the individual level solely on the basis of EHR is crucial for qualitative forecasts and efficient allocation of resources, according to the researchers.

Moreover, it is known that the National COVID Cohort Collaborative database has already been created in the United States, which accumulates information on coronavirus incidence and its consequences. Articles have been published (e.g. Brown et al., 2021) in which this database is used as an information platform for in-depth research and forecasting. In this paper, the authors presented a multifactor model of logistic regression, which revealed links between age, male gender, liver disease, dementia, African or Asian descent, obesity and severe consequences of COVID-19.

A secure OpenSAFELY analytical platform has been developed to provide detailed primary care records for a significant proportion of patients in the country, and to study COVID-19 morbidity and mortality in the UK's National Health Service (Williamson et al. 2020). On this platform, electronic patient medical records are pseudonymically linked to data from the COVID-19 confirmed inpatient death notification system. It is known that in early 2020, this ability to combine information from different sources made it possible to study an array of data on almost 17.5 million adults in the country. Thus, with the further accumulation of data from various sources, the platform provided an opportunity to create a large information base for the study of the pandemic and its consequences.

Some researchers point out that people with mental disorders may be at increased risk for COVID-19 infection and more likely to have adverse effects. For example, a nationwide EHR database of 61 million adult patients from 360 hospitals and 317,000 health professionals in 50 U.S. states by July 29, 2020 was analysed (Wang et al., 2021). As a result, people with a newly diagnosed mental disorder were found to be at increased risk of infection (which is even more prevalent among Afro-Americans and women) and have higher rates of some adverse effects of infection.

As far back as October 2019, all American countries approved the Plan of Action for the Strengthening of Information Systems for Health, which is based on the joint efforts of the Pan American Health Organization and the Inter-American Development Bank and promotes adoption of international standards to ensure the exchange of information, knowledge and data (Pan American Health Organization, 2021). In other words, American countries have made efforts to improve their medical information systems and, if possible, to coordinate their work by expanding the opportunities for information exchange. This decision, in our opinion, was very timely given the pandemic covered the world's population a few months later.

Moreover, information from electronic health registries is used to track the spread of the virus involving geolocation. Thus, according to Singaporean researchers, the combination of data from electronic medical records and maps helped to track contacts not only within local communities, but also among physicians who became infected both in the workplace and in their communities. Based on this information base, a system of personnel surveillance was established to detect clusters of acute respiratory infections among health professionals, which allowed to quickly break the chains of virus spread (Sim et al., 2021).

With the pandemic in the background, a major problem in maintaining electronic information resources in working order was their overburden. Researchers and physicians in many countries report that not only elements of health care systems (hospitals, infirmaries, ambulance crews, medical staff, etc.) are overloaded during peak morbidity, but also electronic registers of these systems. This undoubtedly affects the quality of information registration and, consequently, the maintenance of an appropriate disease information base (Pan American Health Organization, 2021; Ashley, 2020; Slone, 2020; AbouZahr et al., 2021). In addition, other systems more or less health-related are becoming more overloaded during a pandemic, i.e. those directly affected by government pandemic response and recovery measures – the social sphere (unemployment, patient financial support during the illness, accounting and reimbursement of medicines, death, birth, etc.), loans for small business, statistical system and systems of other spheres of state functioning (Kayumova and Meunier, 2021). All relevant information should be collected, protected and stored to ensure the provision of basic administrative services. Failures in the US electronic health system have made it difficult to get vaccinated in the early stages of vaccination (Popperl et al., 2021). In addition to the system registers, which contain EHR of patients with information about routine examinations, diagnoses, prescriptions, tests, vaccinations, etc., the country created registers that should contain information about the incidence of COVID-19 and vaccination against it. This has greatly complicated the process of immunization, monitoring side effects and ensuring a fair and efficient distribution of vaccines.

Another problem that arises when entering data into electronic resources and their subsequent proper use is the lack of a patient ID, according to some physicians and IT professionals. Related to this is the ease of use of electronic patient records and their safety. In other words, the presence of a unique identifier from a technical point of view allows the following:

- avoid duplication of registry entries for the same patient, and therefore not artificially increase the amount of information and time to search for it;
- minimize the possibility of errors in information about the health of patients;
- facilitate the exchange of information between different medical institutions.

However, even in the US health care system, such identifiers are not yet used (Slone, 2020).

Mandatory electronic case reporting (eCR) has been introduced in the United States as part of the Centers for Disease Control and Prevention since January 1, 2022 for all hospitals and infirmaries in the country to obtain information on COVID-19 (Centers for Disease Control and Prevention, 2021). This will allow to automatically create and transmit disease reports from an electronic medical record to health authorities for consideration and action. The system can quickly, securely and seamlessly transfer EHR data in health care facilities to state, local and territorial health care facilities and provide information to health care professionals. Therefore, all information on the incidence of coronavirus in the country should be collected together and can be processed quickly.

In some countries, electronic registers are also used to register persons when accessing premises. For example, the New South Wales Government (Australia) has developed an electronic registration tool called COVID Safe Check-in. Businesses and organizations required by the relevant health care order must register as COVID Safe and keep electronic records of the people who enter their premises. Such records make it possible to track vital contacts when someone is diagnosed with COVID-19 (NSW Government, 2022). When a company or organization registers as COVID Safe, it is provided with a unique QR code to reflect this action. When visiting the premises, customers scan the QR code with their phone's camera and register either with a special Service NSW application or by entering their data in the appropriate web form. After that, persons who visited the premises will be recorded, and the special medical service will be able to contact these people if necessary.

A similar approach has been introduced at the University of Greifswald (Mecklenburg-Vorpommern, Germany), where the central system of the University Computer Center collects and stores contact details of all those who visit its libraries and participate in all kinds of activities and classes (e.g. seminars, lectures, sessions of university bodies, etc.). This information may, if necessary, be passed on to the Department of Health (University Greifswald, University Computer Center, 2022).

Similar systems have been developed and are operating in Japan, South Korea and some other countries. Thus, recording such information allows, on the one hand, to monitor and break the chains of virus spread, and on the other hand, to accumulate a variety of information (on the possibility of detecting the disease at an early stage, asymptomatic carriers, etc.). Clearly, these registers are an additional contribution to the creation of an information base for the COVID-19 study.

It is worth mentioning electronic information resources that store data about clinical trials on coronavirus and the publications of scientists and researchers dedicated to them. These registers and databases have been created both by international organizations and in individual countries. For purposes of illustration the following resources (European Clinical Research Infrastructure Network, 2022; European Network of Centers for Pharmacoepidemiology and Pharmacovigilance, 2021; Stanley et al, 2021) can be presented:

1) WHO International Clinical Trials Registry Platform (ICTRP);
2) Database of clinical trials conducted worldwide and funded by private and public funds (ClinicalTrials.gov, National Library of Medicine);
3) EU Clinical Trials Register;
4) Cochrane Central Register of Controlled Trials (CENTRAL). Cochrane is an international network headquartered in the United Kingdom, a registered non-profit organization and a member of the National Council of Voluntary Organizations of the United Kingdom;
5) Pan African Clinical Trials Registry (PACTR);
6) The EU Electronic Register of Post-Authorization Studies (EU PAS Register);
7) Register of Information Storage Information on ISRCTN (International Standard Randomized Controlled Trial Number) of the Port of Springer Nature;
8) European Network of Centers for Pharmacoepidemiology and Pharmacovigilance (ENCePP);
9) COVID-19 Research Database – Platform C19.

The European Clinical Research Infrastructure Network (ECRIN) website also provides detailed information on national electronic information resources used by countries on all continents to register information related to the incidence of COVID-19 (European Clinical Research Infrastructure Network, 2022).

3. Registers and databases in the medical systems of Nordic countries

As we mentioned earlier, in Europe, special attention is paid to the creation and use of electronic health records in Nordic countries, with Norway and Denmark having the most extensive medical information systems (Puhachova, 2021). According to our information, the health care system of Denmark uses 28 electronic resources, Norway – 21, other northern countries – within 10. Table 1 (compiled by the authors on the basis of information (eSundhed, 2021; The National Center or Register Based Research, 2021; Norwegian Institute of Public Health, 2021; Ministerie van Volksgezondheid, Welzijn en Sport, 2021; TEHIK, 2021; Socialstyrelsen, 2021; Finnish Institute for Health and Welfare, 2021) shows, as the example, electronic registers / databases that may be directly related to the incidence of COVID-19 and possible consequences of the disease. It is clear that these registers are not a complete list of all medical registers available in countries – the virus causes complications to various body systems. In addition, for example, the Births Register and the In Vitro Fertilization Registry (introduced in Denmark) could also be classified as disease-related due to the decline in fertility caused by the pandemic. Yet, in Table 1 it can be seen that if patient registers are available in all northern European countries, then such important systems that contain registers of surveillance of infectious and viral diseases and registers for monitoring the resistance to antimicrobial and antiviral drugs, are created only in Norway, according to our information. This also applies to the immunization registers and the rehabilitation register.

Table 1. Registers of health care systems in Nordic countries

№	Common name of registers in countries	Country					
		Denmark	**Netherlands**	**Norway**	**Estonia**	**Sweden**	**Finland**
1.	Patient register	The National Patient Register, Register of Preventive Measures	The National Register of Hospital Care	Norwegian Patient Register	Estonian National Health Information System, Estonian Health Statistics Database	National Patient Register	Care Register for Health Care, Register of Primary Health Care visits
2.	Register of cardiovascular diseases			Norwegian Cardiovascular Disease Registry		Myocardial Infarction Database	
3.	Register of abortions	The Register of Legally Induced Abortions		Registry of Pregnancy Termination	Estonian Abortion Registry	Register of Abortions	
4.	Birth register	The Medical Birth Register, The Medical Register of Births and Deaths		Medical Birth Registry of Norway	The Estonian Medical Birth Registry	Swedish Medical Birth Register	Medical Birth Register
5.	Registers of surveillance of infectious and viral diseases			Register of Norwegian Surveillance System for Communicable Diseases, Norwegian Intensive Care and Pandemic Registry,			

				Register of the Norwegian System for Monitoring the Use of Antibiotics and Related Infections, COVID-19 Emergency Preparedness Register			
6.	Registers for monitoring the resistance to antimicrobial and antiviral drugs			Register of Norwegian Surveillance System for Antimicrobial Drug Resistance, Norwegian Surveillance System for Antiviral Resistance			
7.	Immunization registry			Norwegian Immunisation Registry			
8.	Register of causes of death	The Register of Causes of Death, The Mortality and Occupation Database			Estonian Causes of Death Registry	Causes of Death Register	Causes of Death Register
9.	Register of lung diseases	The Danish Lung Cancer Register			The Estonian Tuberculosis Registry		
10.	Register of diagnoses established in hospitals	The Register of Hospital Discharges				BD In-patient care diagnosis	
11.	Register of patients undergoing rehabilitation			Rehabilitation Register			
12.	Hospital Discharge Register	The National Hospital Discharge Register					

13.	Register of recipes			Norwegian Recipe Database		National Prescribed Drug Register	
14.	Health insurance register	The Public Health Insurance Register					
15.	Register of registered specialists	The Register of Professional Mobility, The Authorization Register	The National Register of Medical Workers, Dutch Register of Physicians, Register of social hygiene	Register of Medical Employees		Statistical database of health professionals	
16.	Municipal health services register	The Register of Municipal Health Services					
17.	Hospital utilization register	The Hospital Utilisation Register					
18.	Register of state reimbursements for medical care			Database on Control and Payment of Medical Care Compensation			
19.	Register of Medicines and Drugs Statistics	The Register of Medicines and Drugs Statistics	The Register of Medicines and Drug Statistics				
20.	Hospital Errors Register				Hospital Errors Register		
21.	Register of medical services of the armed forces			Registry of the Norwegian Armed Forces Medical Services			

In contrast to the growing pandemic in some countries, specialized registers have been created, for example, the Norwegian Institute of Public Health (NIPH) introduced a COVID-19 Emergency Preparedness Register in 2020 (Beredt C19) (Lindman, 2021). NIPH emphasizes that national surveillance systems and health registries established before the epidemic gather information to 285ravel the purpose of each such registry. However, to get a quick and reliable overview of the situation related to COVID-19, you need to have all the necessary information, so it is better to refer to one register, rather than "extract" and compile data from different sources during research, which significantly slows down the analysis flow. Information on the Beredt C19 is collected from the Norwegian Surveillance System for Communicable Diseases (it provides daily information on confirmed COVID-19 cases and age, sex, site of infection, country of birth), the Norwegian Patient Registry and the Norwegian Intensive Care and Pandemic Registry (see Table 1); at the same time it is possible that in the future, if necessary, new sources of information may be identified. Thus, Beredt C19 provides an operational analysis of how the pandemic and the measures taken affect the health of the population, as well as how medical services are provided.

Quite a large amount of data to be stored on electronic resources relates to information about border crossings by domestic citizens and foreigners. That is, in the specialized registers of border services, in addition to the usual information about travellers, data on the availability of vaccinations against COVID-19, vaccine brands, test results, etc., should be stored. Thus, the coronavirus pandemic has prompted not only health systems around the world, but also other areas of government to introduce new electronic information resources and improve those used previously. The efficiency and comprehensiveness of using diverse information in North European countries in the COVID-19 context is determined by the system approach to creating registers and the availability of a unique identifier of a person for all the registers.

4. The system of electronic medical information resources in Ukraine and its improvement

In Ukraine, state electronic information resources are currently created and operate both in the field of health care and in other areas: social, financial, tax, etc.

An Electronic Health Care System in Ukraine (eHealth) was launched in 2017 in trial mode and in 2018 in operative mode (Electronic health care system in Ukraine, 2022). Its operation is maintained by the National Health Service of Ukraine. It is a sophisticated and hierarchical system with the two components: Central Database (CDB) and Medical Information Systems (MIS). The interactions of users (medical employees, pharmacists, and patients) with CDB are carried out via MIS.

CDB is an information and telecommunication system containing legally established registers, program modules, an information subsystem required for the implementation of government financial guarantees, and other components.

Presently, the following registers are being operated in CDB:

- Register of patients;
- Register of declarations on the choice of a doctor who provides primary medical care;

- Register of business entities in the health protection sector;
- Register of medical specialists;
- Register of medical workers;
- Register of contracts on medical service of the population;
- Register of contracts on reimbursements;
- Register of medical records, records on referrals and prescriptions;
- Register of medical conclusions.

The functions of CDB enable creation, review, information and documentation exchange between medical registers, MIS and government electronic information resources of other systems.

By now, the following MIS modules have been connected to CDB:

- Administrative module of a provider of medical services of the primary medical aid;
- Workplace of a doctor of the primary medical aid;
- Administrative module of a drugstore;
- Workplace of a pharmacist;
- Administrative module of a provider of medical services of the specialized medical aid;
- Workplace of a doctor of the specialized medical aid;
- Working with patient records;
- Data access.

Hence, MIS enabling to computerize the operation of business entities in the field of health care sector supports creation, updating, review and exchange of information in electronic form, with CDB in particular.

Presently, eHealth contains 27.7 million registered patients, with entering data on individuals about the fact of vaccination from the fixed nomenclature of deceases, which lays the legal ground for issuance of respective certificates.

A problem that is faced by Ukraine and needs to be dealt with in creating new registers is the availability of a person unique identifier for all the electronic information resources. Another serious problem in Ukraine is the completeness of data filling and the consistency of data from various registers. Thus, the Unified State Demographic Register of Ukraine contains data only about two thirds of the Ukrainian population.

It is obvious that the pandemic of COVID-19 has created new challenges for the health protection system on the whole and for operating of its electronic information resources in particular. Like in Western countries, they are provoked in Ukraine by the occurrence of the system overloading, lack of personnel with good training, large numbers of ill persons among both medical workers and population, etc.

Another problem imposing heavy limitations on applications of registers for analysing COVID-19 morbidity by territorial location (district, residential area) is that the actual residence in Ukraine quite often differs from the registered one. The possibility of using data from mobile network operators for geolocating purposes calls for solution of a series of normative and legal and methodological issues.

An intersectoral Working Group on mathematical modelling of problems related with the pandemic of SARS-CoV-2 in Ukraine was created in April 2020 to predict the development of the situation of COVID-19 diseases. The group was joined by the National Academy of Sciences of Ukraine, Kyiv Taras Shevchenko National University, Vinnytsia National Technical University, and the National Academy of Medical Sciences of Ukraine. One of the operative areas of the Working Group is to elaborate a projection of the evolution of COVID-19 pandemic. Its information base is data from the Center of Public Health at the Ministry of Health of Ukraine and the National Health Service of Ukraine. But this base cannot be referred to as a register.

The Center of Public Health at the Ministry of Health of Ukraine, with the sponsorship of the United Nations Children's Fund (UNICEF) and the U.S. Agency on International Development (USAID) and in the partnership with the international organization REACH, has created an information base from which analytical dashboards and online maps could be developed. They enable for a detailed statistical multifactor and geospatial analysis of COVID-19 morbidity and mortality, operation of hospitals and quarantine restrictions in schools at the level of country and individual settlements. But this information base is not a register in the strict sense, either. The public access to this resource was closed after the beginning of full-scale aggression of Russia Federation against Ukraine. Once a full-fledged register is available, it will enable to apply quasi-experimental approaches to investigating the efficiency of using various methods of medical treatment.

Hence, CDB contains information about coronavirus patients. But, as we think, both for this purpose, and for supervision of other diseases which are complications of COVID-19 or the most widespread in our country, it is possible to offer some more these resources (as it was proved earlier (Puhachova and Gladun, 2021; Puhachova, 2021), implemented in the Danish, Norwegian and Estonian systems:

1. Register of cardiovascular diseases – due to high mortality from them (it ranks first in the causes of death in Ukraine), including as a complication due to the incidence of coronavirus.
2. Register for monitoring the use of antibiotics and related infections. It is known that the population alone, without the advice of doctors, takes antibiotics. In view of this, in Ukraine it was planned to switch to full prescription release of these drugs in pharmacies. We believe that the availability of a register will help streamline the monitoring of antibiotic use and its consequences.

3. Register of surveillance for resistance to antiviral drugs – due to uncontrolled consumption of such drugs by the population, especially during the COVID-19 pandemic.
4. Immunization register – to register the received (including mandatory, planned, booster) vaccinations by the country's residents, as well as to track the volume of vaccine use and related financial costs.
5. Hospitals utilisation register, which is extremely relevant during epidemics.

To this list, in our opinion, the Specialized Register of Complications after Recovery from COVID-19 and the Register of Tests for the Presence of the Disease should be added (it should be noted that testing is conducted by both public and many private laboratories, so information on test results is scattered) or recovery after it, bearing in mind that sufficient statistics have already been accumulated on the disease and its consequences.

In addition, as mentioned above, it would be appropriate to supplement the electronic system of the State Migration Service with an additional specialized register (sub-register) containing information on individuals crossing the border related to the COVID-19 pandemic.

The creation of new registers will require additional resources, but it can allow to systematize the respective information and accelerate its access. It is important not only in view of measuring its social and economic impact, but also for gaining experiences in creating analogous registers in time of other epidemics or infectious diseases.

5. Conclusions

In more than two years of the COVID-19 pandemic, physicians and scientists have amassed vast amounts of data on morbidity, treatment, consequences, and mortality from the disease; there have also been many research results. Of course, all this information must be aggregated, sorted and be stored electronically with the ability to be quickly accessed by specialists (it is about impersonal data sets). This is exactly the work that is being done in the health systems of many developed countries. In Ukraine, thanks to the introduction of an Electronic Health Care System in 2018, there are electronic registers that contain a lot of information about patients, including those who have recovered (died) from coronavirus. But the vast amounts of data that will accumulate and continue to be collected until the end of this pandemic are prompting experts to consider whether the data are stored in a way that is convenient enough to use, including in medical statistics. In view of this, and taking into account the experience of developed countries, we have proposed the introduction of several new electronic registers, including those directly related to COVID-19 disease.

In our further research it is planned to analyse the impact of the COVID-19 epidemic on demographic processes in Ukraine on the basis of information from electronic information resources.

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