The Implementation of the Essential Training for Primary Health Care Workers on the Integrated Management of Hypertension and Diabetes for Primary Health Workers in 7 Regions of Ukraine: Five-year Post-Evaluation. Longitudinal Qualitative Research

Tetiana Kiriazova, Anastasiya Dumcheva, Myroslava Filippovych, Oleksandr Zeziulin

Kyiv, 2022

Content

List of Abbreviations

ART	– antiretroviral therapy
CVD	– cardiovascular disease
EIPHP	– European Institute of Public Health Policy
IDI	– in-depth interviews
IQR	– interquartile range
NCD	– noncommunicable disease
NHSU	– National Health Service of Ukraine
PHC	– primary health care
QLR	– qualitative longitudinal research
RC	– regional coordinator
WHO	– World Health Organization
WHO PEN	– WHO Package of Essential Noncommunicable Disease Interventions

Background

The burden of noncommunicable diseases (NCDs) is the public health challenge for each country Member State in the World Health Organization (WHO) European Region, including Ukraine. In 2015, the Ministry of Health of Ukraine, with support of the WHO Country Office, initiated a project aimed to improve the wellbeing of people with chronic diseases and to reduce the NCD burden in Ukraine. It was delivered in line with WHO Global Action Plan for the Prevention and Control of NCDs 2013-2020 endorsed by the World Health Assembly Resolution (WHA66.10), SDG Goal #3: "Reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being".

The project envisaged implementation of the WHO Package of Essential Noncommunicable Disease Interventions (WHO PEN) aiming to improve the coverage of appropriate services for people with NCDs at primary care level [WHO, 2020]. Objectives also include strengthening of the national capacity to integrate and scale up care of heart disease, stroke, cardiovascular risk, diabetes, cancer, asthma and chronic obstructive pulmonary disease in primary health care in resource-limited settings. In 2017 – 2019, the project focused on strengthening prevention and control of NCDs in clinical settings.

A key achievement of the project was development and implementation of the "Essential Training for Primary Health Care Workers on the Integrated Management of Hypertension and Diabetes" using the WHO Package of Essential Noncommunicable Diseases Interventions (WHO PEN) for primary health care. The training sessions were delivered as a 2-day course in 7 pilot regions of the NCDs project. As a result, more than 10,000 primary health care (PHC) workers were trained (around 55% of PHC medical human resources in practice in 7 pilot regions).

Sustainability of activities was ensured through expert dialogue and exchange of information and materials with the regional health authorities, and through a 3-day training-for-trainers course "*Essential Training for Primary Health Care Workers on the Integrated Management of Hypertension and Diabetes*". Further integration of the Integrated Management of Hypertension and Diabetes course in the continuous medical education syllabus, to build up the next-generation competent PHC workforce, was also in place.

The effectiveness of the project was first evaluated in 2018-2019, when the mixed-method research was organized by WHO to measure changes in PHC clinical practices and to assess the effect of the intervention at PHC level. The evaluation included qualitative and quantitative parts, the results of which were documented in several reports and research articles. The evaluation revealed important changes in clinical practice and documented improved capacity of professionals in detection and management of non-communicable diseases and their risk factors. Qualitative data were collected via focus group interviews with health professionals (family doctors, nurses/feldshers), clinic managers, and patients from 7 pilot regions where PHC staff was involved into the above-mentioned intervention. Qualitative analyses highlighted the improved knowledge and skills as well as revealed the need in a sustainable health system change to secure the new clinical practices (Laatikainen et al., 2021). In addition, the evaluation acknowledged that a longer follow-up may help to analyse sustainability of the achieved changes in PHC clinical practice and its effectiveness.

Over the years 2019-2021, WHO provided limited systematic technical assistance to the PHC providers in Ukraine with the implementation of WHO PEN protocols on integrated management of hypertension and diabetes in Ukraine. Evidently, COVID-19 pandemic significantly impacted health service delivery for NCDs around the globe and might have had even more devastating impact on countries with fragile economies and health systems, such as Ukraine.

The current, 2nd wave of the qualitative research organized by the WHO Country Office in 2021, aimed to assess the sustainability of clinical practice changes documented in the 1st wave of the WHO study, as well as to identify the potential enablers, facilitators, and barriers for improvements of integrated care for hypertension and diabetes and for NCD risk factors prevention interventions at PHC level. Most of the data were collected before the Russian Federation invasion in Ukraine, thus reflecting on pre-war reality regarding the country public health system.

This study utilized similar methods as the previous research. In addition, the prospective qualitative longitudinal research (QLR) approach was used to investigate changes in clinical management of arterial hypertension and diabetes occurring between 1st and 2nd wave of the study. To reach this aim, we compared qualitative information received from the same target audiences and on the same research topics in the 1st and 2nd wave of the study. Information that was not comparable to the previous phase of the research (new research topics/themes) was analyzed and presented separately.

The findings of this evaluation will guide stakeholders and clinical practitioners at the national, subnational, and local levels on further improvement of health care provision to the citizens of Ukraine.

Study Goal and Objectives

Overall Study Goal

The overall study goal was to assess the sustainability of clinical practice changes enabled by the implementation of the WHO Package of Essential Noncommunicable Disease Interventions (WHO PEN) for primary care service provision in 7 regions. These changes were documented in the earlier evaluation, organized by WHO in 2018-2019 (hereinafter – 1st wave of the study).

Study Objectives

The study goal was underpinned by the objectives described below. Those were based on the programmatic necessity of the WHO Country Office in Ukraine to identify the potential enablers, facilitators, and barriers for improvements of integrated care for hypertension and diabetes:

Objective 1. Describe clinical practice changes after the WHO PEN training back in 2017-2019.
Objective 2. Assess opinions on the role of the WHO PEN in clinical practice change as well as present and potential barriers and facilitators for further implementation.
Objective 3. Compare clinical changes at PHC level between first (2018-2019) and second (2022) qualitative research waves, where relevant.

Objective 4. Describe what needs to be addressed to improve integrated management of patients with hypertension and diabetes.

Methods

Study Sample

The qualitative study sample included health care personnel from the key groups for the WHO PEN training: primary health care (PHC) managers (hereinafter – Managers), PHC doctors (hereinafter – Family doctors), and PHC nurses (hereinafter – Nurses). For each interviewee group, we planned to conduct three in-depth interviews (IDI) in each of the seven study regions. Thus, the planned overall sample size for this study was 63 respondents, which resulted in 54 IDIs actually conducted as described in below sections.

Study Selection criteria

- 18+ years of age;
- Current medical practitioner within the national health system;
- Managers were selected from the clinics with employed personnel, who was trained previously and/or who themselves completed the training; in each region, two selected Managers had completed training themselves, and one Manager had not completed the WHO training.
- The interview participants represented trained personnel from both urban and rural areas.

Study Procedures

Research team

The study Interviewers were hired based on the criteria of having experience in conducting in-depth qualitative interviews, preferably in the EIPHP studies. A total of 8 interviewers were involved in the study; all of them conducted interviews with respondents from different regions, working at different positions. This approach was selected to avoid interviewer bias and to ensure data quality.

One Regional Coordinator (RC) per each region was hired to coordinate the study in the respective region. The RCs were supposed to currently hold an administrative or clinical position in the regional clinic (presumably a PHC clinic chief physician or a clinic manager) or local public health center, to be able to attend research training and to be willing to participate in the study. All members of the study research team received online training prior to participants' enrollment and data collection, in accordance with their scope of work.

The online training included modules on Research Protocol review, procedures of Informed Consent obtaining and of participants' enrollment, data management and data safety. Training attendance was an obligatory prerequisite to contracting for all the field research team members. Finally, all Interviewers received training on Research Ethics and Human Subject Protection.

RCs were responsible for identifying potential respondents and preparing the list of eligible candidates having interest to participate in the IDI. RC spread the word of mouth, used phone calls and electronic

communication to disseminate the information on the study in PHC clinic/s. In addition, RC performed the prescreening among interested PHC personal on the selection criteria for IDI participants and disseminated IDI Information Sheet providing information on the study goal, participation terms and conditions, compensation and distant communication (availability of a personal computer or a smartphone). Working collaboratively with the potential participants and Interviewer, the RC facilitated their first contact, screening and enrollment of the preselected candidates.

Sampling

Interviewers verified that candidates met IDI participants' selection criteria prior to organizing the first contact with a potential respondent by reviewing WHO PEN certificates, employment records and establishing communication with the local PHC clinic management. In addition, Interviewer balanced the list of IDI participants in terms of gender and age allowing for inclusion of equal proportions of men/women and of urban/rural medical providers, as well as individuals of different age, to assure representativeness of the local PHC providers population.

Data Collection

Because of the COVID-19 country-wide measures to control the epidemic in Ukraine, organizing focus group discussions with target audiences, similarly to the 1st wave of the study, was not possible. Instead, in-depths interviews were conducted distantly - via telephone or online via web-based platforms. The means of communication were agreed with the participants. IDIs were conducted in Ukrainian or Russian language based on the respondent's choice.

Verbal informed consent was obtained by the Interviewer from each IDI participant. No personal identifiable information was used during the course of the interview. Basic sociodemographic information including information on the position in medical facility and work experience was also collected. After informed consent had been obtained, a distant, voice-recorded qualitative IDI for ~45 minutes on average was conducted focusing on topics determined by the IDI guidelines.

Data Analyses

The IDI were audio-recorded and transcribed verbatim by EIPHP investigators. During transcribing, any identifying information like names that might be accidentally recorded was removed. The transcribed interviews were uploaded into the MAXQDA qualitative data management software (Verbi, 1989).

Data analysis proceeded concurrently with data collection. Thematic analysis was used to delineate key concepts and categories from PHC Managers, Family doctors, and Nurses, relevant to building hypotheses in relation to how WHO PEN as well as any other relevant phenomena shape the change in PHC practices (Miles & Huberman, 2005).

Interviews were transcribed verbatim in Russian or Ukrainian, and uploaded to MAXQDA for coding and analysis. Transcripts were coded and analyzed by two research team members (TK, MF) for emergent themes using principles of grounded theory analysis (Strauss & Corbin, 1990). The analysis took place deductively and inductively by exploring major domains related to the study's overall aims but remained

open to unanticipated themes and patterns. The codebook was developed using an iterative and collaborative process to ensure reliability and consistency (Carey, Morgan, & Oxtoby, 1996). The codebook included definitions of each code as well as instructions on the codes application. Qualitative analysis of the interviews proceeded through a multistep process. First, during open coding, members of the research team (TK, MF) independently read the same transcript and identified preliminary coding categories. During this open-coding process, both a priori and inductive codes were generated and applied. A priori codes reflected essential topics and areas in the interview guide. Inductive codes or themes that emerged from the data were added to the codebook. Then an initial coding tree was formed, and the same two researchers individually coded the same interviews using this coding scheme. Inter-coder reliability was assessed following established procedures with 80% agreement or higher considered reliable.

After the coding tree revision, the same researchers then coded the remaining transcripts. Higher-level domains were identified and included post-training initial changes in clinical practice; sustainability of changes; further developments in the field; barriers and facilitators to the intervention implementation etc. Then participants' experiences and perceptions within these domains were summarized, as well as compared to the similar data from the previous wave research.

Prospective qualitative longitudinal research (QLR) methodology was used to analyze the data (Holland et al., 2006; Hollstein, 2021). QLR builds on the assets of qualitative research, placing special emphasis on time and the changes or stability of practices, perceptions and interpretations when following actors through time. Focus may be on changing (or stable) practices, perceptions and orientations of actors and how these relate to certain events or situational, historical, and institutional circumstances (contexts) and possible changes in these circumstances.

It was impossible to involve all same respondents that participated in the 1st qualitative study in 2018-2019, since some PHC providers changed their place of work or were not available for any other reasons. Given the nature of the QLR, the data were analyzed in the following two ways: 1) as a cross-sectional data at the current time point/wave; and 2) as longitudinal data, to compare results of the two waves of the study.

Participant compensation

IDI participants received compensation for their time in the amount of 300 Ukrainian Hryvnias (UAH).

Human Subjects Protection

Ethical Review

All investigators have research ethics training certification. The study protocol was reviewed by the Institutional Review Board (IRB) at the Ukrainian Institute on Public Health Policy (Kyiv, Ukraine).

Informed Consent

For each IDI, Informed Consent form was provided to a potential participant by an Interviewer in advance via email, and verbal informed consent was obtained before the beginning of the interview. All questions

that candidate might have were adequately clarified and explained to them. Potential participants were informed that their participation in the study was completely voluntary and that they had a right to withdraw their consent and stop their participation in the study at any time. Participants were informed that all information they disclosed during the course of the study would be considered confidential (i.e., no personal identifiers would be used, and only aggregated information across all participants would be reported). Participants were explained the potential risks and benefits of the study as well. For all candidates, understanding of essential parts of the document was assured by asking questions to verify their awareness of the study procedures.

Results

Slightly different from the study protocol, 56 (instead of planned 63) in-depth interviews (IDI) were conducted in seven regions of Ukraine in the period between February 06 and March 15, 2022 due to the commencement of war of Russian Federation against Ukraine started on February 24, 2022. Participation in the interview became problematic for many providers, especially from the regions with active hostilities. Since February 24, 2022, eight interviews were conducted with providers from Kyiv, Poltava, Lviv, and Ivano-Frankivsk regions only.

Majority of those providers who said they could not remember the training well and had not implemented what they were taught, refused to participate in the IDI at the stage of their contact with the RC. Partially it might be due to the reason of not being interested to show no involvement in the intervention implementation. Therefore, we might expect that the participants of the 2nd wave of the study were predominantly health care providers who were to some extent interested and able to implement the novel approach in their work, while the opinions and barriers faced by providers who were not able to or not interested in implementing the novelties might not be reflected in this study.

Of 56 respondents, 19 IDIs were conducted with Managers of PHC clinics, 18 IDIs with Family doctors, and 19 IDIs with Nurses.

The socio-demographic characteristics of the participants are presented in Table 1.

Table 1. Socio-demographic characteristics of the health care providers who participated in the in-depth interviews

	Managers of PHC clinics	**Family doctors**	**PHC Nurses**
# of participants	19	18	19
Region			
- Central regions (CR): Kyiv, Poltava, Vinnytsya	9	8	9

- Eastern regions (ER): Kharkiv, Dnipropetrovsk	4	4	5
- Western regions: Lviv, Ivano-Frankivsk	6	6	5
Gender			
– **Male**	5	5	0
– **Female**	14	13	19
Age, years			
– **Median, IQR***	54; 45,5 – 62,5	55; 50 – 62,5	45; 39,5 – 47,5
– **Range**	35 – 71	31 – 72	26 – 59
Education			
– **secondary, secondary special**	0	0	18
– **higher education**	19	18	1
Location of health care facility			
– **Urban**	13	9	10
– **Rural**	6	9	9
The specialty according to the diploma	General Medicine – 14 Pediatrics – 3 Dentist – 1 Sanitary doctor – 1	General Medicine – 17 Pediatrics – 1	Nursing – 16 Medical assistant – 2 Other - 1
Job position	Chief Doctor of the PHC – 9 Medical director/Deputy of the Chief Doctor of PHC - 6 Head of Medical Ambulatory – 4	General practitioner – 14 General practitioner /administrator of the outpatient unit – 3 Pediatrician - 1	PHC chief nurse – 3 PHC nurse – 16
Work experience in current position, years			
– **Median, IQR**	9; 8 – 11,5	14,5; 10 – 21,5	14; 7 – 21,5
– **Range**	2 – 18	4 – 43	3 – 32

*IQR – interquartile range

Training on NCD management

Describing and discussing their impressions from the training workshop, IDI participants – Family doctors, Nurses, and Managers – focused on the novel information / skills / approaches they learned.

As in the wave 1 of the qualitative research, almost all IDI participants could remember the training they were asked about, and the overall impressions of the training were positive among all respondents. Those providers who reported having actively implemented new knowledge and skills, remembered what they had been taught in all details; however, one nurse said she did not remember anything ("*Are you kidding me? Almost five years had passed, what I can remember*!"), and one family doctor was not sure whether their nurse attended the training.

The training provided by WHO was different from all other trainings they attended

The specificity of the training emphasized by the participants was:

- novel approach to the patient management - focus was made on the NCD prevention rather than treatment of the disease ("*risk assessment, pre-disease conditions*");
- focus on health communication and motivation (especially emphasized by nurses);
- analyzed specific patient cases / medical charts (active learning);
- doctors and nurses were trained as a team, and many clinic managers also took part in the training. This made the implementation of the novel skills much easier and ensured more support to the doctors and nurses from the clinic management after training.

"It was the first time when I as a manager had been trained together with my ambulatory staff. This training increased an opportunity for our city residents to receive consultations and treatment according to the world standards". (Manager, CR)

*"This training was so impressive that it changed the attitude of the medical staff to the trainings per se. And for the first time they taught us skills of working as a team". (*Manager, WR)

Describing their impressions of the training, the participants immediately talked about what new skills they had implemented having returned from the training.

"The training greatly spurred the use of those tables, scales, and that magic ribbon, of course". (Family doctor, CR)

*We studied as teams, and everyone saw its specific role from the very beginning". (*Family doctor, ER*).*

"When I returned from the training, I made all efforts so that all my staff also participated". (Manager, CR)

"All informational materials we got at the training formed the basis of Schools for Prevention we organized for our patients. They existed until COVID appeared". (Manager, WR)

It was absolutely new for us: the basics of psychology, how to motivate a patient and to build a conversation with him". (Nurse, CR)

The impressions were extraordinary, because… for the first time a training was attended by a nurse and a doctor together. It's a great experience, it's a team effort, and this team wants to do everything possible for the patient's health. (Nurse, WR)

Remembering how many providers of their health facility participated in the WHO training on NCD prevention and early diagnostics, respondents gave numbers from 40% to 100%; however, there were facilities where only one or two family doctors were trained. Managers, doctors and nurses told us they shared the training materials with their colleagues. In many cases trained providers who have returned from the WHO training provided same trainings for their colleagues on site, using the materials they were given. One respondent from the Central region (Kyiv City) conducted training of trainers on NCDs, and then together with other colleagues they trained doctors and nurses in different districts of their city. Only one physician from Western region admitted that he did not share information or materials from the training as this gave him advantage over other colleagues in the competition for having more patients.

Comparison with the 1st wave results

Similar to what the 1st wave participants shared, IDI participants reported that the most important outcome of the training was that they have changed their understanding of the objectives of the primary care. As many of the focus group (FG) participants mentioned, the focus was made on prevention and early detection of hypertension and diabetes, as well as on effective management of patients with these NCDs.

Diabetes of type II, hypertension – patients may have them for a long time not knowing they had such serious problems. And the main objective of the training was – to detect these diseases as early as possible. (Family doctor, ER)

Motivation to implement new approaches after the training

All groups of providers (Managers, Family doctors, and Nurses) reported that they returned from the training being highly motivated and enthusiastic to implement all the new knowledge and skills on NCD effective management. Many of them said they reassessed their role as professionals and the objectives of their work. One nurse shared that after this training her understanding of her role and responsibilities had completely changed.

I realized that I am much more than just doer of everything the doctor said. I am a member of the team. In general, the doctor and the nurse and the patient are one team that is interested in some result – in improving patient's quality of life. And I realized that I am an indispensable part of this process. (Nurse, WR)

The managers also were inspired and tried to keep their personnel motivated to constantly gain new knowledge and to implement new knowledge and skills in their practice.

As an administrator, I was happy that without financial expenses you can improve the clinic performance and health and life of our patients. (Manager, WR)

However, almost everyone said that with time their enthusiasm to make changes decreased. Some people complained that daily routine and snowball of other responsibilities, especially related to health system reform, made their motivation for changes fade away. Sometimes this decrease in motivation was a result of patients' indifference and noncompliance with the providers' recommendations.

The first eight months – it was like… In the first month, everyone rushed forward, then a month later the staff calmed down a little. At first we started measuring everyone, a month later – every second person, then two out of five, then... Then I saw that my interest was declining, because I noticed from patients: I start talking to him, and he is like – "Why do I need it, why do you ask this? I came up with another question, and you're here to "push" me. " So, at first there was a high motivation, but over time it faded. (Family doctor, CR)

However, those who were able to keep their motivation for longer period, admitted that their focus on implementing novel approach changed with the start of COVID-19 pandemic.

We did everything we were recommended to do, we were so inspired! I used AUDIT scale every day, SCORE table… But then - tons of work, these declarations, then COVID... Now we don't have time for anything. (Nurse, WR)

At the same time, some participants reported they proceeded working according to the new standards even during COVID period – sometimes being '*more pragmatical*': "*We have knowledge, we have instruments. I just try not to waste energy for those who do not want any changes, and to help those who are interested in making progress*". (Nurse, CR).

Comparison with the 1st wave results

In the 1st wave of QR, the majority of providers talked about how inspired and enthusiastic they were returning from the training and that they immediately started implementing innovations, but the reality got them down to earth and decreased their motivation for changes. Those who described how soon their motivation faded away, said their enthusiasm persisted for about six months. These results were very similar to what was found in the 2nd wave of the study; however, more IDI participants reported that they were implementing new methods and approaches successfully, but "*then COVID appeared*".

First changes in clinical practice made after NCD training

Most typical changes in clinical practice

Describing how the training influenced their practice and changed the way they provided services to their patients, participants said they became focused on prevention and early detection of NCDs. The most often cited changes made after the training included the following:

- trainings were conducted in the clinic to cover all personnel;
- medical offices were equipped with glucometers, cholesterometers and other necessary equipment;
- specific changes were made in different facilities: in some, pre-medical offices were organized; in others, a doctor and a nurse started working in separate offices, to ensure confidential communication with patients;
- most physicians and nurses started paying attention to assessing diabetes and hypertension risk factors;
- more often patients were screened for pre-diabetes and hypertension;
- for many, motivational interviewing and health counseling became a part of their everyday practice; in some facilities, "Schools of Health" were organized for patients;
- novel skills implementation, as well as patients' progress, was controlled and monitored by clinic management.

I shared the information I learned at the training with my personnel – family doctors, nurses, a head of ambulatory. (Manager, WR)

All the topics discussed at the training became a part of our practice. (Manager, CR)

After training, we started paying more attention to the lifestyle change as a basis for health improvement. (Family doctor, WR)

We focused more work on modifying the lifestyle of patients as opposed to only medical solutions to the problems. The main thing is a lifestyle modification. (Family doctor, CR)

I realized that without much effort or time, a doctor can give a patient some useful advice. And the authority of the doctor has seriously increased! Earlier, a doctor used to say: "You need a healthy diet." But he didn't know how to explain what a healthy diet was, so it was just useless common phrases. But due to this training, now they can give an effective, valuable advice to the patient. In other words, counseling patients about a healthy lifestyle has significantly improved. (Manager, WR)

Everyone was interested after the training. Just everyone was inspired! More often we started testing blood glucose, cholesterol levels, referred for hemoglobin for an early detection of diabetes… Pre-diabetes was detected. (Family doctor, CR)

We learned about the integrated management of patients with hypertension and diabetes. After the training, we began considering risk factors for these diseases. (Family doctor, CR)

Of course, everyone started to apply 100% of everything we were taught at the training. We organized a School of sanitary education, recruited a group of patients, gave lectures to about 50 patients a year… (Manager, ER)

The first thing we implemented was measuring the body mass index, waist circumference, weighing the patients, asking everyone about bad habits… SCORE scale has become an integral part of our practice. (Nurse, WR)

Right after the training, we allocated a pre-medical office, where before visiting a doctor, a patient's blood pressure, weight, height, body mass index is being assessed. Everything is written in his medical card. And then, if there are abnormalities, we check blood sugar, or if there is heredity or any risk factor for diabetes. We have a special journal and record all the indicators there to track whether the patient has abnormalities in blood pressure or blood glucose. And then we enter it in electronic system. (Family doctor, ER)

Physicians and nurses talked mostly about risk assessment, as well as healthy lifestyle counseling. In addition, some respondents, mostly managers, shared they organized so-called "Schools of Health" in their health facilities and even communities ("hromadas"), in this case "*going out of health facilities to the communities*". These schools were popular in local people and existed until COVID-19 pandemic was announced.

Now every contact between a patient and a doctor begins with a measurement - height, weight, body mass index, waist circumference... There is not a single outpatient clinic, not a single doctor's appointment where this does not happen. (Family doctor, CR)

We established a "School of Health" and appointed people in charge at the facilities. These schools were organized at each outpatient clinic. (Manager, CR)

We have eleven ambulatories. When we returned with the doctor [from the training], we had a meeting, we showed all the materials that we were given at the training, we taught our colleagues everything that we learned. Copied and shared all the materials. Now all staff uses it all the time. (Nurse, CR)

According to the participants, novel skills implementation as well as patients' progress was controlled and monitored by clinic management.

The Dnipropetrovsk Health Center supervised the implementation of training recommendations; there were checks, and some kind of supervision and monitoring as well. We reviewed patient medical charts, and our medical administrator also did the analysis. So we had control on the regional and local levels. (Manager, ER)

Our medical administrator did the patient data analyses stratified by patients, diagnoses, examinations... She was one of the WHO trainers, so it was good to have her as a supervisor. (Manager, CR)

Training coincided in time with the start of our use of the electronic informational system. For instance, we now enter the information on the patient examination, and during the next visit we check for his compliance with the recommendations. (Nurse, CR)

Before we only treated patients who already had a problem; now we try to prevent development of a disease at an early stage. (Nurse, ER)

Only one physician spoke sharply that in modern realities there is no room for change.

Measuring the waist?! Don't make us laugh! Are we abroad or what? Look, my temperature is 40, but still I have to go to work tomorrow, and you tell me about some waist… (Nurse, CR)

Division of responsibilities between a doctor and a nurse

One of the important aspects of the post-training changes, according to the family doctors and the nurses, were changes in division of responsibilities between a doctor and a nurse. All participants – clinic managers, family doctors, and nurses paid attention to this important question.

The majority of respondents stated that the nurse takes all the necessary measurements, and the doctor evaluates the results and decides on further patient management. Both do the health counseling, but it is still rather a doctor's function. Less commonly, participants reported that the nurse also takes part in lifestyle modification conversations and motivational interviews.

With the huge pressure on primary care, working in tandem is very important. Nurses have taken on most of the work - measurements, risk assessment, and the doctor consults, diagnoses, prescribes treatment. (Manager, ER)

In the past, before the health reform, doctors took on most of responsibilities, and a nurse was just a clerk, writing in patients' medical charts. Now a nurse is a real assistant, she does all preliminary examinations. The doctor can spend more time with the patient, going into details about his lifestyle, his risk factors… (Family doctor, WR)

Before, a nurse was just doing a paperwork; now she collects all the data from a patient, and a doctor does counselling, diagnosis, and treatment correction. (Manager, WR).

Actually, the nurse is now acting as a pre-medical office. She hadn't done this before. She does an overall risks assessment, and I do counselling and motivational interviewing – but a nurse also contributes. So trainings are needed for nurses as well, as we work in a tandem. (Family doctor, CR)

We both counsel patients regarding healthy lifestyle – but lately I am busier with this, since the nurse has a lot of different reporting documentation. (Family doctor, CR)

Finally, the nurses reported that division of responsibilities in the "doctor-nurse" teams had changed after the training, as they became more focused on disease prevention. Most nurses agreed that, as a rule, they do measurements and tests (electrocardiography, measuring weight, height, waist, glucose and cholesterol level etc.), while the doctor discusses patient risks, does counseling on healthy lifestyle and gives recommendations. However, after training, some nurses told they started doing motivational interviewing with patients, telling them about healthy lifestyle, giving recommendation about lifestyle modification. They admitted they became more confident and more professional after the training due to the new knowledge.

The doctor prescribes medicines, while communication about healthy diet, exercising, about alcohol use and smoking, and writing out a referral - this is what I do. This is a nurse's task. (Nurse, CR)

I can say that I came back as a professional who can beautifully, competently, intelligently explain to a patient about hypertension and how it should be managed, - not just make an injection. And you know, I still feel very professional. (Nurse, ER)

Excessive workload of family doctors and nurses

In the IDIs, some family doctors and nurses complained about being very busy with multiple responsibilities. This is very similar to what we learned in the 1st round of the study, but with COVID-19 pandemic the situation became much worse.

In the 1st wave, the health care providers (especially nurses) complained they do not have enough time to do all the needed measurements or lifestyle counselling during patents' visits. Particularly, the nurses were loaded with paperwork (keeping both paper and electronic forms) and other duties.

In the 2nd wave of the study, respondents emphasized that before the pandemic they were quite successful with doing their work, but pandemic (together with so-called "computerization") significantly complicated everything and increased workload on both PHC doctors and nurses. However, there were not so many comments regarding excessive workload of nurses as in the 1st wave of the study.

Those 15 minutes for a patient are not enough to do everything. I try to talk to my patients, but when you have worked seven hours at work and you come home… your work day does not end. Phone calls continue. I'm a senior nurse and I get up to 60 calls a day, you know… We don't have time to rest at all. Saturday, Sunday – still there are phone calls. The doctor burns out, the nurse burns out – we don't have time to rest, and you have to pick up the phone and answer... It's a very heavy workload. (Nurse, WR)

Problems to solve

Discussing the division of responsibilities, respondents mentioned some problems which should be removed for more successful teamwork and better results in NCD management. The main points were:

- All groups of participants acknowledged that it would be better if two nurses were allocated with one family doctor, especially during the pandemic.
- Office for pre-physician examinationis needed, so that a patient comes to a physician having all the measurements and examinations, and a doctor and a nurse could spend precious 12-15 minutes for establishing diagnosis, giving recommendations and health counseling, not for measurements and risk assessment. "*But we are doing all measurements in the doctor's office during patient visit, unfortunately*". (Family doctor, CR)
- Almost all participants complained about computerization which does not save time – on the contrary, it complicates and takes a lot of time; a nurse is overloaded – filling all electronic forms takes time, and nurses have to keep both electronic and paper documentation – "*just in case something happens to the computer and we lose all the data*". (Nurse, CR)

Computerization takes time. A nurse does not have time to do all necessary patient examinations, she is constantly busy. So what is good in theory does not work in practice. (Family doctor, WR)

Comparison with the 1st wave results

In the 1st wave of the QR, respondents shared the opinion that nurses began taking more part in conversations and motivational interviews – however, they thought that, "as a rule, the task of the nurse is to do all measurements and tests, while the doctor discusses all the risks, does lifestyle counselling and gives recommendations". Similarly, in the IDIs the majority of doctors and nurses shared that a nurse makes all the necessary measurements, and the doctor evaluates the results and makes a decision about the further management of the patient. Both may do some counseling on the life change modification, and while some nurses reported they are also involved in healthy lifestyle counselling, it is still mostly doctor's job.

However, just as in the 1st wave, several nurses admitted they became more confident after the training due to the gained new knowledge.

In addition, it should be mentioned that, unlike the 1st wave results, in the IDIs, nurses did not share the opinion that patients trust a doctor more. On the contrary, some nurses believed that it is important for the patients to hear a nurse's opinion and recommendations, and believed they are qualified enough to conduct lifestyle counselling with their patients. Unlike the FG participants in the 1st wave, some nurses said they were using AUDIT scale and were conducting motivational interviewing – at least before the COVID-19 pandemic.

Prevention work with patients: health counseling

Respondents emphasized that even under heavy workload, they do counseling of the patients regarding disease prevention and healthy lifestyle. Some participants shared their unique experience and told us about their creative ideas how to make a patient interested in risk assessment and in the lifestyle modification. The case of a family doctor from the Central region gives an example of initiative and leadership.

> *To remove the patient's own resistance, this is what I do. I'm writing in his card and I'm telling him – in the mean time you can take the test, let's see what numbers you will get, and then I'll prescribe you something. The patient begins the test – and he already has a "sport interest" about this table, and then we can talk about alcohol or nicotine, weight loss, cholesterol. Or… I sit with my back to the wall and a patient sits facing the wall. I printed out the "Hypertension Memo" in A1 format, with big letters. And while I'm writing, he willy-nilly reads this information – that hypertension may not manifest itself and may not affect well-being, but causes vascular disorders, changes in the liver, heart, brain, leads to impaired memory, hearing, vision, mental activity… And then there are always questions. I'm not starting this dialogue, but he starts asking questions!* (Family doctor, CR)

Nurses also talked about them doing lifestyle modification counseling, mentioning they used motivational interviewing and other techniques they learned at the training and felt they were really effective.

> *Empathic listening as an element of the motivational interviewing – it is currently the basis!* (Nurse, WR)

> *We try to do preventive work, to motivate patients to get rid of certain unhealthy habits. To talk more to them about it, to communicate… Because if a patient knows that the healthcare professional believes in him, that he is not alone with his problems, then he is motivated to do something to improve his life.* (Nurse, WR)

> *Team work is important. I as a nurse tell him everything, but without doctor's confirmation it will all be meaningless. It's just that a person usually wants to hear more than one opinion. So, of course, this is the work of two.* (Nurse, CR)

Prevention work with patients: patient reaction / health culture

Most respondents spoke positively about how patients react to the novelties – waist circumference measurement, questions and counseling about lifestyle, alcohol use, smoking etc. They admitted that people react to these methods in a different way, but mostly there was no oppression from patients' side - moreover, patients usually like attention, so many of them support novel approaches.

People who care about their life understand everything correctly. Everyone wants to live an active life without disability. Therefore, most are interested in the result. Now they accurately keep their diaries, as they realized that success of treatment or prevention depends on how they personally participate in this process. And if they are really involved, then it is certainly easier for us. (Manager, CR)

*They react very well. Every patient likes to get some doctor's attention and some advice. They like it when the doctor communicates with them not just formally - measures the pressure, prescribes pills, and you leave. Everyone loves to have a trusting relationship between the patient and the doctor. (*Family doctor, WR)

*Patient reaction is definitely not that negative. Some people were overwhelmed by the fact that they were overweight or their weight was not as good as they thought. In general, everyone reacted positively. (*Family doctor, CR)

There are those who listen, come, and ask for advice, and there are quite many of them – maybe about 40 percent. Of course, there are those who just listen to you – "yes, yes, okay" - and return to their usual way of life. (Nurse, CR)

However, there are certain barriers to the effective prevention, and most cited one was a lack of patients' motivation to make changes in their lifestyle and overall lack of health culture in patients. As, according to some respondents, in Ukraine there is no system of public health per se, both patients and some providers appear not to be ready to take some actions for the lifestyle modification.

People of working age, up to 50 years old – they have no time to go to the doctors. Especially as making an appointment with a family doctor is a real "trash"! Therefore, it is very rare that we are able to determine the risk of disease development and to prevent the disease – maybe in 10% of patients. People usually come already having a disease. (Manager, CR)

Measuring the waist? We tried, but... You see, our people are set up for something different. They want to go to the doctor and get "the golden pill". We explain to them – there is no "golden pill"; we are trying to explain to you how to properly take care of your health. (Nurse, CR)

In Ukraine, there is no public health per se. People are used to having someone take care of their health – like doctor or nurse. We need more videos on TV to show the benefits of exercising, the dangers of smoking, eating junk food, how to behave in stressful situations which are a trigger for hypertension and diabetes... We need positive examples that would encourage people to change their lifestyle and would show that it has an effect. (Manager, WR)

My opinion, as of a manager and a person, – I do not see in the eyes of health professionals the desire to implement something new. People used to work the old-fashioned way… So nothing has changed drastically – at least not as much as we would like. (Manager, CR)

Comparison with the 1st wave results

This data echoed with findings of the 1st wave of the QLR, when the focus group participants (most often nurses/feldshers) expressed the same opinion: most of the patients are lazy and prefer to take a pill rather that make an effort and change their lifestyle. Across all focus groups, the theme emerged of a general lack of health culture in Ukrainian population. According to the providers in the 1st wave, patients do not want to make effort to change their diet, decrease alcohol consumption or quit smoking; some are even not willing to discuss their lifestyle and unhealthy habits with a doctor or a nurse/feldsher. That is why some providers reported they evaluate the patient's willingness to communicate about prevention and lifestyle, and do not waste their time for those patients who are not interested in making some changes.

Management support

Describing support that doctors and nurses received from the clinic management to implement new approach they learned at the training, providers repeatedly mentioned that their managers purchased necessary equipment for their offices. The most often reported management support was about purchasing equipment and consumables for glucometers and cholesterometers. The second aspect mentioned was cascade training of the personnel about new practices for further implementation in their everyday practice. Managers themselves also saw their role mostly in these two aspects.

Our management was very supportive! When we arrived from the training, we were asked - what did we learn? What innovations have been recommended? After that, they bought devices for measuring glucose, cholesterol, test strips, centimeter tapes for everyone. (Nurse, CR)

As a Chief Nurse, I trained new personnel all the approaches I learned at the training. I continue training the new staff, young nurses, so that we all work according to the same standards. (Senior Nurse, ER)

Comparison with the 1st wave results

This was very similar to what has been reported in the 1st wave of the QR, where doctors, nurses, and feldshers most often mentioned a purchase of the equipment for their offices as a support they received from the facility management.

Site equipment

Across the IDIs, the majority of the participants were satisfied with how the sites were equipped. All respondents reported much better equipping of the family doctors' offices after the training than before. Some of them recognized the role of their clinic managers who supported implementation of the new practices, or described how local authorities (mayor, regional administration, territorial hromadas) helped with funding the purchase of the necessary equipment.

There is everything that a family doctor should have at the workplace: glucometer, tonometer, electrocardiograph, measuring tape… We have an office for functional diagnostics. We pay attention to this issue. (Manager, ER)

We have a progressive local government, a young mayor and his young team. For them, the main thing is health of the citizens. Therefore, we bought everything by expense of the local budget. The mayor once invited me and asked: "What is needed for the laboratory? So that it never happens that a person does not have a place to take tests". And we really don't have this problem with this anymore. (Manager, CR)

However, the majority concluded that new equipment was provided due to the health reform that started almost simultaneously with the WHO training. In addition, family doctors in Vinnytsya and Dnipropetrovsk regions mentioned their clinics were very well equipped due to the World Bank project that took place in these regions.

An MoH Order No.504 has just been issued regarding the list of material and technical equipment, which should be in each office of the primary health care (PHC) facilities. So we directed all our resources to provide it, to keep the standards. (Manager, WR)

It was April 2017, right the start of health care reform. Therefore, after the training, a lot has changed – equipment, and service in our institution, and equipment table. With the start of the reform, the financing of medical institutions has changed – and we received scales and height meters... (Family doctor, WR)

Our level of diagnostics has increased. Each outpatient clinic is equipped with a telecard and an electrocardiograph. The World Bank has provided us with almost everything we need. We have all the equipment for telemedicine, we can receive consultations remotely. (Family doctor, CR)

Glucometers and cholesterometers were given to every doctor, to every nurse, and now we do not send people to the laboratory. We also do these tests at patient's home. For example, if a person aged 60+ calls and says he cannot come, we go to his home, measure his blood pressure, sugar, cholesterol... Now all patients have access to these tests. (Nurse, CR)

According to the participants, the equipment of the primary care clinics is strictly controlled in accordance with current legislation.

We carried out planned site equipping according to the equipment table. During accreditation and registration, all this is checked and controlled. And according to this equipment table, we submit quarterly reports – we must confirm that all our family outpatient clinics are equipped according to all the requirements. Plus, we separately report on equipment for the prevention of cardiovascular diseases. (Manager, ER)

Despite the fact that overall many participants were quite satisfied with how their clinics were equipped, there were complaints about a lack of some kind of equipment in the offices. Some may not have pulse oximeter, blood glucometer, or cholesterometer. Often there are no test-strips to perform different tests, even when the equipment is available.

Well, of course, that's not enough. Not enough. We bought urinary and hematological express analyzers for the doctors. But the National Health Service does not pay us for consumables for these tests, although it is much more convenient to do tests on the site, because in 2-3 minutes the doctor can see the result. (Manager, CR)

We have one glucometer and one cholesterometer for two outpatient clinics, that is, for 15 doctors. We share these devices – even days, odd days, and use them in turn. Well, we're trying to adjust somehow. (Family doctor, CR)

We received glucometers for every family doctor. And we have one cholesterometer in our outpatient clinic, one for eight doctors, it is kept at the senior nurse's. (Family doctor, CR)

These problems were particularly pronounced by the nurses from rural ambulatories, personnel of which felt "deprived" of many privileges essential for the urban health care facilities.

You know, it's very tough, because it's a countryside, our outpatient clinic does not have an assigned doctor. Because if there is a doctor onsite, then the best [equipment] is thrown at each outpatient clinic where there is a doctor. And where an outpatient clinic operates without a doctor, it's so difficult, we use the oldest things. Well, we are deprived because we do not have a doctor, that's the main thing. (Nurse, ER)

Comparison with the 1st wave results

At the 1st wave of the study, similarly, the majority of the respondents stated that sites are rather well equipped. At both waves, most providers linked better access to the equipment with health care reform.

Access to laboratory testing

Overall, health care providers admitted that patient access to laboratory testing became better with the health care reform and with improvement of the ambulatories' equipping – particularly, they mentioned availability of glucometers and cholesterometers onsite. Participants emphasized that these tests became available due to the health care reform.

As the list of the free lab tests for the primary care patients is limited, often providers reported they referred patients to the secondary-level health facility for the further lab examinations.

We follow current protocols, standards for treatment of hypertension and diabetes, this is a matter of time. Well, given the fact that with the beginning of the reform, the funding of our institution has slightly improved, we were able to purchase all these devices. Not in one year, though… But we have them now. (Manager, WR)

We have a laboratory that determines main indicators required by the NHSU for the primary level. And there is a secondary hospital for further diagnostics and follow-up. (Family doctor, CR)

All ambulatories possess glucometers and cholesterometers; test strips are supplied in a centralized way. No problem with this for our patients. (Family doctor, CR)

However, providers, particularly from the rural facilities, often complained about limited access to the lab testing. In different facilities, the lab testing accessibility varied. According to many respondents, patients are referred and have to go to the district hospital themselves to do the blood tests for free. Most often, glucose and cholesterol tests are done onsite; however, the supplies of the test-strips for these tests often reported to be limited and definitely below required amounts. At the same time, more complex diagnostics and even general blood test is done at the secondary level clinics in diagnostic centers according to the agreements between health facilities and private lab centers.

While testing at the secondary level clinics is usually free for the patients, patients often have to pay if they refer to the private laboratories. In addition, patients have to go as far as up to 40 km one way to do biochemical and other needed blood tests – it takes both times and money for the transportation; sometimes people have to use two types of public transport one way.

In our laboratory we do a general blood test, blood sugar and cholesterol. And when other tests are necessary – we have a contract with the regional diagnostic center, they do a full range of tests for free for our patients. But you have to get there. It would be better if we had additional laboratory tests here, not to refer patients to the regional center. (Family doctor, WR)

We do only cholesterol at the primary level, this is included in the list of mandatory examinations by the NHSU. Through electronic referrals, we send patients to the secondary level for the short lipid profile. But for patients with an increased risk, unfortunately, an extended lipid profile is unavailable there, so patients go to Kryvyi Rih, which is 36 kilometers from our village, and do it there. (Manager, ER)

Family nurses and family doctors can determine sugar and cholesterol onsite. But if you need to do blood biochemistry, then you have to go to a private laboratory, or by electronic referral to the regional center, to the secondary level. It's 40 kilometers from us. This is a "medical guarantee" programme. But a patient must spend money on the ticket. (Family doctor, ER)

Again, for the patients of rural ambulatories, it is more problematic to get the basic analyses done. Respondents from the rural facilities would report that glucose test but not test for cholesterol was available onsite. Providers believed that the younger patients would rather go to a regional center for the laboratory testing, but many elderly people would just refuse or delay examinations. Overall access to the laboratory testing is limited. As one rural family doctor said, "*To be honest, doing examinations is the problem of a patient himself, and this means setting him up against health care system and against me as a doctor*". (CR)

We do cholesterol test in our clinic. Yes, it is a little far and not organized in a right way, when a person goes to Uman' for the second level to do a blood biochemistry – it is far, and many people will not get there. Maybe the younger patients would go... Also, we have very limited… Once we received these test strips for detecting sugar in the urine, but now they are almost unavailable. (Family doctor, ER)

We don't have a cholesterometer. Lipid profile is done only in the district center and not for free. The neighboring outpatient clinic is 30 km from us, you need to come to the city, take another bus from there, so, you need to change two types of transport in order to get there, and they will determine your cholesterol using these test strips. I cannot do that. The people in our village are already used to the fact that, if necessary, they go to the city, pay money, and do both cholesterol and liver tests, everything that is needed. (Family doctor, ER)

Cholesterol test – it is unavailable onsite. It's only in the lab, it's 11 kilometers to go. I wish we could do a general blood test, because we do not have this option either. To make a general blood test, a patient must go to the district center. We don't do blood test for glucose here, too, because we don't have anything. We refer everyone to the district center. (Nurse, WR)

In terms of examinations, I can only do an ECG and these indicators - weight, height, and abdominal circumference. I don't have anything else. To commute 30 km to the regional center and spend more than 200 UAH - many just will not go to be examined. I refer people but more often I hear - "I can't go." (Family doctor, CR).

Comparison with the 1st wave results

These data mostly coincide with the results of the 1st wave FGs, where almost everyone admitted that access to testing became much better with the health care reform and with availability of glucose meters and cholesterol meters onsite. However, even with the reform in action, access to the labs in smaller cities or villages have remained limited.

Patient access to free medicines

Across the interviews, providers emphasized that "Affordable medicines" programme works successful. It considerably facilitates access to treatment, especially for elderly people with very limited income who could not afford buying medicines for chronic diseases.

According to the respondents, the use of electronic prescriptions also simplified patient access to the free medicines, as they can refill their medicines supply without visiting the doctor. This is especially important during COVID-19 pandemic. While in the beginning some patients of the older age perceived difficulties with the use of the e-prescriptions, getting text-messages on the phone etc., with time, most adapted to these novelties.

Some providers were satisfied with the fact that the range of medicines available within the programme became significantly wider compared with the list of such medicines in the beginning of the reform, after the training. For example, statins recently appeared on the list of affordable medicines.

Regarding access to medicines, the "Affordable medicines" programme is working great! (Manager, ER)

For the vulnerable populations such as elderly people, this is a plus. With the introduction of e-prescription, availability has increased many times over, as no personal visit is required to renew the

prescription, and people in any part of the region can receive medication when it is convenient for them. (Family doctor, WR)

Patients are actively using "Affordable medicines". People already know that there is a special "Affordable medicines " application, e-prescriptions. Yes, it was difficult at the beginning, because the older population could not understand that a prescription came as a text-message. I had to bring them medicines myself for five years… And now they know everything, they get medicines in pharmacies with their phones. (Family doctor, WR)

However, many aspects of the programme were seriously criticized by almost all respondents. The main weaknesses of the programme were as follows:

- Affordable medicines are mostly those cheap monocomponent medicines manufactured in Ukraine. While currently combined medicines are available which are of much better quality, are more convenient and more effective, doctors themselves have to make combinations for their patients and to prescribe them several drugs. So patients have to take 3-4 pills a day instead of one pill.
- The medicines to control for diabetes are of better quality; the list of the drugs for hypertension is very limited, and there are many complaints about their quality. Some providers spoke of these drugs as of "*just ineffective*" while patients "*take them in handfuls*".
- Patients in rural areas have less access to the medicines in terms of this programme, as the village pharmacy may not have an agreement with the National Health Service, so patients have to travel far to receive the drugs in terms of the reimbursement programme.

Younger patients with diseases that are included in the reimbursement programme, as a rule, do not use it, because only cheap and very primitive drugs are on the list. Well, as practice shows, foreign combined drugs are more progressive, convenient and effective. And what is included in the "Affordable medicines " – well, I have to write out three prescriptions instead of one pill for a patient to take daily. Of course, it is easier for him to buy this pill on his own. Not only that - calling me, looking for these text-messages, looking for a pharmacy that works under this programme is also troublesome... However, for patients with limited finances, this is a lifeline. (Manager, CR)

*With hypertension, those free drugs do not help to everyone, because they go as monotherapy. And there you start prescribing… trying to choose a right combination. Some patients use free medications we prescribe and are fine. For others, they do not help. So we look at person's financial situation - if he can afford more expensive drugs, we prescribe them. Of course, pills in a combined form are much more convenient. (*Family doctor, WR*)*

*Sure, we prescribe free drugs, but it is difficult for people to get them - the bus goes once a week to the regional center where they can buy these drugs. There is a pharmacy here in the village, but it cannot dispense these prescription medicines. Not every pharmacy concluded this agreement… This is one of the reasons why patients may miss their doses. (*Family doctor, ER*)*

There are no combined drugs on the list. Our patients have to take pills in handfuls, two or three times a day! I don't know who introduced this reimbursement, who made decisions on which medicines to include on the list, but some are just… And many drugs are ineffective. (Family doctor, CR)

This is a manipulation by the state, as a patient could just get reimbursement for these really good medicines which they are taking regularly and which work well for them. Same with medicines for diabetes – there are also two-component drugs which people are buying without compensation from the state. So I have kind of ambivalent opinion about this programme. (Family doctor, WR)

Well, my personal opinion - there are no really good drugs, especially for cardiovascular disease. Only the simplest, the cheapest… (Manager, WR)

Respondents recommended to make a wider range of medicines available including modern, imported combined drugs which have the best effect and are more convenient for patients.

Comparison with the 1st wave results

Overall, in the 1st wave of the QLR, providers expressed better satisfaction with the "Affordable medicines" programme that especially facilitated access to treatment for elderly people with very limited income. However, after 5-year period, the weaknesses of this programme were adressed more frequently, and IDI respondents were much more skeptical in their opinions of the "Affordable medicines" programme.

Monitoring NCD treatment and prevention

Many participants emphasized that the numbers of people with detected diabetes or hypertension are growing. They talked about more hypertension cases in younger patients, as well as about increase in diabetes incidence, especially during COVID-19 pandemic. There is an increase in the diabetes in people who were hospitalized and received intensive therapy for COVID-19. However, many people stay undiagnosed, as they might just not come for the check-ups with their family doctor for years, and nobody would invite them for a visit.

People with hypertension - well, at least 40%. With diabetes, everything is also complicated – because of the lack of test strips, constant problems with the glucometer, many patients have not been examined. They don't want to go to a separate facility to check their sugar… And it all delays diagnosis in time, so the detection rate of diabetes is LOW. (Manager, CR)

Now every second person has II type diabetes, and every third person goes with pre-diabetes. (Family doctor, ER)

The number of patients with diabetes is growing, many are undetected, they simply do not come. (Family doctor, CR)

The absence of a standard monitoring system for both patients with cardiovascular disease (CVD) and those with elevated risk of NCD was addressed in the interviews. There is no system to monitor changes in patient behavior to understand whether patients follow doctor's recommendations. According to the family doctors, previously, they used to call patients from a dispensary group and invite them for examination, but now there is neither time nor opportunity to do that, and all this "follow-up system" completely depends on a family doctor's initiative.

Before, we called our declarants to invite them for examination. Over the last two years, of course, this has changed a bit. To carry out preventive work, to call for a preventive examination – really we do not have this today, because there is no time or opportunity. Lately, this is more self-appeal. Because we only call for vaccinations. (Manager, CR)

There are patients though not many of them, who adhere to and come to the next visit, or who can be tracked by phone or other means of communication… This happens, but not often. (Family doctor, WR)

Current approach to patient monitoring

Describing the system of following-up patients with NCD or with the risk of NCD, some physicians reported they wait for a patient to come, or call and invite him for a visit, to ensure periodical examinations of a person from the "dispensary group" (electrocardiogram, tests for cholesterol and glucose level etc.).

Dispensary supervision – now there is no such concept. But every doctor forms the same risk groups for hypertension, for diabetes, for tuberculosis. Every family doctor knows his patients. (Manager, WR)

Every doctor has an observation group, knows his risk groups: these are patients with hypertension, extra weight, diabetes. These risk groups are in our precinct passport, and we monitor them. (Manager, CR).

If we talk about hypertension and diabetes, the doctor has to develop a treatment plan for a patient, and plan of his medical examinations. To prescribe how often – quarterly, once a year, once every six months – he should be examined. Patients now have electronic medical records, which is convenient for both doctor and patient. (Manager, WR)

In the providers' opinion, someone must take initiative – and usually this is a doctor, not a patient.

How do I track patients? I know all of them. I made notes for myself. I have almost all patients' phone numbers, we can contact them. If a patient does not have a phone, then his relative does, that's not a problem. (Family doctor, CR)

If a person takes statins, we check his cholesterol twice a year. A stable person comes to check cholesterol, and glucose, too. People who are under supervision for diabetes, they mostly come by themselves for a check. … When a person does not show up for a long time, we call him, we call all patients with diabetes to check glycosylated hemoglobin at least once a quarter. We monitor these patients. (Nurse, CR)

Several nurses were talking about patient diaries - each patient from "observation group" on hypertension received a special diary where they register their blood pressure several times a day. The providers were supposed to check this diary at every patient's visit.

Our patients keep diaries; they record their blood pressure. We give a patient a printed diary and explain him how to measure and record the blood pressure, to record the intake of the medicines. And the patient himself sees that without the medicine his pressure jumps, and when he adheres to our recommendations, everything is under control and everything is fine. This is very clear; we use this method all the time. (Nurse, CR)

Some respondents expressed their ideas on how to monitor patient progress, particularly regarding patients from the risk group. They talked about personnel phone calls (mostly nurses) as well as patients' diaries. Some providers said they ask patient relatives to control patient's adherence to the doctor's prescriptions and recommendations.

One of the ideas that was expressed repeatedly is that a special dispensary day is needed to be devoted to prevention work.

We used to have a dispensary day, when we invited a dispensary group and they were examined by specialists. There should be a separate dispensary day - it would be better both for dispensary group and for preventive work. (Family doctor, ER)

Comparison with the 1st wave results

Similar to what we found in the providers' IDIs, respondents in the 1st wave reported there was no standardized system in the further monitoring of newly detected patients, especially of those without diagnosis but with elevated risk of CVDs. They described various approaches ("recall systems") to following-up patients; the majority reported calling and inviting patients for a visit. The main objective of such visit is to ensure periodical examinations of the person from the risk group (tests for cholesterol, glucose level, ECG etc). Therefore, nothing has changed specifically in the NCD monitoring system and patient following-up during past 5 years.

5-year results of the project implementation

Since 5 years passed after the most trainings were conducted on NCDs complex management, all IDI participants agreed there have been visible results after they started implementing novel knowledge and skills post-training. Most providers shared their experience and talked about positive results – sometimes not multiple, but still impressive.

Some respondents spoke about more general results - such as giving more attention to the prevention work, improving patient-provider communication, and decrease in the number of cases and complications of cardiovascular diseases.

Preventive work, in my opinion, has become more intensive. This is done both at the state and at the local level. (Manager, CR)

Due to our new skills gained at the training, communication between medical providers and patients improved substantially. (Nurse CR)

Cardiovascular complications have decreased, because we have started implementing all new knowledge strongly, actively. (Family doctor, CR)

However, more often the respondent talked more about specific situations and gave examples of successful patient cases. Many providers (mostly family doctors and nurses) shared that the detection of diabetes and hypertension at earlier stages has increased; there is a growing number of patients who managed to take their disease under control due to their lifestyle changes; and that patient-provider communication on lifestyle modification became more productive and leads to sustainable results. Providers mentioned that the "Affordable medicines" program helped to some patients to adhere to NCD treatment.

Detection of cardiovascular diseases at the early stages has improved. As we now use glucometers, we began to detecting more diabetes at the early stages when patient condition can improve without medications. (Family doctor, WR)

Due to integrated management, many people have moved from the 2nd or 3rd degree of obesity to being overweight. They normalized their body weight and respectively reduced their dose of hypoglycemic drugs. The target blood pressure level has been reached for many. The number of strokes and heart attacks has sharply decreased. (Family doctor, CR)

The result was amazing. At first I spend with a patient two or three times for 30-40 minutes, and then he does not bother me for six months. What it means? If he follows our plan, his blood pressure is stable and controlled. As a result of that training, it is now easy for me to consult a patient even over the phone. (Family doctor, CR)

While many providers admitted there are only single stories of success and not many of them, still, the general tendency is that systematic work provides very motivating and inspiring results. Those patients who were more adherent to treatment and other provider recommendations, showed better results in NCD management. However, many patients who start lifestyle changes, give up after some time.

There are very few such cases, but they exist. There is a person with diabetes and hypertension who has modified her lifestyle, listened to our recommendations. And it has been two years now as she has been taking almost no sugar-lowering pills. But for the majority, their life changes last for three to five months. (Family doctor, CR)

Thanks to the "Affordable medicines" program, it is possible to control hypertension, and the number of hypertensive crises has significantly decreased - by 50-70%. (Family doctor, WR)

We see the result. We now have fewer strokes, yes, we have fewer heart attacks at the outpatient level. We did statistics. So we have less cardiovascular disease, we have seen progress. Also, early detection of diabetes - at stages when a diet may help. All this is confirmed by statistics. (Family doctor, CR)

From the nurses' accounts it is seen that they are actively involved in the prevention work. These were nurses who gave a lot of specific examples of successful NCD management in their patients due to the new approach they learned at the training.

There are patients whose blood pressure decreased simply due to lifestyle change. There are patients with diabetes who, following doctor's recommendations, manage to keep their blood glucose under control. Only rational diet – and medications was not needed. And we have especially noticed this after we began actively using the information that we got at the training. (Nurse, CR)

In our village, some people have lost weight, their blood pressure has returned to normal; they are very grateful. Those who are interested in looking good and living healthy life – they follow all our advice and get positive result! In one woman, 13-15 sugar units normalized to normal. That's great! (Nurse, ER)

When we select therapy for a patient, we talk to him about a healthy lifestyle. And when people come in 2-3 months, we see that their sugar level has stabilized, they have lost weight, they look better, and many of their problems are gone. The integrated approach really works! (Nurse, CR)

According to the providers, patients quit unhealthy habits; however, most often it was about reducing excess weight and quitting smoking; no one talked about reducing alcohol consumption.

In a year I saw significantly fewer strokes, heart attacks, in two years – 50 percent decreased heart attacks. It became easier for me to work. I paid a lot of attention to smoking, talked to patients about it. A year later, two people a month quit smoking, two years after this training - 12 people quit smoking within one month! It was a record. Usually there are four-five… (Family doctor, CR)

A few people even gave up smoking. It was due to the training where they taught us how to conduct conversations with patients and ask the right questions. (Nurse, ER)

Comparison with the 1st wave results

It is important to mention that at the 1st wave of the QR, the majority of providers agreed that it is too early to assess the results of the novel approaches to the prevention and detection of the CVDs. They were focused mostly on paying more attention to prevention as the first results of the training. Only some participants from Vinnitsa and Poltava regions shared that due to availability of the tests for glucose and cholesterol onsite, more people were diagnosed with diabetes and other NCDs.

However, after 5-year period, IDI participants were unanimously reporting the results of the intervention implementation. According to all of them, these results would be much more impressive if there was not COVID-19 pandemic negative impact.

COVID-19 as a barrier to changes and their sustainability

Respondents across all regions were talking about huge negative impact the COVID-19 pandemic had on the implementation of the approach of the integrated management of hypertension and diabetes in primary care. They all emphasized that a lot of work had been done before COVID-19 appeared, and then "these diseases have faded into the background due to the pandemic", because of personnel overload and even burnout.

Some respondents pointed at COVID-19 pandemic as at a reason not to have implemented recommended changes, despite the fact that between training and COVID-related lockdown and limitations minimum two years have passed.

The providers understand that patients with cardiovascular diseases are more vulnerable during COVID-19 and try to pay them more attention, but nevertheless, time for one patient decreased substantially during pandemic, while workload increased, leaving no time for CVD prevention.

The "computerization" in terms of reform also was cited as an aspect that complicates work of the primary care personnel during pandemic: there is a requirement to enter all COVID-related information into the electronic HELSI system, and with imperfect Internet access this may take lot of time.

Besides COVID, during these past five years, there were no other barriers to implementation of preventive approaches. (Manager, CR)

Before COVID, we were actively involved in prevention, and patients liked it. With COVID, we do less, we can't pay much attention to them. Such a limited time for one patient, now we have to see not one but three patients in 15 minutes… So we cannot, as before, devote half an hour to motivate him to quit smoking. It all takes time, which is very limited. (Nurse, CR)

There is a huge workload now! Although with this epidemic, the problem of diabetes and hypertension is not gone - on the contrary, it is getting worse! But now we have less time for preventive measures. (Family doctor, ER)

Diabetes, hypertension was our priority before. But they are not anymore – because of the COVID pandemic. The conditions have changed, and now we do not have time to do all the measurements, not to mention health counseling… (Nurse, ER)

Little time is spent on a patient. Now a lot of patients with COVID come, and doctors are so busy that they often do not have time during working hours to enter everything in the computer, still have to stay after work to register those sick leaves... (Family doctor, ER)

Since spring 2020, when it all started with COVID, all burden fell on the primary care. I see patients for five hours a day, I do not have time to go to a restroom! Because during these 5 hours, 80-100 people come by appointment, as COVID vaccinations are assigned to the primary level. And people come without appointments, too… With all questions they go to a family doctor. (Family doctor, WR)

Another barrier is that providers started communicating with patients distantly (especially with vulnerable ones like elderly people). Patients with NCD stopped visiting health facilities, so provider access to them decreased.

It has become more complicated because people are afraid to come to the clinic, now they prefer to consult by phone. (Nurse, ER)

Now our patients with hypertension, with diabetes, who used to visit us regularly before… Because of the coronavirus, everything has changed. We don't see them a lot. (Family doctor, WR)

However, several physicians provided some optimistic comments saying that even in COVID times they devote time to the lifestyle counselling among problematic patients with elevated risk of COVID-19

complications. Some providers said they are doing more preventive work now than right after the training, as they have gained experience during post-training years.

Now, because of the epidemic, there is less time left for a patient. But if a patient is overweight, we still measure blood pressure and glucose. Still, in the pre-medical office, the nurse measures his height, weight and waist circumference, then we consider the results, assess the risks. (Family doctor, ER)

Patients with diabetes, metabolic syndrome, obesity – we know that they have a worse course of COVID disease, and this may be a motivation for the patient. And I… whenever possible, I do not miss a moment to find a new motivation for such patient. (Family doctor, WR)

In 2018-2019, less attention was paid to prevention. To date, we are more experienced, we have studied everything, and we motivate patients to pay attention to their life aspects where we identify risk factors. (Family doctor, CR*)*

Management of NCD patients during COVID-19 epidemic: impact of the training

While talking about COVID-19 pandemic as a significant barrier to the integrative NCD management, most of the respondents emphasized that the training significantly helped them to manage patients with NCD during COVID-19 pandemic.

The main positive aspects cited by providers were:

- ***Attention to patients with risk factors***. As patients with diabetes and/or hypertension had elevated risk of quickly developed complications of coronavirus disease, providers conducted risk assessment and paid specific attention to these patients to prevent such complications;
- ***Provider communication skills.*** Experience of motivational interviewing, of discussing lifestyle with patients, and overall positive patient-provider relationships substantially helped to provide distant councelling to patients;
- ***Teamwork skills*** gained during and after the training were especially helpful during COVID when all providers worked under pressure and their responsibilities increased.

Priority was given if a person came with symptoms of acute respiratory infection, and we knew that he or she had a comorbidity – hypertension, diabetes, – then we were very attentive to such patients, they were our priority. (Family doctor, WR)

The training definitely helped! You see, COVID itself is a serious disease. And we paid attention and took into account all the patient's risk factors to prevent complications of this disease. (Family doctor, CR)

According to physicians, communication and motivational interviewing skills gained at the training were helpful for managing patients during COVID pandemic, when effective communication with a patient has already been established.

During the pandemic, even by the phone… If before it took 15 minutes to convince or explain, now 15-20 seconds is enough – and the patient understands what to do if he had a pathology such as diabetes. Were

it not for this communication, both mortality and cardiovascular complications would be higher. Prevention helps to survive and feel better with coronavirus infection. (Family doctor, CR)

After the training we work as a team. And teamwork has been very helpful in fighting the pandemic. We have a high detection rate of COVID, low mortality and low hospitalization. (Family doctor, CR)

Other factors impacting sustainability of the training-evoked NCD management

Lack of time

Among main reasons which prevented providers from paying enough attention to prevention and early detection of NCD (hypertension and diabetes), the IDI participants reported limited time for a patient visit. This was typical in pre-COVID times, too: according to the respondents, because of 12-15 minutes for seeing one patient, doctor or nurse did not have time for doing all measures and discussing health risks with him.

There are a lot of people, the patient flow is huge. So I will tell you frankly, I do not do that [prevention] every time. I know I have to do that, but I cannot make it because of a lack of time. (Family doctor, CR)

Our Ministry of Health has regulated the number of patients per a family doctor – 1,800 patients. Well, this may be good for the institution funding; but when it comes to fulfilling doctor's functional responsibilities, to taking preventive measures – it's too many. In other words, it is still feasible to provide treatment only, but it's too many for prevention. (Family doctor, WR)

Comparison with the 1st wave result

In the 1st wave of the study, in pre-COVID period, the theme "Lack of time" emerged in every participant's account. The majority complained about limited time for seeing one patient (12-15 minutes), while they might have 30-40 patients during one work shift. In the 2nd wave, almost all respondents talked about lack of time directly associating it with elevated workload during COVID pandemic. Almost no one remembered how lack of time impacted their performance before COVID.

Legislation / health care reform

Changes in legislation and health care reform in Ukraine were mentioned by all respondents as another important factor influencing sustainability of novel clinical practices associated with the training. Actually, all participants talked mostly about health care reform, meaning that all changes in legislation were made in terms of this reform.

Positive aspects of health care reform

Respondents spoke about advantages and disadvantages of health care reform in Ukraine. They saw the following main positive aspects of the health reform: due to reform, ***funding of health care facilities has improved***, allowing ambulatories to be better equipped.

A huge advantage of the training was that it was easier for us to start the reform being already prepared. (Manager, WR)

With the start of the reform, the financing of health institutions has changed. Our institution, like all other institutions contracted by the National Health Service of Ukraine, received funding directly, so we could use money for the institution needs and for motivating doctors. So, after the training, a lot has changed, and equipment of the offices have changed for the better. (Family doctor, WR)

With the reform, everything changed dramatically. We did not have such equipment before - now there are scales, cardiographs, test strips in every office. And patients receive medicines. Only the best came with the reform! There are, of course, nuances… Too many patients for one doctor. But all the rest was only for good. (Family doctor, ER)

Since 2018, transformation of our health care system was taking place. And this contributed to the allocation of funds for all these innovations for each cabinet. (Family doctor, WR)

Thanks to the reform, all our patients with hypertension or diabetes receive an electronic prescription on their phone. A patient goes to the pharmacy and just shows it. He does not have to pay for the drug. (Nurse, CR)

With electronic medical records, it is much easier to monitor dynamics of the patient progress and of the treatment results, This is a big positive moment. (Manager. CR)

The only good side of the health reform – "Affordable medicines" program. At least we can combine these drugs and treat the poorest people. Nothing else. No other support. (Family doctor, ER)

Negative aspects of health care reform

Speaking about negative aspects of the health care reform, respondents gave a longer list of weaknesses of the reform than that of its advantages.

Some people stated that with the reform and staff reduction, prevention has disappeared in principle, as the state is not interested in disease prevention.

Preventive medicine – this area has disappeared completely. Even a couple of hours cannot be allocated for prevention, because… I have to see a maximum of 14-16 people during a work day, but instead I have, sorry, 40-60 patients coming. How can I see a patient in five minutes? When can I talk to him and what can I tell him in principle? Actually, preventive medicine per se is becoming impossible. (Family doctor, ER)

You see, NHSU does not care now about all this prevention work. They now care only about our work in the MIS, how many people we have entered there… Gradually, our medicine is moving further and further from prevention. (Manager, ER)

This reform is just permanent reductions [of personnel]. I already clean the floors in my office myself. And everything is just getting worse. Since the new year, our doctors have worked at 0.75 rates, but the workload is growing. All in all, my expectations were not met at all. (Family doctor, ER)

Reform – this is all about optimization, which means permanent staff reduction. Every month we need to revise staffing, all the time we are surviving… (Manager, WR)

Some respondents complained about specific problems of the rural ambulatories. They told about health facilities where there is no family doctor, and visiting doctor sees patients once a week – 30-40 patients per day and no time for prevention.

There are, you know, internal problems of our outpatient clinics. The main thing is that we have no doctor and no transport. And to get from the village to the clinic – it is very far and very inconvenient. There are villages located 11 kilometers, 20 kilometers far from the clinic... It is very difficult for us to reach people in these villages, especially in winter, – and there are mostly older people, 65+. (Nurse, ER)

This reform, which is underway in our country, does not notice a rural family doctor in principle. They always want to minimize everything. But I think that rural doctor or paramedic, they used to go to the village, visited people, came to every house… They knew who was sick, and they carried out prevention work. We tested sugar with glucometer, measured blood pressure, and in this way we diagnosed many patients with chronic diseases. (Manager, WR)

Computerization as a barrier to implementation of the innovations was mentioned in many participant accounts. Respondents complained that during five years of health reform, functions and responsibilities of family medicine were constantly growing, and in this situation, implementation of electronic technologies did not help, but, on the contrary, complicated the work.

We just lost those two years, they just fell out. Now a doctor is not doing his work, a doctor is busy with writing, filling in some tables... And Viber on the phone, that's it – nothing more. You are not a doctor, but just a mechanical person. You do nothing but work on the computer. Papers used to interfere, now computer interferes. No time to do real work. (Family doctor, CR)

In addition to lots of computer "paperwork", providers complained that Internet is often not fast enough, computer program often "freezes", and they have to waist much time waiting for the system to work. As three years ago, respondents reported they continue keeping both electronic and paper documentation.

Now everything is done in this way that every visit should be recorded in the electronic system. This system often "freezes", Internet is of poor quality… Today, too, the Internet signal is poor, so we cannot… We're just sitting and waiting. You have entered two or three words, then you have to wait... The system has frozen. (Family doctor, CR)

Because that's not how people should be treated! We are already worn out to such an extent... Well, it's impossible to be on your nerves all the time from morning till night - it doesn't pull here, it

freezes there, and that sick leave hasn't been entered into this electronic system... It's all nerves, you know. The electronic system is malfunctioning, and the family doctor is like a dispatcher, giving referrals for different conditions. (Family doctor, CR)

Of course, we keep all documentation in electronic form and keep paper records, too. So we duplicate electronic records, as no one canceled those paper patient medical charts. Double work... (Family doctor, WR)

Participant reported low level of computer literacy among population of older age – both patients and medical providers, as well as among people living in rural areas, – as another barrier to the effective work. Even when every nurse has a computer, lack of computer skills impacts the effectiveness of work.

It's not very popular, those messengers… You know, you have to spend time on that too – especially since we have patients of a certain age category… Well, young people are more about those gadgets, messengers, computer technology in general. And our doctors of older age, they say frankly that in their age it is difficult to learn what we need for our work, we barely use all these technologies. But it has to be learned. Unfortunately, we haven't got training on computer literacy. (Family doctor, WR)

It is very uncomfortable for us to work now. This electronic system has been introduced, and, you know, we are in a rural area, and until it starts "thinking", this electronic program, it takes two or three hours from the start of the working day. Now we all work with 50% effort; we don't have a doctor. And our level of computer skills is very poor... Very low level. And when a doctor comes to our facility once a week, on Thursdays, more than 20 patients come, plus a lot of home visits. He doesn't even have time to show us how to enter all the data on COVID – tests, sick leaves, visits to the doctor… It's all difficult. Every nurse has a computer, but the level of knowledge is low. I wish we had some training on this... (Nurse, ER)

Among other factors impacting implementation of new developments, several providers from Lviv and Poltava mentioned specific local projects as well as the World Bank project, in terms of which the World Bank conducted trainings on prevention, treatment, and emergencies in patients with CVDs.

Comparison with the 1st wave results

Despite reported positive changes, providers outlined a range of barriers which, according to the participants, did not allow them to implement in full extent the knowledge and skills they got at the training. Similar to the 1st wave, main barrier was a lack of time. However, almost everyone IDI participant complained only about COVID-19 pandemic period – according to the respondents, before pandemic, they all actively and effectively implemented new developments introduced at the training.

Facilitators of the implementation of the effective NCD management

While the list of the enabling factors was shorter than of barriers, IDI participants reported a number of factors that facilitated the introduction and sustainability of the novel, training-evoked approaches to the effective NCD management.

Respondents emphasized that their skills and gained experience help them continue their preventive work which has already become an integral part of their professional routine and of the protocols. Providers reported doing risk assessment and motivational interviewing – even by phone during COVID-19 pandemic. In this regard, providers often talked about personnel motivation and management support as one of the strongest sustainability basis. Several physicians shared that online education is very helpful to ensure sustainability of changes.

In many respondents' opinion, a big advantage of the "Affordable medicines" program is that patients keep coming regularly to get prescriptions, so they remain under the doctor's supervision, "in doctor's scope of view". In addition, an office for pre-physician examinations helps to control patients' NCD indicators.

All doctors are young and motivated, so there were no obstacles at the staff level. We always had support from the management as well, there were no obstacles, all our ideas and proposals were taken into account. There was training for the staff on the implementation of best practices, which speeds up the work with patients. (Family doctor, CR)

Of course, we are still implementing changes. Leaflets, booklets are available, just make a copy… SCORE scale is always with us, and the assessment of dependence on nicotine, alcohol is done. For three years I have conducted preventive counseling, and I proceed talking with patients over the phone. Telephone consultations are very helpful. (Family doctor, CR)

All changes have remained, because it has become our everyday life. We have already introduced it into practice – height, weight, body mass index, all examinations are available, sugar and cholesterol tests…. All this is included in our protocols for a patient visit. (Family doctor, CR)

Recently, this work has weakened a bit – so many patients and examinations for coronavirus disease. But we still measure blood pressure and glucose, and recommend patients to pay attention to their indicators. To follow a healthy diet… We continue implementing changes. (Family doctor, ER)

It's great that there is access to online learning - for example, lectures on the management of cardiovascular diseases are great. You can improve your qualification. However, it would be better to show these webinars in the evening, after working hours. (Family doctor, CR)

Support needed

Responding to the question about what kind of support they would need to make integrated NCD patient management more effective, the IDI participants provided a number of suggestions.

Across all regions, three main suggestions emerged repeatedly:

1) ***to increase time for one patient's*** *appointment*;

2) ***to decrease a number of patients for one family doctor***;

3) ***to have an office for pre-physician examination*** where all tests and measurements can be done before a patient visits the doctor, to have more time for patient prevention counseling. In addition, some participants mentioned that specific "dispensary day" is needed, to devote it to work with patients with elevated risk of CVD.

I wished the burden on family doctors reduced a bit. Very large numbers, 1800 patients per a doctor. (Family doctor, CR)

What we would really like and what would help us – if one nurse could take a cardiogram, collect patient medical history, enter it into computer, do all patient measurements, so that a doctor could actually see already "processed" person. Then the doctor would just talk with the patient, make recommendations and really spend 12 minutes. Unfortunately, this is not the case in practice. (Nurse, WR)

R: First, more time per person. Then, if we had only electronic record keeping, it would be easier, not to write in these papers, in these journals that we keep just in case... This also takes time. Well, motivation of doctor and nurse himself. Salary of 5200 hryvnias, is it normal to work? And these are doctors!
I: But they promised to raise it seriously.
R: You put it right – promised. (Nurse, CR)

According to respondents, ***NCD management trainings and booster/refresher trainings***, as well as ***supervisor support***, would be very helpful. Among preferable topics named by participants there were trainings on basic computer skills (particularly supported by nurses), training communication skills, and NCD booster trainings.

If there were more trainings on this topic, and if someone would come, remind, advice and point out mistakes, it would be good. The material base – in principle, we have everything we need. I would like to get more knowledge. (Nurse, ER)

I would like to have more trainings on psychology basics – how to convey information to the patients, how to motivate them for changes in their lifestyle… (Nurse, WR)

Some respondents expressed satisfaction with reform-supported developments, saying both equipment and personnel motivation is available for the effective work.

I don't even know what else can be improved. We have material base, all the needed equipment. We have motivation to convey to a patient that it is possible instead of medications... just not to bring your body to the onset of hypertension and diabetes. (Nurse, CR)

Recommendations for the future

Based on their own experience with the project implementation, the providers discussed recommendations they would give to their colleagues, to other clinics who want to implement the project, and to the government (the National Health Service, the Public Health Center, and the Ministry of Health).

Almost everyone was talking about a need of strong ***support of NCD prevention on the government level.*** Everyone emphasized that NCD prevention must be a responsibility of Ukrainian government. Participants suggested developing and funding NCD prevention programs on national and local level. They talked about school health education (not formal but effective), social marketing, and a healthy lifestyle promotion on TV. Respondents suggested to disable alcohol and tobacco advertising on TV. One person suggested to show short video on prevention and healthy lifestyle promotion in the waiting areas of medical facilities.

Specialized medical institutions should have monitors to show excerpts from TV programs, specialized prevention videos. We need some centralized, state-level approach to this work. (Family doctor, CR)

The main thing is support at the national level. Well, since the population still watches television, it means that a healthy lifestyle should be promoted on TV. Because when people in their 40s – 45s enter my office and they're already living wrecks – well, it's hard... (Family doctor, CR)

We need a state programme to promote a healthy lifestyle. Or else the whole burden falls on the family doctor. (Manager, CR)

Local programs on NCD prevention are needed – on the territorial hromada's, municipal, and regional level. (Manager, WR)

Respondents appeared to be interested in ***access to trainings and booster/refresher trainings*** for health care providers of all levels. The ***standardized protocols and documentation*** were also repeatedly suggested.

Systematized unified working documentation for family physicians has to be developed. A general manual for family doctor is needed, including everything – from primary documentation to reporting forms. And at least basic protocols. We have departed from our protocols, we use European ones and adapt them to local needs. I think this is a wrong way. Approach to treatment in the village and in Kyiv should be the same, the recommendations should be the same. There is a lot of information, but no systematization. The manual can be in electronic form. In 1991, the first manual on family medicine was published, it included documentation, all stages of the family doctor work. Since that time, nothing new has appeared. (Family doctor, CR)

Finally, in accordance with what have been reported earlier, all respondents unanimously suggested to widen the list of available drugs in the "Affordable medicines" program, including polycomponent imported medicines in it, which are both more effective and more convenient for patients.

Thank God there is this "Affordable Medicines" programme, as there are people who cannot afford anything at all, and they at least can take these drugs. Combination drugs should be included in this list of affordable medicines. This would solve a lot of problems. (Family doctor, ER)

Conclusions

Results of the 2nd Wave of the qualitative research

Results of the wave 2 of the qualitative research showed that five years after the WHO training and since the beginning of the health care reform in Ukraine, the participants talked about the impact of the training

on what was happening in the field of NCD prevention and treatment, about the extent to which they were able to implement new approaches learned at the training, and about results of their implementation. Participants spoke about factors impacting implementation of new skills in NCD management. They also discussed strengths and weaknesses of health care reform in Ukraine.

1. *Positive impact of the training*. Generally, since five years passed after the training on integrated NCD management, the vast majority of IDI participants saw positive results of the novel knowledge and skills implementation. After the training, overall situation with prevention work has significantly improved. Respondents also reported impact on the patient clinical indicators, including detection of diabetes and hypertension at earlier stages, decrease in the number of cases and complications of cardiovascular diseases, and patients' "stories of success".

2. *Impression of the WHO PEN training*. Across all groups, IDI participants were satisfied with the training and training materials they received. Most often they remembered a novel approach to the patient management (focus on NCD prevention and health communication), as well as training of doctors and nurses as a team. Many providers including nurses later trained other staff at their workplace; this facilitated implementation of the intervention at the facility level. There was a demand for the booster/refresher trainings and mentorship for the better results of the project implementation.

3. *Motivation and first changes made after training.* All groups of providers remembered high motivation and enthusiasm right after the training to implement all new knowledge and skills on NCD effective management they learned. Many said they reassessed their role as health care professionals. The majority immediately started implementing novel approaches, including more attention to prevention and to integrated management of patients with NCD or with high risk of disease.

Among *typical changes in clinical practice*, participants listed the following:
- improved equipment in the PHC clinics for management of patients with cardio-vascular diseases and diabetes;
- enhanced knowledge and clinical management on assessing risk factors for diabetes and hypertension;
- established pre-medical offices in some PHC clinics;
- successfully integrated health counseling into routine health care practice;
- strengthened monitoring of health care management as it relates to novel skills implementation, as well as patients' progress.

4. *Changes in the division of responsibilities between a doctor and a nurse*. Most often, a nurse would take necessary measurements, while a doctor would decide on further patient management. Less commonly, nurse also took part in lifestyle modification counseling. Nurses themselves admitted they became more focused on prevention work and more confident as a result of acquainting new knowledge and skills.

5. Prevention work with patients. Among barriers to the effective prevention providers mentioned a lack of patients' motivation to make changes in their lifestyle and overall lack of health culture in patients. However, there were many provided stories of success in patients who were interested in being healthy and who followed recommendations.

6. Management support. Describing support received from clinic management to implement new approach, providers most often remembered that new equipment was purchased for their offices. Some also mentioned cascade trainings at their workplace. Managers also saw their role mostly in these two aspects.

*7. Site equipment***.** All respondents reported much better equipping of the family doctors' offices after the training than before. Majority associated this with the health care reform with regulations in the Table of Equipment, that started almost simultaneously with NCD training, or due to the World Bank project in certain regions. The management controlled the compliance of the equipment with the Table of Equipment according to the legislation. However, some providers (especially from rural areas) complained about a lack of some kind of equipment or expendables in the offices. Many participants recommended to establish pre-medical offices to ensure patient access to the basic examinations.

8. Access to laboratory testing has not changed since the 1st wave of the study. While providers admitted that patient access to laboratory testing became better, this happened mostly due to the availability of glucometers and cholesterometers onsite. Many providers, particularly from small cities or villages, complained about patient limited access to the lab testing. In different facilities the lab testing accessibility was different; patients were referred to different facilities (sometimes quite remote) to do the blood tests for free.

9. Access to the medicines. Providers admitted that due to the "Affordable medicines" programme, access to treatment with medicines substantially improved, especially for patients with limited income. Many called this the main advantage of the health care reform. However, there were many claims about quality of medicines provided by the programme; in particular, providers complained about a very limited choice of primitive, cheap monocomponent drugs. They insisted it would be important to ensure patient access to the modern polycomponent drugs in terms of reimbursement or "Affordable medicines" programme, which are more convenient and more effective. In addition, patients in rural areas may have complicated access to medicines in case a local pharmacy does not have an agreement with the NHSU and thus procuring of drugs through the "Affordable medicine" programme is not possible there.

10. *Access to PHC services in rural areas*. In general, residents of rural areas have lower access to services, including laboratory examinations; some rural PHC facilities (ambulatories) are not as well equipped as those in the cities. Access to medicines under the "Affordable medicines" programme was limited for patients in rural areas where there was no pharmacy or where a pharmacy did not have an agreement with the NHSU. According to a respondent, *"People [in rural areas] do not receive the declared health care."*

11. *Lack of standard monitoring system*. IDI participants complained about a lack of standard monitoring system both for patients with cardiovascular disease or those with high risk for NCDs. However, some reported improved monitoring of the project implementation process and results by the clinic management.

12. COVID-19 as a barrier to changes and their sustainability. Respondents considered COVID-19 pandemic to be the main barrier to the sustainable implementation of the intervention. The majority of participants reported that before COVID pandemic, they successfully implemented the novelties of the project. However, with the start of the pandemic, all prevention work slowed down or faded away, as provider contacts with patients were minimized, and the COVID-related workload on medical staff enormously increased. However, several physicians reported that they managed to not interrupt prevention work even under heavy workload during the pandemic.

13. Excessive workload of family doctors and nurses. Providers complained that family doctors and nurses were overloaded with multiple responsibilities during COVID-19 pandemic, which significantly impacted their performance in a negative way.

14. Management of NCD patients during COVID-19: impact of the training. Many providers acknowledged that training helped them to manage patients with NCD during COVID-19 pandemic.
They paid more attention to patients with risk factors to prevent COVID complications; previously gained communication skills helped them to provide distant counseling; and teamwork skills were especially helpful for working under pressure.

15. Other barriers. Besides COVID-19, respondents listed a number of other barriers; some of them were related to the health reform. The main barriers were: little time to see a patient; too many patients assigned to one family doctor; entering information into computers (e-Health) takes a lot of time, since the paperwork doubled – PHC providers had to maintain documentation both electronically and in paper form; finally, insufficient computer literacy of the staff and difficulties with working in the computer programmes were reported as barriers.

According to some participants, a lack of time was typical in pre-COVID times, too: because of limited time for seeing one patient, doing all measurements or providing proper counseling was impossible.

16. Impact of health care reform. Almost every respondent talked about health reform. In general, there were more negative comments related to the health reform than positive opinions.

Among *positive sides of the health reform* providers mentioned improved funding and better equipping of health care facilities, as well as facilitated access to treatment for some categories of patients due to the "Affordable Medicines" programme.

Respondents associated *negative impact of the health reform* with the medical staff reduction and increased workload on the providers. Some believed that "*the state is not interested in disease prevention*". Computerization only doubled their workload. In addition, specific problems of the rural ambulatories became evident.

17. *Facilitators of the implementation of the effective NCD management.* Respondents emphasized that their skills and gained experience helped them continue their prevention work. Providers also talked about personnel motivation and management support the strongest sustainability basis.

Comparison with the results of the 1st wave of the qualitative research

In general, the 2nd wave of the research have shown that, in addition to the problems caused by COVID-19 pandemic, a number of systemic problems have remained unresolved over the three years since the period of the 1st wave of the study. Regarding implementation of the training on the integrated management of hypertension and diabetes for PHC providers, some improvements were evident, while other aspects did not undergo any changes or even became worse.

What has improved

Some aspects of the intervention implementation have improved since the 1st wave of the study.

1. *Intervention impact*. At the 1st wave of the QLR, respondents emphasized it was too early to assess the impact of the training on the prevention and detection of the cardiovascular diseases. However, after 5-year period, IDI participants were able to report positive results of the intervention implementation; some providers were very proud of their achievements. Participants were confident that these results would be much more impressive if not COVID-19 pandemic negative impact.

2. *Training implementation.* In both waves of research, providers talked about their high motivation after training. The majority reported they immediately started implementing innovations they learned at the training; however, many respondents complained their enthusiasm faded away with time. Still, more IDI participants reported that they had implemented new approaches successfully until "COVID appeared", than respondents in the 1st wave did. While at the 1st wave in some regions the majority of providers had not even started implementing the project activities, IDI participants reported the project has been implemented (or had been actively implemented before pandemic) in all pilot regions of Ukraine.

3. *Role of the nurses*. According to the data of both waves of the QLR, trained nurses began participating actively in the health counseling. However, typically, the task of the nurse was to do all measurements, while the doctor provided recommendations. In addition, at the focus groups, nurses used to complain that patients trusted the recommendations of a doctor more, and showed some inferiority complex being uncertain in their knowledge. In 2022, this topic was not mentioned in any nurse's interview - on the contrary, many nurses reported doing preventive counseling and feeling quite confident and respected by patients.

4. *Patient motivation*. Among barriers to the effective prevention, providers mentioned a lack of patients' motivation to make lifestyle changes and overall lack of health culture in patients. This data echoed what was found in the 1st wave, when FG participants complained that patients were lazy to change their lifestyle; some were not willing to discuss their unhealthy habits with a doctor or a nurse. However, in the 2nd wave of the study, there were many provided stories of success in patients who were interested in being healthy and followed recommendations.

5. *Site equipment*. At the both waves of the study, respondents stated that site equipment improved after training, having associated this improvement with health care reform. As before, there were complaints about a lack of some kind of equipment at each doctor's office. However, while the 1st wave participants reported that site equipping considerably varied across regions and facilities, by 2022, overall equipping became more unified across the regions.

What has not changed

Some aspects of the intervention implementation have not undergone many changes within the past three years.

1. *Training*. Similar to what the 1st wave participants shared, IDI participants reported that the most important outcome of the training was that they realized the focus should be made on prevention and early detection of diabetes and hypertension, as well as on effective management of patients with these NCDs. Respondents of both waves believed they received enough knowledge and skills at the training to implement the intervention. As three years ago, there was a demand for the booster trainings, supervision and mentorship to ensure the proper intervention implementation and its sustainability.

2. *Management support*. Discussing management support they received after the training, providers across all groups reported that their managers purchased needed equipment for their offices (scales, height meters, glucometers etc.). This was very similar to what has been reported in the 1st wave of the qualitative research, where doctors, nurses, and feldshers reported no support or mentioned a purchase of the equipment for their offices as the only support they received from the facility management.

3. *Access to laboratory testing* has not changed much since the 1st wave of the study. All changes for the better happened mostly due to availability of glucometers and cholesterometers onsite. Many providers, particularly from rural areas, complained about patient limited access to the laboratory testing. These data completely coincide with the results of the 1st wave of the study.

4. *Specifics of the rural areas*. In general, residents of rural areas have lower access to services, including laboratory examinations or use of the "Affordable medicines" programme. The equipment of rural ambulatories was often worse than that in the cities. The overall situation has not changed in the past three years.

5. *Monitoring system*. Similar to what we found in the providers' IDIs, respondents in the 1st wave reported there was no standardized system in further monitoring of newly detected patients, especially of those without diagnosis but with elevated risk of CVDs. They described various informal "recall systems" to following-up patients. The majority reported calling and inviting patients for a visit, to ensure periodical examinations of the person from the risk group (tests for cholesterol, glucose level, ECG etc.). Therefore, nothing has changed specifically in the NCD monitoring system and patient following-up during the past 3 years. As three years ago, there was a demand for the unified forms for monitoring patient progress, including patients form "dispensary group" and those with elevated risks of NCDs, as well as for monitoring the overall prevention work.

What has become worse

According to the QLR results, there were aspects of the intervention implementation that not only have not improved but even have shown negative tendencies since the 1st wave of the study.

1. "Affordable medicines". In the 1st wave of the study, providers expressed better satisfaction with the "Affordable medicines" programme that especially facilitated access to treatment for elderly people with limited income. However, after 5-year period, the weaknesses of this programme became more obvious, so IDI respondents were much more skeptical in their opinions of the "Affordable medicines" programme. They repeatedly talked about low quality of the medicines affordable in terms of this programme as well as about limited access to these medicines of patients in the rural areas.

2. "Lack of time". In the pre-COVID period study, the theme "Lack of time" emerged at every focus group. The participants complained about limited time for seeing one patient, which was a barrier for the intervention implementation. In the 2nd wave of the study, most respondents repeated this theme in the context of elevated workload during COVID-19 pandemic, emphasizing that with COVID, absolutely no time was left for NCD prevention. Almost no one mentioned that lack of time impacted their performance before COVID-19.

3. *Excessive workload of family doctors and nurses*. The majority of family doctors and nurses complained about being overloaded with multiple responsibilities. This is very similar to what we learned in the 1st round of the study, but with COVID-19 pandemic the situation became much worse. However, if at the 1st wave respondents talked about the excessive workload on nurses, now, during pandemic, both doctors and nurses had excessive workload; the doctors even more so.

Recommendations for the future

The respondents recommended *actions to be taken* to improve implementation of the integrated NCD management at the PHC level. Among the most often given recommendations were:

1) strong support of NCD prevention on the government level. This included developing and funding of NCD prevention programmes at national and local levels;
2) access to trainings and booster trainings for health care providers of all levels;
3) standardized protocols and documentation for monitoring patients with disease and with elevated risk of NCD;
4) expansion of the list of available drugs in the "Affordable medicines" programme, including modern polycomponent medicines.

Among recommendations for the future, respondents described *support they need* – both on the local or national level – to implement the intervention more effectively. The participants across all groups proposed:

1) to increase time for one patient's appointment;
2) to decrease a number of registered patients per one family doctor;
3) to have an office for pre-physician examination where all tests and measurements could be done before a visit to the doctor;
4) to provide health care workforce with more NCD management trainings and booster trainings, as well as supervisor support.

Literature

WHO package of essential noncommunicable (PEN) disease interventions for primary health care. Geneva: World Health Organization; 2020. https://www.who.int/publications/i/item/who-package-of-essential-noncommunicable-(pen)-disease-interventions-for-primary-health-care

Laatikainen T, Dumcheva A, Kiriazova T, Zeziulin O, Inglin L, Collins D, Farrington J. Capacity building of health care professionals to perform interprofessional management of non-communicable diseases in primary care - experiences from Ukraine. BMC Health Serv Res. 2021 Jan 27;21(1):91. doi: 10.1186/s12913-021-06068-1.

Verbi, S. MAXQDA, software for qualitative data analysis. Sozialforschung GmbH, 1989-2010.

Miles, M. B., & Huberman, A. M. Matrix displays: Some rules of thumb qualitative data analysis (pp. 239–244). Thousand Oaks, CA: Sage, 1994.

Strauss, A. L., & Corbin, J. Basics of Qualitative Research: Grounded Theory Procedures and Techniques. Thousand Oaks, CA: Sage, 1990.

Carey, J. W., Morgan, M., & Oxtoby, M. J. (1996). Intercoder agreement in analysis of responses to open-ended interview questions: Examples from tuberculosis research. CAM Journal, 1996; 8, p.1-5.

Holland J., Thomson R., Henderson S. Qualitative Longitudinal Research: A Discussion Paper, Families & Social Capital ERSC Research Group, London South Bank University, 2006.

Hollstein, B. Promises and pitfalls of qualitative longitudinal research, Longitudinal and Life Course Studies, 2021; Vol 12 (1), p. 7–17.