

STRENGTHENING THE ROLE OF THE PRIMARY HEALTH CARE IN THE COVID-19 RESPONSE

EVIDENCE FROM YEREVAN, STUDY RESULTS

DAVIT MELIK-NUBARYAN, PHD

GANNA SAKANYAN, PHD

LIST of ABBREVIATIONS

Abbreviation	Explanation
CDC	Centers for Disease Control and Prevention
COVID-19	Novel coronavirus
ICU	Intensive care units
NPI	Non-pharmaceutical interventions
NCD	Non-communicable diseases
MoH	Ministry of Health
PHC	Primary health care
PPE	Personal protective equipment
WHO	World Health Organization

Table of Contents

Executive summary	3
Introduction	4
Methodology	6
Discussion	7
Conclusion	15
References	18

Executive summary

Such unprecedented event as novel coronavirus pandemic requires coordinated, well-organized response of entire government and society to reduce the negative outcomes on people's lives. Especially important is proper organization of the healthcare system's work and its most important part - the primary health care, which known to be the entry point of the individual to the system that provides wide range of preventive, diagnostic, treatment and follow-up services.

The study revealed several systematic omissions in organization of the PHC involvement in COVID-19 response, which might have had serious negative outcomes on the overall effectiveness of the taken measures. With the increasing pressure on the healthcare system, as a result of uncontrolled community transmission, the decision was made to manage uncomplicated and mild cases of the COVID-19 at PHC level, but it was done without proper communication and discussion with the stakeholders, without serious preparation and planning, capacity assessment, allocation of the additional financial and technical resources.

The leadership and coordination of the anti-epidemic activities were inadequate in comparison with the extraordinary challenges, resulting in insufficient involvement of the community settings and local governments in the pandemic response activities, which mainly limited with provision of the personal protective equipment for PHC facilities.

Another major problem discovered, was absence of the organized and regular risk-communication with the population aimed to increase awareness about the transmission, protection and importance of the safe behavior. In general, absence of the comprehensive communication strategy on national, sub-national and local levels could have been led to the serious underestimation of the threats caused by virus, with its all consequences.

The main problems that staff of the PHC facilities met during COVID-19 patients management were delays with COVID-19 testing results, high workload of medical personnel due to the increased number of serving patients and as a result, lack of time for treatment and follow up of infected persons and their contacts. In addition, there was poor coordination of the COVID-19 management, characterized by unavailability of ambulance medical services, absence of beds in hospitals serving COVID-19 patients, which seriously impeded hospitalization of the COVID-19 patients.

According to the study results, provision of the essential medical services was disrupted as well. Thus, the number of PHC visits in 2020 decreased in average by 21.2% compared to 2019. The number of visits to the narrow specialists dropped by 26.7% in 2020 compared to previous year. Most affected was management of such vital non-communicable diseases as hypertension, diabetes, cancer, asthma, lung and renal diseases, which resulted in unprecedented high excess mortality from cardiovascular and lung diseases.

However, PHC service providers continue to serve population, despite the objective difficulties, caused by pandemic and they play an important role in protection of their health.

Introduction

Originating in the Province of Hubei, in China, the epidemic unleashed by a new strain of the Coronaviridae virus family (SARS-CoV-2) that causes the disease known as COVID-19 has been spreading rapidly on all continents. On March 11th 2020, just over two months after it began, the WHO declared COVID-19 to be pandemic, after over 118.000 cases were confirmed worldwide from 114 countries [*WHO SR (Table 1, 2), 2020*]. Globally, as of 18 July 2021, the cumulative number of cases reported globally is now over 190 million and the number of deaths exceeds 4 million [*WHO WEU, 2021*].

Overcrowding, poverty, poor hygiene practices, and weak information management systems are keys among factors and social determinants of COVID-19 spread [*Abrams E., Szefler S., 2020*]. The severity of the epidemic has led many national governments to adopt highly intensive non-pharmaceutical interventions NPI, such as lockdown strategies, with the aim of flattening infection curve, avoiding overwhelming the healthcare system and reducing social overburdening by the incidence and mortality.

The global spread of the virus has overwhelmed health systems all over the world testing their strength and resilience. Many of even highly developed countries during the pre-vaccination period were failing in their COVID-19 response. The situation is far worse in low- and middle-income countries with scarce resources and vulnerable health systems. They clearly lacked funding to address key gaps in the availability of commodities such as personal protective equipment PPE and in the large number of trained health care workers needed for the COVID-19 response.

Nevertheless, gradually health systems all over the world adapted to cope with the COVID-19 pandemic. Much policy attention had been devoted to preventing the spread of the COVID-19 virus – such as ramping up testing, tracking and tracing capacities, the use of PPE and physical distancing measures – as well the rapid scaling-up of hospital and workforce capacities to manage sudden surges in care demand and overcrowded ICU. However, the pandemic also deeply affects many people who have not contracted the virus. People with chronic conditions are not only highly vulnerable to complications and death from COVID-19, but they are also suffering from disruptions to their regular care routines. Many non-COVID-19 patients were unable to access needed care during the first wave of the pandemic. Examples of such indirect health impacts include people with delayed diagnoses, cancelled, foregone and delayed care [*OECD SF, 2021*].

At the peak of the first wave of infection, a number of countries scaled back delivery of non-COVID-19 related health services in an effort to increase hospital and health system capacity. For example, in United States, Portugal, and Chile all non-urgent elective surgeries were cancelled to free up space in hospitals [*OECD CPT, 2020*]. In France, ambulatory surgery has dropped by nearly 80% during the lockdown period (15 March – 11 May 2020) compared to same period in 2019 [*Finkel S., at all, 2020*].

Beyond hospital care, a number of countries also postponed care in other settings during the first half of 2020 as countries implemented policies to reduce non-essential medical services, including ambulatory care, vaccinations, laboratory testing, physical therapy, cancer screening,

and other routine care. A recent systematic review of data across 20 countries showed that health care utilization decreased by a median of 37% of services overall, 42% for visits, 31% for diagnostics, 30% for therapeutics and 28% for admissions [Moynihan R., et al, 2020].

Research in the United Kingdom found a 76% decrease in urgent referrals from PHC for people with suspected cancers and a 60% decrease in chemotherapy appointments for cancer patients in comparison to levels before the COVID-19 crisis [Lai A., et al, 2020]. One review found that cancer-screening programs have been clearly interrupted since the onset of the COVID-19 disease. The anticipated outcomes include delayed diagnosis and marked increases in the numbers of avoidable cancer deaths [Ibrahim A., et al, 2021]. In France also, the number of cancer diagnoses decreased by 35% to 50% in April 2020, as compared to April 2019 [Santi, P., Pineau E., 2020].

A number of countries have seen significant reductions in the use of face-to-face outpatient services during peaks of infections. The most common reasons for interrupting or reducing were cancellation of scheduled treatments, reduced availability of public transportation, fear of visiting health care centers, and staff shortages due to reassignments to support the COVID-19 response. In addition, some countries experienced disruptions in their supply chains and faced challenges in the distribution of drugs and health products, all of which has affected [Mehrotra A. et al., 2020].

Furthermore, the recent survey conducted by WHO revealed that over one year after the pandemic began, still there are serious disruptions of essential health services. Particularly, about 90% of countries, including Armenia continue reporting one or more disruptions, marking no substantial global change since the first survey conducted by the WHO in the summer of 2020. According to the report, primary care, rehabilitative, palliative and long-term care are most heavily affected, with over 40% of countries reporting disruptions that affect the availability of and access to quality services, including for the most vulnerable individuals [WHO CS, 2021].

Primary care is an essential foundation for the global response to COVID-19. It plays a significant role in gatekeeping and clinical responses: identifying and triaging possible COVID-19 cases, making an early diagnosis, helping vulnerable people cope with their anxiety about the virus, and reducing the demand for hospital services [Rust G., et al, 2009, Lee A., Chuh A. A., 2010, Kearon J., Risdon C., 2020].

According to the WHO, the main principles of PHC in the COVID-19 response are: a) maintain delivery of essential health services; b) identify and manage potential cases as soon as possible; c) avert the risk of transmission of infection to contacts and health-care workers; d) enhance existing surveillance such as for influenza-like illness and severe acute respiratory infection; e) strengthen risk communication and community engagement; and f) support provision of vaccination services against COVID-19 [WHO PHC, 2020].

Methodology

To achieve the research goals a qualitative study design was selected. Comprehensive and rigorous assessment methodology was applied which consisted of the 4 components: (1) analysis of the RA's legal documents and assessment of the official press-releases placed on the government's websites, which are regulating work of the PHC during COVID-19 pandemic, including provision of the routine (essential) services and COVID-19 response; (2) evaluation of PHC performance indicators during COVID-19 pandemic; (3) analysis of the results of in-depth interviews with the PHC settings' chief medical officers on PHC preparedness and response to the COVID-19 pandemic, based on specially developed interview guide, consisting of 34 specific questions; (4) synthesis and analysis of the obtained data on the role that PHC has played during the current COVID-19 pandemic in Armenia.

The main research questions stated to achieve the goals of the study was as follows:

How prepared was the PHC in Armenia to response COVID-19, how the PHC maintained provision of essential services to the population during COVID-19 pandemic and what could be the major directions for the strengthening PHC response to COVID-19?

Sub-questions:

1. Did PHC facilities receive necessary support required to guarantee self-safety and effective treatment of the country citizens?
2. Were PHC physicians provided with an up-to-date guideline on safety and case management?
3. Were they provided with the necessary PPE and technical supplies to achieve their goals?
4. What were PHC providers' major needs for effective response to COVID-19?
5. What were the most pressing workforce training needs and most effective ways to deliver these?
6. What policies and incentives would be applied to increase PHC resiliency and surge capacity in the future?

Study settings

The study has been conducted among 6 outpatient clinics of Yerevan, or 16.7% of polyclinics (independent and unified) of the capital [*NIH Yearbook, 2020*]. Participant PHC facilities have different organizational structure and ownership, particularly three from the six selected facilities obey to the Yerevan municipality and are community property, 2 are university facilities and one is private outpatient clinic. Together, all 6 outpatient facilities serve 214.586 population, which is 19.6% of the Yerevan total population [*Armstat NPP, 2021*]. Information about selected PHC performance indicators before and during COVID-19 pandemic have been obtained directly from the statistical departments of the participant outpatient clinics.

Study participants

The recruitment process resulted in the inclusion of chief medical officers of 6 Yerevan outpatient clinics. All study participants invited to participate in individual 40-60 minutes semistructured in-depth interviews to share their experiences and challenges facing during COVID-19. They met inclusion criteria, particularly all of them were key informants with at least 5 years of professional experience in that position and were identified using purposive sampling methods, which included representativeness or comparability and sequential approaches to provide pertinent information for the assessment, based on participants' experience and expertise [Curry L.A., *at all*, 2009]. Five of participants were females and one male and their ages ranged from 35 to 65 years old.

Data sufficiency was reached after analysis of all the relevant legal documents and press releases and six interviews, giving enough richness and depth of the data.

Data collection

The data production involved the official documents, press releases and publications search on the fight against COVID-19, regarding PHC, since May 2020 from the RA government and WHO websites. Semi-structured in-depth interviews were conducted by the research group between 1 March and 10 March at a time convenient for participants. In-depth interview guide was developed for data collection. The guide was designed to optimize the value of the data collected to meet the objectives of the qualitative study. The questions in the guide were adapted to the participants' role, responsibilities and professional experience.

Data analysis

The document research involved three stages: organization, pre-analysis, and material analysis. The exploratory phase required reading the documents and classifying them according to dimensions and theoretical/analytical categories. Content analysis method was applied for analysis of the selected documents.

Content analysis techniques were used also to analyze in-depth interview transcripts. The main themes identified during the fieldwork (largely repeating the sequence of the themes included in the field guides) were used to organize the results section.

Discussion

Situational analysis

Armenia is a country located in the Armenian Highlands of Western Asia, with a 2.96 million population, one third of which live in the capital city, Yerevan [Armstat NPP, 2021]. The first COVID-19 case was detected in Armenia on March 1, 2020. As of June 28, 2021 there were 224.851 registered COVID-19 positive cases and 4510 deaths, case fatality rate is 2,0%. According to the official statistics, another 1099 COVID-19 positive patients died because of other illnesses [NCDC, 2021]. Such classification of the COVID-19 mortality differs from the following approach recommended by the WHO: "a death due to COVID-19 is defined for surveillance purposes as a death resulting from a clinically compatible illness, in a probable or confirmed COVID-19 case,

unless there is a clear alternative cause of death that cannot be related to COVID disease (e.g. trauma).” [WHO MC, 2020].

By the end of 2020, exceptionally high excess mortality was registered in Armenia, when compared to the average mortality rate for the 2016 -2019 period. Particularly, the overall excess mortality was 32%, without deaths occurred as a result of military conflict (Y 36) it was 24%, which is 2 times higher than annual excess mortality in EU countries [Eurostat, 2021, Armstat SES, 2016, 2017, 2018, 2019, 2020]. Besides the deaths from the COVID-19, there were 52% more deaths from the diseases of the respiratory and 20% more deaths from the diseases of the circulatory systems, in comparison with the average mortality from same causes during 2016 to 2019.

In 2020, there were registered 28.177 cases of COVID-19-related pneumonia, additionally there were recorded 24.321 cases of pneumonia of unknown etiology, which is 3.62 times higher compared to the 2016-2019 average [Armstat SES, 2016, 2017, 2018, 2019, 2020]. Such a high incidence of pneumonia of unknown etiology indicates that in reality, the majority of these cases were COVID-19-related, but due to some reasons the healthcare system could not identify them, did not provide appropriate management at PHC and hospital levels. Untested individuals, or people with negative test results were deprived of the opportunity to receive the same care as COVID-19 positive once, including visits by PHC doctors, follow up, hospitalization in the COVID-19 clinics, free of charge medical care, etc. The reasons of this unfavorable phenomenon and the role of the people with COVID-19 symptoms in epidemiological processes need further investigation and analysis.

Legal framework assessment

The Interdisciplinary Commission for coordination of the activities aimed to prevention of the spread of the COVID-19 in the Republic of Armenia was established by the Prime Minister’s decree from January 30, 2020 # 93-A. The Deputy Prime Minister headed the Commission. The representatives of the WHO and FAO were members of the Commission as well.

Taking into consideration the increased spread of the novel coronavirus in Armenia the Government declared state of emergency on all the territory of Armenia on March 16, 2020, 5 days after the WHO statement that COVID-19 could be characterized as pandemic [The Government of Armenia, 2020]. Starting from the March 21, the economic activities of the country were gradually shut down. The total lockdown was announced on March 24, 2020 by the Decision of the Commandant #15. The lockdown restrictions gradually eased since April 23, 2020 (Decision of the Commandant #54). Since the first decade of July 2020, nearly all economic sectors have been allowed to reopen, almost all restrictions imposed have been lifted.

The epidemiological control, including early detection, treatment, isolation, contact tracing and case reporting procedures are regulated by the sanitary-epidemiological rules and norms # AK-3.1.1-021-10 on “Sanitary-epidemiological control of the flu and other acute respiratory infections in the Republic of Armenia”, signed by the Minister of Health on December 17, 2010. In accordance with mentioned sanitary-epidemiological rules and norms, after the declaration of the epidemic the PHC facilities have to switch to a 7-day work week, perform proactive community case detection and increase public awareness among population served regarding

the prevention and management of the acute respiratory infections. The key functions of the pandemic control strategy, the contact tracing and follow up, also should have been conducted by the PHC settings as well.

Few weeks after the beginning of the COVID-19 epidemic, the MoH developed and adopted by the Minister's Order #336 from 31.01.2020 the guideline on surveillance, case investigation and home care of COVID-19 uncomplicated and mild cases. The document stated that it is preferable to isolate the COVID-19 patients in hospitals and specialized places, but in case of limited capacities PHC physicians can manage patients with uncomplicated and mild forms of the disease at home.

However, despite the presence of the legal documents, on practice there is no evidence that the PHC facilities have followed the above mentioned sanitary-epidemiological rules and norms and have been involved in COVID-19 management at the early stages of the pandemic, probably because the Government adopted strategy of isolation of all patients, suspected cases and contacts in specially designated quarantine places (hotels, medical centers or institutions providing medical assistance and service).

Later, due to the increase of the disease incidence and recognition that it already spreads across the country, in accordance with the decision of the Commandant #65 from 05.05.2020, some activities were transferred to the PHC facilities. Particularly, the responsibilities of the PHC at that stage were: follow up of healthy, but self-isolated contacts and organization of their hospitalization in case of development of the symptoms. The decision anticipated that the health workers should contact the self-isolated persons on 1-st and 7-th day of isolation and visit them on the 14-th day to evaluate their health status.

The study revealed that there were technical obstacles with the practical implementation of the decision, such as limited availability of phones, misbalance between number of health workers and number of self-isolated individuals, absence of the transport, and as a result significant increase in PHC staff workload.

Full involvement of the PHC in COVID-19 patient management and treatment processes was announced by the Minister of Health through Facebook post on 19.05.2020. The Order of the Minister of Health #1606 on "Organization of the medical care of the patients with novel coronavirus at the outpatient settings" was signed just after two days, on May 21, 2020, without discussion with PHC managers and preparation of the facilities. The Order in general terms describes the process of the service delivery, including sampling, follow up and hospitalization criteria and organization of the hospitalization with the Triage center operating at the St. Grigor Illuminator Medical Center of the MoH. Another Ministerial Order from June 30, 2020, #2051-A, guides clinical management of mild and uncomplicated cases of the COVID-19 at PHC level, also allowing distance case management and prescriptions for PHC doctors.

In general, the state authorities adopted number of legal acts regulating service provision at PHC level, but it was done without careful planning, communication, capacity assessment and proper

control over the practical implementation of the legal documents and feedback from the service providers.

Findings

All selected outpatient facilities, except one are serving both adults and children. In average 73.6% of the serving population in the mentioned five polyclinics were adults and 26.4% children. The percentage of elderly people older 60 in average was 25.5%. Patients with chronic diseases accounted for 10.3%. Among them 54.1% had cardiovascular diseases (CVD), 14.7% obesity, 14.5% diabetes, 9.9% some form of malignant neoplasms, 3.8% chronic obstructive pulmonary disease (COPD), and 3.0% other chronic diseases.

The average nurses-to-physicians ratio in the studied polyclinics was 1.15, slightly less than the average for Armenia 1.45 [*NIH Yearbook, 2020*]. The percentage of elderly persons among the personnel was 21.4%. Among physicians it was 26.1% and among nurses 23.9%. The COVID-19 infected persons accounted for 20.2% of the personnel. The percentage of the infected physicians and nurses was approximately the same (22.5% and 24.0%). The percentage of the infected among elderly was a somewhat higher 26.6%. Among elderly physicians the percentage of infected was 22.2%, among elderly nurses 32.9%.

Preparing a robust system of PHC Centers to provide quality responses to such situations of public emergency as COVID-19 pandemics was not trivial matter. For their effective preparation and enrollment, it was very important to widely discuss the decision about the transferring of the management of the mild COVID-19 patients to the PHC facilities, with all stakeholders and take into account their opinion. Meanwhile, the answers on the question about the discussion of the mentioned decision with the stakeholders showed that it has not been discussed properly in advance. One of the chief medical officers of the polyclinic mentioned that the decision was not discussed at all, the other one thought that the discussion was formal and the comments and suggestions did not been considered. The rest four of the respondents declined to answer the question saying that it is difficult for them.

At the same time, the overwhelming majority of the chief medical officers mentioned that the goals and objectives of the decision to organize treatment of mild forms of COVID-19 in PHC were presented by MoH and they are well aware about them. All of them agreed that the management of COVID-19 patients in PHC is relevant to the pre-planned goals and objectives. Only one chief medical officer of the polyclinic confessed that the MoH explanations were vague and unclear and the present management of COVID-19 patients in PHC is mostly irrelevant to the defined goals.

All the chief medical officers, except one considered that all the necessary preparation activities, e.g. retraining of the PHC personnel on clinical management of COVID-19 and infection control, etc. mostly were conducted properly and timely and the medical personnel acquired adequate knowledge and skills to work with COVID-19 patients. All the respondents were unanimous in

their opinion that the PHC personnel has absolutely or mostly sufficient access to all guiding materials regarding clinical management of the COVID-19 patients and infection control.

According to the assessment of all the chief medical officers, except one, medical care provided to patients with COVID-19 at different levels is mostly managed by approved legal documents, is mostly integrated and well-coordinated by the Triage center. At the same time, half of the respondents were not able to evaluate the effectiveness of the PHC support center at the St. Grigor Illuminator Medical Center. It was evaluated as ineffective by two of the respondents, and as mostly effective by only one top manager.

Among the main barriers that PHC doctors meet during referrals of the COVID-19 patients to hospitals all chief medical officers, except the one mentioned first of all absence of beds in hospitals serving COVID-19 patients, the other mentioned barrier was unavailability of emergency medical services and refusal of patients of hospitalization. The problems with patients hospitalization were not mentioned only by one chief medical officer of the polyclinics.

There were also problems with testing of the COVID-19 patients. Among the main obstacles that PHC doctors meet during organization of testing, two of the chief medical officers mentioned late test results, another two of them identified refusal of patients to be tested.

“It often took a long time to call the triage center, which took time away from the doctor’s scheduled work”.

Chief medical officer of the polyclinic.

According to the opinion of the majority of chief medical officers, lack of time was a main challenge that PHC physicians met during treatment and follow up of COVID-19 patients. Five of six respondents perceived medical personnel workload as higher than usual because of the increased number of patients served by one doctor, number of distance consultations and home calls after the mild COVID-19 patients management was transferred to PHC facilities. Despite a year into the pandemic, concerns also remained over physicians’ personal protective equipment and lack of knowledge.

Although increased physicians’ workload, the work of medical personnel, according to the opinion of all interviewed chief medical officers, was scheduled properly and met their professional responsibilities, although some of them mentioned time loss due to the calls to the Triage center.

According to the opinion of all respondents high workload of the medical personnel during pandemic did not affect the comprehensiveness of the routine PHC services, e.g. management of the patients with NCD, provision of drugs, immunization. All the essential medical services mostly were maintained properly. However, the chief medical officers indicated their relatively

“...the provided medical services are not so effective, because the work is related to the population; many problems are associated with the insubordination of the population and our lack of leverage”.

Chief medical officer of the polyclinic.

low effectiveness. In addition, it should be mentioned, that our data clearly indicate serious decrease of the PHC visits in participant policlinics, which is clear indicator of some disruption in the maintaining of essential medical services. Particularly, comparison of the number of visits to the polyclinics during 2020 and 2019 years revealed that in all polyclinics, except one there was decrease in the number of visits to the general practitioners in average by 21.2%. It's obvious that the most common reason for reduced number of visits was fear of visiting health care centers, particularly among patients with NCD, such as diabetes, hypertension, cancer, etc. who are in high-risk group for COVID-19.

The number of phone consultations during the 2020 year differed in polyclinics, ranging from 34,772.7, to 1143.7 per 10,000 registered population. It should be emphasized that private policlinic was the only one with the increased number of visits compared to the past year (by 81.9%).

In four of the six polyclinics, there was an increase of the number of home visits in average by 25.3%. In the remaining two polyclinics, there was a slight decrease in the number of home visits (in average by 9.7%), which might be related with increased number of phone consultations.

“According to the order of the Minister of Health, if a patient does not have complaints, physician can communicate with him via phone calls”.

Chief medical officer of the polyclinic.

All the top managers, except one mentioned that PHC physicians also visit self-isolated patients at homes according to the above-mentioned decision of the Commandant.

The reduction in number of visits to the narrow specialists was registered in five of the six polyclinics in average by 26.7% in 2020 compared to 2019. There is only one polyclinic where the number of visits to narrow specialists increased (by 23.3%). The analysis of narrow specialists visits dynamics by different disease groups, revealed increased number of cases among patients with diabetes in half of the polyclinics in average 2.4 times and decrease in the remaining ones in average by 25.0%. Among patients with hypertension, there was in average 2.7 times decrease, among patients with cancer 17.9% decrease, lung diseases 1.8 times decrease, asthma 1.9 times decrease, renal diseases 1.4 times decrease. There was also a slight change in the volume of provided medicines, increase in average by 12.3% in 2020 compared to 2019.

Despite the increased workload of the PHC personnel, their remuneration according to the majority of respondents (four of six) during the COVID-19 remained the same. The majority of the top managers (four of six) agreed also that the financing of the facilities during pandemics was not changed.

“It can be considered that it remained the same, as once a small amount was transferred”.

Chief medical officer of the polyclinic.

As role of PHC facilities in COVID-19 control all chief medical officers mentioned first of all increase of the population awareness, the disease treatment and prevention, organization of

patients' hospitalization. One of the top managers mentioned also coordination of treatment process at all levels of medical care.

Community and community-based organizations engagement is seen as critical in many health initiatives, such as for communicable diseases and maternal and child health initiatives, and more recently has been considered a fundamental component during outbreaks, largely arising during the 2014–2015 Ebola epidemic in West Africa [*Questa K., at all, 2020*]. According to the WHO community engagement serves to maximize the effectiveness of COVID-19 preparedness and response strategies and prevents transmission at the community level. Involving community-based organizations as a part of the unconventional health workforce in coordination with PHC can form a robust community ownership model to implement public health interventions in a timely, equitably, and culturally compliant manner [*Valdiserri R.O., Holtgrave D.R., 2020, WHO CSU, 2020*]. However, there is concern over the lack of community involvement in COVID-19 control in Armenia, despite the fact that according to the legislation the local governments has serious role in epidemic control, particularly they have to fulfill the assignments of the central government, but the analysis of the available legal documents revealed absence of such assignments [*National Assembly of the Republic of Armenia, 2002*]. As it was mentioned by three of the six chief medical officers, participation of local government bodies in the fight against COVID-19 was limited only by provision of PPE and some activities aimed to increase awareness of population about the disease. The rest top managers were not aware about any form of their participation. No one of the six top managers was aware about any training program organized for community and local government bodies for their engagement in COVID-19 prevention and control. Four of the six chief medical officers were even not aware what an important role

“...Many of the citizens hide their illness because they don't want to inform people around”.
Chief medical officer of the polyclinic.

community and, particularly local government bodies can play in supporting of COVID-19 patients management and were not able to assess the necessity of their enrollment in the mentioned activities. Only two of them pointed out such a necessity but at the same time, they doubted that it would be very effective because sick citizens usually try to hide their disease.

Alongside the direct efforts of the government and healthcare professionals against the COVID-19 pandemic, spreading risk awareness through effective communication channels is a key driver in empowering the general population with the knowledge needed to do their part in alleviating the quick spread of COVID-19. The PHC facilities should play a key role in risk communication. The results of the research revealed that PHC facilities were not been involved in risk communication process at the early stages of the epidemic. Only two of the six top managers recognized the PHC active engagement since the beginning of the pandemic. According to the

«It is impossible to inform thousands of people, the citizens visiting the polyclinic and contact persons usually are informed”
Chief medical officer of the polyclinic

rest four chief medical officers, the involvement of PHC facilities in risk communication process even after one year of the pandemic is not active.

Meanwhile, the majority of the respondents witnessed about the organization of training programs on risk communication for PHC medical personnel and about the availability of the guiding documents on risk communication responsibilities of the PHC.

All levels of the health care system should be involved in the health care response to the COVID-19 pandemic. The coordination of services between all levels is essential for an effective and efficient COVID-19 response. Collaboration with public health services helps ensure that health care providers stay informed of local surveillance information and relevant public health guidance, activities, and initiatives. The primary care practices should rapidly and continuously reinvent themselves during a pandemic using the National CDC's pandemic framework. According to the opinion of the majority of the chief medical officers, effective collaboration between PCH and public health services is in place. Only one respondent mentioned that the collaboration is mostly not effective.

"I don't remember the dates and organizers of training programs, but there were a lot of them via Zoom platform."

Chief medical officer of the polyclinic.

"...There were a lot of different on-line training courses."

Chief medical officer of the polyclinic.

The E-health system recently implemented in Armenia to facilitate exchange of clinical and non-clinical information, transparency and accountability in medical service provision, and support for monitoring and evaluation. All the interviewed top managers recognized its effectiveness during the COVID-19 pandemic. Among the main problems associated with the E-Health system, all of them mentioned slow running speed. Some of the chief medical officers also indicated impossibility of the data analysis due to the incompleteness of entered data, periodic loss of entered data and inconvenience of entry cells.

All the chief medical officers indicated that majority of patients with COVID-19 were mainly satisfied with COVID-19 management at the PHC level. Among the main reasons for patients' dissatisfaction with the quality of provided PHC services, five of the participants indicated long waiting time, four of them indicated the necessity to buy medicines and low accessibility of laboratory and diagnostic services. One of the participants recommended evaluating patients' satisfaction through the survey, because the evaluation of chief medical officers based only on the presence of complaints.

"I can't provide you with the objective information about patients' satisfaction, because my assessment is based on data about their complaints."

Chief medical officer of the polyclinic.

The COVID-19 pandemic has highlighted an urgent need for expand digital solutions, allowing patients to receive distance access to the medical care and getting support from general practice. However, not all people in Armenia and even in Yerevan have access to modern digital equipment. During the COVID-19 pandemic majority of patients in Yerevan were able to have remote medical consultations mainly via phone calls. The main problems associated with the patients telephone consultations indicated by five of the six study participants were low accessibility of communication technologies and the necessity of medical personnel to pay for phone calls by themselves, necessity to conduct remote consultations outside the working hours. Two of top managers stated that there are difficulties with remote consultations for elderly patients and one mentioned unequal workload distribution among medical personnel.

As the main obstacles to more effective epidemic control two of the participants indicated insufficient funding, two others not effective coordination of care at different levels. It was surprising but the half of the participants did not identify any cause. One of the chief medical officers indicated insufficient leadership capability of the MoH, another one low awareness of the population.

“It is very important to regulate diagnosis coding. A laboratory confirmed COVID-19 case has its code, but there is no code suggested for clinically or epidemiologically diagnosed cases with the negative COVID-19 lab results. However MoH requires monthly reports about number of negatively tested clinically diagnosed cases”.

Chief medical officer of the polyclinic.

All the respondents were unanimous in their opinion that COVID-19 pandemic brought new challenges to PHC. Among suggestions for improvement of the COVID-19 management effectiveness in PHC, the participants indicated the following: a) provide medical care at all stages in accordance with internationally accepted clinical guidelines and practices; b) conduct practical training programs as for family doctors as well as for specialists; c) implement lung ultrasound examination as a basis for COVID-19 diagnostics; d) regulate diagnosis coding of COVID-19; e) provide more detailed information about number of COVID-19 positively tested people and number of hospitalized patients.

Conclusion

It is evident that PHC has an essential role in COVID-19 response, both in maintaining essential health services and organization of the early detection, testing, contact tracing, treatment and follow up of the uncomplicated and mild cases of the disease. At present the role of the PHC becomes even more important, taking into consideration start of the mass vaccination against COVID-19 which recognized to be the most effective strategy to fight a pandemic. From that point of view substantial involvement and participation of the PHC executives in planning decision-making process, sharing and clear understanding the purposes of taken actions could significantly improve the quality, effectiveness and efficiency of the pandemic management, finally saving lives and protecting health of thousands of people.

Prompt establishment of the risk-communication strategy of the PHC with serving population, thoughtful engagement of the community and community leaders especially in promoting of the mass vaccination, could change the current unfavorable tendencies recorded in Armenia.

Thus, based on the study results, the following conclusions have been made:

1. For effective enrollment of PHC facilities in provision of effective response to COVID-19 pandemic, the communication is very important. Preliminary and widely discussion of the decision about transferring the management of the mild COVID-19 cases to the PHC facilities with all stakeholders and taking into account their opinion, could seriously increase the effectiveness of the COVID-19 response.
2. In reality, the majority of RA' outpatient clinics have not been informed regarding upcoming decision, accordingly it has not been discussed properly with them. Nevertheless, after the decision was made, the MoH informed them about its goals and objectives and the management of COVID-19 patients in PHC was relevant to the pre-planned goals and objectives.
3. The PHC personnel mostly had sufficient access to all guiding materials regarding clinical management of the COVID-19 patients and infection control. At the same time, it was suggested to organize practical training programs on COVID-19 management for family doctors and specialists.
4. Medical care provided to patients with COVID-19 at different levels was mostly integrated and well-coordinated by the Triage center. There was effective collaboration between PCH and public health services. However, the study participants were not able to evaluate the effectiveness of the support center at the St. Grigor Illuminator Medical Center or evaluate it as ineffective.
5. The main problems that PHC doctors met during COVID-19 patients care were the following: delays with COVID-19 testing results, high workload of medical personnel due to the increased number of serving patients and as a result, lack of time for treatment and follow up of COVID-19 patients, unavailability of emergency medical services, absence of beds in hospitals serving COVID-19 patients, lack of PPE and knowledge.
6. In fact, there was disruption of the essential health service maintaining. The comparison of the number of visits to the polyclinics during 2020 and 2019 years revealed, that in the absolute majority of studied outpatient clinics there was decrease in the number of total visits in average by 21.2% and reduction in the number of visits to the narrow specialists in average by 26.7%. Particularly, decrease in the number of visits in 2020 was registered among patients with hypertension, diabetes, cancer, asthma, lung and renal diseases. The reduction in the number of visits to the polyclinics was accompanied by an increase in the number of home calls in average by 25.3%.
7. Despite the increased workload of the PHC personnel, their remuneration according to the majority of respondents as well as financing of the outpatients clinics during the COVID-19 mainly remained the same.

8. The majority of patients with COVID-19 were mainly satisfied with COVID-19 management at the PHC level. Among the main reasons for patients dissatisfaction with the quality of provided PHC long waiting time, the necessity to purchase prescribed drugs and low accessibility of laboratory and diagnostic services have been indicated.
9. The PHC facilities still have no active involvement in risk communication even after one year of the pandemic, although training programs on risk communication for PHC medical personnel were organized and the guiding documents on risk communication responsibilities of the PHC are available.
10. There is a lack of communities and local governments' participation in COVID-19 control in Armenia. The majority of study participants were even not aware about the role of the communities and local government bodies in supporting of COVID-19 control and were not able to assess the necessity of their enrollment in the mentioned activities.
11. The main barriers to more effective epidemic control are insufficient funding, not effective coordination of care at different levels of service delivery, the MoH insufficient leadership capability and low awareness of the population.

Currently, outpatient clinics are intensively involved in the treatment of patients with COVID-19 and their role is gradually increasing. However, the treatment of coronavirus is new for the PHC facilities and the burden of polyclinics continuously increases. That is why PHC should be strengthened and structured as one of the main health sectors engaged in the COVID-19 response, given that the disease widely spreads across the country and reaches all groups of the population, especially those under the risk.

References

1. *Abrams E.M., Szeffler S.J.* COVID-19 and the impact of social determinants of health. *Lancet Respir Med* 2020;18(5):e2020. DOI: [https://doi.org/10.1016/S2213-2600\(20\)30234-4](https://doi.org/10.1016/S2213-2600(20)30234-4).
2. *Armstat NPP.* Number of permanent population of the RA as of April 1-st, 2020. National Statistical Committee. Available from: https://armstat.am/file/article/nasel_01.04.2021.pdf.
3. *Armstat SES.* Socio-Economic Situation of RA, January-December 2020, 2019, 2018, 2017, 2016. Reports, the Statistical Committee of the RA. Available from: https://armstat.am/file/article/sv_12_20a_520.pdf, https://armstat.am/file/article/sv_12_19a_520.pdf, https://armstat.am/file/article/sv_12_18a_520.pdf, https://armstat.am/file/article/sv_12_17a_520.pdf, https://armstat.am/file/article/sv_12_16a_520.pdf.
4. *Curry L.A., Nembhard I.M., Bradley E.H.* Qualitative and mixed methods provide unique contributions to outcomes research. *Circulation* 2009. 119, 1442-1452.
5. *Eurostat.* Excess mortality-statistics. Eurostat, online publication. Data extracted on 14 July 2021. Available from: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Excess_mortality_-_statistics#Excess_mortality_in_the_European_Union_between_January_2020_and_April_2021.
6. *Finkel S., Séguret F. and Meunier C.* Estimation de l'impact à M7 de l'épidémie de COVID-19 sur l'activité Hors Covid en France. 2020. Available from: <https://www.fhf.fr/Finances-FHF-Data/FHF-Data>.
7. *Ibrahim A., Matthias B., Zohre M., Edward G., Fatemeh H., Hamid S., Leila A.* Has COVID-19 Affected Cancer Screening Programs? A Systematic Review. *Frontiers in Oncology*, Volume 11, 2021. Pages 1540. ISSN=2234-943X. DOI=10.3389/fonc.2021.675038
8. *Kearon J., Risdon C.* The role of primary care in a pandemic: Reflections during the COVID-19 pandemic in Canada. *J Prim Care Community Health*. 2020;11:2150132720962871. DOI: 10.1177/2150132720962871.
9. *Lai A. G., Pasea L., Banerjee A., Denaxas S., Katsoulis M., Chang W. H., et al.* Estimating excess mortality in people with cancer and multimorbidity in the COVID-19 emergency. *SAIL Databank View project biological data mining View project Estimating excess mortality in people with cancer and multimorbidity in the COVID-19 emergency*. 2020. Vol. 15/11, p. 16. DOI: <http://dx.doi.org/10.13140/RG.2.2.34254.82242>.
10. *Lee A., Chuh A. A.* Facing the threat of influenza pandemic - roles of and implications to general practitioners. *BMC Public Health*. 2010;10:661. DOI: 10.1186/1471-2458-10-661.
11. *Mehrotra A., et al.* "The Impact of the COVID-19 Pandemic on Outpatient Visits: A Rebound Emerges," *To the Point* (blog), Commonwealth Fund, updated May 19, 2020. DOI: <https://doi.org/10.26099/ds9e-jm36>
12. *Moynihhan R., Sanders S., Michaleff Z. A., Scott A., Clark J., To E. J., Jones M., et al.* *MedRxiv* 2020.10.26.20219352; DOI: <https://doi.org/10.1101/2020.10.26.20219352>

13. *National Assembly of the Republic of Armenia*. The Law of Republic of Armenia On Local governance, Article 35. Available at <https://pdf.arlis.am/153407>.
14. *NCDC*. National center for disease control and prevention state non-commercial organization. The Ministry of Health of the Republic of Armenia. <https://ncdc.am/%d5%af%d5%b8%d6%80%d5%b8%d5%b6%d5%a1%d5%be%d5%ab%d6%80%d5%b8%d6%82%d5%bd%d5%a1%d5%b5%d5%ab%d5%b6-%d5%b0%d5%ab%d5%be%d5%a1%d5%b6%d5%a4%d5%b8%d6%82%d5%a9%d5%b5%d5%a1%d5%b6-%d5%ab%d6%80%d5%a1%d5%be-487/>.
15. *NIH Yearbook*. "Health and Health Care" Yearbook Republic of Armenia 2020/National Institute of Health after named after academician S. Avdalbekyan, MoH 2020.– 265 pages: Available from: <http://nih.am/assets/pdf/atvk/7a49393c82714fa62d26b4ed804ca36b.pdf>
16. *OECD CPT*. Country Policy Tracker. Organisation for Economic Co-operation and Development, 2020. Database. Available from: <https://www.oecd.org/health/COVID19-OECD-Health-System-Response-Tracker.xlsx>.
17. *OECD SF*. "Strengthening the frontline: How primary health care helps health systems adapt during the COVID 19 pandemic", OECD Policy Responses to Coronavirus (COVID-19), OECD Publishing, Paris, DOI: <https://doi.org/10.1787/9a5ae6da-en>.
18. *Questa K., Das M., King R., et al.* Community engagement interventions for communicable disease control in low- and lower middle-income countries: evidence from a review of systematic reviews. *Int J Equity Health* 2020;19:1–20.
19. *Rust G., Melbourne M., Truman B.I., Daniels E., Fry-Johnson Y., Curtin T.* Role of the primary care safety net in pandemic influenza. *Am J Public Health*. 2009;99 Suppl 2:S316-23. DOI: 10.2105/AJPH.2009.161125.
20. *Santi, P. and Pineau E.* Les inquiétants effets sanitaires collatéraux du coronavirus, *Le Monde*. 2020. Available from: https://www.lemonde.fr/sciences/article/2020/07/13/diagnostics-prise-en-charge-traitements-le-coronavirus-a-des-effets-sanitaires-collateraux-tres-larges_6046098_1650684.html.
21. *The Government of Armenia*. The Government of the Republic of Armenia Decision # 298-N from 16 march 2020, on Declaring a state of emergency in the Republic of Armenia. Available from: https://www.moj.am/storage/uploads/298voroshum_ENG.pdf.
22. *Valdiserri, R.O., Holtgrave, D.R.* Responding to Pandemics: What We've Learned from HIV/AIDS. *AIDS Behav* 24, 1980–1982 (2020). DOI: <https://doi.org/10.1007/s10461-020-02859-5>.
23. *WHO CS*. Second round of the national pulse survey on continuity of essential health services during the COVID-19 pandemic. Interim report. World Health Organization 2021. WHO reference number: WHO/2019-nCoV/EHS_continuity/survey/2021.1.
24. *WHO CSU*. COVID-19 strategy update. World Health Organization, Geneva 2020. Some rights reserved. Available at: https://www.who.int/docs/default-source/coronaviruse/covid-strategy-update-14april2020.pdf?sfvrsn=29da3ba0_19&download=true

25. *WHO MC*. Medical certification, ICD mortality coding, and reporting mortality associated with COVID-19. World Health Organization 2020. Available from: <https://www.who.int/publications/i/item/WHO-2019-nCoV-mortality-reporting-2020-1>.

26. *WHO PHC*. Role of primary care in the COVID-19 response. Interim guidance Revised and republished as of 9 April 2021 (Originally published on 26 March 2020). World Health Organisation, WPR/DSE/2020/004. Available from: <https://apps.who.int/iris/bitstream/handle/10665/331921/Primary-care-COVID-19-eng.pdf?sequence=5&isAllowed=y>.

27. *WHO SR*. World Health Organization. Coronavirus disease (COVID-2019): situation report 51. Geneva: World Health Organization. Available from: <https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200311-sitrep-51-covid-19.pdf>.

28. *WHO WEU*. World Health Organization. COVID-19 Weekly Epidemiological Update Edition 49, published 20 July 2021. Available from: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20210720_weekly_epi_update_49.pdf?sfvrsn=e036283e_4&download=true.

Limitations

During this research, official statistical publications, legal documents, official statements of the national authorities, as well as international organizations and scientific publications have been assessed and analyzed. However, official statistical yearbook 2020, regarding performance of the healthcare system is not published yet, therefore the data obtained during the study could not be compared. The study was conducted among the PHC facilities of the capital city of Armenia, the situation in the regional cities and rural areas have not been assessed and might be different and need further research. The COVID-19 pandemic is still in development, the mutations of the virus, mass vaccination campaign and other factors could rapidly change the epidemic situation and its impact of the healthcare system in general and PHC in particular.

Financing

The Open Society Foundations Armenia, within the frame of the Policy Research Fellowship Grantee # 20213, funded this study.

Conflict of Interests

In terms of this study, we have no conflict of interest to declare.

Contact Details

Davit Melik-Nubaryan, PhD, Senior Lecturer

Yerevan State Medical University after M. Heratsi, Department of Public Health and Healthcare Organization, Koryun str. 2, Yerevan, Armenia

E-mail: davit.melik-nubaryan@meduni.am

Tel: +374 60 621 345