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# Primary Healthcare Physicians' Attitude and Practice on COVID-19 Control and Management

## Brief Report

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**Project Description**

The Support to Control COVID-19 and Other Infectious Disease Outbreaks Activity strengthens the national capacity to control COVID-19 and other communicable disease outbreaks and emergencies of potential public health concern, advancing the Public Health Emergency Preparedness and Response strategy in Armenia. The activity is funded by the United States Agency for International Development (USAID) and is implemented by the American University of Armenia Fund, in collaboration with the Ministry of Health (MoH) of Armenia.

The project focuses on the following spheres:

1. To strengthen the capacity of the Government of Armenia to formulate and implement public policies and services to prevent and respond to emergencies of potential public health concerns.
2. ***To advance the health sector capacity for the surveillance, detection, assessment, early notification, and response to disease outbreaks and other emergencies of potential public health concern.***
3. To improve literacy on COVID-19 and other communicable diseases among the Armenian population.

The AUAF team conducted comprehensive assessments of the PHC system and laboratory network to identify existing gaps. Based on this work, the team was able to develop an action plan for strengthening the capacity of the healthcare system to be able to better balance the demands of a direct public health emergency response with the need to simultaneously maintain delivery of essential health services.

## Primary Healthcare Physicians' Attitude and Practice on COVID-19 Control and Management

### Introduction

A cross-sectional telephone survey conducted among general practitioners and family physicians in Armenia was funded by the United States Agency for International Development (USAID) and implemented by the American University of Armenia Fund in collaboration with the Ministry of Health of Armenia from June to September 2021. The survey aimed to quantitatively explore primary healthcare (PHC) providers' attitude and practice towards COVID-19 control and management, and to assess the compliance level of PHC providers with the existing COVID-19 guidelines. The sampling and data collection were conducted in partnership with the National Institute of Health after Academician S. Avdalbekyan (NIH). This report includes a short summary of methods and findings of the following domains explored by the survey: socio-demographic characteristics of the participants; COVID-19 related trainings; attitude towards COVID-19 in general; practice regarding COVID-19 control and management; practice regarding COVID-19 infection control and prevention; and PHC provider vaccination status, attitude towards vaccination, and their own readiness to receive a vaccination.

### Brief methodology

The target population for the survey was PHC providers who were involved in the treatment of COVID-19 patients in Armenia. The research team used the list of all PHC providers that NIH owns as a sampling frame. This list of general practitioners and family physicians was created by the NIH for organizing continuing medical education activities for them throughout Armenia. Simple Random Sampling technique was used to select the potential study participants from the NIH list. The intended sample size was equal to 384. Considering a 60% response rate, the team randomly selected 640 potential participants from the provided list. After the random selection of the participants, the NIH contacted 519 potential participants and asked for their permission to give their contact information to the interviewers, reviewed their eligibility, and asked participants their preferred time for the interview. Inclusion criteria for selecting study participants were fluency in Armenian and being involved in COVID-19 outpatient management for at least 1 month. After having the

list of potential participants of the study, the interviewers contacted them via telephone and invited them to participate t consisted of 80 questions divided into the following sections: socio-demographic characteristics of the participants; COVID-19-related trainings; attitude towards COVID-19; practice regarding COVID-19 control and management; practice regarding COVID-19 infection control and prevention; and PHC providers' vaccination status, attitude towards vaccination and readiness to receive the vaccination.

**Findings**

Overall, 355 PHC providers participated in the survey. The refusal rate was 24.9% (n=129). The main reason for refusals was the lack of time and busy schedules of the healthcare providers. The majority of participants were females (91.6%) with a mean age of 56.3 years, with an average of 24.7 years of working experience (**Table 1**).

Study participants were categorized as "compliant" and "non-compliant" based on their antibiotic prescription practices. The findings revealed that 40.6% of survey participants were compliant to the first line antibiotic prescription practice, meaning their first choice of antibiotic was Amoxicillin as per national guidelines, and 59.4% were not compliant.

**COVID-19-related trainings -** The majority of participants answered that they had participated in at least one training in each of the following areas since the beginning of the pandemic: IPC (95.7%), COVID-19 case management (95.5%), and the proper use of PPE (58.8%) (**Table 2).** Those participants who were compliant to the first line antibiotic prescription guideline reported a significantly higher proportion of participation in a training on outpatient COVID-19 case management compared to non-compliant participants (98.6% vs. 93.8%, p=0.028, respectively).

**Attitude towards COVID-19** – The majority of the participants (**Table 3**) had medically correct attitudes towards the listed COVID-19-related statements including: susceptibility to COVID-19 infection cannot be reduced by taking minerals and vitamins (e.g. Vit C, D, Zn) (68.5%); COVID-19 complications (e.g. hospitalization and pneumonia) cannot be prevented by taking antibiotics (67.1%); people with COVID-19 can transmit the virus to others when they do not have any symptoms (92.7%); and symptomatic treatment such as antipyretics for fever and pain, adequate nutrition and appropriate hydration are sufficient for patients with mild COVID-19 (95.4%). The vast majority of participants agreed or strongly agreed that the healthcare system in Armenia has the capability to control the

COVID-19 epidemic situation (86.1%) and that interventions implemented by the Armenian government are sufficient to control the COVID-19 situation (83.9%).

**Attitudes towards COVID-19 Infection Prevention and Control (IPC) –** Similarly, a mainly medically correct attitude was found in regards to the statements related to COVID-19 IPC measures such as: taking their own gown home is harmful (67.3%); wearing masks to prevent transmission (96.0%); and PPE (gown, surgical/respiratory mask, gloves, goggles/face shield) are effective in protecting healthcare workers from the COVID-19 infection (93.2%). The vast majority of participants were confident that they have proper/quality PPEs at work to protect them from COVID-19 (92.0%). Similarly, the vast majory noted that they had had been properly informed about the procedures and tools required for self-protection from COVID-19 (99.4%) and trained on how to use PPE (91.8%).

**Practices regarding COVID-19 control and management** - Most participants stated that they are guided by the Armenian national *guidelines and protocols* (91.0%) and their own experience (72.1%) in their treatment of patients with COVID-19 (**Table 4**). Participants' practices regarding the *prescription of medications for mild COVID-19 cases* during outpatient treatment varied. The most frequently prescribed medications by surveyed physicians included antipyretics (89.3%), and Vitamins C (81.1%) and D (80.3%). All of the participants conducted some form of *monitoring of their COVID-19 patients: the* most frequently mentioned monitoring modality included phone calls (97.2%) and home visits (76.3%).

The main *reason noted by participants for prescribing antibiotics* to their patients mentioned was the treatment of suspected bacterial pneumonia (75.5%). However, 53.1% of non-compliant participants mentioned prescribing antibiotics for the treatment of any type of radiologically confirmed pneumonia. A few participants were prescribing antibiotics to prevent pneumonia (8.5%) and to manage all confirmed COVID-19 cases (2.3%).

According to the participants, the *top three prescribed first-choice antibiotics* were amoxicillin (40.6%), azithromycin (30.1%), and ceftriaxone (16.3%). Many participants stated that they did not prescribe *combination antibiotic therapy*. The most common reason for prescribing combination therapies included the treatment of a patient with comorbidities those patients who have comorbidities (24.3%). The most frequently prescribed combination antibiotic therapies included amoxicillin/clavulanic acid with azithromycin, and Azithromycin with Ceftriaxone (which was in accordance with the ministerial order No

1856-A on “Outpatient management of pneumonia: clinical guideline” (Նախարարի հրաման No 1856-Ա «Արտահիվանդանոցային թոքաբորբերի վարման կլինիկական ուղեցույցը հաստատելու մասին») the recommended combination antibiotic therapy is Amoxicillin/Clavulanic acid with Azithromycin or with Doxycycline).

Although not recommended by ministerial order No 1606-A on “Outpatient management and treatment of COVID-19 patients (Նախարարի հրաման No 1606-Ա «Արտահիվանդանոցային պայմաններում կորոնավիրուսային հիվանդությամբ պացիենտների բժշկական օգնության եվ սպասարկման կազմակերպման կարգը հաստատելու մասին») the majority of participants prescribed corticosteroids (60.9%) and anticoagulants (89.6%) to their outpatient COVID-19 patients. Significantly more non-compliant participants reported prescribing corticosteroids and anticoagulants compared to compliant participants (53.9% vs. 65.7%, p=0.025 and 85.4% vs. 92.4%, p=0.034, respectively).

**Practices regarding COVID-19 IPC** - During interactions with COVID-19 patients, general practitioners and family physicians reported safe practices: 95.2% reported always wearing surgical masks, 58.5% reported always wearing a gown, 57.6% reported always wearing goggles, and 53.1% reported always wearing gloves (**Table 5**). According to almost one-third of participants (27.8%), a patient’s clinical presentation and medical history always influenced their decision in choosing PPE. The majority (96.1%) noted always performing hand hygiene before and after touching Covid-19 patients, and keeping a one-meter distance from their patients (74.3%) and other healthcare workers (75.4%) whenever possible.

**COVID-19 vaccination status, attitudes, and readiness** - More than half of the participants (57.8%) believed that they are not at risk of getting COVID-19 in the next 1 year (**Table 6**), and 57.4% of them said that the main reason for the latter is the fact that they are already vaccinated against COVID-19. In total, 65.4% of study participants received at least one dose of COVID-19 vaccination, of which 62.9% were fully vaccinated (41.2% of the total study population, n=146). More participants in the compliant group were vaccinated compared to the non-compliant group (74.3% vs. 59.2, p=0.003). The most prevalent vaccine received among the PHC providers was AstraZeneca (46.5%) followed by Sputnik V (33.6%). Overall, the participants’ attitudes toward COVID-19 vaccinations were positive. However, more than half of the participants agreed (50.0%) or strongly agreed

(3.8%) that COVID-19 vaccines are being rushed without appropriate testing. Many of them (42.0%) were concerned about the safety of a vaccine developed emergently during the pandemic. Nevertheless, the vast majority of the PHC providers (98.0%) said they would advise their patients to get vaccinated against COVID-19.

**Conclusion**

The assessment revealed low compliance with the case management guidelines, including antibiotic misuse, and overuse of corticosteroids and anticoagulants. The healthcare system should ensure availability of user-friendly case management guidelines and algorithms to the PHC providers, as well as develop enforcement and monitoring mechanisms to improve compliance.

**TABLES**

| ***Table 1. Socio-demographic characteristics and bivariate comparisons of compliance with first choice antibiotic recommendations*** | | | | |
|---|---|---|---|---|
| **Variables** | **Total** | **Compliant** | **Noncompliant** | |
| | **N=355 (100%)** | **N=144 (40.56%)** | **N=211 (59.44%)** | **p-value** |
| Gender, N (%) | | | | |
| Female | 325 (91.55) | 135 (93.75) | 190 (90.05) | .218 |
| Age, years M (SD) | 56.29 (11.19) | 55.53 (10.32) | 56.80 (11.74) | .298 |
| Number of months involved in COVID-19 treatment, M (SD) | 15.52 (2.32) | 15.68 (2.15) | 15.41 (2.43) | .285 |
| Number of years in practice of GP/family physician, M (SD) | 24.67 (13.45) | 22.80 (12.38) | 25.95 (14.02) | ***.030*** |

| ***Table 2. COVID-19 related trainings and bivariate comparisons of compliance with first choice antibiotic recommendations*** | | | | |
|---|---|---|---|---|
| **Variables** | **Total** | **Compliant** | **Noncompliant** | |
| | **N=355 (100%)** | **N=144 (40.56%)** | **N=211 (59.44%)** | **p-value** |
| Infection prevention and control (IPC), N (%) | 337 (95.74) | 139 (97.20) | 198 (94.74) | .261 |
| Proper use of personal protective equipment (PPE), N (%) | 207 (58.81) | 91 (63.64) | 116 (55.50) | .128 |

| | | | | |
|---|---|---|---|---|
| Outpatient COVID-19 case management, N (%) | 338 (95.75) | 141 (98.60) | 197 (93.81) | ***.028*** |
| Testing (PCR) COVID-19, N (%) | 119 (34.00) | 49 (34.51) | 70 (33.65) | .869 |
| COVID-19 vaccination related, N (%) | 336 (95.45) | 137 (96.48) | 199 (94.76) | .448 |
| Other, N (%) | 110 (33.95) | 48 (37.21) | 62 (31.79) | .314 |

***Table 3. Attitudes towards COVID-19 and bivariate comparisons of compliance with first-choice antibiotic recommendations***

| **Variables** | **Total** | **Compliant** | **Noncompliant** | |
|---|---|---|---|---|
| | **N=355 (100%)** | **N=144 (40.56%)** | **N=211 (59.44%)** | **p-value** |
| Susceptibility to COVID-19 infection can be reduced by taking minerals and vitamins (e.g. Vit C, D, Zn), N (%) | | | | .805 |
| Strongly agree | 4 (1.15) | 1 (0.71) | 3 (1.44) | |
| Agree | 106 (30.37) | 45 (31.91) | 61 (29.33) | |
| Disagree | 231 (66.19) | 91 (64.54) | 140 (67.31) | |
| Strongly disagree | 8 (2.29) | 4 (2.84) | 4 (1.92) | |
| COVID-19 complications (for example, hospitalization, and pneumonia) can be prevented by taking antibiotics, N (%) | | | | .057 |
| Strongly agree | 9 (2.55) | 2 (1.40) | 7 (3.33) | |
| Agree | 107 (30.31) | 36 (25.17) | 71 (33.81) | |
| Disagree | 218 (61.76) | 100 (69.93) | 118 (56.19) | |

| | | | | |
|---|---|---|---|---|
| Strongly disagree | 19 (5.38) | 5 (3.50) | 14 (6.67) | |
| COVID-19 patients with mild illness do not require hospitalization, N (%) | | | | .386 |
| Strongly agree | 40 (11.33) | 19 (13.19) | 21 (10.05) | |
| Agree | 294 (83.29) | 120 (83.33) | 174 (83.25) | |
| Disagree | 17 (4.82) | 5 (3.47) | 12 (5.74) | |
| Strongly disagree | 2 (0.57) | 0 (0.00) | 2 (0.96) | |
| Isolation is necessary for all suspected or confirmed cases to contain virus transmission, N (%) | | | | .240 |
| Strongly agree | 50 (14.16) | 16 (11.11) | 34 (16.27) | |
| Agree | 274 (77.62) | 113 (78.47) | 161 (77.03) | |
| Disagree | 28 (7.93) | 15 (10.42) | 13 (6.22) | |
| Strongly disagree | 1 (0.28) | 0 (0.00) | 1 (0.48) | |
| People with COVID-19 cannot transmit the virus to others when they do not have any symptoms, N (%) | | | | .234 |
| Strongly agree | 8 (2.27) | 2 (1.39) | 6 (2.88) | |
| Agree | 16 (4.55) | 4 (2.78) | 12 (5.77) | |
| Disagree | 304 (86.36) | 125 (86.81) | 179 (86.06) | |
| Strongly disagree | 24 (6.82) | 13 (9.03) | 11 (5.29) | |

| | | | | |
|---|---|---|---|---|
| Symptomatic treatment such as antipyretics for fever and pain, adequate nutrition and appropriate hydration is sufficient for patients with mild COVID-19, N (%) | | | | .135 |
| Strongly agree | 22 (6.29) | 11 (7.75) | 11 (5.29) | |
| Agree | 312 (89.14) | 128 (90.14) | 184 (88.46) | |
| Disagree | 16 (4.57) | 3 (2.11) | 13 (6.25) | |
| Strongly disagree | 0 (0.00) | 0 (0.00) | 0 (0.00) | |
| One of the ways to prevent transmission of COVID-19 infection is by wearing masks, N (%) | | | | .713 |
| Strongly agree | 42 (12.00) | 17 (11.89) | 25 (12.08) | |
| Agree | 294 (84.00) | 122 (85.31) | 172 (83.09) | |
| Disagree | 12 (3.43) | 3 (2.10) | 9 (4.35) | |
| Strongly disagree | 2 (0.57) | 1 (0.70) | 1 (0.48) | |
| Smokers are less likely to contract Covid-19 compared to non-smokers, N (%) | | | | .119 |
| Strongly agree | 2 (0.63) | 2 (1.55) | 0 (0.00) | |
| Agree | 73 (22.81) | 24 (18.60) | 49 (25.65) | |
| Disagree | 228 (71.25) | 94 (72.87) | 134 (70.16) | |
| Strongly disagree | 17 (5.31) | 9 (6.98) | 8 (4.19) | |
| The COVID-19 is transmitted mainly via air, N (%) | | | | .177 |
| Strongly agree | 35 (9.94) | 16 (11.19) | 19 (9.09) | |

| | | | | |
|---|---|---|---|---|
| Agree | 274 (77.84) | 115 (80.42) | 159 (76.08) | |
| Disagree | 43 (12.22) | 12 (8.39) | 31 (14.83) | |
| Strongly disagree | 0 (0.00) | 0 (0.00) | 0 (0.00) | |
| The PPE (gown, surgical/respiratory mask, gloves, goggles/face shield) are effective in protecting healthcare workers from the COVID-19 infection, N (%) | | | | ***.034*** |
| Strongly agree | 33 (9.35) | 16 (11.11) | 17 (8.13) | |
| Agree | 296 (83.85) | 124 (86.11) | 172 (82.30) | |
| Disagree | 24 (6.80) | 4 (2.78) | 20 (9.57) | |
| Strongly disagree | 0 (0.00) | 0 (0.00) | 0 (0.00) | |
| All antiseptics are effective in killing the COVID-19 virus, N (%) | | | | .218 |
| Strongly agree | 17 (4.84) | 10 (6.99) | 7 (3.37) | |
| Agree | 236 (67.24) | 99 (69.23) | 137 (65.87) | |
| Disagree | 97 (27.64) | 34 (23.78) | 63 (30.29) | |
| Strongly disagree | 1 (0.28) | 0 (0.00) | 1 (0.48) | |
| Hand washing with soap and water reduces the risk of infection from COVID-19, N (%) | | | | .358 |
| Strongly agree | 39 (11.08) | 20 (13.89) | 19 (9.13) | |
| Agree | 307 (87.22) | 122 (84.72) | 185 (88.94) | |
| Disagree | 6 (1.70) | 2 (1.39) | 4 (1.92) | |

| | | | | |
|---|---|---|---|---|
| Strongly disagree | 0 (0.00) | 0 (0.00) | 0 (0.00) | |
| Transmission of COVID-19 can be prevented through regularly rubbing hands with alcohol-based hand solutions if soap is not available, N (%) | | | | ***.041*** |
| Strongly agree | 24 (6.82) | 15 (10.42) | 9 (4.33) | |
| Agree | 302 (85.80) | 123 (85.42) | 179 (86.06) | |
| Disagree | 25 (7.10) | 6 (4.17) | 19 (9.13) | |
| Strongly disagree | 1 (0.28) | 0 (0.00) | 1 (0.48) | |
| I believe taking my own gown home is not harmful, N (%) | | | | .229 |
| Strongly agree | 9 (2.60) | 5 (3.55) | 4 (1.95) | |
| Agree | 104 (30.06) | 45 (31.91) | 59 (28.78) | |
| Disagree | 224 (64.74) | 85 (60.28) | 139 (67.80) | |
| Strongly disagree | 9 (2.60) | 6 (4.26) | 3 (1.46) | |
| I am confident that I have proper/quality PPE at work to protect me from COVID-19, N (%) | | | | .075 |
| Strongly agree | 22 (6.27) | 11 (7.75) | 11 (5.26) | |
| Agree | 301 (85.75) | 125 (88.03) | 176 (84.21) | |
| Disagree | 28 (7.98) | 6 (4.23) | 22 (10.53) | |
| Strongly disagree | 0 (0.00) | 0 (0.00) | 0 (0.00) | |
| I have been properly informed about the procedures and tools required for self-protection from COVID-19, N (%) | | | | .470 |

| | | | | |
|---|---|---|---|---|
| Strongly agree | 39 (11.08) | 17 (11.89) | 22 (10.53) | |
| Agree | 311 (88.35) | 126 (88.11) | 185 (88.52) | |
| Disagree | 2 (0.57) | 0 (0.00) | 2 (0.96) | |
| Strongly disagree | 0 (0.00) | 0 (0.00) | 0 (0.00) | |
| I have been properly trained on how to use PPE, N (%) | | | | .300 |
| Strongly agree | 43 (12.22) | 19 (13.19) | 24 (11.54) | |
| Agree | 280 (79.55) | 117 (81.25) | 163 (78.37) | |
| Disagree | 29 (8.24) | 8 (5.56) | 21 (10.10) | |
| Strongly disagree | 0 (0.00) | 0 (0.00) | 0 (0.00) | |
| I always know whom to approach when I have questions regarding the management of a COVID-19 patient, N (%) | | | | .285 |
| Strongly agree | 24 (6.92) | 12 (8.51) | 12 (5.83) | |
| Agree | 301 (86.74) | 123 (87.23) | 178 (86.41) | |
| Disagree | 22 (6.34) | 6 (4.26) | 16 (7.77) | |
| Strongly disagree | 0 (0.00) | 0 (0.00) | 0 (0.00) | |
| I am confident that I have enough knowledge on how to manage a COVID-19 patient, N (%) | | | | .203 |
| Strongly agree | 32 (9.25) | 16 (11.27) | 16 (7.84) | |
| Agree | 291 (84.10) | 120 (84.51) | 171 (83.82) | |
| Disagree | 23 (6.65) | 6 (4.23) | 17 (8.33) | |
| Strongly disagree | 0 (0.00) | 0 (0.00) | 0 (0.00) | |

| | | | | |
|---|---|---|---|---|
| The available information to the general public about COVID-19 disease is sufficient in Armenia, N (%) | | | | .237 |
| Strongly agree | 18 (5.28) | 9 (6.47) | 9 (4.46) | |
| Agree | 236 (69.21) | 98 (70.50) | 138 (68.32) | |
| Disagree | 82 (24.05) | 32 (23.02) | 50 (24.75) | |
| Strongly disagree | 5 (1.47) | 0 (0.00) | 5 (2.48) | |
| The healthcare system in Armenia has all of capability to control the COVID-19 epidemic situation, N (%) | | | | .752 |
| Strongly agree | 17 (5.12) | 7 (5.22) | 10 (5.05) | |
| Agree | 269 (81.02) | 111 (82.84) | 158 (79.80) | |
| Disagree | 45 (13.55) | 16 (11.94) | 29 (14.65) | |
| Strongly disagree | 1 (0.30) | 0 (0.00) | 1 (0.51) | |
| The interventions implemented by the Armenian government are sufficient to control the COVID-19 situation, N (%) | | | | .550 |
| Strongly agree | 12 (3.65) | 6 (4.65) | 6 (3.00) | |
| Agree | 264 (80.24) | 104 (80.62) | 160 (80.00) | |
| Disagree | 50 (15.20) | 17 (13.18) | 33 (16.50) | |
| Strongly disagree | 3 (0.91) | 2 (1.55) | 1 (0.50) | |

| ***Table 4. Practices regarding COVID-19 control and management, and bivariate comparisons of compliance to first-choice antibiotic recommendations*** | | | | |
|---|---|---|---|---|
| **Variables** | **Total** | **Compliant** | **Noncompliant** | |
| | **N=355 (100%)** | **N=144 (40.56%)** | **N=211 (59.44%)** | **p-value** |
| Which of the following are guiding your medical decisions while treating COVID-19 patients? N (%) | | | | |
| Armenian National Guidelines/protocols | 323 (90.99) | 131 (90.97) | 192 (91.00) | .994 |
| WHO guidelines | 175 (49.30) | 75 (52.08) | 100 (47.39) | .385 |
| US NIH/CDC guidelines | 95 (26.76) | 34 (23.61) | 61 (28.91) | .268 |
| Protocols/guidelines developed by our PHC facility | 98 (27.61) | 34 (23.61) | 64 (30.33) | .164 |
| My own medical experience | 256 (72.11) | 97 (67.36) | 159 (75.36) | .099 |
| Other | 17 (4.79) | 8 (5.56) | 9 (4.27) | .576 |
| Which of the following do you usually prescribe to mild COVID 19 cases during home-based treatment? N (%) | | | | |
| Antipyretics | 317 (89.30) | 135 (93.75) | 182 (86.26) | ***.025*** |
| Antivirals | 137 (38.59) | 46 (31.94) | 91 (43.13) | ***.034*** |
| Vit C | 288 (81.13) | 111 (77.08) | 177 (83.89) | .108 |
| Vit D | 285 (80.28) | 111 (77.08) | 174 (82.46) | .211 |
| Zn | 171 (48.17) | 57 (39.58) | 114 (54.03) | ***.007*** |

| | | | | |
|---|---|---|---|---|
| Anticoagulants | 149 (41.97) | 47 (32.64) | 102 (48.34) | ***.003*** |
| Corticosteroids | 16 (4.51) | 3 (2.08) | 13 (6.16) | .069 |
| Antibiotics | 23 (6.48) | 7 (4.86) | 16 (7.58) | .306 |
| Other | 44 (12.39) | 17 (11.81) | 27 (12.80) | .781 |
| For which of the following COVID-19 cases do you usually recommend hospitalization? N (%) | | | | |
| Confirmed, symptomatic COVID-19 pregnant patients | 270 (76.06) | 112 (77.78) | 158 (74.88) | .530 |
| Suspected COVID-19 patients with body temperature >38.5°C lasting 3 days and/or blood oxygen level SpO2 ≤93% and/or respiratory rate >22 per minute | 193 (54.37) | 84 (58.33) | 109 (51.66) | .215 |
| Confirmed COVID-19 patient, more than 60 years old, with pneumonia, without hypoxia | 168 (47.32) | 77 (53.47) | 91 (43.13) | .055 |
| Confirmed COVID-19 obese patient, with pneumonia, without hypoxia | 211 (59.44) | 94 (65.28) | 117 (55.45) | .064 |
| COVID-19 patients with body temperature >38.5°C lasting 3 days and/or blood oxygen level SpO2 ≤93% and/or respiration rate ≥30 per minute | 269 (75.77) | 109 (75.69) | 160 (75.83) | .977 |
| Other | 41 (11.55) | 20 (13.89) | 21 (9.95) | .255 |
| Do you use CRB-65 severity scores to make a decision regarding the need for hospitalization? N (%) | | | | .726 |
| Yes | 156 (44.44) | 66 (46.15) | 90 (43.27) | |

| | | | | |
|---|---|---|---|---|
| No | 76 (21.65) | 32 (22.38) | 44 (21.15) | |
| I am not aware of that score | 119 (33.90) | 45 (31.47) | 74 (35.58) | |
| How do you usually conduct monitoring of your COVID-19 patients? N (%) | | | | |
| Phone calls | 345 (97.18) | 142 (98.61) | 203 (96.21) | .179 |
| Home visits | 271 (76.34) | 117 (81.25) | 154 (72.99) | .072 |
| SMS | 75 (21.13) | 34 (23.61) | 41 (19.43) | .343 |
| Video calls | 111 (31.27) | 47 (32.64) | 64 (30.33) | .645 |
| Other | 23 (6.48) | 8 (5.56) | 15 (7.11) | .559 |
| I do not do any monitoring | 0 (0.00) | 0 (0.00) | 0 (0.00) | - |
| How long do you usually do daily monitoring of COVID-19 mild cases? N (%) | | | | .784 |
| I do daily monitoring | 351 (99.43) | 142 (99.30) | 209 (99.52) | |
| I do not do daily monitoring | 2 (0.57) | 1 (0.70) | 1 (0.48) | |
| Number of days, M (SD) | 13.57 (1.80) | 13.69 (1.66) | 13.49 (1.89) | .301 |
| How long do you usually do daily monitoring of COVID-19 asymptomatic cases? N (%) | | | | .977 |
| I do daily monitoring | 347 (98.58) | 141 (98.60) | 206 (98.56) | |
| I do not do daily monitoring | 5 (1.42) | 2 (1.40) | 3 (1.44) | |
| Number of days, M (SD) | 13.07 (2.46) | 13.25 (2.18) | 12.95 (2.63) | .267 |

| | | | | |
|---|---|---|---|---|
| For what reasons do you usually prescribe antibiotics to COVID-19 patients? N (%) | | | | |
| Prevention of pneumonia | 30 (8.45) | 11 (7.64) | 19 (9.00) | .650 |
| Management of all confirmed COVID-19 cases | 8 (2.25) | 0 (0.00) | 8 (3.79) | ***.018*** |
| Treatment of suspected bacterial pneumonia | 268 (75.49) | 119 (82.64) | 149 (70.62) | ***.010*** |
| Treatment of any type of radiologically confirmed pneumonia | 169 (47.61) | 57 (39.58) | 112 (53.08) | ***.012*** |
| Other | 45 (12.68) | 19 (13.19) | 26 (12.32) | .808 |
| On average, for how long do you prescribe empiric antibiotics to COVID-19 patients with pneumonia without complications? M (SD) | | | | |
| Number of min days | 5.26 (1.20) | 5.34 (1.16) | 5.21 (1.23) | .324 |
| Number of max days | 8.47 (2.49) | 8.69 (2.59) | 8.31 (2.42) | .191 |
| Please list the most frequently prescribed three antibiotics in your practice for COVID-19 patients in descending order. N (%) | | | | |
| Amoxicillin | 144 (40.56) | - | - | - |
| Azithromycin | 107 (30.14) | - | - | - |
| Ceftriaxone | 58 (16.34) | - | - | - |
| Doxycycline | 3 (0.85) | - | - | - |
| Levofloxacin | 29 (8.17) | - | - | - |
| Moxifloxacin | 9 (2.54) | | | |
| Clarithromycin | 1 (0.28) | - | - | - |

| | | | | |
|---|---|---|---|---|
| Which of the following COVID-19 patients do you usually prescribe combination antibiotic therapy? N (%) | | | | |
| All COVID-19 patients | 2 (0.56) | 2 (1.39) | 0 (0.00) | .087 |
| Adults who have comorbidities | 86 (24.29) | 38 (26.39) | 48 (22.86) | .447 |
| Patients who either had previously isolated *S. aureus* or *P. aeruginosa* from the upper respiratory tract or who had been hospitalized in the previous 90 days and were prescribed antibiotics | 67 (18.93) | 31 (21.53) | 36 (17.14) | .301 |
| All COVID-19 patients with pneumonia | 38 (10.73) | 16 (11.11) | 22 (10.48) | .850 |
| COVID-19 patients with severe and/or bacterial pneumonia | 33 (9.30) | 12 (8.33) | 21 (9.95) | .606 |
| Depending on the severity of COVID-19 | 28 (7.89) | 10 (6.94) | 18 (8.53) | .586 |
| None | 153 (43.22) | 61 (42.36) | 92 (43.81) | .787 |
| Other | 8 (2.26) | 4 (2.78) | 4 (1.90) | .587 |
| Please choose the most prescribed two-antibiotic combination therapies in your practice for COVID-19 patients with bacterial pneumonia in descending order. N (%)[1] | | | | |
| Clarithromycin+ Doxycycline | 0 (0.00) | 0 (0.00) | 0 (0.00) | - |
| Amoxicillin/Clavulanic acid+ Doxycycline | 3 (0.85) | 2 (1.39) | 1 (0.47) | .579 |
| Doxycycline+ Azithromycin | 4 (1.13) | 3 (2.08) | 1 (0.47) | .338 |
| Azithromycin+ Ceftriaxone | 43 (12.11) | 8 (5.56) | 35 (16.59) | ***.007*** |
| Amoxicillin/Clavulanic acid+ Azithromycin | 50 (14.08) | 32 (22.22) | 18 (8.53) | ***<.001*** |

| | | | | |
|---|---|---|---|---|
| Moxifloxacin+ Azithromycin | 6 (1.69) | 1 (0.69) | 5 (2.37) | .451 |
| Amoxicillin/Clavulanic acid+ Levofloxacin | 20 (5.63) | 14 (9.72) | 6 (2.84) | ***.022*** |
| Importance of listed factors for the decision to prescribe empirical antibiotic treatment, N (%) | | | | |
| Severity of disease (clinical presentation) | | | | .934 |
| 1(Least important) | 14 (4.09) | 7 (5.00) | 7 (3.47) | |
| 2 | 9 (2.63) | 4 (2.86) | 5 (2.48) | |
| 3 | 39 (11.40) | 17 (12.14) | 22 (10.89) | |
| 4 | 55 (16.08) | 21 (15.00) | 34 (16.83) | |
| 5 (Most important) | 225 (65.79) | 91 (65.00) | 134 (66.34) | |
| Laboratory markers | | | | .193 |
| 1(Least important) | 12 (3.48) | 5 (3.55) | 7 (3.43) | |
| 2 | 16 (4.64) | 7 (4.96) | 9 (4.41) | |
| 3 | 44 (12.75) | 10 (7.09) | 34 (16.67) | |
| 4 | 80 (23.19) | 36 (25.53) | 44 (21.57) | |
| 5 (Most important) | 154 (44.64) | 68 (48.23) | 86 (42.16) | |
| N/A[2] | 39 (11.30) | 15 (10.64) | 24 (11.76) | |
| Radiology findings | | | | .820 |
| 1 (Least important) | 7 (2.02) | 3 (2.13) | 4 (1.94) | |
| 2 | 8 (2.31) | 2 (1.42) | 6 (2.91) | |
| 3 | 39 (11.24) | 17 (12.06) | 22 (10.68) | |

| | | | | |
|---|---|---|---|---|
| 4 | 60 (17.29) | 21 (14.89) | 39 (18.93) | |
| 5 (Most important) | 205 (59.08) | 85 (60.28) | 120 (58.25) | |
| N/A[2] | 28 (8.07) | 13 (9.22) | 15 (7.28) | |
| Importance of below listed tests results for the decision to prescribe empirical antibiotic treatment, N (%) | | | | |
| C-reactive protein | | | | .554 |
| 1 (Least important) | 15 (4.34) | 5 (3.50) | 10 (4.93) | |
| 2 | 24 (6.94) | 6 (4.20) | 18 (8.87) | |
| 3 | 50 (14.45) | 21 (14.69) | 29 (14.29) | |
| 4 | 42 (12.14) | 18 (12.59) | 24 (11.82) | |
| 5 (Most important) | 167 (48.27) | 70 (48.95) | 97 (47.78) | |
| N/A[2] | 48 (13.87) | 23 (16.08) | 25 (12.32) | |
| Procalcitonin | | | | .234 |
| 1 (Least important) | 43 (13.35) | 13 (9.70) | 30 (15.96) | |
| 2 | 34 (10.56) | 13 (9.70) | 21 (11.17) | |
| 3 | 38 (11.80) | 12 (8.96) | 26 (13.83) | |
| 4 | 36 (11.18) | 19 (14.18) | 17 (9.04) | |
| 5 (Most important) | 84 (26.09) | 39 (29.10) | 45 (23.94) | |
| N/A[2] | 87 (27.02) | 38 (28.36) | 49 (26.06) | |
| White-blood count | | | | .377 |
| 1 (Least important) | 13 (3.78) | 5 (3.52) | 8 (3.96) | |

| | | | | |
|---|---|---|---|---|
| 2 | 19 (5.52) | 5 (3.52) | 14 (6.93) | |
| 3 | 52 (15.12) | 17 (11.97) | 35 (17.33) | |
| 4 | 69 (20.06) | 27 (19.01) | 42 (20.79) | |
| 5 (Most important) | 135 (39.24) | 62 (43.66) | 73 (36.14) | |
| N/A[2] | 56 (16.28) | 26 (18.31) | 30 (14.85) | |
| Neutrophil count | | | | .641 |
| 1 (Least important) | 12 (3.49) | 4 (2.82) | 8 (3.96) | |
| 2 | 19 (5.52) | 5 (3.52) | 14 (6.93) | |
| 3 | 50 (14.53) | 19 (13.38) | 31 (15.35) | |
| 4 | 64 (18.60) | 29 (20.42) | 35 (17.33) | |
| 5 (Most important) | 141 (40.99) | 58 (40.85) | 83 (41.09) | |
| N/A[2] | 58 (16.86) | 27 (19.01) | 31 (15.35) | |
| Has your institution developed its own guidelines/protocols for antibiotic treatment of patients with COVID-19? N (%) | | | | .780 |
| Yes | 93 (26.27) | 35 (24.31) | 58 (27.62) | |
| No | 251 (70.90) | 105 (72.92) | 146 (69.52) | |
| Do not know | 10 (2.82) | 4 (2.78) | 6 (2.86) | |
| Do you prescribe corticosteroids to your outpatient COVID-19 patients? N (%) | | | | ***.025*** |
| Yes | 215 (60.91) | 77 (53.85) | 138 (65.71) | |
| No | 138 (39.09) | 66 (46.15) | 72 (34.29) | |

| | | | | |
|---|---|---|---|---|
| Do you prescribe anticoagulants to your outpatient COVID-19 patients? N (%) | | | | ***.034*** |
| Yes | 318 (89.58) | 123 (85.42) | 195 (92.42) | |
| No | 37 (10.42) | 21 (14.58) | 16 (7.58) | |
| *1-Among n=355*<br>*2- Those tests are either unavailable or not used for this purpose* | | | | |

| ***Table 5. Practices regarding COVID-19 IPC and bivariate comparisons of compliance to first line antibiotic recommendations*** | | | | |
|---|---|---|---|---|
| **Variables** | **Total** | **Compliant** | **Noncompliant** | |
| | **N=355 (100%)** | **N=144 (40.56%)** | **N=211 (59.44%)** | **p-value** |
| During interaction with the COVID-19 patient, I wear the following PPE | | | | |
| Gown, N (%) | | | | ***.042*** |
| Never | 16 (4.52) | 2 (1.39) | 14 (6.67) | |
| Sometimes | 131 (37.01) | 51 (35.42) | 80 (38.10) | |
| Always | 207 (58.47) | 91 (63.19) | 116 (55.24) | |
| Surgical mask, N (%) | | | | .304 |
| Never | 2 (0.56) | 0 (0.00) | 2 (0.95) | |
| Sometimes | 15 (4.24) | 8 (5.56) | 7 (3.33) | |

| | | | | |
|---|---|---|---|---|
| Always | 337 (95.20) | 136 (94.44) | 201 (95.71) | |
| Gloves, N (%) | | | | .283 |
| Never | 35 (9.89) | 11 (7.64) | 24 (11.43) | |
| Sometimes | 131 (37.01) | 50 (34.72) | 81 (38.57) | |
| Always | 188 (53.11) | 83 (57.64) | 105 (50.00) | |
| Goggles, N (%) | | | | ***.036*** |
| Never | 24 (6.78) | 6 (4.17) | 18 (8.57) | |
| Sometimes | 126 (35.59) | 44 (30.56) | 82 (39.05) | |
| Always | 204 (57.63) | 94 (65.28) | 110 (52.38) | |
| During an interaction with a COVID-19 patient: | | | | .508 |
| My patient's clinical presentation and history influenced the decision in choosing PPE, N (%) | | | | |
| Never | 205 (58.07) | 82 (57.75) | 123 (58.29) | |
| Sometimes | 50 (14.16) | 17 (11.97) | 33 (15.64) | |
| Always | 98 (27.76) | 43 (30.28) | 55 (26.07) | |
| I perform hand hygiene before and after touching COVID-19 patients, N (%) | | | | .380 |
| Never | 4 (1.13) | 2 (1.39) | 2 (0.95) | |
| Sometimes | 10 (2.82) | 2 (1.39) | 8 (3.79) | |
| Always | 341 (96.06) | 140 (97.22) | 201 (95.26) | |

| | | | | |
|---|---|---|---|---|
| I keep at least a 1-m distance from patients whenever possible, N (%) | | | | .632 |
| Never | 12 (3.39) | 4 (2.80) | 8 (3.79) | |
| Sometimes | 79 (22.32) | 29 (20.28) | 50 (23.70) | |
| Always | 263 (74.29) | 110 (76.92) | 153 (72.51) | |
| I keep at least a 1-m distance from other healthcare workers whenever possible, N (%) | | | | .344 |
| Never | 15 (4.24) | 4 (2.80) | 11 (5.21) | |
| Sometimes | 72 (20.34) | 26 (18.18) | 46 (21.80) | |
| Always | 267 (75.42) | 113 (79.02) | 154 (72.99) | |

***Table 6. Vaccination status, attitudes and readiness, and bivariate comparisons of compliance to first-choice antibiotic recommendations***

| **Variables** | **Total** | **Compliant** | **Noncompliant** | |
|---|---|---|---|---|
| | **N=355 (100%)** | **N=144 (40.56%)** | **N=211 (59.44%)** | **p-value** |
| Do you think you are at risk of getting COVID-19 in the next 1 year? N (%) | | | | .891 |
| Yes | 136 (42.24) | 56 (41.79) | 80 (42.55) | |
| No | 186 (57.76) | 78 (58.21) | 108 (57.45) | |

| | | | | |
|---|---|---|---|---|
| If not, why do you think you are not at risk of getting COVID-19 in the next 1 year? N (%) | | | | ***.046*** |
| I believe I already had the disease and I am immune to it (not diagnosed by PCR) | 8 (4.37) | 3 (3.90) | 5 (4.72) | |
| I have already recovered and won't get re-infected (diagnosed by a PCR test) | 54 (29.51) | 16 (20.78) | 38 (35.85) | |
| I am vaccinated against COVID-19 | 105 (57.38) | 52 (67.53) | 53 (50.00) | |
| I did not have clinical symptoms but I have antibodies against COVID-19 | 5 (2.73) | 3 (3.90) | 2 (1.89) | |
| Other | 11 (6.01) | 3 (3.90) | 8 (7.55) | |
| If you get COVID-19, how severe do you think your COVID-19 infection be? N (%) | | | | ***.021*** |
| I will have mild symptoms which will probably not require hospitalization | 53 (58.24) | 29 (70.73) | 24 (48.00) | |
| I will have moderate symptoms which will probably need hospitalization | 21 (23.08) | 4 (9.76) | 17 (34.00) | |
| I will have severe symptoms which will probably require admission to the Intensive Care Unit | 17 (18.68) | 8 (19.51) | 9 (18.00) | |
| Have you received a COVID-19 vaccination? N (%) | 232 (65.35) | 107 (74.31) | 125 (59.24) | ***.003*** |
| How many doses of COVID-19 the vaccine have you received? N (%) | | | | .237 |

| | | | | |
|---|---|---|---|---|
| 1 dose | 86 (37.07) | 44 (41.12) | 42 (33.60) | |
| 2 doses | 146 (62.93) | 63 (58.88) | 83 (66.40) | |
| Please provide the product name of 1st does of the Covid-19 vaccine dose? N (%) | | | | .606 |
| AstraZeneca | 105 (46.46) | 47 (46.53) | 58 (46.40) | |
| Sputnik V | 76 (33.63) | 35 (34.65) | 41 (32.80) | |
| Coronavac | 39 (17.26) | 15 (14.85) | 24 (19.20) | |
| Sinopharm | 6 (2.65) | 4 (3.96) | 2 (1.60) | |
| Were you vaccinated against influenza in the past 2 years? N (%) | | | | .086 |
| Yes | 262 (73.80) | 115 (79.86) | 147 (69.67) | |
| No | 91 (25.63) | 28 (19.44) | 63 (29.86) | |
| Do not remember | 2 (0.56) | 1 (0.69) | 1 (0.47) | |
| **Attitudes towards COVID_19 vaccination** | | | | |
| In general, I am against vaccines. N (%) | | | | .890 |
| Strongly agree | 4 (1.14) | 2 (1.41) | 2 (0.95) | |
| Agree | 22 (6.25) | 8 (5.63) | 14 (6.67) | |
| Disagree | 257 (73.01) | 102 (71.83) | 155 (73.81) | |
| Strongly disagree | 69 (19.60) | 30 (21.13) | 39 (18.57) | |
| COVID-19 vaccines can significantly reduce the duration of the pandemic. N (%) | | | | .747 |
| Strongly agree | 60 (17.24) | 27 (19.29) | 33 (15.87) | |

| | | | | |
|---|---|---|---|---|
| Agree | 275 (79.02) | 107 (76.43) | 168 (80.77) | |
| Disagree | 10 (2.87) | 5 (3.57) | 5 (2.40) | |
| Strongly disagree | 3 (0.86) | 1 (0.71) | 2 (0.96) | |
| COVID-19 vaccines are the best way to prevent disease complications (for example, hospitalization, pneumonia). N (%) | | | | .185 |
| Strongly agree | 42 (11.97) | 20 (14.08) | 22 (10.53) | |
| Agree | 291 (82.91) | 118 (83.10) | 173 (82.78) | |
| Disagree | 18 (5.13) | 4 (2.82) | 14 (6.70) | |
| Strongly disagree | 0 (0.00) | 0 (0.00) | 0 (0.00) | |
| A COVID-19 vaccination should be mandatory for everyone who is eligible. N (%) | | | | .412 |
| Strongly agree | 20 (5.70) | 10 (7.04) | 10 (4.78) | |
| Agree | 249 (70.94) | 102 (71.83) | 147 (70.33) | |
| Disagree | 75 (21.37) | 29 (20.42) | 46 (22.01) | |
| Strongly disagree | 7 (1.99) | 1 (0.70) | 6 (2.87) | |
| A COVID-19 vaccination should be mandatory for all healthcare providers who are eligible. N (%) | | | | .334 |
| Strongly agree | 38 (10.76) | 14 (9.79) | 24 (11.43) | |
| Agree | 245 (69.41) | 106 (74.13) | 139 (66.19) | |
| Disagree | 64 (18.13) | 22 (15.38) | 42 (20.00) | |
| Strongly disagree | 6 (1.70) | 1 (0.70) | 5 (2.38) | |

| | | | | |
|---|---|---|---|---|
| COVID-19 vaccines are being rushed without appropriate testing. N (%) | | | | .058 |
| Strongly agree | 12 (3.75) | 3 (2.36) | 9 (4.66) | |
| Agree | 160 (50.00) | 54 (42.52) | 106 (54.92) | |
| Disagree | 145 (45.31) | 68 (53.54) | 77 (39.90) | |
| Strongly disagree | 3 (0.94) | 2 (1.57) | 1 (0.52) | |
| It is preferable to acquire immunity against infectious diseases naturally (by having the disease) rather than by vaccination. N (%) | | | | .259 |
| Strongly agree | 15 (4.48) | 6 (4.44) | 9 (4.50) | |
| Agree | 75 (22.39) | 23 (17.04) | 52 (26.00) | |
| Disagree | 233 (69.55) | 100 (74.07) | 133 (66.50) | |
| Strongly disagree | 12 (3.58) | 6 (4.44) | 6 (3.00) | |
| The safety of a vaccine developed in an emergency, during the pandemic, cannot be guaranteed. N (%) | | | | .197 |
| Strongly agree | 5 (1.71) | 3 (2.46) | 2 (1.17) | |
| Agree | 118 (40.27) | 41 (33.61) | 77 (45.03) | |
| Disagree | 165 (56.31) | 75 (61.48) | 90 (52.63) | |
| Strongly disagree | 5 (1.71) | 3 (2.46) | 2 (1.17) | |
| I trust science to develop safe new vaccines. N (%) | | | | .126 |
| Strongly agree | 28 (8.24) | 8 (5.88) | 20 (9.80) | |

| | | | | |
|---|---|---|---|---|
| Agree | 301 (88.53) | 126 (92.65) | 175 (85.78) | |
| Disagree | 11 (3.24) | 2 (1.47) | 9 (4.41) | |
| Strongly disagree | 0 (0.00) | 0 (0.00) | 0 (0.00) | |
| I trust science to develop effective new vaccines. N (%) | | | | .262 |
| Strongly agree | 26 (7.78) | 9 (6.62) | 17 (8.59) | |
| Agree | 300 (89.82) | 125 (91.91) | 175 (88.38) | |
| Disagree | 7 (2.10) | 1 (0.74) | 6 (3.03) | |
| Strongly disagree | 1 (0.30) | 1 (0.74) | 0 (0.00) | |
| I trust the Ministry of Health to ensure that safe vaccines are administered to the Armenian population. N (%) | | | | .054 |
| Strongly agree | 28 (8.64) | 13 (10.00) | 15 (7.73) | |
| Agree | 281 (86.73) | 116 (89.23) | 165 (85.05) | |
| Disagree | 13 (4.01) | 1 (0.77) | 12 (6.19) | |
| Strongly disagree | 2 (0.62) | 0 (0.00) | 2 (1.03) | |
| Would you advise your patients to get vaccinated for COVID-19? N (%) | | | | .790 |
| Yes | 346 (98.02) | 141 (98.60) | 205 (97.62) | |
| No | 3 (0.85) | 1 (0.70) | 2 (0.95) | |
| Not sure | 4 (1.13) | 1 (0.70) | 3 (1.43) | |