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# Pharmaceutical services in Romania during the COVID-19 pandemic

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## Abstract


Pharmacies played an important role in society during the pandemic, being visited by customers more often than before. Communication with them was more intense, and this allowed the pharmacies to expand into other types of services. The study presents the changes produced on the Romanian pharmacy market from the perspective of the customers. It measured the confidence of pharmacists, the degree of information about the services offered, the attitude towards new services (measuring blood pressure, blood sugar, osteoporosis, etc.) and opinions about vaccination in pharmacies. The results of the research showed that people have a very high degree of confidence in the advice they receive in pharmacies. The pharmacies provide basic services (dispense of medication, information on their use, and tips for improving the health), but less services for health testing, preparation of medicines, and involvement in health care programs. Citizens want to benefit from the new services that pharmacies are offering now (rapid tests for blood pressure, glucose or infections), but they are reluctant to testing spirometry, osteodensitometry, skin cancer and age related degenerative diseases (Alzheimer's) at pharmacies. However, vaccination in pharmacies is the most strongly rejected, especially by women, people with higher education, high incomes, and chronically ill.

**Key words:** pharmacies; vaccination; survey; Romania.

**Classification JEL:** A14 (Sociology of Economics); D22 (Firm Behavior: Empirical Analysis); D91 (Role and Effects of Psychological, Emotional, Social, and Cognitive Factors on Decision Making); G14 (Information and Market Efficiency; Event Studies; Insider Trading); I15 (Health and Economic Development); M14 (Corporate Culture; Diversity; Social Responsibility);

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## 1. Introduction

With the onset of the COVID-19 pandemic, countries have taken a set of measures to counteract it, based mainly on non-pharmaceutical interventions: wearing a mask, hand sanitization, physical and social distancing, travel restrictions, school closures, partial or total shutdown of the economy and society, etc. (Nicola et al, 2020). Following the outbreak of vaccines, public authorities in most countries were convinced that mass vaccination would end the pandemic and they began campaigning to promote vaccination, but faced rejection from some categories of population. Doubts about the safety of COVID vaccines have been largely the same as those against pneumococcal vaccines, shingles, human papillomavirus (HPV) or tetanus (MacDonald, 2015). They are based on fears that negative side effects are sometimes more serious than the virus itself, that there are other ways to fight the virus, that the risks of serious illness and death are low, and that there are hidden goals of pharmaceutical corporations and governments. Because reluctance to vaccinate is one of the top 10 threats to global health, the World Health Organization has established the Vaccine Confidence Project (VCP) since 2010, which has conducted numerous surveys, focus groups, in-depth qualitative researches, and discussions with experts (Larson et al, 2016) in order to understand the roots, trends and impact of mistrust, developing the "Vaccine Confidence Index" (VCI) which was implemented from 2015 to 2019 in 149 countries (de Figueiredo et al, 2020). The existence of standard global measurement indicators has led to the development of policies to reduce mistrust and increase acceptance of vaccines.

Given that four flu pandemics have caused global morbidity and mortality in the last century, several experts have tried to identify additional locations for vaccine administration beyond the medical offices and hospitals or polyclinics, and pharmacies have been perceived by some of them as key partners in public health (Meyerson et al, 2013; American Public Health Association, 2006; Centers for Disease Control and Prevention, 2012). Almost all people live near one or more pharmacies, they meet pharmacies in their ways when shopping (at the farmers market, at the supermarket, at the mall, etc.). Pharmacies have an extended schedule, until late in the evening, some are open 24 hours a day, on weekends and during public holidays, and they have a comfort zone where they can provide vaccination services often at a lower cost than at health care center, without an appointment or waiting time. Pharmacists have in-depth knowledge of the physicochemical properties of medicines and the body's reactions to them, and in some countries they are trained to make vaccines safely. In addition, pharmacists are always among the top three most honest and ethical professions (Gallup, 2020). Some experts have suggested that the involvement of pharmacists in immunization campaigns could prevent 16 million diseases, over 200,000 deaths and savings of up to 100 billion US dollars. (Bartsch et al, 2018).

The American Pharmacists Association (APhA) has consistently encouraged its members to become involved as educators (providing information, advice, and counseling on vaccines to

patients served), facilitators (host the immunization made by physicians and nurses, stockpile and distribute the vaccines) and immunizers (administering themselves the vaccines and intervening in case of adverse reactions). In recent decades, American pharmacists have widely administered various vaccines to accelerate the immunization of the population, and the spread of the A-H1N1 virus in 2009 has facilitated this. In 2011, one in five American adults was vaccinated against the flu at a pharmacy, and the percentage has increased year by year (Bach and Goad, 2015). In addition, 30% were vaccinated after finishing their work schedule, evening, night, weekend or holiday (Burson et al, 2016).

Most of the difficulties faced by American pharmacists in their vaccination work were related to legislative barriers, competition with physicians and their professional associations, inefficient reimbursement and compensation systems, and access to patient records databases (AJMC, 2018). The misinformation regarding the importance of vaccines among patients and those who provide these medical services played a significant role as well as the reserve of some pharmacy professionals that the expansion of their field of competence will greatly diminish their fundamental role and lead to loss of professional identity. These problems were studied by specialists long before the COVID-19 pandemic broke out, so vaccination in pharmacies was not a practice adopted by many states.

The spread of the SARS-VOC2 virus has led to an overcrowding of intensive care units in hospitals, overburdening of medical staff, and decisions that have created inequalities in the access of vulnerable people to treatment. Some countries have allowed pharmacists to be included in clinical prevention strategies, recognizing their role as health experts. Their professional associations have offered their services to governments, showing fundamental studies that demonstrated that pharmacists have a major role not only in determining the health of the population, but also in reducing health and economic inequities and in promoting the sustainable development of society (Rabionet, 2021 ).

The governments of some countries have refused to allow pharmacists to carry out vaccination, saying that there are studies that show that, even in highly developed countries, they have quite limited scientific knowledge in the field and this affects the formation of a correct opinion (Ciliberti et al, 2020; Della Polla et al, 2020). Strong opposition from medical associations has prevented the legislation from being amended, as they publicly expressed fears that overlapping responsibilities will create problems not only for the two professions, but also for the government in terms of covering insurance costs, as well as for citizens, who would be exposed to some risks because vaccination is not just a simple inoculation of a substance in the body, but it requires professional skills and organizational structures that pharmacists do not have. Pharmacies do not meet the conditions to implement vaccination policies, and the authorities do not have to grant such authorization to institutions that cannot guarantee the fulfillment of professional standards. Pharmacists can only be allies of public health care providers and their involvement in joint training courses will increase the protection of public health. They do not have access to the patients' medical records, disease history and do not know their relationship with the doctor who prescribes only certain vaccines and not others (Della Polla et al, 2020). Even though they responded promptly to the COVID crisis, providing supplies of medicine and

professional advice and reducing inequities, the new emerging strains of viruses require decisions based on medical studies and less so on pharmaceutical ones.

Despite strong opposition from physician associations to involving pharmacies in the administration of vaccination, the role of pharmacies in increasing the immunization of the population has been important, and studies have shown this (Isenor et al, 2016; Murray et al, 2021). Patients appreciated the involvement of pharmacists in the regular check-up of vaccines, proactive conversations and recommendations, attention to their needs. At the pharmacies where they could be vaccinated, 92% of patients were very satisfied with the injection technique and services received and 86% felt very comfortable with the vaccination administered by pharmacists (Papastergiou et al, 2014). The administration of vaccines by pharmacists is supported by two thirds of patients (MacDougall et al, 2016). They want a specialization in immunization and training for pharmacists, certification of service quality and licensing of the location, safety guarantees and the ability to intervene in case of side effects, pain, and fear of injection (Gerges et al, 2018) (Beal, 2020).

Research conducted on 992 subjects in Saudi Arabia (Al-Mohaithef and Pahdi, 2020) confirmed in the midst of the pandemic what the World Health Organization has stated even in 2014 (Report of the SAGE Working Group on Vaccine Hesitancy, 2014): that acceptance of the vaccine is determined by three factors: trust, convenience (affordability) and satisfaction. Pharmacies have played an important role in stimulating all these factors.

The COVID-19 pandemic has led to unexpectedly large increases in demand of drugs, not only for those who fight the virus, but also for those who support life and improve health. Demands have sometimes exceeded the ability of manufacturers to maintain acceptable levels of pharmacy supply, and drug shortages have been a stress factor. Many countries have had to import massive amounts of drugs and active pharmaceutical ingredients, especially from China and India. During the lockdown period (March-May 2020) many drug factories stopped production and, when they reopened, they did not have enough staff due to government imposed restrictions and the keeping their employee in quarantine. Production supervision and product testing were affected, and the quality of some medicines was lower. Travel bans have delayed the transport of medicines and their packaging. Monitoring the needs of the population and hospitals has been affected by the restrictions of movement and the change in reporting procedures (Choe et al, 2021).

Numerous countries have issued regulations on the production of some medicines and the strict monitorization of the supply chain. The intervention of the authorities in the market through massive imports, substantial financing, tax exemptions, stimulating the cooperation between domestic and foreign producers has increased the availability of medicines in pharmacies. Buyers were able to choose from a wider range of products. Investment in pharmaceutical research and development has increased in many countries, and the traditional dependence on the prices imposed by Big Pharma has diminished in favor of government subsidies. (Robinson, 2021; Corporate Europe Observatory, 2020).

The pandemic was an opportunity for the pharmaceutical market, producing major changes that continued even after the disappearance of panic in the first months (Ayati et al, 2020).

There has been an increase in online drug buying and online communication (tele-pharmacy), with suspicion that some people have misdiagnosed themselves, buying drugs that have produced reactions in contact with other treatments, that there has been abuse of drugs, sometimes of poor quality drugs. (Jairoun et al, 2021).

Pharmacists' collaboration with physicians, dentists, and other health professionals has been significantly improved during the pandemic and increased their role in human health care - pharmacists have felt part of an important system, even though their role has often been silenced. The pharmacy functioned as a triage system for those who had health problems, offering advice and treatment. (Moore, 2020).

The pandemic has allowed pharmacies to expand their services, offering advice for drug therapy management, diabetes control, testing for blood glucose, cholesterol, and various infectious diseases such as flu or streptococcus, etc. (Gombos, 2021). The focus on emerging clinical activities and services has increased the role of pharmacists in communities.

There are fears that, after the end of the pandemic, things will return to pre-2020 and that the relationship with pharmacists will diminish, but on the other hand, there is hope that people will not forget the effort made by pharmacists during this period and that the mark they left on the society will not be wiped out and the current trends in consumption of pharmaceuticals will be maintained.

## **2. Research methodology**

In order to determine the level of services offered by pharmacies, the changes in consumer behaviors and attitudes during the pandemic and the prospects for future market developments, a nationally representative opinion poll was conducted in Romania among the citizens living in cities.

Subsequent to this goal, the main objectives of the research were:

- Satisfaction and trust in the services received in pharmacies and in their staff
- The level of information and knowledge regarding the services offered by pharmacies
- Attitude towards the new services provided by pharmacies to its customers (blood pressure measurement, blood glucose, rapid testing, etc.)
- Flu vaccination in pharmacies: reasons for acceptance and rejection.

The research was conducted between February 15-26, 2021 on a sample of 1,003 subjects, representative of the adult population of Romania living in urban areas. The sample was non-probabilistic, structured by quotas, according to sex, age, level of education, type of urban locality, development regions (including all counties), income obtained in January 2021. Weights of each socio-demographic category were established according to the data of the National Institute of Statistics from the Tempo Online database.

The data was collected by telephone and online in equal proportions, with the help of a team of operators from the Social Research Bureau. As a first step, the people selected from the institute's databases were invited to complete the online questionnaire. In the second phase, the interviews were conducted by telephone until the completion of each socio-demographic category in order to ensure representativeness. The interview was answered by people living in 150 cities, out of a total of 319 existing cities in Romania. The final sample has a statistical error of +/- 3.1%, at a 95% confidence interval. In other words, out of a hundred surveys conducted on the same sampling scheme, 95 will have the same figures with variations in the margin of error of 3.1%, and 5 could have figures with larger differences. The verification of the correctness of the answers and the final balancing of the sample was performed by Professor Marin Burcea.

The questionnaire was created by professors Elena Druică, Marin Burcea and Viorel Mihăilă from the Center for Research in Applied Behavioral Economics within the Department of Administration and Business of the University of Bucharest. Seven and nine-step scales were used to measure the intensity of opinions on certain aspects. They were later grouped into a three-step, resulting in scales such as: agree – somehow agree - disagree; important – somehow important - unimportant; useful - somehow useful - useless.

The results of the survey were processed using the SPSS Statistics 20 program, and the answers are presented in absolute and relative numbers, without being weighted. In addition to the descriptive analysis of the variables, a series of correlations were made with the socio-demographic data, in order to highlight the consumers' profiles. Shapiro-Wilk tests for measuring the normality of variables and D'Agostino for asymmetry analysis were performed to verify the distribution of responses on the main variables.

The research was funded by the Romanian Association of Pharmaceutical Distributors and Retailers and the Romanian College of Pharmacists, based on contract no. 2 / 11.02.2021. A summary of the results was presented at the Parliament Palace on June 15, 2021 in the presence of the most important public authorities in Romania (deputies, senators, ministers, secretaries of state, etc.) and personalities in the pharmaceutical field (ADRF, 2021).

The structure of the interviewed population keeps the characteristics of the structure of the adult urban population of Romania, with an error of +/- 3.1%. Table 1 shows the final structure of the sample on 6 criteria.

**Table 1. Socio-demographic characteristics of the interviewed population**

<b>Variable</b>		<b>Number</b>	<b>Percent</b>
<b>Sex</b>	Masculine	435	43,4%
	Feminine	568	56,6%
<b>Age group</b>	18-34 years	231	23,0%
	35-49 years	292	29,1%
	50-65 years	275	27,4%
	Over 65 years	205	20,4%
<b>Level of education</b>	Elementary and vocational school	118	11,8%
	High School	575	57,3%

	Higher education (college, master, Ph.D)	310	30,9%
<b>Type of urban locality</b>	City, capital of county	657	65,6%
	Other city/town	346	34,4%
<b>Region of development</b>	Centre	119	11,9%
	West	89	8,9%
	South Muntenia	143	14,3%
	North East	181	18,0%
	North West	129	12,9%
	South East	127	12,7%
	South West Oltenia	98	9,8%
	București Ilfov	117	11,7%
<b>Monthly income</b>	Sub 1.000 RON	122	12,2%
	1.001 – 1.999 RON	224	22,3%
	2.000 – 2.999 RON	248	24,7%
	3.000 – 3.999 RON	151	15,1%
	4.000 – 4.999 RON	98	9,8%
	5.000 – 5.999 RON	64	6,4%
	6.000 – 6.999 RON	27	2,7%
	Peste 7.000 RON	69	6,9%
<b>Total</b>		<b>1003</b>	<b>100%</b>

### 3. Results and discussions

#### 3.1. The medical profile of the urban population in Romania

Almost three quarters of the adult inhabitants of Romanian cities went to the pharmacy at least once a month. One in five people over the age of 65 accessed the services of a pharmacy every week.

**Table 2. How often people go to the pharmacy**

<b>Approximately, how often do you go to the pharmacy?</b>	<b>Percent</b>
More often than once a week	3,5%
Once a week	13,4%
Twice a month	27,5%
Once a month	26,7%
Even more rarely	28,9%

Women, people with elementary education, those over 65 years old, married, domiciled in the south of the country (except Bucharest) went to the pharmacies most often. People under the age of 35 go to pharmacies 3 times less than those over the age of 65, and those with less than 10 years of education go to pharmacies twice as often as those with



completed high school education. Cohabiting people go to pharmacies more than twice as often as the married ones.

People use pharmaceuticals not only for themselves but also for others close to them. Seventy percent of the urban population of Romania considers their health condition to be very good, grading their health with 8, 9 and 10 on a scale from 1 to 10. The average health grade is 8 and only 9% give their health less than 5, saying that their health is worse compared to other people their age. The self health assessment gets higher with the number of years of study (from 7.4 average grade of those with less than 10 years of education to 8.2 average grade of those with higher education) and decreases with age (from the grade 8.9 of those aged 18-29 to the grade 7.1 given by those over 65).

Three out of ten people are treated for a chronic illness. More than half of the chronically ill are people over the age of 65, and 41% are in the 50-64 age group.

**Table 3. Situation of the chronically ill**

<b>Do you get health care for a chronic condition?</b>	<b>Yes</b>	<b>No</b>
18-34 years	6,9%	93,1%
35-49 years	20,2%	79,8%
50-64 years	41,1%	58,9%
Over 65 years	52,7%	47,3%
<b>Total</b>	<b>29,5%</b>	<b>70,5%</b>

Those under a treatment for chronic illness are more women than men (32% versus 26%), more people with basic education than with secondary education (37% versus 24%), more married people than those living in cohabitation (34% versus 13%), more those with incomes over 6,000 lei per month than those with incomes below 4,000 lei (48% versus 23%).

### **3.2. Satisfaction with the services provided by pharmacies and confidence in the advice provided**

Satisfaction with the services offered in pharmacies is at a very high level. On a scale of 1 to 9, where 1 means total dissatisfaction and 9 means total satisfaction, citizens gave an average grade of 7.7. Table 4 shows the distribution of percentages on each step of the measurement scale and a synthesis on 3 steps.

**Table 4. Satisfaction with the services provided by pharmacies**

<b>On a scale of 1 to 9, where 1 means not at all satisfied and 9 means fully satisfied, how satisfied are you in general with the services provided to you in pharmacies?</b>		
<b>1</b>	1,1%	Not satisfied: 2,2%
<b>2</b>	0,5%	
<b>3</b>	0,6%	

<b>4</b>	2,2%	Average satisfied: 13,0%
<b>5</b>	4,6%	
<b>6</b>	6,2%	
<b>7</b>	17,3%	Satisfied: 84,8%
<b>8</b>	25,9%	
<b>9</b>	41,6%	

Satisfaction decreases as people have more frequent contact with pharmacies; it is high for those who rarely go to pharmacies (average 8.6) and decreases for those who use it more often than once a week (average 7.1), but it is still high. Women, people with elementary education, the elderly, the married and those with incomes below 2,000 lei per month have a lower level of satisfaction than the average of the urban population.

Confidence in the advice received in pharmacies is also at a very high level. On the same scale from 1 to 9, the citizens gave an average grade of 7.1. Table 5 shows the distribution of responses regarding the confidence on each stage of the measurement scale.

**Table 5. Confidence in advice received in pharmacies**

<b>On a scale of 1 to 9, where 1 means no confidence and 9 means total confidence, how much confidence do you have in the advice you receive in pharmacies?</b>		
<b>1</b>	3,0%	Lack of confidence: 7,9%
<b>2</b>	2,1%	
<b>3</b>	2,8%	
<b>4</b>	2,6%	Average confidence: 19,3%
<b>5</b>	7,5%	
<b>6</b>	9,2%	
<b>7</b>	19,3%	
<b>8</b>	21,9%	Confidence: 72,8%
<b>9</b>	31,6%	

If satisfaction with pharmacy services decreases as people use their services more often, confidence in pharmacist counseling increases with increasing pharmacy visits. Those who go to pharmacies weekly have significantly more confidence in the advice offered by pharmacists than those who rarely go (7.5 versus 6.9). In the counties of Western Romania and in the small towns, people have more confidence in advising provided by pharmacists than in the South-East of the country and in the county capital cities. Confidence grows as the level of education increase and is high for people over 65 and with low incomes.

Statistical tests show that education is the main criterion that produces variations in satisfaction and confidence in pharmacies. Those with more years of schooling tend to give higher grades than those with up to 10 years of education. It is followed by age (young people have more satisfaction and confidence in pharmacists than the elderly), sex (women appreciate pharmacy services more critically than men), geographical area (those from the

West of the country are more satisfied than those in the South and East) and marital status (people living in cohabitation are more satisfied than those who are married or single).

Satisfaction with the services offered by pharmacies is given by several factors: the characteristics of the pharmacies, the interaction with the pharmacist and the specialized advice. Tables 6, 7 and 8 show the grouping of questions according to each of these characteristics. Each table is followed by comments showing the variations of opinions according to the socio-demographic criteria analyzed.

**Table 6. Evaluation of the pharmacies' characteristics**

<b>Please rate your perception of the following statements on a scale of 1 to 7, where 1 means that you do not agree at all with them and 7 means that you completely agree with them:</b>	<b>Agree</b> <i>Note</i> 6-7	<b>Somehow agree</b> <i>Note</i> 3-5	<b>Disagree</b> <i>Note</i> 1-2	<b>Average</b> <i>Note</i> 1-7
Pharmacy is very clean	89,3%	10,3%	0,4%	6,5
Pharmacy's location is convenient	80,6%	17,1%	2,3%	6,2
The medication I need is available	78,1%	19,6%	2,3%	6,0
The pharmacy staff is sufficient to serve customers in a reasonable time	67,4%	29,0%	3,6%	5,7
The waiting area in the pharmacy is comfortable and convenient for me	62,9%	30,8%	6,3%	5,6
The cost of the medication I need is reasonable	42,5%	48,9%	8,7%	5,0

The cleanliness of the pharmacy, its position close to home, and the availability of the necessary medicines are the most appreciated aspects of the pharmacies in Romania. And the cost of medicines is the weakest point most frequently mentioned, especially in Bucharest and in the South and East of Romania, by women and people over 65 years of age. The higher the monthly income, the greater the dissatisfaction with drug prices. Dissatisfaction with the cost of medicines increases as people go to pharmacies more often.

**Table 7. Interaction with the staff in pharmacies**

<b>Please rate your perception of the following statements on a scale of 1 to 7, where 1 means that you do not agree at all with them and 7 means that you completely agree with them:</b>	<b>Agree</b> <i>Note</i> 6-7	<b>Somehow agree</b> <i>Note</i> 3-5	<b>Disagree</b> <i>Note</i> 1-2	<b>Average</b> <i>Note</i> 1-7
The pharmacist was polite	88,6%	10,6%	0,8%	6,4
The pharmacist was respectful with the customers	86,5%	12,7%	0,8%	6,4
The pharmacist was available during my visit	82,9%	15,6%	1,6%	6,2
The pharmacist showed interest toward my needs	79,4%	18,5%	2,1%	6,1
The pharmacist treats all customers the same	78,5%	18,6%	2,9%	6,1
The time taken by the pharmacist to process a prescription was reasonable	70,6%	24,5%	4,9%	5,8

The pharmacist was bored while interacting with me	18,3%	22,4%	59,2%	2,8
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The interaction with the pharmacist is perceived as very favorable: politeness, respect, availability, and speed of service were appreciated by the majority of the population, especially young people, men, those with higher education, those from the West of the country, who rarely use pharmacy products. Especially the women, those from big cities and county capitals, and those with secondary education complained more about the bored pharmacists.

**Table 8. Professional advice**

<b>Please rate your perception of the following statements on a scale of 1 to 7, where 1 means that you do not agree at all with them and 7 means that you completely agree with them:</b>	<b>Agree</b> <i>Note</i> 6-7	<b>Somehow agree</b> <i>Note</i> 3-5	<b>Disagree</b> <i>Note</i> 1-2	<b>Average</b> <i>Note</i> 1-7
The time given by the pharmacist for my medication advice was sufficient	78,4%	18,1%	3,5%	6,0
The pharmacist constantly stressed the importance of taking the medication as recommended	71,5%	23,2%	5,3%	5,8
The pharmacist explained to me the details of taking the medicine in a language I understand	69,7%	21,2%	9,1%	5,7
The pharmacist gave me written instructions on how to take the medicine	61,7%	25,0%	13,3%	5,3
The pharmacist gave me information about the precautions I need to take when taking medication.	59,3%	26,1%	14,6%	5,2
The pharmacist gave me information on how to store the medicines correctly	52,8%	28,9%	18,3%	5,0
The pharmacist gave me information about possible interactions between my medication and other medications	45,0%	31,2%	23,8%	4,6
The pharmacist gave me information about the side effects that the medicines can cause	43,3%	32,2%	24,5%	4,6
The pharmacist gave me additional advice in addition to medication (diet, exercise, etc.)	34,6%	33,8%	31,6%	4,1

People receive advice from pharmacists that is satisfactory in terms of how the medicine should be taken, but insufficient in terms of side effects, interactions with other medicines or foods, and storage conditions. Women, those with secondary education, from the big cities, from the South and East of Romania (the Old Kingdom) and the chronically ill were the most critical in terms of the advice received from pharmacists.

The correlations show that the satisfaction with the services received in the pharmacies is determined by the characteristics of the pharmacy, by the attitude of the pharmacist, by the

time given to their customers, and by the professional advised offered. Also, people who say they can afford to buy medicine have shown a higher degree of satisfaction with pharmacies.

Not all pharmacies offer the same services and not all services offered by pharmacies are known by customers. Table 9 shows the hierarchy of services offered.

**Table 9. Services provided by pharmacies**

<b>In your opinion, what are the main services now offered by pharmacies near you?</b>	<b>Yes</b>	<b>No</b>	<b>I don't know</b>
Release of prescription drugs	82,5%	5,0%	12,6%
Informing and advising patients on the use of medicines	68,9%	16,0%	15,1%
Release of over-the-counter medications	68,6%	14,3%	17,1%
Informing and advising patients on the maintenance of their health	49,9%	27,3%	22,8%
Testing of biological parameters with special equipment (blood pressure, blood glucose, spirometry)	33,7%	35,3%	31,0%
Preparation of medicines (in pharmacy, on request) or other health products	33,7%	25,4%	40,9%
Participation in programs and campaigns to promote and protect the health of the population	26,1%	20,9%	53,0%

Pharmacies offer basic services (over-the-counter and prescribed medicines, information on their use and how to improve and maintain health), but to a lesser extent they offer health testing, medicine preparation, and involvement in health care programs. The latter services are little known, found especially in large cities, county capitals, in Western Romania.

### **3.3. Attitude towards new services that could be offered by pharmacies**

Regarding the usefulness of new services offered by pharmacies, the answers were generally predictable: almost all are wanted by more than two thirds of citizens. With one exception: preventive flu shot. Table 10 shows the hierarchy of the most useful new services according to the preferences of the urban population.

**Table 10. The usefulness of new services offered in pharmacies**

<b>On a scale of 1 to 7, where 1 = not at all useful and 7 = very useful, how useful would it be for the services below to be offered in pharmacies through specially trained pharmacists?</b>	<b>Useful</b>	<b>Somehow useful</b>	<b>Useless</b>	<b>Average</b>
	<i>Note 6-7</i>	<i>Note 3-5</i>	<i>Note 1-2</i>	<i>Note 1-7</i>
Determination of blood pressure, determination of cholesterol - for preventing cardiovascular diseases	79,5%	11,8%	8,7%	6,1
Determination of blood sugar - for preventing diabetes	78,3%	12,7%	9,0%	6,0
Performing rapid tests for detecting infections	75,5%	12,5%	12,0%	5,8

such as Sars-VOC2, Hepatitis B and C, seasonal flu				
Advanced periodic advising in case of polymedicine (for patients treated with more than 5 medications)	72,2%	17,6%	10,2%	5,7
Spirometry - for the early detection of lung diseases	70,5%	15,7%	13,8%	5,6
Remote advising (online, by phone) on how to take medication	69,4%	19,0%	11,6%	5,6
Assessment of auditory / visual acuity	68,9%	17,4%	13,7%	5,6
Osteodensitometry - for preventing osteoporosis	68,1%	18,3%	13,6%	5,6
Remote advising (online, by phone) on possible interactions between my medication and other medications	68,1%	18,9%	13,0%	5,6
Early detection of severe dermatological conditions (skin cancer)	67,6%	17,5%	14,9%	5,6
Remote advising (online, by phone) on performing rapid tests in pharmacies to detect infections (for Sars-Cov2, Hepatitis B and C, seasonal flu)	66,6%	18,8%	14,6%	5,5
Alzheimer's test - for preventing degenerative diseases of age	66,3%	18,3%	15,4%	5,5
Smoking cessation assistance	64,3%	21,2%	14,5%	5,5
Prevention of transmissible diseases through vaccination (eg. influenza vaccination)	11,9%	19,3%	68,8%	2,2

People would like to benefit from new services in pharmacies, the most useful being the measurement of blood pressure, blood sugar, performing quick tests to detect infections. Correlations and significance tests have shown that the usefulness of these services increases as people go to pharmacies more often. It is also high in the North, center and West of the country and lower in the South and in Bucharest, it is greater in small cities than in large ones, and more appreciated by men than by women. The usefulness of these services decreases as the years of education increase, those with higher education being more skeptical than those with less than a high school diploma. Patients with treatment for chronic diseases have less confidence in the new services that can be offered by pharmacies, and distrust grows with the monthly income increases: people with higher incomes want to benefit from these services in medical offices and not in pharmacies.

The ranking of the most useful of the new services offered in pharmacies presented in Table 11 does not differ much from the table above, but it shows more clearly the preferences of patients for testing for cardiovascular disease, for detecting infections such as hepatitis or flu and for measuring blood glucose. These three services get the approval of the half of the population studied.

**Table 11. Ranking of the most useful new services offered by pharmacies, from the customers' perspective**

Which new services do you think are most useful to you if they were offered by pharmacies? ( <i>only one answer</i> )	Percent
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Determination of blood pressure, determination of cholesterolemia - for preventing cardiovascular diseases	23,3%
Performing rapid tests for detecting infections such as Sars-VOC2, Hepatitis B and C, seasonal flu	14,7%
Determination of blood sugar - for preventing diabetes	12,3%
Spirometry - for the early detection of lung diseases	8,6%
Smoking cessation assistance	6,7%
Advising on performing rapid tests in pharmacies to detect infections (for Sars-Cov2, Hepatitis B and C, seasonal flu)	6,4%
Advice on how to take medication	4,7%
Assessment of auditory / visual acuity	4,1%
Advising on possible interactions between my medication and other medications	4,1%
Early detection of severe dermatological conditions (skin cancer)	4,1%
Alzheimer's test - for preventing degenerative diseases of age	3,8%
Osteodensitometry - for preventing osteoporosis	3,0%
Advanced periodic advising in case of polymedicine (for patients treated with more than 5 medications)	2,6%
Prevention of transmissible diseases through vaccination (eg. influenza vaccination)	1,8%

The correlations made show that the measurement of blood pressure is more desirable by men than by women (27% versus 20%), by those with elementary education than by those with college education (30% versus 20%), by those over 65 twice as much as young people under 30 (32% versus 16%), by married people twice as much as those living in cohabitation (26% versus 13%), by those on low incomes (less than 3,000 lei per month) than by those with high incomes (27% versus 14%), by chronically ill than by healthy people (27% versus 21%).

Rapid tests for detecting infections are more desirable for women, small town residents, those with secondary education (high school graduates: 18%), young people under 30 (21% - 3 times more than those over the age of 65: 8%), singles, those with low incomes and those who are not treated for any chronic disease.

Measurement of blood glucose in pharmacies is especially desirable for people with higher education, over 50 years, with chronic diseases.

Spirometry is especially in demand in large cities, by young people with average monthly incomes, who do not have chronic diseases.

Regarding the safety of these new services that could be provided by pharmacies, research shows that people tend to accept many of them as quite safe, but to be skeptical about the safety of spirometry, osteodensitometry, Alzheimer's test, and skin cancer screening. In these four situations, most people think that these services are safer if they are performed in medical offices.

**Table 12. Confidence in the new services offered by pharmacies, compared to those offered by polyclinics**

<b>Which of the following new services provided in pharmacies by specially trained pharmacists is considered as safe/reliable as in polyclinics/primary health care provider?</b>	<b>It would be equally safe</b>	<b>It wouldn't be equally safe</b>
Determination of blood sugar - for preventing diabetes	80,0%	20,0%
Smoking cessation assistance	76,1%	23,9%
Determination of blood pressure, determination of cholesterolemia - for preventing cardiovascular diseases	75,6%	24,4%
Advice on how to take medication	73,5%	26,5%
Performing rapid tests for infections such as Sars-VOC2, Hepatitis B and C, seasonal flu	70,9%	29,1%
Advising on possible interactions between my medication and other medications	70,2%	29,8%
Advising on performing rapid tests in pharmacies to detect infections (for Sars-Cov2, Hepatitis B and C, seasonal flu)	69,6%	30,4%
Advanced periodic advising in case of polymedicine (for patients treated with more than 5 medications)	68,6%	31,4%
Prevention of transmissible diseases through vaccination (eg. influenza vaccination)	64,0%	36,0%
Assessment of auditory / visual acuity	62,0%	38,0%
Spirometry - for the early detection of lung diseases	55,7%	44,3%
Osteodensitometry - for preventing osteoporosis	49,4%	50,6%
Alzheimer's test - for preventing degenerative diseases of age	46,9%	53,1%
Early detection of severe dermatological conditions (skin cancer)	44,5%	55,5%

Early detection of severe dermatological conditions within a pharmacy is the service that most people consider the most inappropriate to perform in these locations. More reticent are people from the Old Kingdom (Muntenia and Moldova), from the county capitals, with higher education, aged 35-65, with high incomes, who rarely go to pharmacies. The Alzheimer's test for preventing degenerative diseases is viewed with skepticism by the same social groups too if the test is done in pharmacies. The statistical analyzes carried out highlighted a profile of people who trust the safety of these new services provided by pharmacies: they have low incomes, live in Western Romania, in small towns, have elementary and secondary education, are young and have no chronic diseases. The skepticism is higher in the case of polymedicine of some patients - 69% of those who take more than 5 drugs were reluctant to expand the services offered by pharmacist in a field occupied so far by doctors.

The use of new services that could be offered by pharmacies was measured in the questionnaire through the scheme proposed by Icek Ajzen in 1991, known in the literature as the theory of planned behavior. It essentially states that various types of behaviors - such as behaviors toward new services offered in pharmacies - can be predicted with a high level of accuracy if attitudes, subjective norms, and perceived behavioral control are measured. These are related to certain sets of beliefs and they determine the intentions. And the intentions consistently explain future behavior. The attitude-norms-control scheme was



measured by a set of 15 questions, and the research results confirm the theoretical model with accuracies of 70% to 90% for each item. When people feel that the decision to use the new services provided by pharmacies will not be manipulated but will be entirely theirs, that those services will bring them positive results, that they will be able to use the new services easily and save time by using them, people will be inclined to look at them favorably and test their effectiveness. Their reluctance is related to the hostile family environment, cumbersome access procedures, and unknown complications that may arise from their use. Table 13 presents the answers to 15 questions, constructed according to the theory of planned behavior (Azjen, 1991).

**Table 13. The use of new services offered by pharmacies**

<b>On a scale of 1 to 7, where 1 means 'total disagreement' and 7 means 'total agreement', to what extent do you agree with the following statements?</b>	<b>Agree</b> <i>Note 6-7</i>	<b>Somehow agree</b> <i>Note 3-5</i>	<b>Disagree</b> <i>Note 1-2</i>	<b>Average</b> <i>Note 1-7</i>
The decision to use the new pharmacy services will be entirely mine	82,6%	11,3%	6,2%	6,2
Using new pharmacy services is beneficial for me	67,8%	20,6%	11,6%	5,6
I expect a simple and easy registration procedure to access these new pharmacy services.	67,3%	19,8%	12,9%	5,6
I think I will save time by using these new pharmacy services	67,3%	20,2%	12,5%	5,5
I expect a more efficient service in pharmacies with this new offer	67,1%	19,9%	13,0%	5,5
I expect good promotion of these new pharmacy services in hospitals, polyclinics and doctors' offices.	66,9%	20,1%	13,0%	5,5
I expect the new pharmacy services to be reimbursed by CNAS	65,6%	19,0%	15,4%	5,5
I will try to use the new services as soon as they become available	64,9%	20,9%	14,2%%	5,5
I see no obstacle in using these new services offered in pharmacies	63,7%	23,6%	12,7%	5,5
I intend to use the services as soon as they become available	62,9%	23,0%	14,1%	5,4
I plan to use these services as soon as they are available	61,0%	25,2%	13,8%	5,3
I think my family and friends will think I should use the new pharmacy services	58,3%	27,5%	14,2%	5,3
I am sure that family and friends will use these services as soon as they are available	58,2%	29,5%	12,3%	5,3
Using new services in pharmacies is easy	54,4%	32,0%	13,6%	5,2
Adding new services to pharmacies is not a good idea	31,9%	21,0%	47,1%	3,6

Correlations and statistical tests show that the biggest fear in using the new services offered in pharmacies is related to the difficulty of accessing and understanding them - almost half of the subjects fear that these services will not be able to be used too easily. The inhabitants of Bucharest and the big cities, women, college graduates, the elderly, people with above average incomes, the chronically ill are those who most frequently express this fear. These social groups justify their reluctance by arguing that family and friends will not use the new services too quickly. In fact, these new services represent a cognitive overload that tires some people because of their complexity and difficulty in understanding the results. This reveals a lack of experience in the use of equipment and procedures, an increasingly difficult adaptation to the new technologies, and a need for support and guidance. The transfer of some services from the medical office to the pharmacy affects a mental pattern of some people, a pattern built over time, humbly learned by the state in the queues of some polyclinics, maintained at huge expense.

Confidence in pharmacists significantly influences confidence in the using the new services, and correlations show that around the age of 36-37 the idea of rejecting new services begins to be structured, and this rejection increases as people get older, reaching to one third of retirees. Similarly, low-income people tend to use the new services, but as the monthly income increases, the intention to use them decreases, and the decrease becomes steep for those who have more than 1,000 EURO per month.

People in poor health (who evaluate their health with a grade of 1 to 3 on a scale of 10) and those in very good health (who grade their health from 8 to 10) strongly expresses their intention to use the new services, while those with a “middle” health (who grade their health from 4 to 7) are the most reluctant to the new services offered in pharmacies.

### **3.4. Flu vaccination in pharmacies**

About a third of the urban adult population in Romania has been vaccinated in the last flu seasons. Most of them have higher education, are over 50 years old, have medium and high monthly incomes, have chronic diseases and go to pharmacies frequently.

Another 47% of respondents would be willing to get vaccinated and pay for it. Most of them are men, with elementary and secondary education, young people under 30, but also people over 65, with low incomes, without chronic diseases. Table 14 shows the distribution of responses on the amount people are willing to pay in order to get the vaccine at pharmacies.

**Table 14. The amount that people are willing to pay in order to get the vaccine at pharmacy**

<b>How much would you be willing to pay for the vaccine to be given to you in a pharmacy by a specially trained pharmacist?</b>	<b>Percent</b>
10 lei	34,4%
20 lei	18,5%

30 lei	19,1%
Over 30 lei	5,0%
0 lei / I don't want to get vaccinated / I've already had the vaccine	23,0%

Most people would therefore be willing to pay 2-3 EURO to get vaccinated at pharmacies. Higher amounts would be willing to pay people in the West of the country, in small towns, men, with secondary education, young people under 30, with a monthly income of over 1,000 EURO, who do not have chronic diseases.

Therefore, 80% of the adult population of Romanian cities have been vaccinated or agree to be vaccinated. But not everyone believes in the protection that the flu vaccine offers in the event of an infection. Table 15 shows the confidence in the effectiveness of flu vaccines, measured on a scale of 1 to 7. The national average is 5.5.

**Table 15. Protection given by the flu vaccines**

To what extent do you think flu vaccine protects you from complications if you get sick? Choose an answer on a scale of 1 to 7, where 1 means not at all and 7 means a lot.		
<b>1</b>	6,1%	Not at all: 10,0%
<b>2</b>	3,9%	
<b>3</b>	3,4%	A little: 29,3%
<b>4</b>	11,7%	
<b>5</b>	14,3%	
<b>6</b>	18,5%	A lot: 60,7%
<b>7</b>	42,2%	

The correlations show that the inhabitants of Bucharest and in the South and East of Romania, those with high school diplomas, those over 50 years old, married, with low monthly income (under 1,000 EURO) have the highest distrust in the efficiency of vaccines. The regression analysis shows that people who think they are in poor health (grades 1 to 3) or in good health (grades 8 to 10) have more confidence in the effectiveness of flu vaccines than those who think they have an average state of health (grades 4 to 7).

Barriers to vaccination were measured through 5 items and the results presented in Table 16 show that all 5 anti-vaccination reasons have high weights in the population value system. Government pro-vaccination campaigns have provoked rejection in 4 out of 10 citizens.

**Table 16. Reasons for not getting the flu vaccine**

Tell us how important the following reasons are for you in a decision not to get vaccinated.	Important <i>Note 6-7</i>	Somehow important <i>Note 3-5</i>	Unimportant <i>Note 1-2</i>	Average <i>Note 1-7</i>
I am convinced that my body can cope without the need for vaccination	45,6%	34,1%	20,3%	4,7
The work schedule of my health care	43,2%	26,5%	30,3%	4,4

provider/polyclinic ends before I can get there from work				
I don't trust the vaccine	42,6%	31,0%	26,4%	4,5
It is difficult for me to get to the health care provider/polyclinic	41,1%	28,3%	30,6%	4,3
The vaccine is too expensive	40,3%	34,1%	25,6%	4,4

There are reasons for the difficult access to the vaccine when it is administered in the family doctor's office or in the polyclinic and there is a lack of confidence in the vaccine. For whatever reason, barriers to vaccination are higher for women in large cities with low levels of education, low monthly incomes, who have not been vaccinated and do not suffer from any chronic disease, but who report having an average health (who self evaluate their health with score from 4 to 7 on a scale of 1 to 10). In addition, it is significant that married people are more reluctant to vaccination than single people or those who cohabit. The Shaphiro-Wilk test shows that the wife is an impediment against vaccination, which acts with the same force, but in the opposite direction, as college diplomas to support vaccination. Single women or those living in cohabitation do not have such a negative attitude toward the vaccine as married women, and men's attitudes toward vaccination are more neutral or favorable, regardless of their marital status. For men, the impediments are more closely linked to access to the vaccine, as in the case of people with higher education; they say that the doctor's schedule does not overlap with their schedule or that it is difficult for them to reach the health care provider.

Because vaccination with at a doctor's office is more difficult than vaccination at pharmacy, the questionnaire included 6 questions to measure the attitude towards vaccination at pharmacies, and Table 17 shows the distribution of answers, grouped from 7 to 3 scales, as well as the average grade obtained.

**Table 17. Opinions about vaccination at the pharmacy**

<b>Suppose you could get the flu shot at the pharmacy. To what extent do you agree with the following statements?</b>	<b>Agree</b> <i>Note 6-7</i>	<b>Somehow agree</b> <i>Note 3-5</i>	<b>Disagree</b> <i>Note 1-2</i>	<b>Average</b> <i>Note 1-7</i>
I would get to the pharmacy easier than to the family doctor/polyclinic for the vaccine	57,4%	23,8%	18,7%	5,1
The vaccine will be available at the pharmacy throughout the vaccination campaign	56,5%	28,3%	15,2%	5,1
I think many of my friends and acquaintances and even family members would get the vaccine at the pharmacy, instead of waiting in line at the family doctor / polyclinic.	50,4%	30,3%	19,2%	4,9
My relatives (family, friends) would like to know that I got my flu shot	45,0%	36,2%	18,8%	4,7
Pharmacists are professionally trained to administer the vaccine	36,4%	35,5%	28,1%	4,2

In case of complications, the pharmacy specialists know how to intervene	34,8%	38,1%	27,1%	4,2
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Predictably, pharmacy vaccination is viewed favorably mainly due to its accessibility, compared to vaccination at polyclinics - over 50% of the population appreciate this service. Statistical analyzes show that people who are satisfied with the services provided by pharmacies and who trust the advice provided by pharmacists have a significantly more favorable attitude towards vaccination at pharmacies. People with higher education are more inclined to accept vaccination at pharmacies, saying more often than those with less than high school education that pharmacists are ready to administer the vaccine and know how to intervene in case of complications. Skepticism is growing proportionally to the monthly income, but it is lower for people who have already been vaccinated and do not suffer from any chronic illness. Those who take more than 5 medicines to treat some diseases (polymedicine) are less favorable to vaccination at pharmacies. And people who believe that the vaccine can protect them from the unpleasant effects of the disease are more inclined to accept the vaccination at the pharmacy. For most people, the opinions of those close to them (friends or family members) contribute a lot to structuring an opinion on vaccination at pharmacies.

Less than half of those who have high confidence in pharmacists believe that they are ready to administer the vaccine, and their distrust is due to the fact that pharmacists have not had the chance to demonstrate acquiring new professional skills in this area, skills that have been reserved so far to doctors.

## Conclusions

A survey conducted in July 2010 on 841 adults in urban areas in Romania shows that 73% of subjects used the services of a pharmacy less than once a month. The percentage dropped to 11% after 11 years. The research was also conducted by the Bureau of Social Research, on a sample built on the same criteria and was coordinated by the same specialists, so the data can be compared. And they show that the importance of pharmacies in the lives of citizens has increased greatly. People are satisfied with the services they receive and trust the advice of pharmacists, although there are differences in perceptions depending on gender, education, age and region of development. Increasing contacts with the pharmacists has created a type of interaction that citizens want to become even more complex. They want to receive more information about how to store and administer medicines, about possible side effects or interactions with other medicines or food, and they want to have easier access to this information from the pharmacist, not from the doctor or the internet.

Satisfaction with the services offered in pharmacies is closely linked to the attitude of the pharmacist, the attention paid to customers, the availability of medicines and their costs. However, there are several socio-demographic categories in which there has been a greater reluctance both to current services and to those that could be offered: women, people with higher education, high income, chronically ill. In their case, the pharmacist's perception as a medicine seller and less so that of a health expert still predominates.

The expansion of pharmacies toward other related services is perceived favorably by the majority of the population, the most desirable being the tests for detecting cardiovascular diseases, infections (including SARS-VOC2) and measuring blood sugar. However, people are reluctant to test for Alzheimer's, dermatological problems or osteoporosis - which they consider less safe when done in pharmacies than when done in the doctor's office or hospital.

The fear of vaccination at pharmacies is related to the idea that pharmacists are not prepared for offering such services, the belief that the respondents' family and friends will not accept vaccination at pharmacies, the lack of confidence in the usefulness of vaccination and government campaigns. The greater the confidence in pharmacists, the easier it is to accept new testing and vaccination services, and the greater the confidence in pharmacists as public educators.

The pharmacy market has undergone a major change due to the pandemic and this process is still going on. The pandemic was an accelerator, but the changes are no longer dependent on it. Pharmacies have developed communication campaigns with the public that can continue even after the end of the pandemic. They have expanded their services and, even if vaccination will not be one of them, others will soon make their presence felt because their acceptance is high among citizens.

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*Ethical approval:* The Ethics Committee of the Bureau of Social Research critically evaluated the research methodology and concluded that the study complied with the criteria of the Declaration of Helsinki on Ethical Principles for Medical Research involving Human Subjects, European Regulations (like as the General Data Protection Regulation) and Romanian law no. 363/2018 on the processing of personal data and the protection of privacy (decision of the Ethics Committee of the Bureau of Social Research no. 75 / 10.02.2021).

*Consent Statement:* The subjects were sent an information letter together with the questionnaire, stating the objectives of the study and the intention to publish the results in a prestigious scientific journal, and the completion of the questionnaire represents the informed consent to participate. In this way, the written consent of the subjects was obtained for the publication of the information provided by them.

*Conflict of Interest:* The author declare no conflict of interest for this article.

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