

# The Analysis of the Influence of Residence in the Purchase of Pharmaceutical Products

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## Abstract

This paper analyzes the relationship between the purchase of pharmaceutical products in pharmacies and the residence of customers. The customers sampled lived in either a city or in a village. The first step in this paper was to statistically detect the differences between residence of a town and a village while the second step aimed at detecting the probability of purchase by residents of a city and residents of a village. Regression analysis, specifically logistic regression is used because the dependent variable is binary in nature. The analysis is conducted for five groups of medicaments: (1) medicines for immune support, (2) pharmacy cosmetics, (3) vitamins and minerals, (4) medicines to support the nervous system and (5) painkillers.

*Key words: pharmaceutical market, logistic regression, marketing research, probability of purchase*

## 1. INTRODUCTION

The pharmaceutical market has an important position nowadays. This position is given by a long-time history, by the current size, and the size predicted for the future.

Metyš and Balog (2006) describe history and differences in pharmaceutical marketing. Medicine and efforts to solve health problems are old as mankind. Healing skills were carried out previously by healers, shamans and priests. Specialization did not exist and healers performed the role of physicians and manufacturers of medical products. Necessary division of labor emerged in the 5th or 4th century before BC. A roles were separate. The market has changed. The machine production was introduced in the 19th century and it was the beginning of mass production of chemical medicaments. There are three groups of influences. These influences are the ancestors of pharmaceutical companies in present form. The first predecessor of pharmaceutical companies were pharmacists and persons operating pharmacies. For example Pharmacy U Černého orla (Black Eagle Pharmacy) in Prag – the predecessor of Zentiva, Pharmacy U Bílého anděla (White Angel Pharmacy) in Prag – the predecessor of Ivax-Galena. The second precursor were wholesalers of raw materials for production of pharmaceuticals. The third group has origins in the chemical industry. The pharmaceutical market is very dynamic and it changes very quickly. These changes are in the form of mergers and acquisitions. In 2002, the transaction was carried out in the amount of 59.515.000.000 USD. Pfizer (company in the USA) acquired the Pharmacia (company in the USA).

The pharmaceutical market grows every years. This growth is seen as an increase in the number of companies, in the number of products offered, and in revenues. Kroček (2010) says the following - the Company Healtz IMS estimates that the pharmaceutical market will grow by 5-8 % annually to 2014 and sale of pharmaceutical products will grow around 4 % to 6 % annually.

Medicaments in the pharmaceutical market can be divided into two groups. The first group includes prescription drugs. They are available only in pharmacies with the consent of a doctor. The second group is known as OTC (over the counter). Customers can purchase these medicaments without a prescription. Designation OTC is for freely available medicaments, dietary supplements, medical tools, nutritional supplements, special nutrition, tests, hygiene and toiletries and drinks (Metyš, Balog, 2006).

Customers decide on buying the OTC alone. People select the medicaments (brand or type) and purchase it themselves. But there are various external and internal influences. It is necessary to pay attention to factors that influence the purchase of medicaments from a marketing perspective. It is important to identify the characteristics of customers, their demographic, psychographic, geographic and behavioral characteristics. It is important to know the influencer and the strength of influence.

This paper deals with the five groups of medicaments. These medicaments are freely sold in pharmacies or in other distribution channels. The aim is to analyze whether the place of residence of respondents influences their purchase of selected medicaments. Also, the paper aims at identifying whether there are statistically significant differences between people in the city and people in the village. The analysis is performed by logistic regression methods. If there are differences between residents then probability of purchase for each category is estimated.

## 2. THEORETICAL BACKGROUND OF CUSTOMER BEHAVIOR (SPECIFICALLY INFLUENCES ON PURCHASE)

Consumer behaviour is the study of the processes - individuals or groups select, purchase, use or dispose of products, services, ideas or experiences to satisfy needs, and desires (Solomon, 2009). Consumer behaviour is influenced by various factors.

These factors may affect the Decision making process. Purchasing decision-making process has several phases. The phases are follows: recognition, information search, alternative evaluation and selection, outlet selection and purchase, and postpurchase processes. There are certain factors that play a role at each phase (Hawkins, Mothersbaugh, Best, 2007).

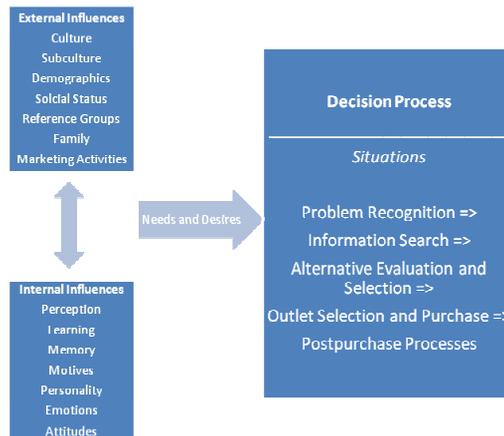


Fig. 1 - Overall model of consumer behavior, source: Hawkins, Mothersbaugh, Best; 2007

Baumgartner and Steenkamp (1996) indicate that consumer behaviour is influenced by many factors. Customers are influenced by a risk of buying, innovativeness in the adoption of new products, variety in purchase, retail facilities or window displays, and interviews with other persons about purchases.

Internal and external factors affect customers (it is shown in Figure 1 above). These facts are transferred to decision-making process by affected customers. Individuals develop self-concepts and subsequent lifestyles based on a variety of internal and external influences. These self-concepts and lifestyles produce needs and desires. It affects the decision-making process, as is indicated in Hawkins, Mothersbaugh and Best (2007). The decision-making process affects internal and external factors in the form of experiences and acquisitions.

The *internal factors* are determined by customers. Hawkins, Mothersbaugh and Best (2007) divide these factors into seven groups – perception, learning, memory, motivation, attitudes, personality, and emotions.

Boone and Kurtz (2012) say - the *perception* is a process by which individuals receive and assign interest to stimuli. Stimuli are gathered through the five senses – sight, hearing, touch, taste and smell. Perception of object results from the interaction of two types of factors: stimulus factors (size, colour) and individual factors (including sensory processes, experience, basic motivations and expectations of individual). *Learning* is change in the content and structure of long-term memory, it is the result of information processing.

Memory can be divided into short-term memory and long-term memory. As indicated by Hawkins, Mothersbaugh and Best (2007) - each individual has (1) short-term memory (working memory), it is a portion of total memory that is currently activated or in use and (2) long-term memory, it is that portion of total memory devoted to permanent information storage. Short-term memory has a limited capacity to store information and sensations and long-term memory is viewed as an unlimited, permanent storage.

Jamal, Davies, Chudry and Al-Marri (2006) describe *motivation* based on two types of psychosocial needs: personal and social. Motivation is the reason for a behaviour, e.g. purchase). The reasons may be personal or social. The personal motives include the needs for role-playing, self-gratification, diversion, learning about new things, physical activity, and sensory stimulation. The social motives include the communication with others, group attractions, status and authority, and pleasure in bargaining.

*Attitudes* are described by Hawkins, Mothersbaugh and Best (2007) as an enduring organization of motivational, emotional, perceptual and cognitive processes with respect to some aspect of the environment. The internal factors are also: *personality* (characteristics of person), and *emotions* (relatively uncontrolled feeling that affect behaviour).

Hawkins, Mothersbaugh and Best (2007) divide external factors into seven groups – culture, subculture, demographic characteristic, social status, reference groups, family, and marketing activities.

*Culture* can be defined as the values, beliefs, preferences and tastes handed down from one generation to the next. Every marketer need to understand their role in consumer decision making. Boone and Kurtz (2012) say that marketing strategies have to be varied in each area. This is due to the differences in cultures in different areas.

Hawkins, Mothersbaugh and Best (2007) define subculture, demographic characteristic, and family as follows. *Subculture* is a segment of a larger culture whose members share the distinguishing values and patterns of behavior. Subculture produces unique market behaviors. Members of subculture are part of the larger culture. *Demographic characteristic* includes the number, education, age, income, occupation and location of individuals in society. Family has a role in teaching children how to consume and household decision making,

Social status and reference groups are defined by Boone and Kurtz (2012) as follows. *Social status* – consumers belong to a number of social groups. Differences in group status and roles can affect buying behavior. Status is the relative position of any individual member in a group. Roles define behavior that members of a group expect of individuals who hold specific positions within that group. Groups define formal roles and others. *Reference groups* influence a person's behavior by the value structures and standards. Children are especially vulnerable to the influence of reference groups. They base their buying decisions on outside forces (television, internet, fashion icon, singer, actor and other celebrity, friends). Boone and Kurtz (2011) says that reference groups have a few members act – opinion leaders. They share their experience and opinions about new products.

*Marketing activities* is concentrated in product strategy, price strategy, place strategy and promotion strategy. Marketing communication has an important role in the decision making process. It can be realized using advertising, promotion, public relations, direct marketing and personal selling.

Purchasing behaviour of customers can be divided into two categories. Customers ask themselves two types of questions – (1) whether the customers buy products, (2) which products the customer buys (if there are substitutes). Consumers have a difficult situation in deciding because the number of variants available as the market grows. There is the problem of how people choose from among a large number of variants. People make decisions based with the aim of maximizing their total benefit in relation to their budget line.

### **3. DATA COLLECTION AND METHODOLOGY**

#### **3.1 Data collection methodology**

Data was collected by using primary marketing research. The questionnaire was the main instrument for data collection. The questionnaire contained questions about the purchase of five groups of pharmaceutical medicaments and other questions about consumer behaviour and characteristics of respondents (demographic, geographic and lifestyle). In this article is used data about purchase of medicaments and residence of respondents. Interviewed people could indicate a town as place of residence (179) or a village (110).

The analysis and conclusions are made on a sample of 289 respondents. Respondents were selected by the snowball technique. The research took place in December 2010. Respondents were men and women who were older than 18 years. The sample of respondents was limited geographically; as they were all selected from the Moravia region. The absolute frequencies of the five categories of medicaments are listed in Appendix 1.

### 3.2 Theoretical basis of logistic regression method

Regression analysis allows researchers to explore the relationship between variables (dependent and independent), (Hendl, 2009). Regression analysis is an approach of mathematical modeling that can be used to describe the relationship among several independent variables to a dichotomous dependent variable (Kleinbaum, Klein, 2010). There are three groups of regression analysis (1) one-dimensional linear models, (2) multivariate linear models and (3) nonlinear models, (Yan and Su, 2009).

Logistic regression belongs to a group of nonlinear models. Categorical dependent variable is used in the logistic regression and continuous dependent variable is used in the linear regression. This is the difference between logistic and linear regression. According to Meloun and Militký (2006), logistic regression take three types:

- (1) binary logistic regression - dependent variable can take only two values, dependent variable has a binary character and independent variables can be categorical and also continuous,
- (2) ordinal logistic regression - dependent variable has an ordinal character, it can take two or more values, independent variables can be categorical and also continuous, and
- (3) nominal logistic regression – dependent variable has a nominal character, independent variable can be categorical and also continuous.

Binary logistic regression is used in this paper. Great attention is paid to binary logistic. Binary logistic regression can be used if the dependent variable takes only two values. Examples are as follows: obtaining the largest number of votes in elections, scoring a goal in a match, win or lose, success in business, successfully completed studies, winning a contract in a tender, decrease or increase in the exchange rate (Hendl, 2009).

The logistic regression can be used in marketing management for customer satisfaction measurement, tracking brand loyalty, purchasing behaviour for the brand or service, identifying factors influencing purchase, defining the target group of customers.

#### 3.2.1 The logistic model

There is a binary variable  $Y_i$  (can take only two values) characterizing the positive and negative response to the  $i$ -th respondent for  $i=1, \dots, N$ , where  $N$  is the number of respondents. Pecáková (2007) says that each respondent is characterized by the vector  $x_i=(1, x_{i1}, x_{i2}, \dots, x_{iK})$  containing  $K$  the elements. The binary variable  $Y$  is called dependent variable and it is explained by independent variables. In this case the dependent variable can take two values – respondents purchased the medicaments or respondents did not purchase the medicaments.

The likelihood of a positive response of the  $i$ -th respondent  $P_i=P(Y_i=1)$  on the basis of its characteristic vector  $x_i$  can be expressed as function  $F(\beta; x_i)$ , which is increasing and have a domain of definition  $(-\infty, +\infty)$  and a range  $(0,1)$ , so is accepted that  $F(-\infty)=0$  a  $F(+\infty)=1$  likelihood function of a response can be written as

$$P_i=F(\beta; x_i), \tag{1}$$

where  $\beta$  is vector of parameters  $(\beta_0, \beta_1, \dots, \beta_K)$ .

The cumulative distribution function of the logistic distribution can be written in the shape

$$P_i = P(Y_i = 1) = F(\hat{\mathbf{a}}; \mathbf{x}_i) = \frac{e^{\hat{\mathbf{a}}\mathbf{x}_i}}{1 + e^{\hat{\mathbf{a}}\mathbf{x}_i}} \quad (2)$$

this is a function of the probability of answer (Hosmer, Lemeshow, 2000). The probability of a negative response is  $1 - P_i$

The percentage probability of positive and negative responses (odds) is given as

$$\frac{\pi}{1 - \pi} = \frac{P(Y_i = 1)}{P(Y_i = 0)} = e^{\hat{\mathbf{a}}\mathbf{x}_i} \quad (3)$$

Hilbe (2009) gives an equation for the odds ratio in following form. The odds ratio for dichotomy variable ( takes values 0 or 1, there is no other option). It is shown as

$$OR(1, 0) = \frac{\pi(x_j = 1) / [1 - \pi(x_j = 1)]}{\pi(x_j = 0) / [1 - \pi(x_j = 0)]} = \exp(\beta_j) \quad (4)$$

### 3.2.2 An estimate of model parameters

Unknown parameter or parameters  $\beta$  is/are estimated by using known method of maximum likelihood. This method is based in finding a likelihood function  $l()$ , which is maximized after that. The likelihood of a positive answer of  $i$ -th respondent is a characteristic by vector  $\mathbf{x}_i$ , then

$$P(Y_i = 1 | \mathbf{x}_i) = \pi(\mathbf{x}_i) \quad (5)$$

and the likelihood of a negative response as  $1 - \pi(\mathbf{x}_i)$

The combined probability of positive and negative responses can be written then as (Hosmer, Lemeshow, 2000)

$$P(Y_i | \mathbf{x}_i) = \pi(\mathbf{x}_i)^{y_i} [1 - \pi(\mathbf{x}_i)]^{(1 - y_i)} \quad (6)$$

## 4. STATISTICAL ANALYSIS AND DISCUSSION OF RESULTS

The estimated models are sorted in accordance with a quality assessment. The first is the best model and the last is the lowest quality model. There are five estimates relating to the five groups of medicaments. Statistical analysis deals with the relationship between purchase of medicines and place of the residence of respondents. The hypothesis testing is carried out at the 5% value of significance. Analysis ere done on these groups of medicaments: pharmacy cosmetics, medicines for immune support, vitamins and minerals, medicines to support the nervous system, and painkillers.

Hypotheses about the possible outcomes are listed prior to the analysis. The relationships between the place of residence and the purchase of the medicaments can be expected in the three groups: vitamins and minerals, medicines for the immune support and medicines to support the nervous system. Place of residence will affect the purchase in these categories. People living in the village have substitutes to replace vitamins and minerals and medicines for the

immune support. They can consume their own products instead of chemical products. People from this area are not under great pressure as people in cities. Place of residence will affect the purchase of this category too.

It can be assumed that the place of resident will not influence the purchase of pharmacy cosmetics and the purchase of painkillers.

#### 4.1 Pharmacy cosmetics

The pharmacy cosmetics are the first category. This group includes ointments, creams, shampoos, hair lotion and many others. It is applied to the body or hair. This products are used to prevent or after the outbreak of illness. Estimations of the logistic regression model is shown in Fig. 2 below. There is information about quality of model and about significance of the model.

Logistic regression		Number of obs	=	289
Log likelihood = -196.3531		LR chi2(1)	=	7.90
		Prob > chi2	=	0.0049
		Pseudo R2	=	0.0197

Cosmetics	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
Residence	-.6866325	.2463122	-2.79	0.005	-1.169396 - .2038694
_cons	.9677999	.3592249	2.69	0.007	.263732 1.671868

Fig. 2 - Estimate of logistic regression for the pharmacy cosmetics. Source: author

Quality of the model is judged by the coefficient of determination in the linear regression. A higher coefficient means a higher quality. Logistic regression does not have the classical form of the coefficient of determination. There are special coefficients called Pseudo R2. Several coefficients Pseudo R2 were developed over time. These coefficients have different ways of calculating (Hilbe, 2009). Pseudo R2 value is usually lower than the classical value of R2 (coefficient of determination in linear regression). This is the reason for using the coefficient for comparing different models (Hosmer, Lemeshow, 2000). This estimated model is the most appropriate of the five monitored. It has the highest coefficient; Pseudo R2 is equal to 0.0197. P value in the model is 0.0049. It means that the model is statistically significance. This conclusion is drawn from the comparison of 0.05 and 0.0049. P value for coefficient (0.005) is lower than 0.05. It is statistically significance too. The constant has the same results. In this category of medicaments there exist a differences between urban people and people from the village. Residence is an important factor which influences the purchase of pharmaceutical cosmetics. The equation of estimated model in this case is as follows:

$$P_i = P(Y_i = 1) = \frac{e^{(0.9677999 - 0.6866325 \cdot x_i)}}{1 + e^{(0.9677999 - 0.6866325 \cdot x_i)}}$$

where P is probability of purchase,  $i = 1 \dots N$ , where N is number of respondents. The city is described as 1 and village as 2 in the research. From formula (7) the probability of purchase of pharmaceutical cosmetics for people living in towns is 56.9 % and probability of purchase of pharmaceutical cosmetics for inhabitants of the village is 40 %. For people living in towns, there is greater probability to buy the pharmaceutical cosmetics. There are only presumptions

on this result. It can be given by an opportunity to buy it, skin condition (influence of the environment), increased revenue or a greater influence of advertising (more opportunities to be exposed to advertising).

Cosmetics	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]
Residence	.503268	.1239611	-2.79	0.005	.3105546 .8155689

Fig. 3 - Odds ratio for the pharmacy cosmetics. Source: author

Information about odds ratio is shown in Fig. 3. Formula for odds ratio is in Chapter 3.2.1, specifically formula (4). Odds ratio is given by the relationship between odds to purchase for inhabitants of the village and odds to purchase for people living in towns. Odds to purchase for people living in towns are 1.383 and odds to purchase for inhabitants of the village are 0.667. Odds ratio is equal to 0.503268.

#### 4.2 Medicines for immune support

The second category is the medicines for immune support. Immunity is encouraged before the onset of illness (with the first symptoms) or after onset of illness. Estimated logistic regression model is shown in Fig. 4 below.

Logistic regression	Number of obs	=	289
	LR chi2(1)	=	7.26
	Prob > chi2	=	0.0071
	Pseudo R2	=	0.0181
Log likelihood = -196.48062			

Immunity	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
Residence	-.6571445	.2455867	-2.68	0.007	-1.138486 -.1758033
_cons	.9840473	.359387	2.74	0.006	.2796617 1.688433

Fig. 4 - Estimate of logistic regression for the medicines for immune support. Source: author

This model is the second most appropriate model but the Pseudo R2 is low, Pseudo R2 is equal to 0.0181. The P value for model shown that the model is statistically significant because the P value is lower than 0.05. Coefficient and constant are statistically significant too. P values are greater than 0.05. Place of residence has an influence on the purchase of medicines for immune support. Residence is an important factor which influences the purchase of medicines for immune support. Equation of estimated model in this case is as follows:

$$P_i = P(Y_i = 1) = \frac{e^{(0.9840473 - 0.6571445 * x_i)}}{1 + e^{(0.9840473 - 0.6571445 * x_i)}}$$

where P is probability of purchase,  $i = 1 \dots N$ , where N is number of respondents. The city is described as 1 and village as 2 in the research. The probability of purchase for inhabitants in towns is 58.1 % and probability of purchase for inhabitants of the village is 41.8 %. The reason for this situation can be environment and human susceptibility to disease.

Immunity	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]
Residence	.5183293	.1272948	-2.68	0.007	.3203037 .838783

Fig. 5 - Odds ratio for the medicines for immune support. Source: author

Odds ratio is shown in Fig. 5. Formula for odds ratio is in Chapter 3.2.1, specifically formula (4). Odds ratio is given by the relationship between odds to purchase for inhabitants of the village and odds to purchase for inhabitants in towns. It is the same as in the previous chapter. Odds to purchase for people in towns are 1.387 and odds to purchase for inhabitants of the village are 0.718. Odds ratio is equal to 0.5183293.

### 4.3 Vitamins and minerals

This category is very large and the number of buyers is also high (see Appendix 1). These supplements are taken in disease, as prevention or in the various bodily complaints. They complement a balanced diet. In some cases they replace a balanced diet. Estimated model is shown in Fig. 6.

Logistic regression		Number of obs	=	289	
		LR chi 2(1)	=	3.46	
		Prob > chi 2	=	0.0630	
		Pseudo R2	=	0.0097	
Log likelihood = -176.7166					
Vitamins_m-s	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
Residence_cons	-.4834619	.2595186	-1.86	0.062	-.992109 .0251853
	1.487458	.3908333	3.81	0.000	.721439 2.253477

Fig. 6 - Estimate of logistic regression for the vitamins and minerals. Source: author

Quality estimation of this model of the five tested groups is at the center. Pharmacy cosmetics and medicines for immune support have a better estimate and medicines to support the nervous system and painkillers have a lower estimate. The second group is listed in other part of the analysis.

As shown the P value in this model is not statistically significant because 0.063 is greater than 0.05. Coefficient is not statistically significant too because 0.062 is greater than 0.05. It does not matter whether the respondent lives in the village or in town. Place of residence does not affect the purchase of vitamins and minerals.

In some cases, it is possible to expect that people living in village will consume their cultivated crops (fruits and vegetables) instead of purchased vitamins. Those people who live in towns do not have the opportunity to grow their own crops and thus they will buy more supplements (vitamins and minerals). This is only a presumption arising from the possibility of people and it is not proven by research results.

### 4.4 Medicines to support the nervous system

The purchase of the following category of medicaments is the smallest. It is shown in Appendix 1. This category includes drugs to support the fight against smoking, combat stress and nervous strain for example. Estimate of the logistic regression model is shown in Fig. 7 below.

Logistic regression	Number of obs	=	289
	LR chi 2(1)	=	0.47
	Prob > chi 2	=	0.4937
Log likelihood = -137.47336	Pseudo R2	=	0.0017

Nerves	Coef.	Std. Err.	z	P> z	[ 95% Conf. Interval ]
Residence	-.2169516	.319282	-0.68	0.497	-.8427328 .4088296
_cons	-1.197514	.4566055	-2.62	0.009	-2.092444 -.3025833

Fig. 7 - Estimate of logistic regression for the medicines to support the nervous system. Source: author

This model has the lowest quality estimation of the four previous estimates. It shows the value of Pseudo R2. It is at a very low level. This model is not statistically significant because the P value of the model is equal to 0.4937. It is greater than 0.05. It is tested at the 5 % significance level. Constant is statistically significant (it is equal to 0.009) but the coefficient is not statistically significant (it is equal to 0.497).

The results indicate that the place of residence of a person does not affect the purchase of medicines to support the nervous system. It could be expected that the purchase of this medicaments will be greater in a cities than in a villages because people in cities experience a more hectic life. Differences in the purchase according to residence are not demonstrated.

#### 4.5 Painkillers

The last analyzed group of medicaments is known as painkillers. This category is intended for patients seeking the medicaments after the onset of pain or before the onset of pain. The frequently used term for painkillers is analgesic. These medicaments are painkillers of teeth, head, joints and back for example. Fig. 8 shows whether the place of residence influences the purchase of this category.

Logistic regression	Number of obs	=	289
	LR chi 2(1)	=	0.00
	Prob > chi 2	=	0.9484
Log likelihood = -148.94111	Pseudo R2	=	0.0000

Painkillers	Coef.	Std. Err.	z	P> z	[ 95% Conf. Interval ]
Residence	.0192402	.2972886	0.06	0.948	-.5634347 .6019151
_cons	1.291934	.4342862	2.97	0.003	.4407483 2.143119

Fig. 8 - Estimate of logistic regression for the painkillers. Source: author

This estimate is totally unsuitable because the Pseudo R2 is equal to zero. R2 determines the quality of the estimated model. Despite the unsuitability of this model analysis are done to ascertain whether place of residence affects the buying painkillers. The estimated model is not statistically significant because value 0.9484 is greater than 0.05. The same case is visible in the coefficient. P-value is greater than 0.05 (0.948>0.05). Results show that the place of residence does not affect the purchase of painkillers. People buy painkillers regardless of whether they live in the city or village. The influence of residence was not statistically demonstrated. It is necessary to take into account the low level of quality of this model.

## 5. CONCLUSION

The pharmaceutical market grows every years and this growth will continue in the future. This information and specific details are in the introduction of this paper. It is very necessary to find the factors that influence the purchase of these products. This information is necessary in marketing management and it is necessary in products targeting for specific target groups.

The aim of this paper was to analyze the factors that influence consumer behaviour in the pharmaceutical market. Investigations were done to determine whether the place of residence influences the purchases of various pharmaceutical product categories. The following product categories were analyzed: (1) medicines for immune support, (2) pharmacy cosmetics, (3) vitamins and minerals, (4) medicines to support the nervous system, and (5) painkillers.

Data was collected through primary marketing research; by interviewing method. The research involved 289 respondents. The regression analysis was used in this research. The logistic regression is used in this case because dependent variable was a binary.

The research results show the following information. Place of residence affects two groups of analyzed medicaments only; specifically pharmaceutical cosmetics and medicines for immune support. The probability of purchase of pharmaceutical cosmetics for inhabitants of towns is 56.9 % and probability of purchase of pharmaceutical cosmetics for inhabitants of village is 40 %. The probability of purchase of medicines for immune support for people in towns is 58.1 % and probability of purchase for inhabitants of village is 41.8 %.

The place of residence does not affect the purchase of vitamins and minerals, painkillers, and medicines to support the nervous system.

Pseudo R2 values are too small. Individual models can be compared with these values. A low values indicate that estimates lack other important predictors for the models. This predictor (residence) does not have the greatest influence on the dependent variable.

It is necessary to examine other factors that influence the purchase of medicaments. It is necessary to pay attention to an internal and an external factors. This is the subject of further research and estimations.

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Appendix 1- Purchase of selected category of pharmaceutical products. Source: author

1. Medicines for immune support		Purchase	
		Yes	No
Residence	Town	104	75
	Village	46	64
Total		150	139
2. Pharmacy cosmetics		Purchase	
		Yes	No
Residence	Town	102	77
	Village	44	66
Total		146	143
3. Vitamins and minerals		Purchase	
		Yes	No
Residence	Town	131	48
	Village	69	41
Total		200	89
4. Medicines to support the nervous system		Purchase	
		Yes	No
Residence	Town	35	144
	Village	18	92
Total		53	236
5. Painkillers		Purchase	
		Yes	No
Residence	Town	141	38
	Village	87	23
Total		228	61