

## THE IMPACT OF ECONOMIC FACTORS ON THE REALITIES OF OUTPATIENT MULTI-DRUG TREATMENT OF CHRONIC DISEASES IN RURAL AREAS

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Sygit K, Kołłątaj W, Sygit M, Kołłątaj B: The impact of economic factors on the realities of outpatient multi-drug treatment of chronic diseases in rural areas. *Ann Agric Environ Med* 2011, **18**, 29–34.

**Abstract:** The reform of the health care system in Poland introduced in 1999 brought not only a lot of disappointments arising from the failure in performing its basic assumptions, but also from the deterioration in access to medical care by patients coming from the poorest class of the Polish population. The subjects were 209 people at the age of 52–80 years including 149 women and 60 men – inhabitants of rural areas of Lublin province. These were outpatients who attended the Endocrine Clinic in Poniatowa. The studies were conducted with the use of the standardized survey questionnaire. Of all 209 respondents requiring long-term multidrug therapies for chronic diseases, 128 (61.2% of those surveyed) reported episodic or permanent noncompliance to treatment regimens, 90 people (43%) had applied medications in a way at variance with medical recommendations. Among the reasons, economic factors were most often mentioned. Only 21 respondents (10%) expressed the opinion that they had always possessed sufficient means to buy necessary drugs. Current regulations concerning the refunding of costs of medicines may make effective outpatient treatment of chronic diseases impossible. Almost 61.2% of the polled treated themselves contrary to medical recommendations. In most cases, improper courses of treatment were caused by financial problems.

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**Key words:** rural areas, chronic diseases, poverty, treatment abandonment.

### INTRODUCTION

Four big social and economic reforms enforced in Poland in 1999 have made a fundamental breakthrough in the life of the average inhabitant of Poland. Health care reform was drawn up to achieve the following objectives: to improve the health of society, to meet patients' expectations concerning the availability of medical benefits, and to protect the public finances from catastrophe [16].

Potential patients expected, *inter alia*, increments in the availability and quality of medical services as well as improvement of conditions to perform effective treatment of rehabilitation procedures possible on an outpatient basis. Patients requiring chronic treatment expected that they

would have easy access to modern medicines within their financial capabilities.

The fact that more than 10 years have passed since the beginning of such a reform provides an opportunity to make summaries and assessments of the issues involved.

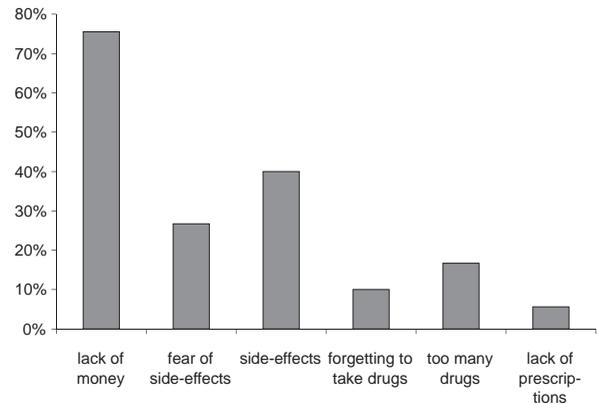
Even a cursory analysis leads to the finding that the main objectives of this reform have not been implemented satisfactorily. Already in the first years of the implementation of changes in the functioning of health care, the reform of the health care system in Poland was estimated as the worst of all four reforms [23]. In 2008, representatives of 59% of non-governmental organizations, local governments and trade unions expressed the opinion that the reformed Polish health system was so bad that it required radical changes [17].

Opinions expressed by patients themselves were varied, but generally in the majority of cases they were critical. The survey conducted in 2001 with a representative national sample of 1,162 persons aged 15 and over showed that nearly two-thirds of Poles negatively assessed the health care system in Poland [15]. The following years brought more disappointment, so that in 2008 there another attempt was made to perform an amendment to the reform. As an effect, a growing public dissatisfaction was observed. This dissatisfaction was most strongly articulated by the poorest people [15]. This is understandable, because one of the major defined goals of the health system reform was reducing the costs of health care. The question was whether this dissatisfaction had arisen only from the difficulties in access to specialists, long waiting time for hospitalization and for applying of highly specialized procedures, or had got deeper reasons, such as the belief that the reform had been made only to reduce budget expenditure allocated to medical treatment. There were indications that one of the most important reasons for dissatisfaction was the real cost of treatment financed by patients – mainly the prices of prescription medicines. The reasons for such dissatisfaction were evident and mostly clear in the poorest districts of our country, especially since people living in poverty have more health problems than those who are well-off [9, 19, 20].

In Poland, the least prosperous regions are as follows: Lubelskie Province and Świętokrzyskie Province, where in 2008 there was noticed the highest proportions of families living in poverty (in Lublin Province the percentage of unemployed was equal to 15.3, while in Poland the average value was close to 10.6 [24]). In 2009 average monthly income per one person in the Lublin Province was equal to 826 PLN (currency – Polish Złoty) [25], while the average monthly income in Poland was almost 35% higher and amounted to 1,114.49 PLN [7, 25]. Poverty mostly affects little-industrialized areas such as rural districts. In Lublin Province, the regions of high unemployment and agriculture as a main source of income are the following districts: Chełm, Włodawa and Opole Lubelskie. Analysis of health care *status quo* in such districts could be a good idea for assessment of the real consequences of reforms initiated in 1999, and for the presence of eventual risks that have resulted from changes in health care principles.

## MATERIAL AND METHODS

The subjects were 209 people at the age of 52–80 years (mean 63.5, SD 6.32), 149 women and 60 men – inhabitants of the rural areas of Opole Lubelskie, Poniadowa and Chodel in Lublin province. They were outpatients who attended the Endocrine Clinic in Poniadowa and due to the presence of co-morbid medical conditions required multidrug therapies – long-term multispecialist treatment because of endocrinological, cardiac, and quite often orthopedic, gastrological as well as rheumatologic problems.



**Figure 1.** Reasons for permanent non-compliance with treatment regimens (multiple-choice question; 90 subjects).

The polled group consisted of 188 pensioners, 14 people with unemployment status and 7 who were professionally active.

A special original standardized survey questionnaire with questions concerning details of ambulatory treatment of chronic diseases as well as household budgets details, including sources of income and structure of expenses including expenses related to treatment was applied.

The questionnaire contained 15 closed-end questions. Among them:

- one-choice questions concerning age, education, residence, household conditions and household budget, sources of income, applied therapy, and the cost of monthly treatment;
- multiple-choice questions concerning the causes and reasons for neglecting medical recommendations, domestic spending priorities, and ways of reducing expenditure in the event of deficits in financial resources.

The survey was carried out during the period: December 2009–April 2010 and was based on survey feedback issued during a visit to the outpatient Endocrine Clinic and received during a subsequent visit to the Clinic.

**Statistical methods.** Most of the obtained data were grouped ones. Among them there – those which concerned money spent on drug, household expenses and food outlays (Tables 1–3).

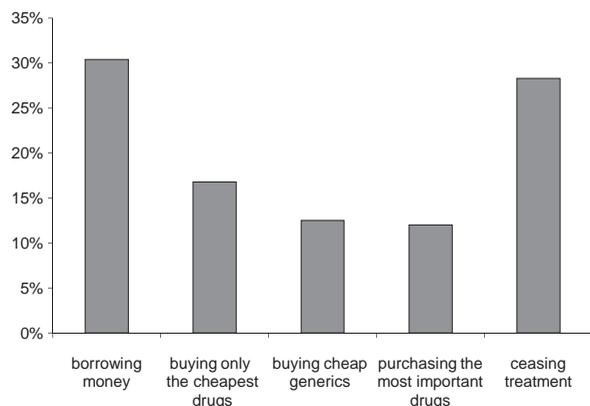
Grouped data statistics were used to estimate:

- mode values (the observation with the maximum frequency) defined as presented algebraic equation:

$$mode = L + \frac{(F - F1)}{(F - F1) + (F - F2)} \times h$$

where:  $L$  = lower limit of the modal class,  $F$  = frequency of the modal class,  $F1$  = frequency of the class immediate previous to the modal class,  $F2$  = frequency of the class immediate next to the modal class,  $h$  = range of the modal class (higher limit – lower limit).

- median values (preceded by identifying median classes); the medians were calculated by the following formula:



**Figure 2.** Proceedings in the case of the lack of funds to purchase drugs (answers given by 184 respondents).

$$\text{median} = L + \left( \frac{\frac{n}{2} - cf}{F} \right) \times h$$

where:  $n$  = the number of observations,  $L$  = lower limit of median class,  $cf$  = cumulative frequency of class prior to median class,  $F$  = frequency of median class,  $h$  = class size (higher limit – lower limit).

Histograms for all the grouped data are presented in Figures 1–5.

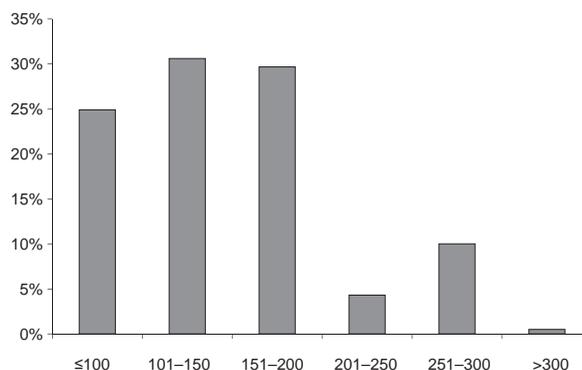
## RESULTS

Of all the 209 respondents requiring constant application of multidrug therapies, 90 people (43%) consistently realized ambulatory treatment in ways inconsistent with medical recommendations. Such departures from recommended therapy schemes were as follows:

- taking only some of the recommended medications – 30 respondents,
- periodic treatment interruptions – 14 respondents,
- taking medications in an irregular way – 12 respondents,
- preferring longer than recommended dose intervals – 9 respondents,
- application of smaller than recommended doses – 20 respondents,
- application of higher than recommended doses of drugs – 5 respondents.

The reasons for taking medicines inconsistent with the recommendations of doctors are presented in Figure 1 (answers to multiple-choice question). Among the reasons there were: primarily economic factors (lack of money – 68 subjects – that is 75.5% of those who claim improperly realized pharmacotherapy), the fear of potential hazards of applied therapies (24, i.e. 26.7%) and side-effects of such therapies (36 subjects – 40.0% of those who claimed improperly realized pharmacotherapy). Other causes were much less frequently mentioned.

184 respondents (88% of polled) confessed that they had some transitory financial troubles hindering systematic



**Figure 3.** Monthly medication costs per person (PLN).

purchases of medicines, and posing problems with continuing ambulant treatment. The people, suffering from periodical lack of money, making it impossible purchase of all prescribed medicines, used the following ways to solve this problem: 56 (30.4% of those with financial problems) used to borrow money to continue therapy, 128 (61.2% of surveyed, i.e. almost 70% of those with financial problems) made episodic essential modification of the schemes of the ambulant treatment. Such periodic essential modifications of the schemes of the treatment were realized in the following ways:

- buying only these prescribed drugs which were the cheapest (31 subjects – 16.8%);
- buying cheaper generic drugs without any consultations with doctors about this decision (23 subjects – 12.5%);
- buying only those prescribed drugs which were considered as the most important (22 subjects – 12%);
- temporary cessation of treatment (52, i.e. 28.3% of those with financial problems) (Fig. 2).

Only 21 respondents (10% of those polled) expressed the opinion that their financial situations were good and they had always possessed sufficient means to buy the necessary drugs. 4 subjects (2% of those polled) did not answer this question.

Taking into consideration the expenditure on medicines versus expenditures in the overall structure of expenses of respondents, the spending on drugs represented a very significant item in the budgets of those polled – (compare data: Tables 1–3; Figures 3–5). The structure of the monthly expenditures was as follows: median monthly medication cost per person was in the ‘101–150’ PLN bracket (177 respondents, i.e. 84.7% of those polled, declared monthly medication costs per person as being below 201 PLN); median monthly household expense per person was in the ‘451–500’ PLN bracket; median monthly food expense per person was in the ‘251–300’ PLN bracket. The modes were as follows: 142.9, 278.4 and 445.9 (PLN), medians: 141.0, 254.4 and 429.0 (PLN). Therefore adding up such modes makes 867.2 PLN/month/person; adding up medians makes 824.4 PLN/month/person.

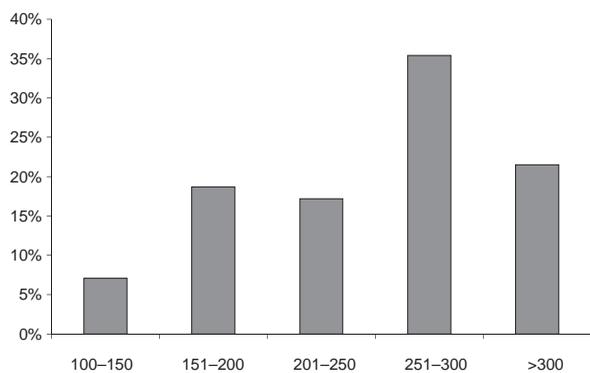


Figure 4. Monthly food expenses per person (PLN).

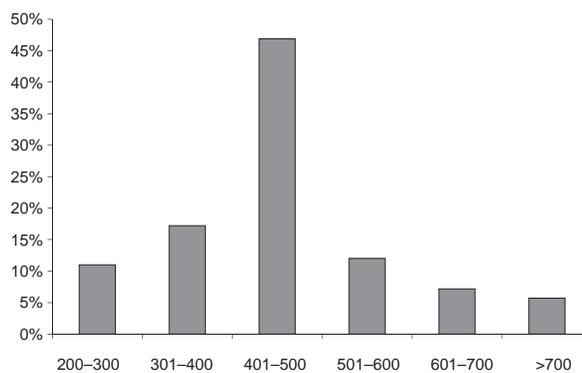


Figure 5. Monthly household expenses per person (PLN).

## DISCUSSION

Effective therapy is always based on: good diagnosis of the disease, well-chosen therapy, good availability of drugs, and exemplary doctor–patient cooperation.

The treatment of ambulatory chronic diseases, especially treatment of the elderly, is generally based on multi-drug therapies composed by many medical specialists. Working out an individual therapeutic plan while taking into account the interactions of drugs (both synthetic and readily used or even over-used herbal medicines [2, 5, 6, 12]) and the necessity to avoid serious side-effects consists in drawing up a list including well-founded drugs and dosing regimen details. Any *ad hoc* modifications involving changes of types of medications, number of medicines taken, doses, frequency of administration, or even hours of taking medications, can result in significant deterioration of the patient's health status, side-effects of treatment or even the appearance of life-threatening consequences. Applying a multidrug therapy, especially in elderly people, presents a lot of problems arising from age impaired memory, depressed mood, psychological troubles involving the fear of side-effects of therapies, a difficult financial situation, or difficulty in mobility making the systematic purchases of needed medicines difficult.

In the context of a number of newspaper publications [10] and articles published across the Internet [14], one can draw the conclusion that financial reasons may impact in an unfavourable way on the courses of ambulatory multi-drug therapies.

Taking into account the costs of applied multidrug therapies, they appear to be apparently reasonable. Considering the obtained data, one must realize that although the median monthly medication cost per person was in the '101–150' PLN bracket (Tab. 1), 93 respondents (44.5% of those polled) declared the monthly medication cost per person as being above 150 PLN (brackets: '151–200' – 62 subjects, i.e. 29.7%, '201–250' – 9 subjects, i.e. 4.3%, '251–300' – 21 subjects (10%) and '>300' – 1 subject (0.5%) (Fig. 3). It should be emphasized that in the majority of cases these were the costs of real but not recommended

treatment courses (therapeutic schemes modified by the patients themselves). However, if one takes into account the median monthly household expenses per person as being close to 401–500 PLN (rent, gas, furnace oil or coal, electricity, water, telecommunication charges, as well as minor repair expenses; some of those polled lived alone so their costs of living were proportionately high); the median monthly food expenses per person were in the '251–300' PLN bracket, whereas the total sum of the monthly household, food and drugs expenses per person was high (Figures 3–5; Tables 1–3).

It must be taken into consideration that the sources of income in most cases were pensions (188 – therefore almost nine-tenths of the respondents were pensioners), and the fact that in 2009 the average pension from outside the KRUS system (Agricultural Social Insurance Fund in Poland) in Lublin Province was equal to 1,140.18 PLN, in the KRUS system – 902.71 PLN, and average pension due to disability – 1,074.37 PLN. It must be emphasized that the average monthly income per person in the province of Lublin in 2009 was equal to 826 PLN [25].

The summed medians of monthly household, food and drugs expenses exceed the above presented value of 826 PLN (by 41.2 PLN); the summed means of monthly household, food and drugs expenses were very close to the monthly income per person in the province of Lublin in 2009.

If one realizes that the data describing the financial situation of the pensioners indicates the lack of financial reserves, the conclusion may easily be drawn that any unexpected expenses (such as failures of domestic appliances, the necessity of a house renovation, any increment in prices, etc.) may be a reason for making dramatic decisions: to restrict food expenses, to withhold payment of bills, to abandon necessary running repairs, or to cut back on prescribed drugs. The tendency to cut back on costs of treatment realized by the poorest patients may be observed worldwide [4, 13, 18, 22], even in such industrialized countries as the USA [8].

Treatment failure due to abandoning or modifying multi-drug therapy may mean a worsening of the quality of life,

**Table 1.** Monthly medication costs per person (PLN).

Class interval (PLN)	50–100	101–150	151–200	201–250	251–300	301–350
Frequency (F)	52	64	62	9	21	1
Cumulative frequency (cf)	52	116	178	187	208	209
Median class interval – median		141.0				
Modal class interval – mode		142.9				

**Table 2.** Monthly food expenses per person (PLN).

Class interval (PLN)	100–150	151–200	201–250	251–300	301–350
Frequency (F)	15	39	36	74	45
Cumulative frequency (cf)	15	54	90	164	209
Median class interval – median				254.4	
Modal class interval – mode				278.4	

**Table 3.** Monthly household expenses per person (PLN).

Class interval (PLN)	200–300	301–400	401–500	501–600	601–700	701–800
Frequency (F)	23	36	98	25	15	12
Cumulative frequency (cf)	23	59	157	182	197	209
Median class interval – median			429.0			
Modal class interval – mode			445.9			

frequent stays in hospitals including intensive care treatment, appearance of unexpected complications, or even the shortening of a patient's life.

Since the results of the research carried out showed that cases of improperly realized ambulatory multi-drug therapies are not incidental but a relatively frequent phenomena, the problem should be considered in the category of risk to public health. It goes without saying that the situation must change, and that the patients need help. There also remains the question about the possible scale of such help and about the recommended methods.

It is obvious that budget deficits in our country do not permit extravagances and the aid should be directed to the needy people. There are several good ideas implemented in different countries. Among them:

- free drug coupons;
- tax relief for the chronically ill;
- tax relief programme for the elderly and disabled;
- financial support for the poor;
- financial support for members of poor families;
- controlled distribution of free drugs to patients suffering from selected diseases (usually diseases posing a significant threat to other people – such as leprosy, AIDS and tuberculosis).

Coupons for free drugs are popular in the United States. Such coupons are typically offered by drug companies or passed to consumers via doctors and pharmacists, and sometimes can also be obtained online. The idea seems to be very good but in most cases it is not a targeted assistance for the poor, but such coupons are forms of direct-to-consumer advertising of prescription drugs [1, 11], or a way of getting rid of drugs with periods of validity being

about to expire. This concerns both prescription and non-prescription drugs.

Tax reliefs for the chronically ill granted in Poland are the forms of financial help addressed only to selected, disabled people [21]. This help depends on the disability but not on the degree of poverty, and may not be considered as a method for fighting against irregularities in ambulatory treatment resulting from the lack of financial means.

Tax relief programmes for the elderly and disabled are local initiatives. As the example, there may be mentioned the task relief ordinance, applied in Wilton (1974), addressed to seniors at the age of 65 or over who had resided in the town for at least five years. Such programmes provide tax credits but do not specify the purposes for which the money should be spent [3].

Financial support addressed directly to the poor or to members of families with low income is a form of State aid realized in some countries, including Poland. Unfortunately, this form of financial aid does not guarantee that it will be used as intended, and thus does not guarantee the continuation of treatment in any situation of unmet domestic finances.

Taking into consideration Polish realities, coupons for medications would be the best idea for helping poor people with the continuation of ambulatory treatment. It is obvious that such aid may provoke attempts to sell such vouchers, therefore in order to prevent such misuse, the mentioned fee tickets should be registered ones.

The beneficial points of such method are as follows: the aid is addressed directly to needful people, and it is directly targeted to enable proper treatment.

178 respondents (85.2% of those polled) declared monthly medication costs per person as being below 201

PLN (Fig. 3, Tab. 1). Considering the above data, coupons worth about 200 PLN (more or less 70\$), each one given monthly, would be (in most cases) quite sufficient.

### CONCLUSIONS

1. Current regulations of medicines costs refunds may make effective outpatient treatment of chronic diseases impossible.

2. Almost 61.2% of the polled applied treatment contrary to medical recommendations. In mostly cases improper courses of treatment were caused by financial problems.

3. It seems advisable to create effective mechanisms to ensure financial assistance to chronically ill people requiring long lasting outpatient treatment.

4. Considering obtained data, registered coupons worth about 200 PLN each one given monthly would be (in most cases) quite sufficient.

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