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## **Changes in the public health infrastructure in Poland in the context of an aging population**

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## Abstract

The problem of an aging society, particularly the health situation of a group of older people is a challenge for health care for the coming years. Poland among other EU member states has one of the lowest (1) share of the population aged 65 years and older, they constitute approx. 17% of the population. Despite this, according to forecasts up to 2060 Polish society will be the oldest in Europe. Multidisease, polypharmacy and insufficient number of specialists is unfortunately characteristic of this group identify. This creates a need for a specific type of care that takes into account all aspects of the disease, integrating often use several different treatments at the same time. Among the population over 65 years of assistance in connection with, among others, dependence requires approx. 36%, and the proportion increases with age. It can be assumed estimates that the number of people in need of substantial assistance in complex activities of everyday life is 750 thousand. (2). In the system of care for older people play a crucial role alternative forms of care such as day care centers, senior clubs, the daily nursing homes. These institutions fulfill complementary function, ensuring the safety of patients not only medically, but also caring. In addition to providing health care infrastructure for the elderly it is essential to adequate saturation system with trained medical staff. According to the Polish Chamber of Physicians number of geriatricians authorized to practice the profession in Poland is amounted to 433 people in 2017, of which 422 were professionally active. Keep in mind that within one day it is impossible to create the base with geriatric specialists, which is why it is so critical to take action now.

## Introduction and aim

The Act of 11 September 2015. Of elderly specifies the tasks for, among others, public administration bodies and state organizational units, which should monitor the situation of the elderly. Specified in the Act activities should lead to the development of diagnosis, with the objective of improving health and its determinants, quality of life and access to health care financed from public funds. Decision-makers in healthcare recognize the growing problem of an aging population and the need to take action in this field. One of the main challenges is to adjust the health care system to health requirements of the elderly. Polish health care system requires a number of organizational changes aimed at adapting to current trends and demographic projections. Changes are essential in the field of healthcare infrastructure, as well as activities aimed at increasing the number of specialists in the field of geriatrics. When planning the organization of health care for the elderly should take into account the specific characteristics of this group of patients: multidisease and its associated polypharmacy, the long duration of treatment and the need to integrate health care at all levels.

The aim of the study was to present the changes taking place in healthcare in Poland in connection with the problem of an aging population, as well as to present the current status and possible forecast of changes in the health care system.

In course of preparation of this paper a review of the scientific literature was performed in the first place. After reviewing the publications in the personal scope an overview of the health situation as well as public financing in the subject of health care of the elderly. Using databases including public statistics Data Center for Health Information Systems, the financial statements of the National Health Fund, the Polish Chamber of Physicians and the Center for Postgraduate Education of Nurses and Midwives and international statistics database (Eurostat, OECD) analysis of the current resources of the public health care system in the context of geriatric care was carried out at three levels: POZ, AOS and hospital treatment. Based on the verified information sources, an overall assessment of the needs in the field of geriatrics was conducted.

## Description of knowledge

### Demographic changes linked to aging

Poland, like most European Union countries, is faced with a growing problem of an aging population. It is necessary to take measures aimed at adapting the health care system to the new challenges associated with prolongation of life. Poland among other EU member states has one of the lowest share of population aged 65 years and older, they constitute approx. 17% of the population (3). However, the decline in the birth rate, lengthening the life expectancy and increased emigration of young people, according to forecasts will make the Polish population by 2060 one of the oldest in Europe. Demographic forecasts for 2060 show a doubling of the number of people aged 65 years in relation to the present, while the number of people aged over 80 years will grow 4-fold. As it appears from the CSO demographic forecasts for the years 2014-2050: "Whilst maintaining the previous rules concerning the statutory retirement age - per 100 people of working age have accounted for 75 of persons entitled to a pension. Even an increase in the fertility rate to a level that guarantees replacement of generations not prevent a decrease in the number of Polish population and progressive aging of the population "(4).

Since the early 90s of the last century a continuous increase in the average life expectancy can be seen. Women's age is lengthened (5) to 81.8 years (2017), and for men 74.0 years (2017). This growth is amounted to 6.6 years and 7.8 years. From the point of view of health care not only average life expectancy is significant but also life expectancy in good health is essential. According to Eurostat data (6) for those born in 2016 in Poland, in the case of men, the life expectancy in health is amounted to 61.3 years, and 64.6 years for women. After exceeding 65 years of age the length of continuation of health decreases to 8.2 years for men and 8.9 years for women.

### Diseases of the elderly

Knowledge of the health problems of the elderly is one of the first steps towards efficient and effective organization of geriatric care. Seniors, due to age, they are a particular group whose

health needs are significantly different from those in the younger age groups. One of the most typical features of a geriatric patient is multidisease, especially in people aged 70-84 years (2). This creates a need for a specific type of care that takes into account all aspects of the disease, integrating often use of several different treatments at the same time.

Older people suffer mainly from age-related diseases such as degenerative, inflammatory and neurodegenerative diseases. It is estimated that in 2020 the incidence of the disease will be halved for neuropsychiatric disorders and chronic non-communicable (7). Nearly 80% of the elderly suffer from, at least one chronic disease or suffering from the effects of accidents or injuries completed. Patient geriatric diseases primarily affect age-related, which include m. In. cardiovascular disease, COPD, cancer, osteoporosis, arthritis, type 2 diabetes, Alzheimer's disease or cataracts (2).

Among the most common cardiovascular disease is hypertension, which is found in 78% of women and 72% of men in the elderly. Pulmonary disease is the fourth leading cause of death in Poland, among which the most common is chronic obstructive pulmonary disease (COPD). It is estimated that approx. 9% of people over the age of 40 suffer from it, but due to non-specific and non-troublesome initial symptoms number of patients with the disease may be much higher. For this reason, early diagnosis of COPD, which would allow to take effective treatment, is extremely rare (2).

The incidence of cancer increases with age - it is estimated that more than half of all cases affect people over 65 years age. According to data from the National Cancer Registry the total number of cases in 2015 is amounted to 163.3 thousand. The vast majority (75%) of deaths from cancer takes place after 60 years of age (8).

Vertebral fractures are a problem 25% of women over the age of 50, and the incidence increases with age, reaching 50% in the percentage of women over 85 years. On the other hand, approx. 10% of the population over 60 years of age suffers troublesome symptoms associated with osteoarthritis (2).

In the elderly 22% of people suffer from diabetes. The disease is closely associated with obesity, which is found in 40% of women and 28% men, including abdominal obesity in 90% of women and 73% men. Dementing disease affects 400 thousand. people in Poland, including the most common among them Alzheimer's disease is diagnosed in 250 thousand. Clinical symptoms of depression relate to 13.5% of the population aged over 65 years (2).

Among other health problems of the elderly can be mentioned the condition of teeth (every other Polish senior does not have a single tooth own), communication problems associated with hearing loss (affecting 8-15% of people over 60 years of age and 28-40% over 75 years ) or kidney disease, which are among the most unrecognized and affects 25% of women and 28% of men aged 65-69 years and 66% of women and 72% of men over the age of 90 years (2).

In connection with the occurrence of several diseases at the same time a major concern of the elderly is polypharmacy, which is associated with a high risk of side effects. Occurrence of multidisease and polypharmacy among geriatric patients makes their treatment a significant economic burden for the system, as well as social for the patients themselves and their

surroundings. Reduced efficiency of the body in the elderly causes the disease to have more severe and most often a chronic condition, so its early detection it is important, which can prevent the development of disease to the advanced stage in which there will no longer be possible to return to independence and efficiency. Consequence of multidisease is non self-reliance of elderly people and dependence on the help of others. Among the population over 65 years of age approx. 36% of the population required help and the proportion increases with age. It is estimated that the number of older people in need of substantial assistance in complex activities of everyday life is 750 thousand. (2).

#### Resources of the health care infrastructure and medical personnel

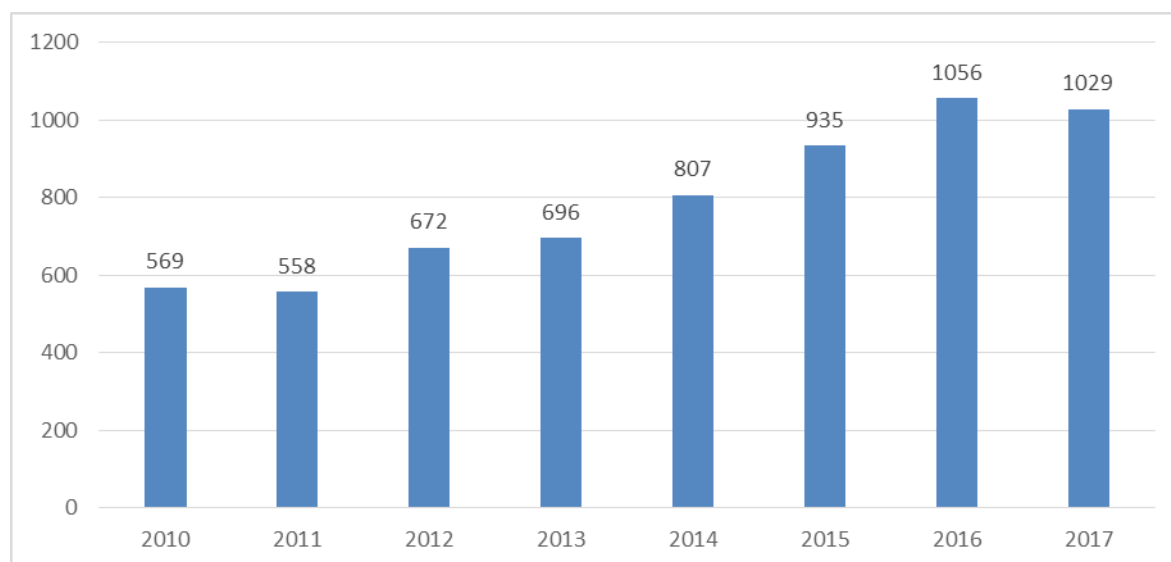
The growing problem of an aging population requires increased efforts of the healthcare system. Evaluation of existing resources may allow to assess to what extent the Polish health care system is prepared for the constantly growing population of seniors and their health needs. Resources include both health infrastructure, eg. places in homes for the treatment of the elderly and the number of beds in the geriatric wards, as well as human resources.

In 2017 Poland had 49 branches with a geriatric profile, as compared to 2010 and 21 branches gives over two-fold increase. Progressive growth in this topic is a positive phenomenon, however, may wonder his pace compared to the health needs of the elderly and their availability. The largest number of geriatric branches is located in the province. Silesia - 13 branches, while in the Warmia-Mazury there is no acting geriatric ward at all (9).

When discussing the topic of geriatric care in Poland, keep in mind that a large proportion of people over 60 years of age suffering from geriatric diseases are treated in other departments, in particular the department of internal medicine. This phenomenon is a burden for the health care system, due to the fact that this units are not adjusted to the comprehensive treatment of the elderly multidisease.

In the past eight years there has been a progressive increase in the number of geriatric beds. In 2017 this number was 1 029 (10). Relative to the previous year there was a slight decline, but in the long-term section you can see a general trend of growth (Fig. 1). While in the current demographic situation of Polish society it is a positive trend, the rate of beds per 10 thousand. population is 0.3, and remains relatively low. Number of patients treated in the last year of geriatric wards amounted to 30 025 people (at the rate of 10 thousand. Population - 7.8). Average patient spent eight days on the ward within the stationary hospital treatment. Analyzing the above information gives you an index of 29.3 per one treated bed geriatric (11).

Figure 1. Number of beds in geriatric wards in general hospitals in 2010-2017



Source: Own calculations based on data CSIOZ

Polish problem in health care is inadequate structure of hospital beds. Given the under-utilization of hospital beds in Poland should reflect on their optimization and, where possible, ensuring an urgent beds. Analysis of the cost of treating patients over 60 years of age showed that they are inferior in case of treatment in geriatric wards than in internal wards (7). Despite the increase in the number of beds in geriatric wards, however, it is a disturbing trend in their use. In 2017 years geriatric beds per cent utilization was 67.2% and over the last eight years is in the range between 60 and 70%. This translates into keeping unused resources and incurring related costs (11).

In addition to inpatient treatment of seniors also takes place in outpatient care. In 2017 years to people aged 65 years and more than 54 million granted advice in primary care. This represented about 1/3 of all the advice given in the context of PHC this year in Poland (169 million). In terms of specialized outpatient care was granted a person older than 32 million tips from the advice given 116 million in total. Only 71,000 tips have been granted in the framework of specialized geriatric care (12). In 2016, in Poland they operate 84 geriatric clinics, of which the last five years came only 7 new geriatric clinic. It is a disturbing phenomenon, because the transfer of the patient's treatment to the level of outpatient health care is to use both for the beneficiary and for the system.

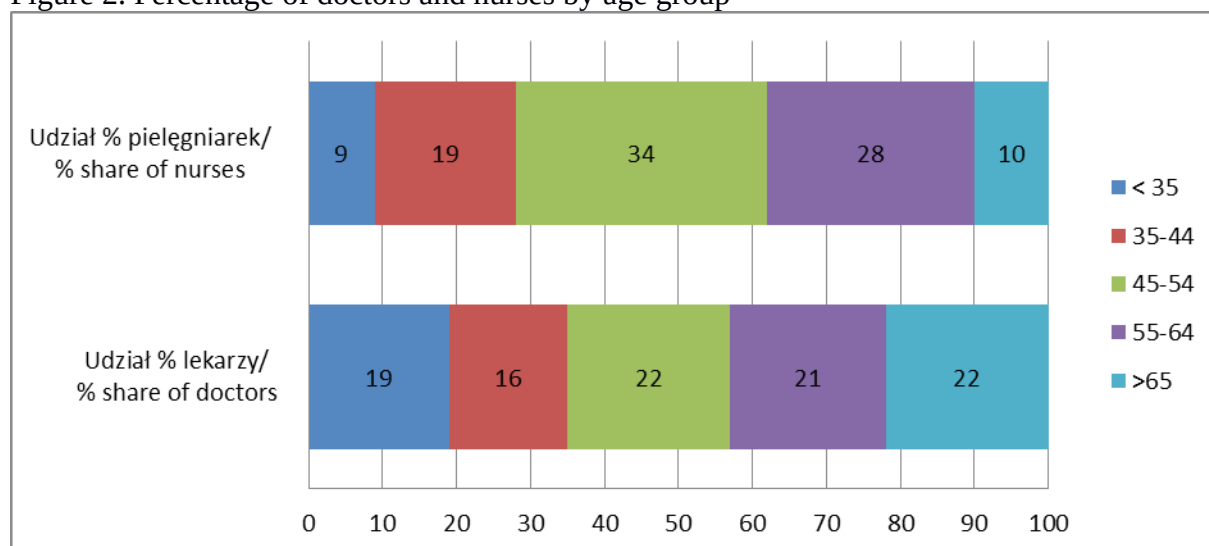
In the system of care for older people alternative forms of care such as day care centers, senior clubs, the daily nursing homes play an important role. These institutions fulfill complementary function, ensuring the safety of patients not only medically, but also caring. The example of other European countries there is a need to de-institutionalization of geriatric care and transfer it to a large extent to the lowest and most favorable, in this case, care. This will allow for the integration and coordination of health and care services, taking into account the individual needs of the patients (13).

## Medical staff

In addition to providing health care infrastructure for the elderly it is essential to adequately saturate the system with trained medical staff. The number of doctors in Poland is amounted to 146 037 people of which 131 590 were economically active. Indicator of the number of physicians was 2.3 per 1 000 inhabitants. By a factor of 3.4 for the OECD countries is Poland ranks below average. For comparison, in the EU the figure is in Germany - 4.1 doctor per 1 000 inhabitants in the Czech Republic - in Slovakia and 3.7 - 3.5 (14).

A major problem to ensure the proper system operation is a high percentage of people who are or soon will be at retirement age. Such doctors have the largest share in the total number of doctors. The percentage of physicians over the age of 65 years is 22 per cent (Fig. 2). Due to the growing problem of staff shortages, actions are taken to reduce deficits, but there is still a lack of long-term, consistent policy on this subject.

Figure 2. Percentage of doctors and nurses by age group



Source: Own study based on data CSIOZ, NIL, NIPiP

Among the medical specialties that deal with the treatment in the elderly can distinguish three groups of physicians:

1. Specializations which patients first contact with the health care system, mainly general practitioners and internists – these doctors are the basis of care for the elderly. GP doctor embedded in gatekeeper positions should deal with the diagnosis and monitoring of new symptoms of exacerbations of chronic diseases in case of such a need to refer patients under specialist care, depending on the situation performed as part of outpatient specialist care or as part of hospital treatment.
2. Doctors specialists who practice in their lead large part of diseases of old age in areas such as cardiology, oncology, neurology, but also hypertensiology, psychiatry and medical rehabilitation.
3. The last group of specialist are doctors dedicated to the specificity of the elderly, that is, geriatricians. According to the Polish Chamber of Physicians in Poland we have 433 doctors

specializing in geriatrics, of this number 422 persons actively engaged in the occupation (Table. 1).

Table 1. Number of selected fields of medical specialists.

Field	Specialists	Professionally active specialists
Geriatrics	433	422
Hypertension	343	339
Cardiology	4 422	4 342
Family medicine	11 508	11 125
Internal diseases	31 126	28 985
Psychiatry	4 435	4 159
Neurology	4 627	4 289
Oncology	914	902
Medical rehabilitation	2 125	1 968

*Source:* Own study based on data from the Central Register of Physicians of Poland Polish Chamber of Physicians (accessed 15.12.2018)

From January 23, 2004, due to the shortage of geriatric doctors and difficulties in securing the availability of geriatric services, it is a priority field of medicine. Despite this change, physicians still do not want to choose this specialization. This is all the more important considering the problem of ensuring replacement of generations of medical professions. Please note that the process of training specialists takes approx. 10 years since starting his medical studies to obtain a degree of specialization. Using the experience of other countries, in particular the UK, it is estimated that in Poland the demand for doctors geriatricians is approx. 800 professionally active specialists in order to provide adequate care for the elderly. This is due to the assumption in the British model of 4,000 people aged over 75 years old. there should be one geriatrician, as in the case of a group of people between 65 and 74 years of age (4).

In addition to the second group of doctors and health professionals, whose presence is essential for healthcare for the elderly are nurses. In 2017 Poland were 291 864 working nurses. Relative to the preceding five years the right to practice the profession gained more than 10 thousand people. In this group of professional personnel there is also significant deficit. According to OECD data rate of nurses per 1 000 population is 5.2 with an average of 9.0. For comparison, in the Czech Republic this ratio in 2015 was 8.0, 13.3 and in Germany (15). The nurses who specialize in geriatrics, internal diseases, family nursing, long-term care and palliative care will be of special importance in the care of the elderly.



Table 2. The number of people completing selected nursing specialties particularly important for care for the elderly from 2002 to 2016

Nursing specialization	The number of people completing a specialization in a particular field in the period 2002-2016 (for the spring session)
Geriatrics	690
Palliative care	818
Long-term care	2 242
Family nursing	896
Internist	4 423
Cardiology	1 808

*Source: Report of the Supreme Council of Nurses and Midwives - Protection of Polish society in the provision of nurses and midwives, Warsaw 2017*

A very important fact in the context of demographic change, is distinguished specialization in geriatrics. The specificity of working with older people, which in addition to multidisease, polypharmacy and often also have varying degrees of abnormal behavior, requires specific nursing skills (16).

In the geriatric care system emerged in recent years another profession - medical caregiver. It is a new medical profession (exists since 2008) and has been classified as a profession and specialization for the needs of the labor market - Regulation of the Family Minister, Labor and Social Policy of November 7, 2016 amending the regulation on the classification of professions and specialties for the needs of the labor market and the scope of its application. In Poland there are approx. 116 schools educating medical caregivers. Since 2007, when training of medical caregivers had begun, there appeared about 15 thousand graduates on the market (17). Due to the very difficult demographic situation of the nursing profession, the importance of this profession should be emphasized in the care of geriatric patients.

#### Expenses related to the treatment of older people

The aging population is a huge organizational challenge for the health care system. CSO estimated that in 2035 there will be 23% of people over 65 years old. According to the NIK audit on the evaluation of medical care for elderly people in Poland, there is no geriatric care system for the elderly. Insufficient is also its availability and the lack of standards of medical care for the elderly (7).

The resources necessary to ensure the optimal system include the human resources analyzed in the article, ie the number of specialists prepared to care for the elderly, infrastructure resources, ie the number of geriatric beds or places in institutions where older people are treated most often. These are the most important but not the only resources that are important for the organization of effective geriatric care.

The health care system aging also entails a change in the structure of expenditure. According to the report 'The 2015 Aging Report Economic and Budgetary projections for the 28 EU Member States (2013-2060)' (18) public expenditure on health will increase to 5.6% of GDP in 2060, of which approx. 1.1% will be spent on healthcare for the elderly. It is therefore important to prepare comprehensive valuation of health benefits for the geriatric patients. In the functioning reimbursement system in Poland for hospital treatment there are no JGP groups dedicated to benefits geriatric healthcare services. The majority of geriatric patients are directed to internal disease departments, where, due to the type of JGP groups and the nature of financing, the main reason for hospitalization and related medical procedure is treated. This leads to a paradox. Hospital holding strictly to the guidelines cannot provide comprehensive health care to the geriatric patients, which host many drugs at the same time and in need of treatment of several diseases at the same time. On the other hand, medical ethics requires giving comprehensive medical treatment and to ensure the highest possible horizontal, which generates an increase in unit costs. Carried out for the analysis of NIK showed that the average unit cost of services provided within 12 months from the date of discharge of elderly wielochorobowością on the ward is 1 380 zł higher than the cost generated at the geriatric ward (7). Hospital holding strictly to the guidelines cannot provide comprehensive health care to the patient geriatrycznemu, which host many drugs at the same time and in need of treatment of several diseases at the same time. On the other hand, medical ethics requires giving comprehensive medical treatment and to ensure the highest possible horizontal, which generates an increase in unit costs. Carried out for the analysis of NIK showed that the average unit cost of services provided within 12 months from the date of discharge of elderly wielochorobowością on the ward is 1 380 zł higher than the cost generated at the geriatric ward (7). The hospital, strictly following the guidelines, cannot provide comprehensive health care to a geriatric patient, i.e. who is taking multiple drugs simultaneously and requiring the treatment of several diseases at the same time. On the other hand, medical ethics requires giving comprehensive medical treatment and treatment to be as good as possible, which generates an increase in unit costs. Carried out for the analysis of NIK showed that the average unit cost of services provided within 12 months from the date of discharge of elderly wielochorobowością on the ward is 1 380 zł higher than the cost generated at the geriatric ward (7). or receiving multiple medications at the same time and in need of treatment of several diseases at the same time. On the other hand, medical ethics requires giving comprehensive medical treatment and to ensure the highest possible horizontal, which generates an increase in unit costs. The analyzes carried out at NIK request showed that the average unit cost of benefits provided within 12 months from the discharge of an elderly person with multiple care in the internal ward is PLN 1,380 higher than the cost generated in the geriatric ward (7).

National Health Fund data show that the value of the expenditure on health increased significantly from approx. 55 years. Data from the National Health Fund has also shown that beneficiaries over 65 years of age represent 13.2% of the insured, while hospital treatment of these patients is above 30% of the total cost of hospitalization (19). It is estimated that spending on treatment of patients over the age of 65 are nearly 3 times higher than patients to 65 years. In 2014, the highest treatment costs involved patients aged 60-69 years. According to forecasts by the National Health Fund, these costs over the years will shift to older patients - in 2030 they will be focused on patients aged 75-76 years.

## Summary

Given the demographic changes taking place in Polish society, it is necessary to provide adequate healthcare infrastructure in the field of geriatrics. Aging of the population in Poland in relation to other European countries is very dynamic. For this reason, it seems particularly important to prepare facilities in the form of functioning geriatric wards and clinics, which will comprehensively cover the health care of people aged 60+. The increase in the number of highly specialized branches for patients in old age is a positive phenomenon, but with the progress of demographic changes it is necessary to intensify actions in the area of adapting infrastructure to the situation of the society. Although there is an increase in the number of geriatric wards, their overall number remains low. They are the province, where there is no geriatric unit at all. Elderly patients are treated mostly in internal disease departments or cardiology departments that are not adapted to the long-term treatment process of these patients. This fragmentation of the treatment is disadvantageous both for the system and the patient.

A geriatric specialist, through the knowledge he has, can comprehensively plan the course of treatment and provide general health care for a person over 60 years of age. Granting the status of the coordinator of care over the elderly to geriatrics specialist seems to be one of the solutions to be implemented in the Polish system. Such a solution could bring a number of benefits for all participants in health care. For the patient, the primary benefit will be increased safety and effectiveness of medical treatment. Elderly person with multidisease often stays under the care of several specialists who lead their treatment path independently. This increases the likelihood of adverse interactions between the processes of treatment, which may result in prolonged treatment and reduced effectiveness. For the health care system, coordinating activities within the framework of healthcare for a patient aged 60+ will allow to use the possessed funds in a more effective way. The crisis of medical staff in the perspective of demographic change will also require increasing the before and postgraduate education of doctors of other specialties in a geriatric and specificity of old age. There is also an urgent need for the training of other professional groups related to medical care and social assistance: medical nurses or carers. The crisis of medical staff in the perspective of demographic change will also require increasing the size and postgraduate education of doctors of other specialties in a geriatric and specificity of old age. There is also an urgent need for the training of other professional groups related to medical care and social assistance: medical nurses or carers. The crisis of medical staff in the perspective of demographic change will also require increasing the size and postgraduate education of doctors of other specialties in a geriatric and specificity of old age.

After the analysis of the collected information on changes in the health care infrastructure in the context of an aging population in Poland you can make the following observations:

- In the present state, the geriatric health care system in the context of progressing demographic changes is not prepared to provide comprehensive health services to the elderly.
- Due to the length of the process of training qualified medical staff, in order to adjust the number of specialists in geriatrics and geriatric nurses to the population, it is necessary to initiate action at the moment, which will bring result in 10 years.
- Changes should be made in the system of payments for medical services through the creation of groups dedicated to geriatrics.

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