# Preventive healthcare and health promotion in local governments based on the example of health policy programmes concerned with cardiovascular diseases implemented in Poland in 2009–2014

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# Abstract

**Background:** Cardiovascular diseases (CVD) are the cause of over 4.3 million deaths in the World Health Organisation European Region and around 1.9 million deaths in the European Union member states alone. They are also the number-one cause of death in Poland. In 2010 CVDs accounted for 46% of all deaths, and in 2013 — 45.8%.

Aim: The aim of the study was to evaluate the performance of the tasks of local government units in the area of preventive healthcare and health promotion on the basis of health policy programmes concerning CVD.

**Methods:** The study was based on a desk research. The data included in the annual reports submitted to the Minister of Health concerning completed health policy programmes concerned with CVD, was used.

**Results:** A total of 795 programmes were completed in 2009–2014. The greatest number of programmes were completed by municipalities followed by counties. The costs incurred by voivodeships in connection with the programmes were significantly higher compared to the costs paid by municipalities and counties. Diagnostic programmes accounted for 74% of the overall number of programmes, and preventive programmes made up only 24%. The greatest number of programmes were completed in Mazowieckie and Swietokrzyskie voivodeships. The smallest number of programmes were completed in Lubelskie, Lubuskie, and Podlaskie voivodeships.

**Conclusions:** Insignificant involvement of local government units can be seen in the fight against CVD. Particular types of local government units demonstrate a varied degree of involvement in the performance of health policy programmes. The small number of preventive programmes points to the fragmentary completion of tasks concerned with preventive healthcare and health promotion. Some of the voivodeships failed to properly address the health needs of local communities in respect of CVD. More programmes need to be completed, and they need to cover more people. Some guidelines should be developed for local government units concerning their involvement in the fight against CVD.

Key words: preventive healthcare and health promotion, health policy programme, local government unit, cardiovascular disease

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## **INTRODUCTION**

Cardiovascular diseases (CVD) account for over 4.3 million deaths in the World Health Organisation (WHO) European Region and around 1.9 million deaths in the European Union (EU) member states alone [1]. The death rates for CVD vary greatly between different EU member states. In Bulgaria, Romania, Estonia, Latvia, and Lithuania the diseases account for over 50% of the overall number of deaths, while in Denmark, the Netherlands, the United Kingdom, France, and Belgium the percentage is below 30% [2]. According to the WHO, CVD will remain the number-one cause of death in developed countries at least until 2030 [3].

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Cardiovascular diseases are also the number-one cause of death among Poles. In 2010 the diseases claimed the lives of 174,000 people, i.e. 46% of the overall number of deaths. The standardised mortality rates for CVD reached 451.8/100,000 [4]. In 2013 in Poland 177,000 people died due to a CVD, i.e. 45.8% of the overall number of deaths. The standardised mortality rates in that year reached 433.3/100,000 [2].

The current rate of decrease in CVD death rates in Poland is only slightly greater than the average of the EU-15 countries. If the rate continues at the same level, men in Poland will reach the mortality level recorded in the EU-15 countries in 2029, and women five years earlier. The situation looks worse in terms of premature deaths, i.e. among people below 65 years of age. With the current rate of decrease, Polish men will reach the average mortality level recorded in the EU-15 countries around 2040, and women around 2028 [5].

At a national level, in 2003–2012 there was a National Programme of Prevention and Treatment of Cardiovascular Diseases [6] and the National Programme of Providing Equal Access to the Means of Prevention and Treatment of Cardiovascular Diseases for 2013–2016 [7]. At a regional and local level, the tasks in the area of healthcare are conducted by local government units. Under those tasks, local government units complete programmes in the area of preventive healthcare and health promotion, e.g. through health policy programmes [8]. The programmes concern, for instance, important epidemiological issues and other significant health problems [9].

The aim of the study was to evaluate the performance of health policy programmes concerned with CVD by local government units in 2009–2014.

#### **METHODS**

The study was based on desk research. The data included in the annual reports submitted by voivodes to the Minister of Health concerning health policy programmes completed by local government units, was used. The analysis covered all the programmes concerned with CVD completed in 2009–2014. The analysis covered the performance of programmes by local government units at all levels, i.e. the largest divisions (voivodeships), second-degree divisions, which form parts of voivodeships) (counties), and the fundamental divisions (municipalities). Cities with the status of a county are reported as counties.

The analysis covered programmes whose name, objective, or description of tasks indicated that they concern a CVD. The programmes were classified into one of the three group types: preventive programmes, diagnostic programmes, and therapeutic programmes. The programmes were classified into particular groups on the basis of the objective specified by a given local government unit, the type of programme, and the description of actions taken under the programme.

Analysis was performed for the number of programmes implemented in particular voivodeships in 2009–2014, the number of programmes implemented in successive years by all the voivodeships collectively, the number of programmes implemented in successive years by particular voivodeships, the number of programmes implemented in particular years by municipalities, counties and voivodeships, the number of preventive and diagnostic programmes implemented in particular years, and the number of preventive and diagnostic programmes implemented by municipalities, counties, and voivodeships.

The mean value of total costs of all preventive and diagnostic programmes implemented in municipalities, counties, and voivodeships in 2009–2014 was also calculated.

The analysis also included the distribution of maximum populations covered by programmes relative to the costs of the programme.

#### **RESULTS**

In the period covered by the analysis, local government units at all levels completed 795 programmes. The programmes were related to, e.g. prevention of ischaemic heart disease, atherosclerosis, and strokes. The programmes enabled patients to undergo tests, e.g. arterial blood pressure tests, cholesterol tests, electrocardiography, and consult a doctor. Under promotional and educational actions, local government units encouraged patients to have free tests as a part of information campaigns with leaflets and posters with information about the tests.

Figure 1 presents the number of programmes implemented in particular voivodeships in 2009–2014.

The greatest number of programmes were implemented in Mazowieckie and Swietokrzyskie voivodeships, the smallest in Lubuskie and Podlaskie voivodeships.

Figure 2 presents the number of programmes implemented in particular years in all voivodeships.

There were more programmes implemented in 2009– -2011 compared to 2012–2014. The analysis also covered the number of health programmes implemented in successive years by particular voivodeships (Table 1).

There are dynamic changes in terms of the number of programmes implemented in successive years in Malopolskie, Mazowieckie, Podkarpackie, and Pomorskie voivodeships. The number of programmes held in subsequent years in Malopolskie voivodeship increased in 2011, only to decrease in the following years. The number of programmes held in Mazowieckie and Pomorskie voivodeships was decreasing year by year. The number of programmes implemented in Podkarpackie voivodeship increased in 2010–2011, only to decrease in the following years.

In 2009–2014 municipalities implemented 615 programmes, counties — 143 programmes, and voivodeships — 33 programmes. Table 2 presents distribution in terms of the number of programmes implemented by particular local government units in successive years.



Figure 1. The number of programmes implemented in particular voivodeships in 2009–2014



Figure 2. The number of programmes implemented in successive years 2009–2014

There is a clear downward tendency in respect of the number of programmes implemented by municipalities in successive years. The numbers of programmes implemented by counties and voivodeships were comparable in successive years.

A clear majority of municipalities and counties did not implement any health policy programmes concerned with CVD in the analysed period. Table 3 presents the number of programmes implemented by particular types of local government units (Table 4).

The highest percentage share of municipalities that implemented programmes in the analysed period was recorded in 2009 and it reached 4.3%. The lowest percentage was recorded in 2013 — 2.17%. An insignificant involvement in implementation of health policy programmes concerned with CVD was also proved true for counties. The highest percentage of counties that implemented programmes was recorded in 2009 — 6.31%, and the lowest in 2012 — 3.42%.

In 2009–2014 there were in total 595 diagnostic programmes, 192 preventive programmes, and one therapeutic programme. Table 5 presents the number of preventive and diagnostic programmes implemented in successive years. The greatest number of programmes was implemented in 2009. The numbers of programmes implemented in 2010– 2014 are also presented as a percentage of the programmes that were implemented in 2009.

A decrease in the number of preventive and diagnostic programmes implemented in 2012–2014 in relation to the number of programmes implemented in 2009– –2011 was found.

The analysis also covered the relations between the type of a programme (preventive, diagnostic) and the local government unit (municipality, county, voivodeship) (Table 6).

Preventive programmes accounted for 21.8% of all the programmes implemented by municipalities, 30.06% of all the programmes implemented by counties, and 42.4% of all the programmes implemented by voivodeships.

The programmes were divided into those addressed to adults and children and those addressed to women and men.

Voivodeship	Year					
	2009	2010	2011	2012	2013	2014
Dolnoslaskie	12	12	7	11	4	7
Kujawsko-pomorskie	12	10	7	3	3	5
Lubelskie	3	2	2	1	1	2
Lodzkie	5	2	2	1	3	4
Malopolskie	16	11	29	14	10	9
Mazowieckie	43	14	29	19	17	16
Opolskie	5	3	3	1	2	2
Podkarpackie	2	10	9	3	4	3
Podlaskie	1	1	1	4	1	1
Pomorskie	31	16	9	4	4	6
Slaskie	7	12	9	5	4	5
Swietokrzyskie	17	27	25	18	13	20
Warminsko-mazurskie	3	4	4	2	2	8
Wielkopolskie	5	7	9	6	5	6
Zachodniopomorskie	14	17	15	11	12	18
Lubuskie	2	2	1	1	2	3

# Table 1. The number of programmes implemented in particular years and voivodeships

Table 2. The number of programmes implemented in successive years by particular local governments

Local government unit		Year				
	2009	2010	2011	2012	2013	2014
Municipality	144	115	127	82	63	84
County	29	31	25	17	20	21
Self-governed voivodeship	5	4	9	3	4	8

Table 3. Frequency distribution of particular types of local government units by the number of implemented of programmes in2009–2014

Local government	No. of		No. of ir	nplementing ι	inits in particu	lar years	
unit	programmes	2009	2010	2011	2012	2013	2014
Municipality	0	2371	2386	2381	2413	2425	2402
	1	77	72	74	51	45	70
	2	23	20	19	14	9	7
	3	7	1	5	1	0	0
County	0	356	357	359	367	364	364
	1	19	17	17	10	13	12
	2	5	5	4	2	2	3
	3	0	0	0	1	1	1
	4	0	1	0	0	0	0
Voivodeship	0	11	13	9	14	13	9
	1	5	2	6	1	2	6
	2	0	1	0	1	1	1
	3	0	0	1	0	0	0

Local government unit	Year					
	2009	2010	2011	2012	2013	2014
Municipality	4.3%	3.75%	3.95%	2.66%	2.17%	3.10%
County	6.31%	6.05%	5.52%	3.42%	4.21%	4.21%
Voivodeship	31.25%	18.75%	43.75%	12.5%	18.75%	43.75%

Table 4. Percentage of municipalities, counties, and voivodeships that implemented programmes in successive the years 2009–2014

Table 5. The number of preventive and diagnostic programmes implemented in successive years 2009–2014 (percentage in relation to the number in 2009)

Programme type	Year					
	2009	2010	2011	2012	2013	2014
Preventive	49	33 (67.3%)	38 (77.6%)	22 (44.9%)	21 (42.9%)	29 (59.2%)
Diagnostic	128	117 (91.4%)	123 (96.1%)	77 (60.2%)	66 (51.6%)	84 (65.6%)

The greatest number of programmes, namely 513, were addressed to adults, and only 60 were addressed to children. The number of programmes dedicated for women (184) and men (187) was comparable. The same relation was observed for all the successive years.

The analysis also covered the total costs in PLN of preventive and therapeutic programmes in municipalities, counties, and voivodeships (Table 7).

The expenditure on the preventive and diagnostic programmes incurred in voivodeships were higher than the expenditure of counties and municipalities. Voivodeships and counties expended significantly more on preventive programmes compared to diagnostic programmes. The expenditure on preventive and diagnostic programmes incurred by municipalities was comparable (Table 8).

There clearly is no correlation between the costs of a programme and the size of population covered by the programme. The programmes addressed to the smallest population (up to 1967 people) were the most expensive.

## **DISCUSSION**

Despite the improvement of the epidemiological status that has taken place over the last two decades, death rates for CVD in Poland, specifically regarding the number of premature deaths (i.e. under 65 years of age), remain at a high level [10]. It is estimated that the number of deaths due to CVD will exceed 188,000 per year in 2020, and 200,000 in 2030 [2]. The anticipated increase in the population of elderly people in Poland by 2030 (increase of 1.4 million of people aged 65–74 years and 1.6 million of people aged 75 years or more) will lead to a significant increase in the number of people with cardiovascular problems [11]. Forecasts predict that the number of heart attacks in the population in Poland will increase by 2030 compared to the situation observed in 2009–2012, only because of the change of age structure, by Table 6. The number of preventive and diagnostic programmes implemented by municipalities, counties, and voivodeships in 2009–2014

Programme	Local government unit				
type	Municipality	County	Voivodeship		
Preventive	134	43	14		
Diagnostic	480	100	19		

Table 7. Average overall costs of preventive programmesand diagnostic programmes implemented in municipalities,counties, and voivodeships in 2009–2014

Programme	Local government unit				
type	Municipality	County	Voivodeship		
Preventive	24801.10	25025.75	141168.54		
	PLN	PLN	PLN		
Diagnostic	21656.25	11899.33	67468.50		
	PLN	PLN	PLN		

 Table 8. Maximum population covered by a programme relative to the costs of implementation of the programme

Costs in PLN	Maximum population		
	covered by a programme		
Up to 10,000	Up to 14,316 persons		
10,000–20,000	Up to 6,656 persons		
20,000–50,000	Up to 39,782 persons		
50,000–100,000	Up to 6968 persons		
100,000-250,000	Up to 50,000 persons		
250,000–500,000	Up to 13,500 persons		
500,000–700,000	Up to 1967 persons		

39% among men and 42% among women, i.e. 38,000 cases. If the hospitalised prevalence remains at the current level, by 2030 one may expect an increase in the number of hospitalised cases of CVD of nearly 390,000 compared to 2012 (37% for men and 34% for women) [5, 12]. In the context of the epidemiological data, the insufficient activity of local government units in terms of implementation of CVD programmes and the annually decreasing number of implemented programmes must be viewed in a negative light.

The greatest number of health policy programmes in the analysed period were completed by municipalities, and the smallest by voivodeships. Local government units ran mostly diagnostic programmes, which accounted for 75.5% of the overall number of programmes. It is not to be criticised because the programmes provide financing for a wide range of actions. Nonetheless, it might be symptomatic of deficits in the healthcare system in Poland, which consists of imposing the obligation of financing certain health services on diagnostic health policy programmes [13]. One can assume that the programmes that entailed the highest expenses and covered the smallest population (up to 1967) were diagnostic programmes.

Preventive programmes made up only 24% of the overall number of programmes. The greatest number of preventive programmes were implemented by municipalities followed by counties. At the same time, the costs incurred by municipalities and counties in connection with diagnostic and preventive programmes reached a comparable sum. Voivodeships expended significantly more money on preventive programmes compared to diagnostic programmes. Analyses conducted by the WHO show that around 80% of heart attacks, strokes, or type 2 diabetes cases could be avoided if we managed to eliminate the most important risk factors [14, 15]. In addition, high blood pressure, high cholesterol levels, overweight and obesity, low consumption of fruit and vegetables, limited physical activity, tobacco smoking, alcohol consumption, and air pollution in cities account for 80% of deaths and 84% of cases of ischaemic heart disease, and 54% of deaths and 68% of years of health that are lost due to stroke, in countries with high-income economies [16]. In view of the foregoing, the implementation of a small number of preventive programmes by local government units and the significant decrease in the number of preventive programmes implemented in 2012-2014 compared to the number of programmes implemented in 2009-2011 must be viewed in a negative light. Some doubts are raised by the fulfilment of objectives established under the National Health Programme for 2007-2015 [17]. Chapter 4 "Essential action on the part healthcare institutions and local government units" names two objectives: activation of local government units and non-governmental organisations for the benefit of health and improvement; and optimum use of healthcare system and local government infrastructure for the purpose of health promotion and health education.

The study also evaluated how local government units addressed the health needs of citizens arising out of mortality due to CVD. In 2000-2001 the highest death rates were recorded in Slaskie, Lodzkie, and Opolskie voivodeships, and the lowest rates were recorded in Warminsko-Mazurskie, Podlaskie and Pomorskie voivodeships. In 2009-2010 the death rates reached the highest levels in Swietokrzyskie, Lodzkie, and Lubelskie voivodeships, while the lowest rates were recorded in Pomorskie, Podlaskie, and Wielkopolskie voivodeships. Throughout 2000-2010 the number of deaths due to CVD in Poland decreased by 21%, with the most prominent decreases recorded in Pomorskie (30%) and Slaskie (29%) voivodeships. The least significant improvement was recorded in Warminsko-Mazurskie (decrease of 2%) and Swietokrzyskie (decrease of 6%) voivodeships [4]. In 2012 the largest number of deaths due to CVD were recorded in Slaskie, Swietokrzyskie, and Lubelskie (over 490/100,000) — the number was around 25% higher compared to Podlaskie voivodeship, which had the lowest death rate (394/100,000). Although the number of deaths in Lodzkie and Lubelskie voivodeships was the highest, the voivodeships implemented a small number of programmes on CVD. In addition, the number of programmes implemented in Lubelskie voivodeship decreased year by year. Since 2012 Lodzkie voivodeship has seen an insignificant increase in the number of implemented programmes. Those voivodeships failed to properly address the health needs of their citizens. In terms of the number of programmes implemented in 2009-2013, the actions taken by local government units in Swietokrzyskie voivodeship deserve the greatest praise. Nonetheless, the decreasing number of programmes implemented throughout 2010–2013 is an alarming tendency. A similar observation was made for Slaskie voivodeship.

The analysis also covered the expenditure on particular types of health policy programmes on CVD. In 2009-2013 the largest resources on health policy programmes [18-20] were expended by voivodeships (the greatest share in 2013, around 10% of the budget) followed by municipalities (the greatest share in 2012, around 1.1% of the budget). The percentage share of expenditure on programmes on CVD in counties during the period covered by the study did not exceed 0.2%. A positive tendency is the increase in the percentage share of the funds expended on programmes on CVD observed in voivodeships and municipalities in 2010–2013. The analysis of the structure of expenditure incurred by particular local government units shows that the funds are probably dedicated in the first instance to the fulfilment of obligatory tasks prescribed by the law. The decrease in the number of programmes observed since 2010 might be a consequence of introduction of changes in regulations on implementation of health policy programmes. Since 31 August 2009 ministers and local government units are obliged to consult projects with the Agency for Health Technology Assessment and Tariff System (AOTMiT) [21]. In 2010–2013 the AOTMiT approved only 31.3% of programmes, it rejected 46.9% of programmes, and granted conditional approval to 21.9% of programmes concerned with CVD [22]. Although the opinion of the AOTMiT is not binding on the local government units, one might assume that they did not want to risk implementing programmes that were not approved. The conclusion of long-term programmes that started before 2010 and the insignificant percentage of approved programmes could account for the decrease in the number of programmes. It is probable that more funds were dedicated for continuation of running programmes (that did not require approval of AOTM) and implementation of programmes that received positive reviews.

Another aspect covered by the analysis was the population covered by a given programme on CVD. Since CVD are indicated as the cause of death of mainly elderly people, i.e. aged 65 years or more, it seems reasonable that more programmes are addressed to adults. The number of programmes addressed to women and the number of programmes addressed to men were comparable. CVDs are more common among women and the death rates are significantly higher among women compared to men. In 2013 as many as 95,000 women died because of CVD, i.e. 51% of the overall number of deaths. The number of deaths among men was lower by around 10% — in 2013 it reached around 41% [2]. One should stress that the fact that women are more likely to die due to CVD than men arises from the women's age structure. After elimination of the differences in age structure between the sexes, it turns out that CVDs pose a much greater threat to men. In 2013 the standardised mortality rates for men was 70% higher compared to the ratio measured for women [23]. In the context of the above data, some doubts are raised by the insignificant number of programmes addressed exclusively to men.

## CONCLUSIONS

- 1. There is insignificant involvement of local government units in the fight against CVD.
- Particular types of local government units demonstrate a varied degree of involvement in the performance of health policy programmes concerned with CVD.
- The small and gradually decreasing number of preventive programmes shows that the tasks of local government units in respect of preventive healthcare and healthcare are fulfilled to a limited extent only.
- 4. Some of the voivodeships failed to properly address the health needs of local communities in respect of CVD.
- 5. It is essential that local government units take on and continue actions aimed at fighting CVD by increasing the number of health policy programmes and increasing the size of the population covered by such programmes, as well as by addressing the health needs of the citizens.
- Some guidelines should be developed for local government units concerning their involvement in the fight against CVD.

#### Conflict of interest: none declared

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# Profilaktyka chorób i promocja zdrowia w samorządach terytorialnych na przykładzie programów polityki zdrowotnej dotyczących chorób układu sercowo-naczyniowego w Polsce w latach 2009–2014

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# Streszczenie

**Wstęp:** Choroby układu sercowo-naczyniowego (CVD) są przyczyną ponad 4,3 mln zgonów w krajach należących do regionu europejskiego Światowej Organizacji Zdrowia (WHO) i ok.1,9 mln w krajach Unii Europejskiej (EU). Według WHO choroby układu sercowo-naczyniowego będą wiodącą przyczyną umieralności ogólnej w krajach rozwiniętych gospodarczo przynajmniej do 2030 r. Są także najważniejszą przyczyną umieralności Polaków. Z powodu CVD zmarło w 2010 r. ponad 174 tys. osób, co stanowiło 46% wszystkich zgonów. Standaryzowany współczynnik zgonów z powodu CVD wynosił 451,8/100 tys. ludności. W 2013 r. z ich powodu zmarło w Polsce ponad 177 tys. osób, co stanowiło 45,8% wszystkich zgonów. Dla 2013 roku standaryzowany współczynnik zgonów kształtował się na poziomie 433,3/100 tys. Obserwowane obecnie tempo spadku współczynników zgonów w Polsce z powodu CVD jest tylko nieznacznie szybsze od przeciętnego dla krajów UE-15. Jeśli takie tempo będzie w Polsce nadal się utrzymywać, to mężczyźni osiągną obecny średni poziom umieralności przedwczesnej, tzn. osób w wieku poniżej 65 lat. Przy utrzymaniu się obecnego tempa spadku polscy mężczyźni osiągną dzisiejszy średni poziom umieralności w krajach UE-15 dopiero ok. 2040 r., a kobiety ok. 2028 r.

**Cel:** Celem pracy była ocena realizacji przez jednostki samorządu terytorialnego zadań z zakresu profilaktyki chorób i promocji zdrowia na przykładzie programów polityki zdrowotnej dotyczących CVD.

#### Adres do korespondencji:

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Wyniki: W latach 2009–2014 jednostki samorządu terytorialnego zrealizowały 795 programów polityki zdrowotnej — najwięcej gminy, mniej powiaty, najmniej województwa. Koszty ponoszone przez województwa na realizację programów były znacznie wyższe od kosztów ponoszonych przez gminy i powiaty. Województwa wydawały znacznie więcej na programy profilaktyczne niż na programy diagnostyczne. Programy diagnostyczne stanowiły 74% wszystkich programów, a profilaktyczne jedynie 24%. Najwięcej programów zrealizowano w województwie mazowieckim, świętokrzyskim i małopolskim, najmniej w lubelskim, lubuskim i podlaskim. Najwięcej programów było adresowanych do dorosłych, najmniej do dzieci. Liczba programów adresowanych do kobiet i mężczyzn jest utrzymywana na zbliżonym poziomie.

Wnioski: Niewielka liczba programów polityki zdrowotnej i ograniczone środki finansowe przeznaczone na ich realizację świadczą o niewielkim zaangażowaniu samorządów w zwalczanie CVD. Poszczególne rodzaje jednostek samorządu terytorialnego w różnym stopniu angażują się w realizację programów polityki zdrowotnej. Niewielka liczba programów profilaktycznych wskazuje na realizację w ograniczonym zakresie przez jednostki samorządu terytorialnego zadań z zakresu profilaktyki chorób i promocji zdrowia. Biorąc pod uwagę poziom umieralności z powodu CVD, w części województw nie uwzględniono lokalnej specyfiki sytuacji zdrowotnej, co może świadczyć o chaotyczności działań jednostek samorządu terytorialnego w tych województwach. Konieczne jest podejmowanie i kontynuowanie przez samorządy terytorialne działań mających na celu walkę z CVD poprzez zwiększenie liczby programów polityki zdrowotnej oraz zwiększanie populacji objętej programami, a także uwzględnienie w podejmowanych działaniach potrzeb zdrowotnych mieszkańców. Należałoby rozważyć określenie dla jednostek samorządu terytorialnego wytycznych dotyczących zaangażowania w problematykę zwalczania CVD.

Słowa kluczowe: profilaktyka chorób i promocja zdrowia, program polityki zdrowotnej, jednostka samorządu terytorialnego, choroby układu sercowo-naczyniowego

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CORRIGENDUM TO "Appropriate bolus administration of glycoprotein IIb/IIIa inhibitors for patients with acute coronary syndromes undergoing percutaneous coronary intervention: intracoronary or intravenous? A comprehensive and updated meta-analysis and systematic review"

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In the article titled "Appropriate bolus administration of glycoprotein IIb/IIIa inhibitors for patients with acute coronary syndromes undergoing percutaneous coronary intervention: intracoronary or intravenous? A comprehensive and updated meta-analysis and systematic review" [1], the name of the first author was given incorrectly as Sadegh Ali-Hassan-Sayegh. The author's name should have been written as Sadeq Ali-Hasan-Al-Saegh. The revised authors' list is shown above. These two spelling are belonging to an author.

## Reference

<sup>1.</sup> Ali-Hassan-Sayegh S, Mirhosseini SJ, Shahidzadeh A, et al. Appropriate bolus administration of glycoprotein IIb/IIIa inhibitors for patients with acute coronary syndromes undergoing percutaneous coronary intervention: intracoronary or intravenous? A comprehensive and updated meta-analysis and systematic review. Kardiol Pol. 2016; 74(2): 104–118. doi: 10.5603/KP.a2015.0138.