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ORIGINAL ARTICLE

PUBLIC HEALTH PHYSICIANS AND DENTISTS IN POLAND: RESULTS FROM PUBLIC HEALTH WORKFORCE PILOT STUDY

Dorota Cianciara[1], Katarzyna Lewtak[1], Maria Piotrowicz[1], Małgorzata Gajewska[1], Ewa Urban[1] , Katarzyna Brukało[2]*

[1]National Institute of Public Health-National Institute of Hygiene, Department of Health Promotion and Postgraduate Education, Warsaw, Poland
[2]Medical University of Silesia, Department of Health Policy, Department of Public Health in Bytom, Poland

ABSTRACT

Background. Monitoring public health workforce is one of the essential functions of the public health system.
Objective. The aim of the study was to identify the specialities for physicians and dentists related to public health in the years 1951-2013, and analyse of available data on physicians and dentists certified as public health specialists (PHS) in 2003-2015.
Material and Methods. The historical analysis covers a relevant regulations of a minister in charge of health. The data on PHS were obtained from the Centre of Medical Exams and included: the number of specialists and their demographic characteristics, professional background, spatial distribution. Density was also calculated.
Results. The public health specialty was introduced in 1999. Before there were specialties in disciplines related to public health. In the years of 2003-2015, 360 physicians and dentists were certified as PHS. The majority of them had former background in another discipline, mostly related to clinical medicine. The average age of specialists was 47.2. Currently, the average age of specialists is ca. 57.6 years, with a prevalence of people aged 61-70 years (36.9%). PHS tend to be older than specialists in other disciplines. Over three fourths of PHS were certified in 2004. With the exception of that year, the public health specialist title was annually obtained by an average of 9 persons. The density of PHS in Poland was 0.94 per 100 thousand inhabitants, ranging between 0.16 and 3.12 in a given voivodeship.
Conclusions. The analysis has revealed numerous obstacles in estimation of the number of PHS and indicated a lack of relevant mechanisms aimed at workforce development. A relevant policy for developing public health workforce is urgently needed.

Key words: *public health, specialty, manpower, physicians, dentists*

STRESZCZENIE

Wprowadzenie. Monitorowanie zasobów kadrowych zdrowia publicznego (ZP) stanowi jedną z podstawowych funkcji systemu ZP.
Cel. Analiza specjalizacji przeznaczonych dla lekarzy i lekarzy dentystów w dziedzinach związanych ze zdrowiem publicznym w latach 1951-2013 oraz danych dotyczących lekarzy i lekarzy dentystów specjalistów ZP w latach 2003-2015.
Materiał i metody. Historyczna analiza rozwoju objęła przegląd rozporządzeń ministra właściwego ds. zdrowia, które regulowały tę kwestię. Aktualne dane dotyczące lekarzy uzyskano z Centrum Egzaminów Medycznych (CEM). Uwzględniono: liczbę lekarzy i lekarzy dentystów specjalistów ZP oraz ich demograficzną charakterystykę, doświadczenie zawodowe, dystrybucję przestrzenną oraz liczbę specjalistów na 100 tys. mieszkańców.
Wyniki. Szkolenie specjalizacyjne w zakresie ZP dla lekarzy dostępne jest od 1999 r. W latach wcześniejszych lekarze mogli uzyskiwać specjalizacje w dziedzinach pokrewnych. W okresie 2003-2015 tytuł specjalisty ZP uzyskało 360 lekarzy i lekarzy dentystów. Większość lekarzy i lekarzy dentystów specjalistów ZP posiadała wcześniejsze doświadczenie zawodowe i inne specjalizacje, głównie kliniczne. Średni wiek, w którym lekarze uzyskali tytuł specjalisty w tej dziedzinie wyniósł 47,2 lat. Obecnie średni wiek lekarza specjalisty ZP wynosi 57,6 lat, dominują osoby w grupie wieku 61-70 lat (36,9%). Lekarze specjaliści ZP są starsi niż specjaliści w innych dziedzinach medycyny. Ponad trzy czwarte specjalistów zdało egzamin specjalizacyjny w 2004 r. Wyłączając ten rok, tytuł specjalisty ZP uzyskuje każdego roku przeciętnie 9 lekarzy. W przeliczeniu na 100 tys. mieszkańców liczba lekarzy specjalistów ZP wyniosła 0,94 i wahała się w granicach 0,16-3,12 w poszczególnych województwach.
Wnioski. Uzyskane wyniki dowodzą licznych trudności w oszacowaniu liczby lekarzy zajmujących się szeroko rozumianym zdrowiem publicznym i wskazują na brak mechanizmów rozwoju kadry. Niezbędne jest pilne opracowanie polityki rozwoju zasobów kadrowych ZP.

Słowa kluczowe: *zdrowie publiczne, specjalizacja, zasoby kadrowe, lekarze, dentyści*

[*]**Corresponding author**: Maria Piotrowicz, National Institute of Public Health-National Institute of Hygiene, Department of Health Promotion and Postgraduate Education, Chocimska 24, 00-791 Warsaw, Poland, tel. +48 22 5421363, fax: +48 22 5421375, e-mail: mpiotrowicz@pzh.gov.pl

INTRODUCTION

In this article to describe physicians and dentists who obtained the public health specialisation (were certified as relevant specialist) the term "public health specialists" (PHS) is used.

Workforce is the foundation of the public health system. PHS make up an important, yet not the sole professional group in this sector. Monitoring and strengthening public health workforce resources, both quantity- and quality-wise, is among the key functions of the public health system [40].

Recently, WHO and international studies have increasingly stressed the need for all physicians to be educated in issues related to public health in parallel to their primary medical education [23, 11, 9, 32, 39, 15]. Health advocacy and promotion of social, economic, educational and political changes affecting health are expected from this professional group at large. Thus, physicians should be equipped with relevant competences that would allow them to lend support to and execute social and health system related changes. Also, their role in reducing health inequalities is highlighted [38, 25, 5, 10]. Undergraduate medical education in Poland currently incorporates certain elements of public health, whereas in the period between 1951 and 1957 an independent undergraduate medical education programme known as sanitary and hygienic studies used to exist.

More substantial expectations are held as regards PHS. Currently, specialisation in public health is only available on the postgraduate level. Apart from the public health specialty, there are a few other ones available that are also related to the public health field, such as epidemiology. Under the regulations currently in force, PHS are referred to as individuals who have acquired knowledge, skills and competences allowing them to shape the health policy, efficiently manage the health system, as well as plan, implement, monitor and assess the effectiveness of health-promoting interventions [21].

The study is aimed at overview of specialties (specialisations) related to public health in 1951-2013 and analysis of public health workforce in Poland as regards physicians and dentists certified as public health specialists in the period from 2003 to 2015.

MATERIAL AND METHODS

The regulations of the minister in charge of health were reviewed to analyse the public health related specialties released in the period of 1951-2013 in terms of professions allowed to specialization, specialty levels and disciplines.

The data on PHS certified between 2003 and 2015 were collected from the Centre of Medical Exams (*Centrum Egzaminów Medycznych* – CEM) database in Łódź. The analysis covered: (1) the number of PHS and their demographic characteristic (i.e. age, sex); (2) their professional route (i.e. the year of certification and professional/specialty background), (3) their spatial distribution. Based on Central Statistical Office data on population size in 2015 the density of PHS was calculated. The data obtained from the CEM do not allow the identification of two distinct professional groups i.e. physicians and dentists, hence the analysis has covered both groups jointly (in Poland the dentists have the professional title of doctor).

RESULTS

The overview of specialities related to public health (1951-2013)

The system of certifying has over the years evolved frequently in regards to the professions, specialty levels and disciplines. Information on physicians and dentists are presented in Table 1. Up until 1966, regulations specified the principles of certifying only physicians. In 1973, the ordinance of the Minister specified the specialties to choose for physicians, dentists and pharmacists. Subsequent regulations were concerned with the specialties available to physicians and dentists. Separate regulations, in turn, governed other medical professions such as nurses, midwives, pharmacists, and laboratory assistants (referred to as laboratory diagnosticians in Poland) [27, 28].

In 1951-2013, some changes affecting the specialty levels were introduced (see Table 1). Up until 1966, first (I) and second (II) degree specialty were in force. In 1973, primary specialties were introduced in lieu of the former I degree specialties, whereas "derivative" specialties replaced the former II degree specialties [18]. In the same year, sub-specialties emerged, as a one-time occurrence only, such as health education, or health education pedagogy. In the years of 1999-2013 specialties were divided into primary and detailed specialties for physicians and primary for dentists. In 2013 education system has been changed again and introduced the distinction into 77 medical and 9 dental specialties [26].

Public health specialty was launched in 1999 and has since been available to physicians and dentists alike [30]. In the history of postgraduate education of physicians in the field of public health, however, numerous other related specialties existed. Epidemiology and hygiene as specialties were introduced in 1951, and communicable diseases in 1953. Those have been continued ever since but other disciplines (as hygiene) underwent many changes throughout the years. Occupational medicine recognized as one of the major areas of public health has been released as separate specialty since 1973. Other specialties, such as transport medicine and industrial medicine were available at given periods of time (see Table 1).

Table 1. Specialties related to public health for physicians and dentists (1951-2013) in Poland

Name of specialty (specialisation)	Year of introduction of specialty (specialisation)										
	1951[1]	1953[2]	1958[3]	1962[4]	1966[5]	1973[6]	1999[7]	2001[8]	2005[9]	2013[10]	Type of specialty (specialisation)
Epidemiology	■										
Epidemiology		■									I and II degree
Epidemiology			■	■	■	■					II degree
Epidemiology								■			Medical and dental, detailed specialties
Epidemiology									■		Medical, primary specialties
Epidemiology										■	Medical and dental
General hygiene and epidemiology			■	■	■						I degree
Hygiene and epidemiology							■				Medical and dental, primary specialties
Hygiena	■										
General hygiene		■	■								II degree
Hygiena				■	■						II degree
School hygiene		■									II degree
School hygiene				■	■						I i II degree
School medicine						■					II degree
Occupational hygiene		■									II degree
Occupational hygiene					■						II degree
Occupational medicine							■	■	■		Medical, primary specialties
Occupational medicine						■					I degree
Occupational medicine										■	Medical
Communal hygiene		■									II degree
Environmental hygiene						■					II degree
Food and nutritional hygiene		■				■					II degree
Maritime hygiene		■									II degree
Industrial hygiene			■								I i II degree
Industrial medicine				■	■						I i II degree
Industrial medicine						■					II degree
Transport medicine							■		■		Medical, primary specialties
Transport medicine								■			Medical, detailed specialties
Sport medicine							■	■	■		Medical, detailed specialties
Sport medicine										■	Medical
Maritime and Tropical Medicine										■	Medical
Communicable diseases		■	■	■	■						I i II degree
Communicable diseases						■					II degree
Communicable diseases							■	■	■		Medical, primary specialties
Communicable diseases										■	Medical
Public health							■	■	■		Medical and dental, primary specialties
Public health										■	Medical and dental
Healthcare organization			■								I i II degree
Healthcare organization						■					II degree
Social medicine						■					I degree
Health education						■					Sub-specialty („derivative" from II degree specialty)
Medical pedagogy						■					Sub-specialty („derivative" from II degree specialty)

Note: the names of particular specialty are created as rough (direct) translation from Polish

1 Regulation of the Polish Minister of Health. Monitor Polski 1951, No. 103, item 1507.
2 Regulation of the Polish Minister of Health. Monitor Polski 1953, No. 70, item 852.
3 Regulation of the Polish Minister of Health. Monitor Polski 1958, No. 45, item 263.
4 Regulation of the Polish Minister of Health and Social Care. Monitor Polski 1963, No. 2, item 4.
5 Regulation of the Polish Minister of Health and Social Care. Monitor Polski 1966, No. 34, item 176.
6 Regulation of the Polish Minister of Health and Social Care. Dz. Urz. Min. Zdr. i O.S. 1973, No 7, item. 33.
7 Regulation of the Polish Minister of Health and Social Care. Dz.U. 1999, No. 31, item 302.
8 Regulation of the Polish Minister of Health. Dz.U. 2001, No. 83, item 905.
9 Regulation of the Polish Minister of Health. Dz.U. 2005, No. 213, item 1779.
10 Regulation of the Polish Minister of Health. Dz.U. 2013, item 26.

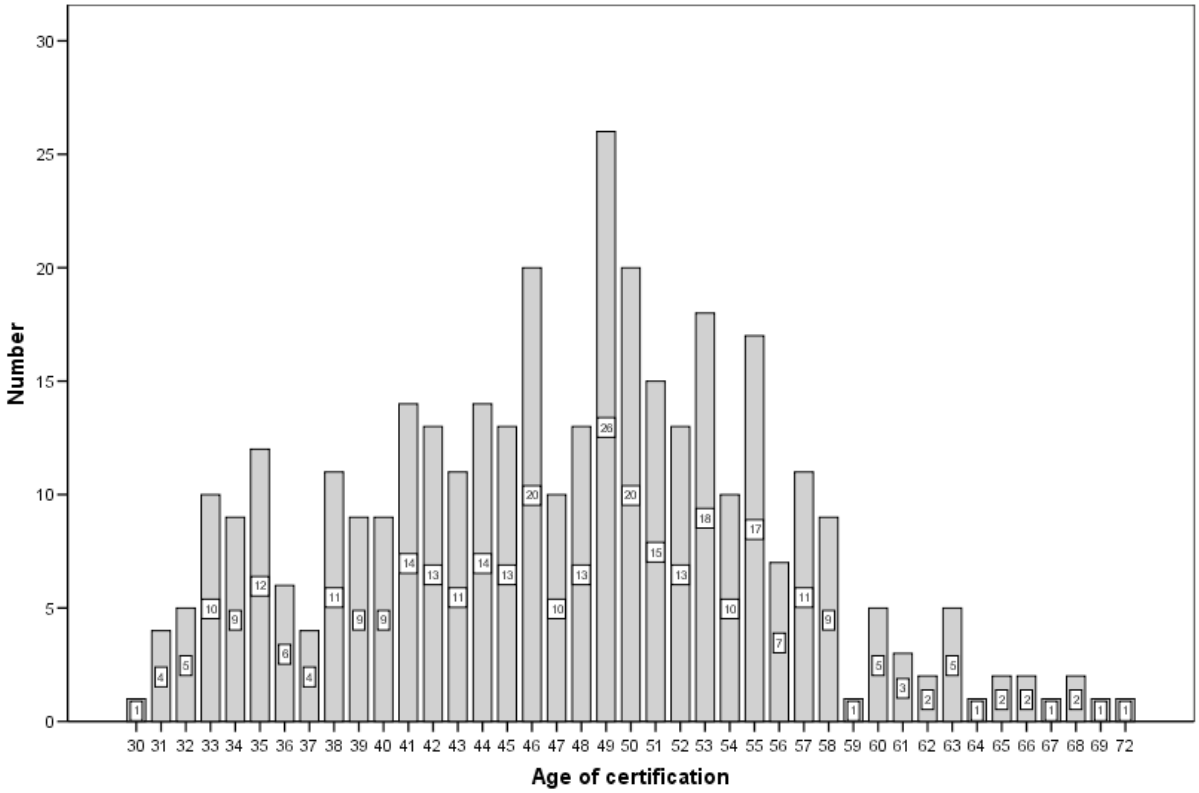

Figure 1. Public health specialists by age of certification

The regulation of 1958 (in force until 1961) allowed physicians to obtain certification in a discipline referred to as "healthcare organisation". Later, this specialty resurfaced again as late as in 1973 beside such specialties as social medicine, health education, or health education pedagogy. All of them were discontinued in 1999. So far, no system has been created that would allow physicians to transfer their "old" specialties into the currently valid ones.

Physicians and dentists certified as public health specialists

The number and demographic characteristics

According to the data from the CEM 360 PHS obtained the public health specialist title in the years 2003-2015 and 130 of them were women. The average age of PHS was 47.2 years (SD = 8.4), with the youngest aged 30, and the oldest 72 (Figure 1). The largest group of PHS were 41-50 years old (42.8%). Men prevailed across all age groups (Figure 2).

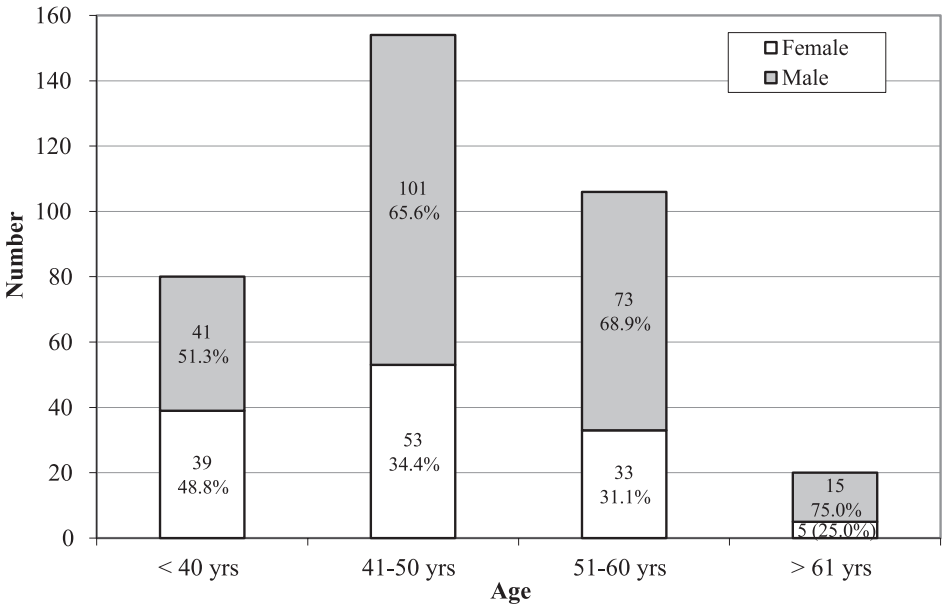

Figure 2. Public health specialists by age of certification and sex

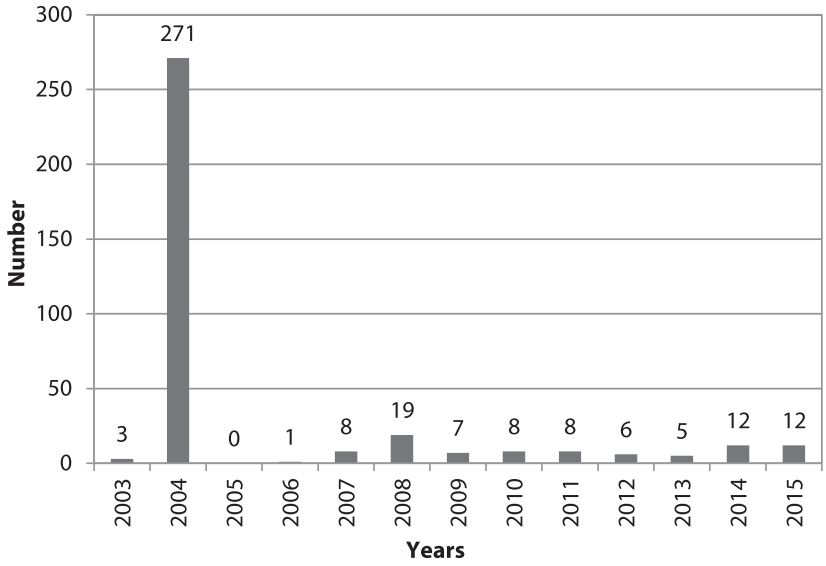

Figure 3. Public health specialists by year of certification

Professional route

Over three fourths of PHS were certified in 2004. In the remaining years, the number of specialist ranged between 1 and 19 (9 per year on average) (Figure 3). In the course of 13 years, a total of 41 exam sessions were held (including 22 in 2004).

More than three fourths of PHS (79.7%) had previous professional experience that is specialty in one or more disciplines. A vast majority (71.1% of total, 89.2% of experienced people) had specialties related to clinical medicine as internal medicine, general surgery, etc. – including medical specialty exclusively (50.3% and 63.1% respectively) or medical speciality together with specialty related to public health (20.8%, 26.1%). Only every tenth PHS (8.6%, 10.8%) had former speciality exclusively related to public health field (including hygiene and epidemiology, occupational medicine, epidemiology, organization of health care, and social medicine). The most common specialties formerly held were: internal medicine (88 people), organization of health care (61), social medicine (49), general surgery (36), paediatrics (32), obstetrics and gynaecology (25), epidemiology (19), occupational medicine (15), hygiene and epidemiology (9).

Table 2. Public health specialists by year of certification and place of residence

Voivodeship / Year	Dolnośląskie	Kujawsko-Pomorskie	Lubelskie	Lubuskie	Łódzkie	Małopolskie	Mazowieckie	Opolskie	Podkarpackie	Podlaskie	Pomorskie	Śląskie	Świętokrzyskie	Warmińsko-mazurskie	Wielkopolskie	Zachodniopomorskie	Total number
2003	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	**3**
2004	12	6	55	12	25	17	48	5	3	14	6	31	2	4	19	11	**271**
2006	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**1**
2007	0	0	2	0	2	0	1	0	0	0	1	1	0	0	1	0	**8**
2008	0	0	2	0	0	0	11	0	0	1	2	0	0	0	3	0	**19**
2009	0	0	1	0	0	2	3	0	0	1	0	0	0	0	0	0	**7**
2010	0	0	0	0	0	0	1	0	2	1	1	1	0	1	0	1	**8**
2011	0	0	2	0	2	1	1	0	0	0	0	2	0	0	0	0	**8**
2012	0	0	0	0	0	1	2	0	0	1	0	1	0	0	0	1	**6**
2013	0	0	0	1	0	0	1	0	0	1	1	1	0	0	0	0	**5**
2014	0	0	2	0	1	0	2	0	0	0	1	4	0	0	0	2	**12**
2015	1	0	2	0	0	1	4	0	0	1	0	1	0	0	1	1	**12**
Total	**13**	**6**	**67**	**13**	**30**	**22**	**75**	**5**	**5**	**21**	**12**	**42**	**2**	**5**	**24**	**17**	**360**
% of PHs certified in 2004	**92.3**	**100.0**	**82.1**	**92.3**	**83.3**	**77.3**	**64.0**	**100.0**	**60.0**	**66.7**	**50.0**	**73.8**	**100.0**	**80.0**	**79.2**	**64.7**	

Spatial distribution and density

Taking into account the place of residence of PHS, the largest number of them were living in voivodeships Mazowieckie, Lubelskie and Śląskie, whereas the smallest – in Podkarpackie, Warmińsko-Mazurskie, Opolskie and Świętokrzyskie (Table 2). Approx. 65% of PHS (234 persons) were located in cities which are voivodeship capitals.

Three fourths of the total number of the PHS were certified in 2004 (Table 2), with the largest group from Lubelskie (55 people; 20.3% certified in 2004), Mazowiecke (48 people; 17.7%) and Śląskie (31 people; 11.4%). The share of PHS certified in 2004 among all PHS in a given voivodeship ranged from 50% (Pomorskie) to 100% (Kujawsko-Pomorskie, Opolskie and Świętokrzyskie).

Assuming all PHS to be still professionally active, there were 0.94 PHS per 100 thousand inhabitants in Poland in 2015. The number of PHS in particular voivodeships varied. The largest ratios were found in voivodeships Lubelskie, Podlaskie and Mazowieckie, whereas the smallest – in Świętokrzyskie, Kujawsko-Pomorskie and Podkarpackie (Figure 4).

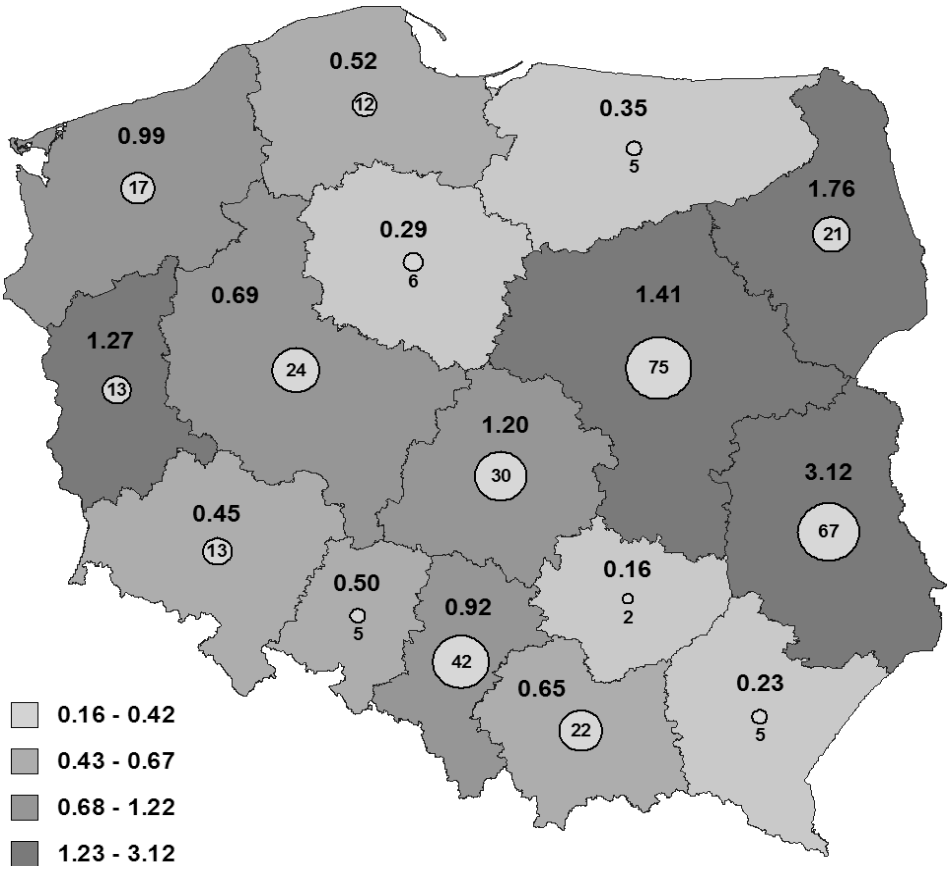

Figure 4. Density of public health specialists by voivodeship (number per 100 thousand inhabitants)

DISCUSSION

There is an inextricable link between medicine and public health, with medicine identified as the source of clinical knowledge, but also the "front-line window" for the identification of public health threats, and the grounds for the practical measures to be executed such as immunizations or screening [17]. Public health domain, in turn, is crucial for community-based measures, preventive services to specific groups and healthy public policy.

Public health history abounds with examples of physicians committed to taking active role on the population level, as was, for instance, the case with John Snow during the cholera outbreak in London's Soho in 1854, or with William Gorgas, a United States Army physician who initiated in 1904 mosquito control in the area of the Panama Canal construction [12, 8].

Public health as a medical specialty originated in England, where, in 1846, Liverpool Sanitary Act mandated the appointment of the Medical Officer of Health. In 1847, doctor William Henry Duncan was appointed the first ever Medical Officer of Health, with an annual salary of £ 750. Concurrently, James Newland was appointed the Borough Engineer and Thomas French - the Inspector of Nuisances [3]. In 1872, the Medical Officer of Health post was introduced throughout the UK [34]. In 1888, the Local Government Act mandated all Medical Officers

of Health practicing in districts with more than 50 thousand citizens to be physicians certified in sanitary science, state medicine or public health. In 1980s, Cambridge University instituted the first ever Diploma of Public health [37].

In the UK, the first school of public health, namely the London School of Hygiene and Tropical Medicine was founded in 1924. In 1970s, the first university specialty programme in public health was launched. In 1972, the UK Faculty of Community Medicine (at present UK Faculty of Public Health) developed training standards for public health specialists. It was only in 1990s that professional education in public health was available to non-medical applicants [6].

In the US, the first medical school to offer postgraduate education in public health was the University of Pennsylvania in 1909, soon followed by Harvard in 1910. The majority of medical schools in the USA, however, did not incorporate public health related content into their primary medical programme. Yet, in spite of the distinct routes of education in medicine and public health, physicians constituted a majority on Public Health Boards.

In 1918, with the substantial support of the Rockefeller's Foundation, John Hopkins University School of Hygiene and Public Health was founded, and in 1922, so was Harvard School of Public Health. The most eminent medical authorities of the times as well as public health leaders solidified the distinct teaching routes for medicine and public health. This situation lasted into second half of a century, when physicians were ultimately recognized as requiring expertise and skills related to public health. The outbreaks of multi-drug resistant TB, Legionnaires' disease, swine influenza, or AIDS that all emerged in 1970s and 1980s showed that physicians need to be adequately qualified in public health related issues to tackle the upcoming health threats [31]. At present, in the US physician education in the public health is conducted in three variants, either as an undergraduate education programme (via combined Medical Doctor or Master of Public Health programs), a residency program (such as General Preventive Medicine), or by mid-career completion of Master of Public Health program available to physicians [16].

Current studies indicate that public health specialty does not enjoy particular popularity among physicians beginning their specialty education programmes either in Poland or in other countries. In a survey carried out among Australian medical students who were asked to indicate a specialty that facilitates combining professional and private life public health was ranked in the third position, following dermatology and general practice. But it occupied the last, nineteenth, position where the prestige of given medical specialties was rated (by male and female physicians alike) [7]. Studies concerning the perceived prestige of given medical specialties have shown an informal hierarchy to exist [33, 24, 13]. The factors affecting the position of a given specialty within the hierarchy have been found to include the following: systems and organs associated with specialty [1]; doctor-patient relationship [33]; social respect [24]; and the use of advanced technologies [13]. According to *Hinze,* surgery and internal medicine are associated with the highest status, whereas paediatrics, psychiatry and general practice are perceived as low-status specialties. In Norway, in turn, physicians and medical students rank neurosurgery as the top-, and geriatrics as the bottom-status specialties [2].

In Poland, education of physicians and dentists in the public health was introduced on the postgraduate level as a specialty programme as late as in 1999. Before that, physicians could be certificated in related disciplines, such as hygiene, epidemiology, communicable diseases, and occupational medicine (or occupational hygiene) and dentists in few of them. However, multiple people still have former certifications in disciplines no longer taught as separate path, such as social medicine, or organization of health care. No system of transfer of the "old" into the currently valid specialties has been developed. Thus, counting all people active in public heath filed is highly difficult if not altogether impossible. According to the information provided by the Supreme Medical Chamber (*Naczelna Izba Lekarska*), the total number of doctors who declared public health specialty totaled 1352 (as of 9.02.2016), whereas the total number of practicing doctors in Poland was 163 756 [20]. In view of these figures, doctors specializing in public health represent 0.8% of doctors population [the Supreme Medical Chamber], while estimates based on CEM data suggest that PHS account 0.2%.

In 2008 in EU alone, specialties related to public health were identified in 21 countries. The names of the specialties in question vary depending on a particular country, including, apart from "public health", other ones, such as preventive medicine, social medicine, or community medicine [35]. The number of physicians specializing in public health in selected countries has been presented in Table 3. In 2014, in Scandinavian countries the percentage of physicians specialising in public health among the total number of physicians ranged from 0.1 % to 1.6%, and among the total number of specialists in all disciplines of medicine ranged from 0.2% up to 3.1 % [36]. For comparison, in Canada, Australia or Japan, the percentage of physicians specializing in public health among the total number of physicians was 0.6% [17, 18, 14].

Table 3. Physicians specializing in public health in various countries

Country	Year	Specialty name	Number of specialists	% of all physicians	% of all specialists
Denmark	2014	Samfundsmedicin (Community Medicine – Public health)	137	0.6	1
Norway	2014	Samfundsmedicin (Community Medicine – Public health)	374	1.6	3.1
Finland	2014	Hälsovård	98	0.5	0.8
Iceland	2014	Socialmedicin	12	1.1	1.4
Sweden*	2014	Socialmedicin	50	0.1	0.2
Canada	2016	Public health & Preventive Medicine	488	0.6	1.3
Australia	2007	Public health Medicine	416	0.6	Not available
Japan	2006	Not available**	1822	0.7	Not available

*members of the Swedish Medical Association. who account for approx. 80% of all physicians in Sweden
** physicians in public health administration agencies; with different specialties related to public health

Data concerning public health workforce in the USA are cited by *Beck* et al. In 2012-2013, a total of 2891 physicians specializing in public health were employed at the local level (namely the National Association of County and City Health Officials (NACCHO) and the Association of State and Territorial Health Officials (ASTHO)). As regards the federal level, in 2013 the Office of Personnel Management (OPM, Federal) employed 6700 public health physicians [4].

As regards the CEM data, assuming all PHS to be professionally active, their current average age would be 57.6 years (SD=9.9), with persons 61-70 years old prevailing in the group. According to the Supreme Medical Chamber data, as of 2015 the average age of a practicing specialist was 54.5. PHS tend to be, therefore, older than specialists in other disciplines of medicine [19]. The data from other countries show these specialists to be relatively younger than it is the case in Poland. In Australia, for instance, the average age of a physicians' specialising in public health was 49 years in 2007 [18]. In contrast to the largely feminized medical profession as a whole in Poland, majority of PHS were men, whereas data from Canada and Australia indicate women to account for approximately half of the total number of these specialists [17, 18].

Three fourths of all PHS were certified in 2004, owing to the fact that a special fast-track specialty line was launched in that year for people with proven achievements in the field [48]. In Poland, the density of PHS (0.94 per 100 thousand inhabitants, in the range of 0.16 - 3.12) is similar to the relevant values in other countries. In Canada, for instance, in 2015 the number of public health physicians per 100 thousand inhabitants was 1.4, and ranged between 0.4 (Newfoundland) and 2.5 (in Quebec) [22].

CONCLUSIONS

1. Between 2003-2013 there was very limited interest in the public health specialty among physicians and dentists. Except 2004, an annual average of 9 physicians (including dentists) were certified as public health specialists.
2. There was a varying number of public health specialists lived in particular voivodeships (from 0.16/100 thousand inhabitants in Świętokrzyskie to 3.12/100 thousand in Lubelskie).
3. The majority of public health specialist had previous background in another discipline of medicine, and was certified in another specialty.
4. The average age of a public health specialist was higher than the average age of a specialist practicing in Poland. Among public health specialists men prevailed.
5. The obtained results indicate multiple obstacles in estimating the number of physicians and dentists practicing in the field of public health, but also point out a lack of relevant mechanisms for the development of workforce in the field. A comprehensive policy of public health workforce development in Poland is indisputably needed.

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Conflict of interest
The authors declare no conflict of interest.

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