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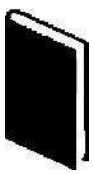

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EDITORIAL

Health status in the transitional countries of South Eastern Europe

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The former communist countries of South Eastern Europe (SEE) have been undergoing a rapid process of transformation from state-enforced rigid economies to market-oriented societies in the past 25 years. However, these fast changes have unevenly affected various countries and different segments of the populations within each country (1).

According to the World Health Organization (WHO) (2), the estimated life expectancy in Albania in 2012 was the lowest in the region among females (75 years vs. 83 years in Greece, which exhibited the highest female life expectancy in the SEE region) (Table 1). The lowest value for male life expectancy in 2012 was observed in Serbia (72 years) followed by Albania, Macedonia and Montenegro (73 years).

A remarkable difference compared with the other neighbouring countries is the particularly small female-to-male gap in life expectancy in Albania, which in 2012 was only two years, whereas it varied in the other SEE countries between five years (for most of the countries) and seven years (in Croatia) (Table 1). This may suggest that smoking has not been very frequent in Albanian males a few decades ago. As a matter of fact, some evidence from the WHO suggests that lung cancer mortality for Albania in the 1980s was much lower than in many other European countries (3). The male-to-female difference in life expectancy in Eastern European countries is strongly influenced by risk differences mainly smoking, alcohol abuse and road traffic accidents (3).

Table 1. Life expectancy at birth for selected years in the countries of South Eastern Europe
(Source: WHO, World Health Statistics, 2014)

Country	Year: 1990			Year: 2000			Year: 2012		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Albania	67	71	69	68	73	70	73	75	74
Bosnia and Herzegovina	70	75	73	72	78	75	75	80	77
Croatia	69	76	73	71	78	74	74	81	78
Greece	75	80	77	76	81	78	78	83	81
Macedonia	70	75	72	71	76	73	73	78	76
Montenegro	73	79	76	72	77	75	73	78	76
Serbia	69	75	72	69	75	72	72	77	75
Slovenia	70	78	74	72	80	76	77	83	80

According to the Global Burden of Disease (GBD) 2010 Study (4), the age-standardized mortality rate in Albania in 2010 was comparable to Montenegro and Macedonia, which were all remarkably higher than Greece and Slovenia. The known positive association between a higher GDP and health outcomes such as life expectancy and lower standardized mortality rates is certainly of influence in the SEE region too. Conversely, in 1990, interestingly, the age-standardized mortality rate in Albania was the lowest in the region, except Greece. One of the possible explanations for this "paradox" (that is the low mortality rate in the impoverished Albania during communist rule) may relate to Albanians earlier deploying a Mediterranean diet which is assumed to have been particularly protective against cardiovascular deaths (5).

Regarding the total burden of disease, the age-standardized disability-adjusted life years (DALY) in 2010 were the highest among Albanian males and females compared with all the other counterparts in the SEE region (4). On the other hand, the age-standardized DALYs in 1990 in Albanian males resembled the average value of the SEE region. Interestingly, in 1990, the

overall DALYs in Slovenian males were higher than among their Albanian counterparts – a trend which was entirely reversed two decades later (4). This is a clear indication of the differential impact of the political and socioeconomic transition on the health of different populations in SEE region (1). Hence, the poorest countries of the Western Balkans exhibit an unfavourable health profile associated with the rapid socioeconomic transition, whereas the wealthier societies including especially Slovenia and Croatia manifest a gradual improvement in the health status of their respective populations.

Regarding the cause-specific mortality, according to the GBD 2010 Study, the death rate from ischemic heart disease in Albania is the highest in the SEE region (4), in line with dramatic changes in dietary patterns in the past two decades with an increase in processed foods which are rich in salt, sugar and saturated fats (6) and an increase in the prevalence of smoking (6). Furthermore, Albania is the only country in the region which has experienced an increase in the mortality rate from ischemic heart disease and cerebrovascular diseases in the past two decades (4) – indicating an early evolutionary stage of the coronary epidemic, which was observed many decades ago in the Western countries.

Conversely, the age-standardized mortality rate from neoplasms in Albania in 2010 was the lowest in the region (4). This is logical given the low lung cancer mortality rate in Albania, which correlates with all-cancer mortality rate (3). In 2010, Croatia and Slovenia exhibited the highest death rates from neoplasms in the region (4).

Regarding diabetes, in 2010, the age-standardized mortality rate was the lowest in Albania and Greece, whereas in Macedonia it was exceptionally high compared with all the other countries in the region (4) probably due to the high rates of obesity in this population.

The age-standardized death rate from chronic obstructive pulmonary disease (COPD) in Albania in 2010 was one of the highest in the region, whereas the bordering Montenegro exhibited the lowest death rates from this chronic condition (4).

As for the major risk factors, the highest burden of disease in the SEE region due to smoking is observed in Macedonia, whereas Slovenia has made a remarkable achievement in the past twenty years in terms of lowering the burden of disease attributable to smoking almost by halve (4). This is a clear indication of the fact that changes during the transition period have differentially affected different countries in the SEE region.

Greece and Slovenia have the lowest burden of disease due to sedentary behaviour, whereas Serbia and especially Macedonia have the highest burden of disease attributable to physical inactivity (4). However, valid and reliable information on physical activity is difficult to obtain.

Currently, Serbia and Macedonia bear the highest burden of disease due to overweight and obesity in the region, whereas Slovenia and Greece have the lowest (4). Interestingly, in 1990, the age-standardized total burden of disease attributable to overweight and obesity in Albania was, by far and large, the lowest in the region (Greece excluded). Twenty years later, however, Albania resembled the average toll of the region (4).

At the fall of the communist rule, a particularly high burden of disease due to high blood pressure (HBP) was observed in several Yugoslavian republics including Bosnia and Herzegovina, Croatia and especially Macedonia (4). Compared with the other countries of the region, the total burden of disease attributable to raised blood pressure in Albania in 1990 was below the average of the SEE countries (4). Twenty years later, the burden of disease due to HBP in Albania was higher than the regional average. Even worse, Albania is the only country in

the region which has not implemented a program to ensure an effective control and management of hypertension at a population level, in contrast with most of the former Yugoslavian republics which have made a significant progress in this regard (2,4).

In addition, Croatia followed by Macedonia had the highest burden of high cholesterol level at the fall of the communist regime, whereas Albania had the lowest in the SEE region (4). On the contrary, two decades later, Albania had the highest burden of disease due to hypercholesterolemia after Macedonia. All countries of the SEE region except Albania have made a significant progress regarding a considerable lowering of the toll of disease attributable to hypercholesterolemia. Hence, Croatia currently shows a twofold decrease, whereas Slovenia has reduced by 2.5 times the cholesterol-related disease burden (2,4).

Interestingly, in 1990, the age-standardized burden of disease attributable to dietary risks in Albania was the lowest in the SEE region, excluding Greece. Conversely, in 2010, the burden of disease due to dietary risks in Albania was the highest in the region after Macedonia (4).

Essentially, regardless of cross-country differences, a cluster of preventable risk factors (smoking, alcohol abuse, overweight, unhealthy diet, and lack of physical activity) are currently contributing in a very important way to the observed increase in the total burden of non-communicable diseases in SEE countries such as cancer, heart disease, lung and liver diseases, and diabetes. Therefore, preventing youths from starting to smoke and refraining from alcohol abuse and refraining from unhealthy diets and promoting their physical activity are major challenges for all the countries of SEE region. These challenges are now major additions to the older but not yet finished challenge of reducing the existing risks by the still relatively high rates of mortality from infectious diseases, accidents and injuries and perinatal problems in these countries.

At a broader level and given the indicated quick changes and large potential differences in health status and health risks, the health information systems of most of the SEE countries need serious revival, improvement and renewal to allow for an adequate management and assessment of the health status of the respective populations. This includes the monitoring of preventive interventions and of essential steps in healthcare reforms. Furthermore, better statistics, regular health surveys and improved healthcare administrative data will allow for better research into the quality of the health systems and health status of the populations in SEE countries and inequalities within the countries, similar to the approach employed by their EU counterparts. From this point of view, strengthening of the health information systems will significantly support better evidence-based health policy making and priority setting in all of the SEE countries.

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Jakovljevic M, Laaser U. Population aging from 1950 to 2010 in seventeen transitional countries in the wider region of South Eastern Europe (Original research). SEEJPH 2015, posted: 21 February 2015. DOI 10.12908/SEEJPH-2014-42

ORIGINAL RESEARCH

Population aging from 1950 to 2010 in seventeen transitional countries in the wider region of South Eastern Europe

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Abstract

Aim: Population aging has profoundly reshaped demographic landscapes in all South Eastern European (SEE) countries. The aim of this study was to provide a thorough comparative inter-country assessment on the speed of population aging in the entire SEE region for the period 1950-2010.
Methods: Descriptive observational analysis of long-term trends on core primary and composite indicators of population aging across seventeen countries of the wider SEE region, with panel data sets at a national level.
Results: During the past six decades, the entire SEE region has experienced a rapid increase in the median age (from 25.2 years in 1950 to 37.9 years in 2010), with a simultaneous fall of fertility rates for two children per woman (from 3.55 children per each childbearing woman in 1950 to 1.49 in 2010), coupled with significant rise in the population of elderly citizens. The speed of population aging has vastly accelerated (with a 2.5 fold increase) over the past three decades. The percentage of individuals over 65 years has doubled from 7% in 1950 to 14% in 2010.
Conclusion: Complex national strategies are needed to cope with the shrinking labour force coupled with the growing proportion of the older population. With all likelihood, population aging will further accelerate in the near future. This profound long-term demographic transition will threaten financial sustainability of current health systems in all SEE countries.

Keywords: aging, demography, population; primary indicators; South Eastern Europe; syncretic indicators, trend.

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Conflicts of interest: None.

Introduction

According to the most realistic official forecasts scenario, global population aging will accelerate. The profound demographic transformation of contemporary societies started almost a century and a half ago in most of the developed nations (1). Surprisingly, this phenomenon is currently moving from rich industrial north to the most emerging markets of the southern hemisphere. The aging of developing nations occurs at a far greater speed. For increasing the proportion of people over 60 years from 7% to 14%, it will take China only 26 years, whereas the same process in France occurred over 115 years (2). To date, most of global aging in absolute terms, by far and large, has occurred in more developed regions with enormous social and economic consequences (3).

The wider South Eastern Europe (SEE) presents a myriad of societies in diverse ethno-religious traditions, prevailing lifestyle patterns and income levels (4). For the purpose of providing a comprehensive insight into the evolution of population aging in this region, a total of seventeen countries were examined in the region's broadly accepted geographical boundaries.

There is a significant gap in regional knowledge on population aging and its consequences in the broader Eastern European region including the Balkan peninsula (5).

The aim of this study was to describe the long-term aging trends and identify the serious aging-related public health challenges in the upcoming decades. The main hypothesis was that speed of population aging and stages of demographic transition differ substantially among the individual nations.

Methods

This was a descriptive retrospective trend analysis conducted on complex national level datasets within 1950-2010 time spans.

The data collection consisted of official release of medium range estimates on core population aging indicators provided by the United Nations (UN), Department of Economic and Social Affairs, Population Division issued within the report entitled: *"World Population Prospects: The 2012 Revision related to the period 1950-2010"* (6).

Countries selected were the ones whose territory lies within geographic boundaries of SEE partially or in its entirety and which are covered by the UN's Department of Economic and Social Affairs official demographic reports. The countries observed included: Albania; Bulgaria; Hungary; Republic of Moldova; Romania; Bosnia and Herzegovina; Croatia; Italy; FYR Macedonia; Montenegro; Serbia; Slovenia; Slovakia; Cyprus; Greece; Turkey; and Ukraine.

Transitional Balkan countries were observed as a subgroup of economies whose territories reside entirely or in large parts within the geographic boundaries of the Balkan peninsula, but were centrally planned economies during the Cold War era (1945-1989): Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Montenegro, the Republic of Moldova, Romania, Serbia and the former Yugoslav Republic of Macedonia (excluding of Greece and Turkey which were free market economies prior to 1989).

The time period 1950-2010 was selected for two reasons: extensive data availability as well as the fact that most local nations actually entered severe population aging in the early post World War II decades, or at the end of the 20th century (7). For the purpose of this analysis there were no missing data, because UN referral bodies provided comprehensive assessments for each nation during the observation period.

Selected indicators of population aging were defined according to the list provided in Anex I of the United Nation's Department of Economic and Social Affairs official projections entitled: *"World Population Ageing: 1950-2050"*. Of the indicators listed, the vast majority were applied in this analysis with few minor exceptions of less relevant compound indicators. Authors had at their disposal complete availability of data for all the seventeen countries and all relevant years/five year periods within the 1950-2010 time span.

Results

Due to the rapid population growth rates in the initial decades of global demographic explosion, many nations of the wider SEE region exhibited bold gains in population size, most prominent in large countries such as Romania, Italy, Ukraine and Turkey. Top performers in terms of population growth were Turkey and Albania which even succeeded to triple their populations within these six decades (Table 1). However, the entire region has recorded profound population aging trends in terms of all the relevant indicators.

Table 1. Ground demographic indicators of population aging: Medium range estimates by the United Nations Department of Economic and Social Affairs - Population Division for 1950 and 2010

COUNTRY	Total population (both sexes, as of 1 July (millions)		Total fertility rate (children per woman)		Population growth rate (% of average annual rate of population change)		Median age of the total population (years)		Percentage of people aged 65+ years	
	1950	2010	1950-1955	2005-2010	1950-1955	2005 - 2010	1950	2010	1950	2010
Albania	1.2	3.2	6.1	1.8	2.7	-0.29	20.9	31.9	5.9	10.1
Bosnia	2.7	3.8	4.8	1.2	2.5	-0.2	20.0	38.6	4.0	15.1
Bulgaria	7.3	7.4	2.5	1.4	0.8	-0.8	27.3	42.4	6.7	18.3
Croatia	3.9	4.3	2.8	1.4	0.7	-0.2	27.9	41.9	7.9	17.5
Cyprus	0.5	1.1	3.7	1.5	1.4	1.3	23.7	34.2	6.0	11.6
Greece	7.6	11.1	2.3	1.5	1.0	0.1	26.0	41.8	6.8	19.0
Hungary	9.3	10.0	2.7	1.3	1.0	-0. 2	30.1	39.9	7.8	16.7
Italy	46.4	60.6	2.4	1.4	0.7	0.6	28.6	43.3	8.1	20.3
Montenegro	0.4	0.6	4.0	1.7	2.2	0.1	21.6	36.3	7.4	12.5
Moldova	2.3	3.6	3.5	1.5	2.3	-1.1	26.6	35.2	7.7	11.2
Romania	16.2	21.9	2.9	1.3	1.4	-0.2	26.3	38.5	5.7	14.8
Serbia	6.7	9.6	3.2	1.4	1.5	-0.6	25.8	37.8	7.6	13.7
Slovakia	3.4	5.4	3.5	1.3	2.1	0.2	27.0	37.2	6.6	12.3
Slovenia	1.5	2.1	2.6	1.4	0.8	0.5	27.7	41.5	7.0	16.7
FYR Macedonia	1.3	2.1	4.0	1.5	1.8	0.1	21.8	36.1	7.1	11.7
Turkey	21.2	72.1	6.6	2.2	2.7	1.3	19.7	28.3	3.0	7.1
Ukraine	37.3	46.1	2.8	1.4	1.4	-0.5	27.6	39.4	7.6	15.8
Transitional*										
Mean ± SD	4.7±4.9	6.3±6.4	3.8± 1.1	1.5±0.2	1. 8±0.7	-0.3±0.4	24.2±3.1	37.6±3.3	6.7±1.3	13.9±2.81
Range	0.4-16.2	0.6-21.9	2.5-6.1	1.2-1.8	0.7-2.7	-1.1-0.1	20.0-27.9	31.9-42.4	4.0-7.9	0.1-18.3
Wider SEE										
Mean ± SD	10.0±13.4	15.6±22.1	3.6± 1.3	1.5±0.2	1.6± 0.7	0.01±0.6	25.2±3.3	37.9±4.0	7.0±1.0	14.0±4.0
Range	0.4-46.4	0.6-72.1	2.3-6.6	1.2-2.2	0.7-2.7	-1.1-1.3	19.7-30.1	28.3-43.3	3.0-8.1	7.1-20.3

* Transitional Balkan countries were considered the following countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Montenegro, the Republic of Moldova, Romania, Serbia and the Former Yugoslav Republic of Macedonia.

All countries have experienced rapid increase in median age (from 25.2 in 1950 to 37.9 in 2010), with a simultaneous fall of fertility rates for two children per woman (from 3.55 children per each childbearing woman in 1950 to 1.49 in 2010). Population growth rate decreased steadily even among the youngest nations of the region from 1.6 in 1950 to 0.01 in 2010. Crude death rates followed the general pattern of improved mortality-based indicators in all countries with a decrease from 13 (per 1000 population) in 1950 to 11 in 2010. Old-age dependency ratio increased from 10.6 in 1950 to 20.9 in 2010. Furthermore, the potential support ratio decreased from 9.9 in 1950 to 5.1 in 2010.

Life expectancy increased substantially: at birth (about 15 years 1950-2010) and ages over 60 (four years increase during 1950-2010) and 80 (1.8 years increase during 1950-2010) (Table 2).

Table 2. Dependency and support indicators of population aging and life expectancies in key age groups: Medium range estimates by the United Nations Department of Economic and Social Affairs - Population Division for 1950 and 2010

COUNTRY	Old-age dependency ratio (individuals 65+ per 100 people aged 15-64 years)		Potential support ratio (individuals aged 15-64 per population 65+ years)		Life expectancy at birth [both sexes combined (years)]		Life expectancy at age 60 [both sexes combined (years)]	
	1950	2010	1950	2010	1950 -1955	2005 -2010	1950- 1955	2005- 2010
Albania	10.8	15.1	9.3	6.6	55.3	76.3	17.5	20.4
Bosnia	6.9	22.3	14.5	4.5	53.7	75.5	13.9	19.7
Bulgaria	10.1	26.8	9.9	3.7	62.1	72.9	17.4	18.5
Croatia	12.1	26.1	8.3	3.8	61.3	76.1	14.4	20.0
Cyprus	10.1	16.4	9.9	6.1	66.7	79.0	17.6	21.4
Greece	10.5	28.6	9.5	3.5	65.8	79.78	16.4	22.9
Hungary	11.6	24.4	8.6	4.1	64.0	73.8	16.0	19.4
Italy	12.4	30.9	8.1	3.2	66.3	81.5	17.2	24.1
Montenegro	13.2	18.3	7.6	5.5	59.8	74.2	15.5	18.9
Moldova	12.0	15.5	8.3	6.5	59.0	68.2	14.2	16.0
Romania	8.7	21.2	11.5	4.7	61.1	73.1	15. 8	19.0
Serbia	11.9	19.8	8.4	5.1	59.1	73.3	15.4	18.3
Slovakia	10.3	17.0	9.8	5.9	64.5	74.7	16.7	19.4
Slovenia	10.7	24.0	9.3	4.2	65.6	78.6	15.4	22.2
FYR Macedonia	12.5	16.4	8.0	6.1	54.9	74.4	14.5	18.6
Turkey	5.2	10.6	19.3	9.4	41.0	73.4	13.3	20.0
Ukraine	11.7	22.4	8.6	4.5	61.8	67.9	16.9	17.2
Transitional*								
Mean ± SD	10.9±2.0	20.2±4.3	9.5±2.2	5.2±1.1	58.5±3.1	73.8± 2.4	15.4± 1.3	18.8±1.3
Range	6.9-13.2	15.1-26.8	7.6-14.5	3.7-6.6	53. 7-62.1	68.3-76.3	13.9-17.5	16.0-20.4
Wider SEE								
Mean ± SD	10.6±2.1	20.9±5.5	9.9±2.9	5.1±1.5	60.1± 6.4	74.9±3.6	15.7±1.4	19.8±2.0
Range	5.2-13.2	10.6-30.9	7.6-19.3	3.2-9.4	41.0-66.7	67.9-81.5	13.3-17.6	16.0-24.1

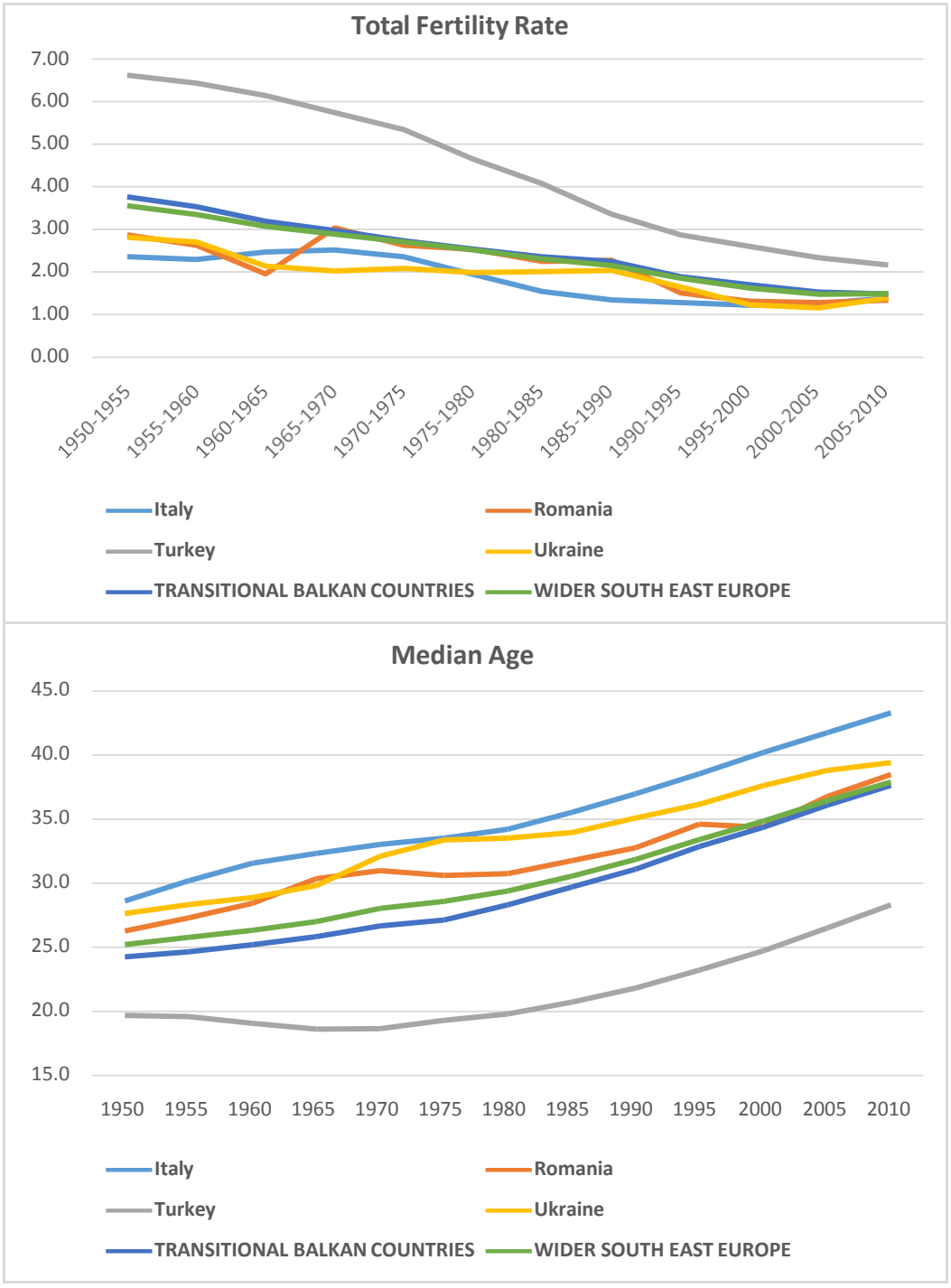
* Transitional Balkan countries were considered the following countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Montenegro, the Republic of Moldova, Romania, Serbia and the Former Yugoslav Republic of Macedonia.

There was evidence of a significant rise in the elderly population, where the percentage of individuals aged over 60 years increased from 9.8% in 1950 to 19.6% in 2010, whereas the percentage of individuals aged over 80 years increased from 0.9% in 1950 to 3.1% in 2010.
Speed of aging was assessed independently in two thirty-year periods (1950-1980 and 1980-2010) using the percentage of individuals aged over 60 years in line with the methodology employed by the UN Population division in the World Population Ageing report issued in 2013.
According to the official UN estimates based on national data, the speed of population aging has vastly accelerated over the past three decades (with a percentage point increase of people over 60 years of 2.8% during 1980-2010) compared to the previous three decades (7.0% during 1950-1980). During the same period, transitional Balkan countries aged considerably faster, from 1.4% increase in the early three decades to 8.1 % increase in the past three decades.
Extensive details on national estimates in five-year periods or single years during 1950-2010 time span, depending on the variable considered, are listed in Tables 1-2.

Discussion

In the early post Ward War II decades, many of populations in the wider SEE region were young, with high fertility rates and a rather modest longevity (8). The latter was determined by a modest literacy level and unhealthy lifestyle/behavioural factors attributable to the low socioeconomic levels of most of the countries. Higher income levels and standards of living were initially observed in Italy followed by Greece and former Yugoslavia (9) in the course of 1960s and 1970s. These countries had higher capabilities and capacities in terms of national health systems and better coverage of rural areas regarding the provision of health care services. We should revoke the fact the urbanization of Balkan societies was still developing rapidly during the second half of the 20th century. Most of the inhabitants were still living in rural communities and therefore reach of extended network of medical facilities increased the percentage of births attended by skilled personnel. In addition, the increase of youth vaccination rates and improved hygiene and availability of antibiotics significantly improved survival in the early childhood. Such changes are clearly visible in the official data provided by regional governments to the various WHO offices including the European Health for All Database. These positive developments were initially visible among the Semashko-type (10) health systems and much later in Turkey (11).
After the "baby boom" of post World War II generations, a few health policymakers anticipated the scale of the population aging that was about to come. Complex socio-cultural changes, as well as economic limitations gradually led to decreasing fertility rates among all of the nations of the region (Figure 1). An essential event giving impetus to the changes was the massive absorption of female labour force into most of the world economies. Women were getting easier access to education and consecutively had higher chances to build up a professional career path. This, in turn, led to governmental financial incentives to women for giving birth to fewer children and, instead, contribute to the community as employed citizens (12).

Figure1. Total fertility rate evolution 1950-2010 (above) and median age evolution 1950-2010 (beneath) in the wider South Eastern Europe, transitional Balkan countries and four largest countries of the region (Italy, Romania, Turkey and Ukraine)



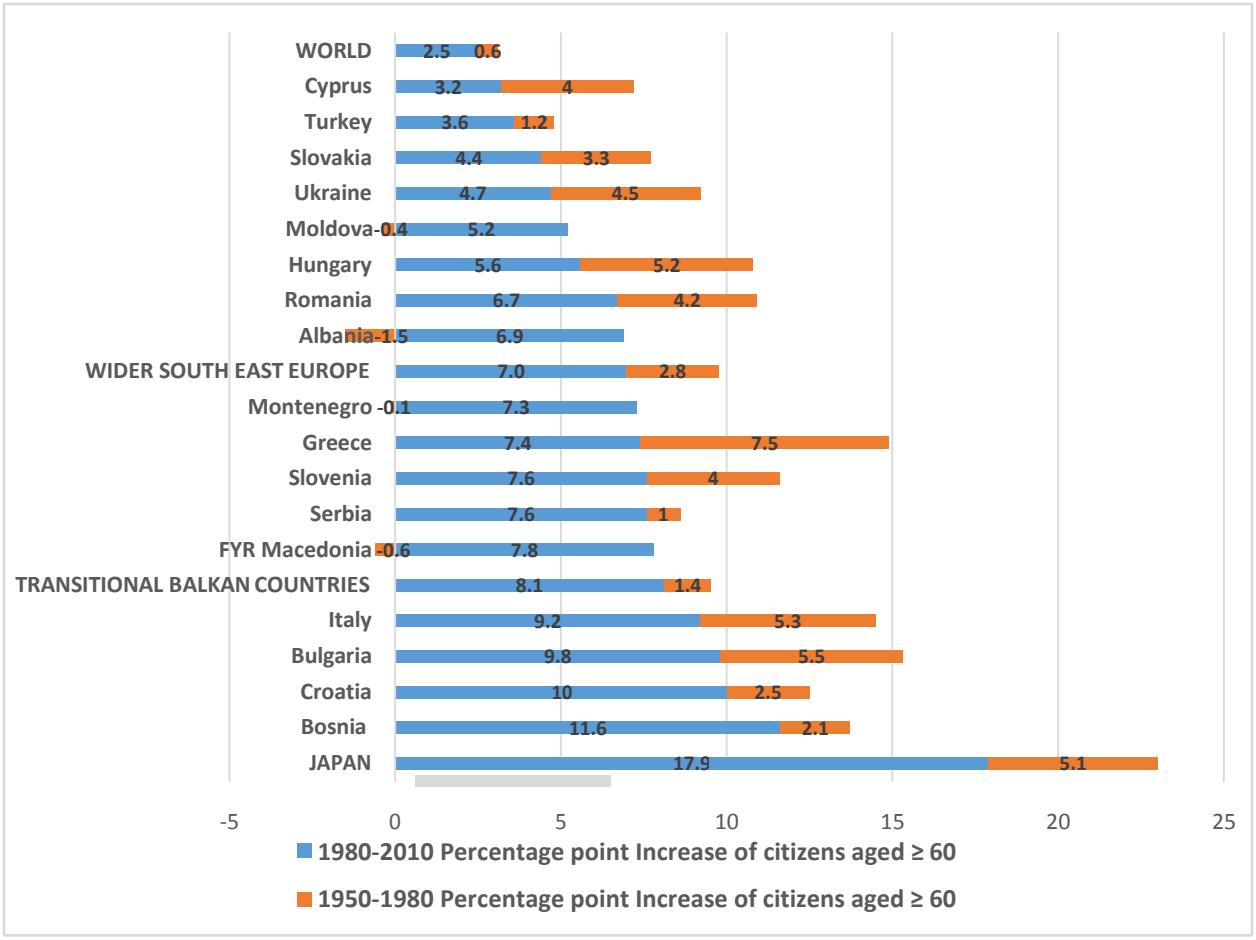
In historical terms, nations were at different stages of this demographic transition at the starting point of our observation (in 1950). Albanian and Turkish populations were quite young at the time with fertility rates above six (per woman), in Bosnia almost five, while Macedonia and Montenegro over four. All the other nations were significantly above the simple population replacement level of 2.1. Currently, after six decades, we have quite an opposite landscape across Europe. Turkey and Ireland remain among the few nations with 2.1 fertility levels. Legalized abortion procedures performed by gynaecologists had a profound impact on vulnerable fertility of Eastern European nations (13). These changes coupled with a significant rise in longevity of almost fifteen years on average in the wider SEE region have ultimately led to dramatic changes of population pyramids in all nations (14). Median age, broadly regarded as one of the most reliable indicators of population aging, has also increased as much as fifteen years (the four largest nations in the region are illustrated in Figure 1).

Speed of population aging is another core issue in this research work. Long-term perspective of six decades has allowed us to split it into two periods to observe the pace of the process across the local nations. During the initial three decades in the so called "take off" stage, there was a very slow pace and, in some countries, it has not even began before 1980s. But, in the latter stage, the scale of the process became much more intensive providing insight into evident acceleration in most countries of the region (15) (Figure 2).

Population aging is about to remain a landmark change of our time in almost all regions of the world, with the exception of sub-Saharan Africa and a few MENA countries – including a total of eighteen countries so-called "demographic outliers" (16). This global fact is constantly increasing the workload and economic burden to the national health systems. Grounds are demanding medical needs of the elderly population (17) joined with significantly longer life expectancies among citizens aged over 60 and 80 years. The worsening of demographic balance of working age population and the elderly throughout the entire region is clearly present. Old age dependency ratio has substantially increased, whereas the potential support ratio has heavily decreased in all countries within the 1950-2010 time span. This means that dwindling tax-base of employees is about to sustain even a heavier layer of retired citizens whose pension contributions to the national social insurance funds has to be supported by the current budget revenues. The most obvious and extreme example of this phenomenon is observed in the world's oldest large nation of Japan (18). Universal health coverage that effectively functions in the second largest global health care market has contributed to the highest attainable longevity.

Most national health systems of the region ranked substantially lower in terms of patient satisfaction, quality and accessibility of medical care in the last WHO ranking of 2000. Severe financial constraints throughout the region are worsened by macroeconomic crisis such as the case of Italy (19), Greece and Serbia (20). Such developments hampered national capacities to expand medical spending (21) and reimbursement of medicines for the retired to cover the needs of aging societies (22). Among the few truly successful options to contain the sky rocketing costs of health care without severe trade-off for quality consists of the generic replacement of brand name drugs. Governmental strategies targeted to give financial incentives to prescribers, dispensers and patients to use "copy cat" pharmaceuticals were already successfully implemented in major global markets such as the Japanese one (23). Innovative industrial manufacturers were at the same time protected from their revenue losses in order to compensate for their research and development expenses across the globe (24).

Figure 2. Speed of population aging expressed as proportion of people aged over 60 years in the entire population (percentage point increase) in two three-decade periods (1950-1980 and 1980-2010) providing clear evidence of a several-fold acceleration in most of the wider SEE countries



Another highly visible trend in regional pharmaceutical market transformation includes the prevailing domination of medicines used to treat non-communicable diseases which are very prevalent in the older age. This is the case with COPD (chronic obstructive pulmonary disease) cancer, diabetes and cardiovascular disorders whose growing share of the market size both in terms of unit dose prescription as well as value-based was recently evidenced in a regional example (25). Interestingly, the most expensive medical care is actually attributable to the patient's last year of life which is most obvious in the case of malignant disorders (26). Only a minor part of these costs might be partially contained by diverse screening and prevention strategies. National authorities have adopted different policies to cope with growing budget impacts of aging with various success stories. Regardless of an almost unbearable burden imposed by this demographic transition, some promising developments in the emerging rapidly evolving economies such as Turkey, might pose an excellent example on promising perspectives for the improved medical care for the elderly (27).

Study limitations

The far reaching process of aging of human populations in Europe dates back much earlier than 1950. Actually, earliest roots of falling fertility levels might be tracked back almost two centuries ago (28). The process itself in some Balkan nations such as Serbia began much earlier, even a century ago (29). Therefore, a minor study weakness could be considered the very time span of this study when taking into account long-term historical processes. Nevertheless, in most of the nations, population aging becomes visible in demographic statistics only during 1980s. Official data worldwide are lacking for most of the countries before 1950. Thus, authors consider the selected time horizon to be the broadest attainable within this methodological framework.

One political entity was omitted from the analysis because of lack of availability of official data although its territory resides within geographic boundaries of the wider SEE. Kosovo (UNSC 1244/99) was exempted from the analysis due to the fact that it is absent from the UN registries during the period under observation. UN estimates bear the minor risks of under- or overestimating the real life population data. Nevertheless, such assessments rely on a sound methodological framework and are most likely to reflect properly hidden demographic trends even in cases of missing data for some countries and some periods (30).

Of the overall UN Department of Economic and Social Affairs list of core indicators of population ageing, a few of them were omitted based on partial or complete lack of such data or grounds for their calculation in the UN's public demographic registries. These indicators include: the illiteracy rate, labour force participation rate, the parent support ratio and the survival rate to a specific age. Although they present a minor setback of the study design, the authors considered that these indicators would not change the demographic landscape of the aging process in any significant manner.

Inclusion of large countries such as Italy, Ukraine and Turkey whose territories rely mostly outside strict geographical boundaries bears the risk of bias. National level extrapolations refer to the entire populations of these countries living in Apennine peninsula, Eastern Europe and Asia Minor. Regardless of this fact, the aim of the paper was to depict a comprehensive image of regional population fluctuations and describe the long-term demographic transition of the respective nations.

Conclusion

Accelerated pace of population aging across the globe will have a profound echo among the rapidly developing SEE markets. Some of these nations have entered this demographic transition only in recent decades such as e.g. Albania. Other countries stand at the borderline of simple replacement fertility rates such as Turkey, which is the region's largest nation. Italian, Greek, Romanian, Hungarian and all the remaining Slavic populations have undergone these changes many decades earlier. These trends will put an additional pressure to the national health systems and the entire regional economy. The balance between working age population and the retired citizens is worsening, thus, leading to a shrinking base of tax payers. At the same time, increased longevity will increase demands for medical care and the burden to families still supporting their elderly people. Complex socioeconomic and health policy strategies will have to be adopted by regional governments to cope with probably the largest single long-term public health challenge of the 21st century.

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ORIGINAL RESEARCH

Geophagia: A cultural-nutrition health-seeking behaviour with no redeeming psycho-social qualities

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Abstract

Aim: We investigated if Geophagia is restricted to only pregnant and lactating women in Ghana. We also investigated if the key driver of Geophagia is poverty and other socio-cultural factors.

Methods: This analysis was part of a broader national study of resilience among the population of Ghana (N=2,000). Regional comparisons were made possible due to the stratified and random selection of representations that were similar in characteristics such as being urban or rural, ethnicity, religion and gender.

Results: It was found that Geophagia was present among both females and males and was not restricted to pregnant and lactating women. Geophagia was not driven by poverty or the lack of formal education or the presence of gainful employment. Geophagia was practiced by both urban and rural residents irrespective of religious proclivities and devotion. The assertion that Geophagia was an instinctive primordial response to gastro-intestinal disturbances was not sustained by the data in this study, although the literature review suggested such in calves and lambs.

Conclusion: In order to address the potential health threats posed by Geophagia, the key cultural drivers need to be studied and understood. We also need to appreciate the shocks and stresses that create such desires. It is not a case of mental illness and it cannot be concluded that Geophagia is driven by a psychiatric disorder. This paper would be disseminated to inform policy in Ghana and beyond.

Keywords: food security, Geophagia, Ghana, poverty, psychiatric disorder, resilience, vulnerability.

Conflicts of interest: None.

Introduction

Geophagia is the deliberate ingestion of soil or non-food substances (1,2). It is also known as Pica (3). There are other types of the practice including pagophagia (ice eating), or coprophagia (feces eating) (4). It is practiced in the United States of America (5,6), in Germany (7), Turkey and other parts of Asia (8-10), and in Australia among the Aborigines (11), as well as Eastern Africa (12), West Africa (13) and in Southern Africa (14,15).

The practice is now common in many nations of the world, irrespective of economic status due to migration and subsequent transfer of culture from one part of the world to the other (13). In other literature, Geophagists are considered to have a psychiatric disorder (16). There are many studies on Geophagia as a cultural-nutrition health-seeking behaviour for pregnant and lactating women. It may also be an instinctive response to gastro-intestinal disturbances (14). Karaoglu et al. (2010) assessed nutritional anaemia in 823 pregnant women in an East Anatolian Province of Turkey. In that study, they found anaemia (Hb <11.0 gr/dl) prevalence in 27.1% of the respondents. Of the anaemic cohort, 50% were deficient in iron, with another 35% being deficient in B_{12} (8).

In a South African study conducted on calves and lambs on farms in the Barkley West, Postmasburg and Vryburg districts of the Northern Cape and Northwest Province of the Republic of South Africa, geophagia had no relationship to pregnancy or lactation. The study found that suckling calves displayed an insatiable appetite for the Mn rich soil and sometimes licked iron poles, which lead to severe constipation, dehydration and even death within a relatively short time. It was found that *"lesions in the liver of the subjects can be attributed to a sub-acute to chronic form of manganese poisoning"* from the soil eaten by the subjects. *"The calves were situated in an area known as the Ghaap Plateau and have superficial outcrops of manganese-rich dolomitic or carboniferous rock of the Reivilo Formation. The soil on the affected farms contains numerous small round-to-ovoid black-grey Mn rich carboniferous concretions ca. 1-10mm in diameter"* (1).

Abraham, Davies, Solomon et al., (2013:1) have informed us that: *"A review of the literature clearly indicates that geophagia is not limited to any particular age group, race, sex, geographic region or time period, though today the practice is most obviously common amongst the world"s poorer or more tribally-oriented people and is therefore extensive in the tropics."* (13).

In Ghana, we are also informed by other researchers of the presence of Geophagists (2,17). In the case of Ghana, since Vermeer's research on Geophagia in the 1970's, not much appears to have been done on the topic. In almost three decades, only one paper appears to have been published on the topic by Taye and Lartey in 1999, although the focus was not entirely on the prevalence and incidence of the practice in the nation. That study researched *"Pica practice among pregnant Ghanaians with particular emphasis on infant birth-weight and maternal haemoglobin level"*. Again, Tayie in 2004, considered *"the motivational factors and health effects of pica"* in a select site (14). Since then, other studies have been conducted elsewhere including that of Kawai et al., 2009 and also Young et al., 2010 which were carried out in Tanzania, East Africa. The Kawai study considered *"Geophagy (Soil-eating) in relation to anaemia and helminths infection among HIV-Infected Pregnant Women in Tanzania"*. Young focused on the *"association of pica with anaemia and gastrointestinal distress among pregnant women in Zanzibar, Tanzania"* (5,6). These studies, however, were conducted on selected communities in Tanzania and did not truly represent the entire nation.

Although Geophagia is a cultural-nutrition habit among pregnant and lactating women in many emerging economies, it appears that this is a common phenomenon among communities in Sub-Sahara Africa and it is not limited to pregnant women. We seek to assess and document the prevalence of Geophagia in a sample of 2,000 inhabitants in the population

of Ghana in all of its ten administrative regions and to attempt to isolate the cultural underpinnings of this phenomenon. We would not delve into the medical, toxicological and psychiatric inquiry of Geophagia on any particular group. None of the researches referred to, concentrated on the *prevalence* and *incidence* of the practice in the nations in which those researches were conducted. Due to its originality, our work would contribute immensely in understanding the practice of Geophagia, at least in Ghana and the sub-region. The outcome would be truly representational of the nation, and would provide the baseline data for further research. The results would be analyzed and disseminated to inform policy on nutrition, mother to child transmission of lead and other substance poisoning, mother to child transmission of helminthes and other bacteria with the proximate cause to Geophagia.

Methods

Sampling

We were confronted with the difficulty of knowing beforehand the communities in Ghana that practice Geophagia. Thus, targeting only the commonly known ones was not enough in determining the prevalence nationwide. Targeting only pregnant women might also give a higher prevalence rate and limit the study just to them due to the practice's wide association to pregnancy. We decided to target women of reproductive age in order to estimate the prevalence for a wider group. We also expanded this to include men since very little is known about the practice in men, although the practice is common in the generally known sites in Ghana. In the end, we targeted pregnant women, women in general and men in order to estimate the prevalence for a wider group. We assumed 20% of persons in Ghana practiced Geophagia based upon a pilot study conducted in Ashaiman, near Tema Municipality, Ghana. This was part of a broader study on assessing the resilience of four communities within Ghana and to identify the coping mechanisms to the observed effects of climate variability. This was done by asking respondents if they had ever willingly eaten earth or clay. The proportion who answered positively was used to estimate the prevalence. This yielded a sample size of 1,710 with 90% power to detect an effect size of 30% at 5% significance level. A sample size of 2,000 gave a reasonable degree of security against the effects of decline in response and a prevalence level closer to 50%. We randomly selected one or more district, municipality or metropolitan area from each of the ten regions (18). We randomly selected one or more communities from each of that and then used the random walk method to evaluate households within each community till the quota for the region was met (19). Regional comparisons were made possible due to the stratified and random selection of representations.

Literature review and Internet search for national standards on nutrition

We searched through national legislation and grey paper to identify national food and nutritional guidelines or standards to evaluate if there is a nexus to geophagia. Due to the paucity of literature on the subject, we were only able to access the Food and Drug Act, the Standards Board Act and the National Nutritional Policy. We also reviewed newspaper reports on geophagia as part of the build-up for the design of the study instrument. We conducted internet searches at sites such as Biomed Central, National Institute of Health, British Medical Council and accessed journals papers on the topic**.** The documentary search on the Internet was conducted using carefully designed phrases like, *"Geophagia, a cultural nutritional artifact," "Geophagia in Ghana, benefits and risks," "Typology of Geophagia, pica, pagophagia (ice eating), coprophagia (feces eating)," "Cultural beliefs, red earth eating and well-being", "Incidence and Prevalence of geophagia, Ghana only"*. We summarized the findings into their respective units, and interpreted them based upon our

skills, knowledge and specialization in public health, risk communication and health promotion.

Statistical analysis

Data was entered into Microsoft Excel 2007, checked for accuracy and consistency to reduce errors. This was then transferred into Stata version 11.0 MP for analysis. Summary statistics such as frequencies, percentages, means and standard deviations were then estimated to compare the prevalence of Geophagia across the various groups and backgrounds. Chi-square and Fisher's exact tests were used to assess the associations between the prevalence of Geophagia and background characteristics, history and its practice as well as differences between males and females in terms of experience with the practice. Significant factors from the tests of association were then used in logistic regression to estimate the relative odds of such practice.

Ethical approval

We applied for Ethical Approval to conduct the study for which approval was granted by the Institutional Review Board of the Ghana Health Service in Protocol dated GHS-ERC 01/11/13.

Study limitations

Many of the papers used in this write-up were the results of research conducted on small groups of people. A key aspect of this study was to document the practice of geophagia nationwide. Despite, due to limited funds, we met several operational challenges. The most difficult of such challenges was the lack of comparison between urban and rural areas for each region. Urban-rural comparison was done at the national level. Despite this observation, we believe that the methodology used in this study was sound. We also covered the entire ten administrative regions of Ghana and believe the sample size is large enough to allow us to generalize the outcome in as far as Ghana is concerned. Nevertheless, in order to assess the true prevalence of geophagia in West Africa, a much bigger study needs to be undertaken in the future.

Results

Overall, mean (±SD) age of study participants was 33.3±12.8 years (among individuals, who ever practiced geophagia, mean age was: 35.2±13.0 years).

Basic demographics of Geophagists

From the basic demographics of the respondents, the overall finding is that Geophagia was present in both females and males; in both rich and poor; in both urban and rural residents; and in both the educated and the non-educated individuals. The practice of geophagia was the highest (21.5%) within the 50-59 year age-group and the lowest (9.8%) within the under-20 year olds and this finding was statistically significant ($P<0.05$). It can also be seen that the practice was more predominant among females (26.2%) and this was also highly significant ($P<0.001$) as shown in Table 1.

It is interesting to show through this data that geophagia was not restricted to females, or pregnant and lactating women, but it was also evident among males. Geophagia was also practiced by persons from different socio-economic groups distinguished with respect to education, marital status, religion, and employment.

Ethnicity and Geophagia practice

Among the various ethnic groups in Ghana, Geophagia was highest in the Akan-Other with a figure of 26.4% ($P<0.001$). The Akan-Other would include the indigenous inhabitants of the

Brong Ahafo, Eastern, Central and Western regions of Ghana. In terms of regions, the Eastern Region has the highest geophagists among all the other regions with 35.7% followed by the Upper West region with 22.8% (P<0.001). Type of residence did not have an influence on the practice of Geophagy (P=0.138). Wealth was not a significant factor in the practice of geophagia (P=0.082) (Table 1).

Table 1. Background of respondents and the practice of Geophagia

Characteristic	Number of individuals	Ever practised geophagia [N (%)]	P-value*
Age-group (years):			
<20	244	24 (9.8)	
20-29	697	108 (15.5)	
30-39	461	72 (15.6)	P=0.005
40-49	377	67 (17.8)	
50-59	144	31 (21.5)	
≥60	72	12 (16.7)	
Sex:			
Female	1,049	275 (26.2)	P<0.001
Male	948	39 (4.1)	
Marital status:			
Never married	840	94 (11.2)	
Married/cohabiting	1127	209 (18.5)	P<0.001
Divorced/separated/widowed	29	11 (37.9)	
Religion:			
None	93	25 (26.9)	
Christian	1409	212 (15.1)	P<0.001
Muslim	416	58 (13.9)	
Traditional African	73	19 (26.0)	
Education:			
None	75	26 (34.7)	
Primary	565	145 (25.7)	P<0.001
Secondary	1074	135 (12.6)	
Tertiary	282	8 (2.8)	
Employment status:			
Not employed	375	43 (11.5)	P=0.005
Employed	1619	270 (16.7)	
Occupation:			
Unskilled labour	82	13 (15.9)	
Agricultural	167	31 (18.6)	
Clerical/secretarial	53	7 (13.2)	P<0.001
Professional/managerial	274	8 (2.9)	
Sales and services	454	126 (27.8)	
Skilled craftsmanship	589	85 (14.4)	
Ethnicity:			
Akan-Ashanti	438	57 (13.0)	
Akan-Fante	208	23 (11.1)	
Akan-Other	265	70 (26.4)	
Ewe	206	33 (16.0)	P<0.001
Ga-Dangbe	138	28 (20.3)	
Mole-Dagbani	252	28 (11.1)	
Grussi/Gur	155	31 (20.0)	
Nzema	140	27 (19.3)	

Other	148	16 (10.8)	
Type of residence:			
Urban	1546	233 (15.1)	P=0.138
Rural	451	81 (18.0)	
Current residence:			
<5 years	920	115 (12.5)	P<0.001
5-9 years	605	99 (16.4)	
≥10 years	466	99 (21.2)	
Current community:			
<5 years	366	43 (11.8)	P<0.001
5-9 years	386	48 (12.4)	
≥10 years	1239	221 (17.84)	
Wealth quintile:			
Lowest	12	3 (25.0)	
Second	286	47 (16.4)	P=0.082
Middle	401	63 (15.7)	
Fourth	664	119 (17.9)	
Highest	622	79 (12.7)	
Ever had biological children:			
No	924	84 (9.1)	P<0.001
Yes	1071	230 (21.5)	
Related to people who practice geophagia:			
No	388	14 (3.6)	P<0.001
Yes	1195	300 (25.1)	
Total	***2000***	***314 (15.7)***	

* P-values from chi-square test and Fisher's exact test in cases when the expected cell frequencies were <5.

Although the practice was highest within those with no formal education and those engaged in sales and service providers, this was not significant in determining familiarity with geophagia, or the lack of it.

We also asked whether geophagia was a commonly known phenomenon (Table 2). It was found that, of the respondents who had ever practiced geophagia, 19.3% of them had heard of geophagia elsewhere and another 19.8% had witnessed this practice.

History and practice of Geophagia among the sexes

We also considered the history and practice of Geophagia. The data showed that females had started the practice at a much earlier age compared to males (P<0.001). The practice being a social conduct, many of the users learned the habit from family members and friends.

Cultural nutrition health-seeking behaviour

The data in Table 2 also seems to suggest that Geophagia is a culturally sanctioned activity between relatives, husbands and wives, as well as the children. Geophagia was not driven by poverty, the lack of formal education, or the presence of gainful employment. In Table 2 respondents who had ever been pregnant and practiced geophagia before, provide interesting insights into the social conduct. Only a small fraction of the respondents (19.3%) accepted or agreed with the notion that Geophagia is practiced by only pregnant women. While 92% of the respondents stated that their desire to eat dirt is stronger when pregnant, (42%) reported that they had strong desire to eat earth even when not pregnant. We did not see any evidence that supported the notion that Geophagia was an instinctive primal response to gastro-

intestinal disturbances, although in the literature review, a study conducted in the Cape region of South Africa among calves and lamps on a farm supported this notion (1). That study also found that when the farmer withdrew the older calves from the Mn rich soil, they did not demonstrate signs of withdrawal but fed normally without the display of appetite for the Mn rich soil.

Table 2. History and practice of geophagia by sex of survey participants

History and practice	Number (percentage)			P-value*
	Female	Male	Total	
Age when geophagia started:				
<20 years	138 (50.2)	22 (56.4)	160 (51.0)	
20-29 years	128 (46.6)	5 (12.8)	133 (42.4)	P<0.001
≥30 years	3 (1.1)	11 (28.2)	14 (4.5)	
Do not remember	4 (1.5)	0	4 (1.3)	
Last time of eating earth:				
<1 month	103 (37.5)	7 (18.0)	110 (35.0)	P<0.001
1-12 months	55 (20.0)	4 (10.3)	59 (18.8)	
>1 year	114 (41.5)	26 (66.7)	140 (44.6)	
Frequency of eating earth:				
Daily	227 (82.6)	5 (12.8)	232 (73.9)	
Weekly	36 (13.1)	19 (48.7)	55 (17.5)	P<0.001
Monthly	5 (1.8)	8 (20.5)	13 (4.1)	
Yearly	1 (0.4)	3 (7.7)	4 (1.3)	
Geophagia hidden from others:				
No	191 (69.5)	16 (41.0)	207 (65.9)	P<0.001
Yes	81 (29.5)	21 (53.9)	102 (32.5)	
Geophagia hidden from:				
Partner/spouse	39 (14.2)	4 (10.3)	43 (13.7)	
Parents	47 (17.1)	13 (33.3)	60 (19.1)	P=0.200
Siblings	10 (3.6)	6 (15.4)	16 (5.1)	
Other family	27 (9.8)	10 (25.6)	37 (11.8)	
Friends	13 (4.7)	6 (15.4)	19 (6.1)	
Learnt geophagia from:				
No one	60 (21.8)	1 (2.6)	61 (19.4)	
Family	139 (50.6)	36 (92.3)	175 (55.7)	P<0.001
Friends	53 (19.3)	1 (2.6)	54 (17.2)	
Both	3 (1.1)	0	3 (1.0)	
Ever had a health problem due to geophagia:				P=0.055
No	249 (90.6)	38 (97.4)	287 (91.4)	
Yes	25 (9.1)	0	25 (8.0)	
Desire to eat earth stronger than food sometimes:				P<0.001
No	197 (71.6)	38 (97.4)	235 (74.8)	
Yes	77 (28.0)	0	77 (24.5)	
Desire to eat earth heightens after rain:				P=0.624
No	233 (84.7)	34 (87.2)	267 (85.0)	
Yes	41 (14.9)	4 (10.3)	45 (14.3)	
Reason:				P=0.676
Smell	40 (14.6)	4 (10.3)	44 (14.0)	
Earth collected by self:				P=0.648

No	261 (94.9)	36 (92.3)	297 (94.6)	
Yes	10 (3.6)	2 (5.1)	12 (3.8)	
Other usual ways of acquiring earth:				
Buying	249 (90.6)	20 (51.3)	269 (85.7)	P<0.001
From family	8 (2.9)	15 (38.5)	23 (7.3)	
From friends	3 (1.1)	0	3 (1.0)	
Mode of consumption:				
Chewed	215 (78.2)	28 (71.8)	243 (77.4)	
Licked	58 (21.1)	7 (18.0)	65 (20.7)	P<0.001
As a drink	0	3 (7.7)	3 (1.0)	
Additives added to earth before consumption:				
No	266 (96.7)	37 (94.9)	303 (96.5)	P=1.000
Yes	8 (2.9)	1 (2.6)	9 (2.9)	
Time of day earth is normally eaten:				
Before meals	2 (0.7)	0	2 (0.6)	P=0.486
After meals	23 (8.4)	1 (2.6)	24 (7.6)	
No particular time	248 (90.2)	37 (94.9)	285 (90.8)	
Total	***275 (100.0)***	***39 (100.0)***	***314 (100.0)***	

* P-values from chi-square test and Fisher's exact test in cases when the expected cell frequencies were <5.

Relative odds of practising Geophagia based on demographics

It was also noticed that females were more likely than males to practice geophagia: OR=8.28, 95%CI=5.84-11.74, P<0.001 (Table 3). This was still significant at almost the same level after adjusting for the other variables in the model, i.e. after taking those other characteristics into account.

Among different age-groups, 50-59 year olds were most likely (2.51 times) to practice geophagia compared to the under-20 year olds. However, this was not significant after adjusting for the other variables although they were still the most likely group to do so (OR=2.90, 95% CI=0.88-9.58, P=0.555).

The odds were against the divorcee, widowed and separated persons who were 4.85 times more likely to find comfort in eating earth than the married, cohabiting and those who had never married; this was however not significant after adjustment.

Table 3. Relative odds of practising geophagia based on background characteristics

Characteristic	Crude		Adjusted	
	OR (95% CI)	P-value	OR (95% CI)	P-value
Age (years):				
<20	1.00 (reference)		1.00 (reference)	
20-29	1.68 (1.05, 2.69)		2.34 (0.85, 6.45)	
30-39	1.69 (1.03, 2.77)	P=0.005	2.32 (0.79, 6.86)	P=0.558
40-49	1.98 (1.20, 3.26)		2.68 (0.89, 8.08)	
50-59	2.51 (1.41, 4.49)		3.06 (0.94, 9.94)	
≥60	1.83 (0.87, 3.88)		3.00 (0.73, 12.33)	
Sex:				
Male	1.00 (reference)	P<0.001	1.00 (reference)	P<0.001
Female	8.28 (5.84, 11.74)		7.73 (4.99, 11.96)	

Marital status:				
Never married	1.00 (reference)	P<0.001	1.00 (reference)	P=0.348
Married/cohabiting	1.81 (1.39, 2.35)		1.34 (0.88, 2.06)	
Divorced/separated/widowed	4.85 (2.22, 10.58)		1.87 (0.44, 8.03)	
Religion:				
None	1.00 (reference)		1.00 (reference)	
Christian	0.48 (0.30, 0.78)	P<0.001	0.59 (0.32, 1.12)	P=0.005
Muslim	0.44 (0.26, 0.75)		0.44 (0.23, 0.86)	
Traditional African	0.96 (0.48, 1.92)		0.91 (0.38, 2.20)	
Education:				
None	1.00 (reference)		1.00 (reference)	
Primary	0.65 (0.39, 1.09)	P<0.001	0.87 (0.44, 1.70)	P<0.001
Secondary	0.27 (0.16, 0.45)		0.50 (0.24, 1.03)	
Tertiary	0.06 (0.02, 0.13)		0.17 (0.05, 0.59)	
Employment status:				
Not employed	(reference)	P<0.001	Omitted due to collinearity	
Employed	1.54 (1.10, 2.18)			
Occupation:				
Unskilled labour	1.00 (reference)		1.00 (reference)	
Agricultural	1.21 (0.60, 2.46)		0.96 (0.42, 2.20)	
Clerical/secretarial	0.81 (0.30, 2.18)	P<0.001	1.08 (0.34, 3.42)	P=0.512
Professional/managerial	0.16 (0.06, 0.40)		0.64 (0.20, 2.03)	
Sales and services	2.04 (1.09, 3.82)		1.37 (0.69, 2.75)	
Skilled craftsmanship	0.90 (0.47, 1.69)		1.33 (0.65, 2.73)	

Discussion

In this study we have been able to show that Geophagia was not caused by food scarcity or insecurity. Even in the farming communities of Ghana, particularly in Western, Brong Ahafo, Ashanti and Eastern regions where the average household has access to food grown on their own farms, geophagia was practiced all year round irrespective of food availability or harvest.

In order to address the potential health threats posed by Geophagia, the key cultural drivers need to be studied and understood. We also need to appreciate the shocks and stresses that create such desires. But first, we need to get the scientific data right without co-mingling it with social analyses. Anything short of this would prolong the debate about whether Geophagia is a cultural-nutrition health-seeking behaviour, or just a mere cultural imperative without redeeming psycho-social qualities (1,15,16).

From the published papers accessed in this paper, we have noticed that, part of the reasons for the debate is that it appears many of the researchers try to explain the outcome of a purely laboratory investigation of the substances involved in geophagia within the cultural context (13). At other times, they attempt to explain the outcome of their social investigation of the behaviour, such as knowledge and attitude associated with the practice, with scientifically oriented language supported by laboratory measurements and equivalencies (14,16,17).

There is a mixture of purposes and, therefore, the literature on Geophagia is replete with claims and counter-claims or findings by the same researchers within the same studies (3,13,21). An example of a purely scientific research which was reported as such was conducted by Dreyer et al. in 2004 (21). They conducted biochemical investigations into Geophagia among certain ethnic group in Southern Africa and concluded that eating black earth among pregnant women in Southern Africa may be beneficial to them and may retard

the loss of iron and other properties. They reported that: *"Absorbent properties for sodium of black earth, though notable, were not homoeostatically significant. Intake was estimated at only 7.5% of dietary guidelines, yet the serum concentration was normal. The same applies to magnesium. This was liberated from black earth in quite large amounts, dietary intake exceeded the RDA (120%) and yet the serum concentration again was normal. Intake of calcium was below the RDA (43.5%), while the serum concentration was normal. Possibly, the calcium liberated from black earth actually functioned as a dietary supplement."*
On the basis of the outcome of their study, Dreyer cautioned that before attributing adverse or beneficial outcomes to geophagia, the ion-exchange capacity of the substance in question should be evaluated. Dreyer et al. did not attempt to extend their findings to any other issue except what they investigated. However, Neser, De Vries, et al. (2000) also conducted a purely scientific inquiry into *„enzootic geophagia of calves and lambs"* in the Cape region of South Africa and concluded among other laboratory findings that: *"the cause of geophagia may not be completely understood"*. The inquiry was not a cause-effect study (1).
Woymodt and Kiss (2002:143) took the historical approach to understand the practice. In their review of the history of geophagia, they suggested that geophagia was an artifact of poverty, that *"where poverty and famine are implicated, earth may serve as an appetite suppressant and filler"* (3). That is to say, Geophagia was an aspect of resilient building or adaptive capacity against food insecurity and food scarcity (16). Although Woymodt and Kiss had previously maintained that Geophagia was associated with poverty, they made immediate reversal of opinion that *"geophagia is often observed in the absence of hunger"*, but that it is *"environmentally and culturally driven"* (3). In the conclusion of their paper, they reversed themselves again that *"the re-emergency of Geophagia might be triggered by famine, cultural-change and psychiatric diseases"*. To underscore geophagia as a psychiatric disease, Woymodt and Kiss quote from Gabriel Garcia Marquez's *„One Hundred Years of Solitude"*, in which one of the novel heroines: '*Rebecca got up in the middle of the night and ate handfuls of dirt in the garden with a suicidal drive, weeping with pain and fury, chewing tender earthworms and chipping her tooth on snail shells".*
Researchers accorded and inured Geophagia with neurosis or psychiatric disorder as exemplified in the apparently hysterical manner the apparently already crazy Rebecca was *„chewing tender earthworms and chipping her tooth on snail shells"* (20). Even though she was in pain, Rebecca continued to chew the dirt, perhaps due to her apparent pre-existing mental disorder. Such conclusions were reached in other scientific publications long before the cultural dimensions of the practice were subjected to empirical investigations (17). Granted, Rebecca is a fictitious character created out of a fertile, probably, male-centric mind (16,20). Despite this statement, the thought that Geophagia is a primal response to psychosomatic episode lingers on.
For researchers to conclude that Geophagia is a psychiatric disorder there has to be empirical studies to confirm this suspicion. Without a contextual and clinical evaluation of a particular Geophagist, it cannot be said that Geophagia is driven by a psychiatric disorder. It appears the outcome reported in this study, debunks the thinking that Geophagia is a sign of psychiatric condition.

Conclusion

In this study, we have provided evidence that geophagia is not restricted to pregnant and lactating women and that it is a general practice among certain groups of people in Ghana, West Africa. We have proffered that, at least in Ghana, Geophagia is a cultural-nutritional, health-seeking behaviour. It is not a conduct which is practiced because of famine or food insecurity, but because of the utilitarian value derived from it. There is also no study on the

phenomenon on this level that has been published on Ghana. Therefore, this study brings to light all the findings associated with the practice of Geophagia. In order not to confuse good laboratory investigation with the cultural impetus that drives the practice of geophagia, researchers of this behaviour need to focus their research questions on specific issues of the conduct. Where there is comingling of cultural analyses with laboratory results, a great deal of confusion may be created, which may lead to the wrong inferences or interventions if need be.

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ORIGINAL RESEARCH

Public health leadership competency level among health professionals in a South Eastern European country

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Abstract

Aim: The aim of this study was to describe the current and the required leadership competency level of health professionals in Albania, employing a recently established international instrument.
Methods: A nationwide cross-sectional study was conducted in Albania in July-December 2014 including a representative sample of 267 health professionals (162 men and 105 women; mean age: 44.7±10.3 years; overall response rate: 89%). A structured questionnaire was administered to all health professionals aiming at self-assessing the current level of leadership competencies and the required (desirable) level of leadership competencies for their current job position. The questionnaire included 52 items grouped into eight subscales/domains. Answers for each item of the tool ranged from 1 ("minimal competency level") to 5 ("maximal competency level"). An overall summary score (range: 52-260) and a subscale summary score for each domain were calculated for both the current and the required leadership competency levels. Wilcoxon signed ranks test was employed to compare the overall scores and the subscale scores of the current and the required level of leadership competencies among health professionals.
Results: Mean value of the overall summary score for the 52 items of the instrument was significantly lower for the current leadership competency level compared with the required leadership competency level (138.4±11.2 vs. 159.7±25.3, respectively; P<0.001). Most of the subscales' scores were significantly higher for the required than for the current leadership competency level.
Conclusion: Our study provides useful evidence about the current and the required level of leadership competencies among health professionals in transitional Albania. Findings of this study may help policymakers in Albania to identify the gap between the required and the current level of leadership competencies among health professionals. Furthermore, findings of this study should be expanded in the neighbouring countries of the South Eastern European region and beyond.

Keywords: Albania, competency level, health professionals, public health leadership, South Eastern Europe.

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Conflicts of interest: None.

Introduction

To date, there have been developed a few competency frameworks in order to assess public health leadership and medical leadership competencies (1-4). These instruments have basically included the key principles and concepts of leadership (5,6). Establishment and refinement of these tools is due to the urgent need to develop strong leadership skills and competencies among public health professionals at large (7). Hence, these leadership frameworks are deemed useful for professional training and continuous medical education in particular, but also for continuous professional development in general (5,6).

Competencies in the area of public health leadership are regarded as a crucial element for the performance and activities of health professionals operating at all levels of health care services (public health, primary health care services, as well as hospital care) in different settings and cultures (7). A key driver in improving leadership within public health is that the nature of the challenges faced by such professionals is evolving. Developing effective leadership is essential as many European countries are putting health systems under significant financial pressures and forcing them to deliver more with diminishing resources (8).

Notwithstanding the current progress towards development of leadership competencies in the area of medicine and public health, the existing frameworks are – on the face of it – too generic and not satisfactorily detailed for a proper assessment of the leadership competency level of health professionals operating in different levels of health care. It has been convincingly argued that a proper identification and assessment of the level of leadership competencies is a basic prerequisite for adjustment of the educational curriculum and training models for health professionals in different European countries (7).

For this very reason, fairly recently, it has been developed a specific public health leadership competency framework with the aim to significantly foster the competency-based European public health leadership curriculum (7). As acknowledged earlier, this competency framework was designed in the context of the Leaders for European Public Health (LEPHIE) Erasmus Multilateral Curriculum Development Project, supported by the European Union Lifelong Learning Programme (7).

The information about public health leadership is scarce for Albania, a former communist country in Southeast Europe, which is characterized by a rapid political and socioeconomic transition associated with deleterious health effects (9,10). The particularly rapid process of transition in Albania over the past twenty five years has been associated with an intensive process of migration, both internal (from rural areas to urban areas of the country) and external (mainly to the neighbouring countries including Greece and Italy) (11). This has also affected the workforce, at least to some extent. Indeed, regardless of the international financial crisis, the relatively poor economic situation and the lack of rapid economic expansion due to limited domestic resources continue to encourage Albanian adults to emigrate (12). In 2013, it was established in Albania a national School of Public Health under the auspices of the University of Medicine. Nevertheless, the curriculum of both undergraduate and postgraduate public health programs does not sufficiently promote leadership skills and competencies for future health professionals in Albania.

The new leadership competency framework was cross-culturally adapted in Albania in May 2014 in a sample of health professionals operating at different levels of health care services (13).

In this context, the aim of our study was to describe the current and the required leadership competency level of health professionals in Albania, employing this recently established international instrument, which was previously validated.

Methods

A cross-sectional study was conducted in Albania in July-December 2014 targeting a nationwide representative sample of 300 health professionals working at different health institutions all over the country (primary health care services, regional hospitals, University Hospital Centre "Mother Teresa", Institute of Public Health, and Health Insurance Fund). Of 300 targeted health professionals, 33 individuals refused to participate. The study sample consisted of 267 health professionals (162 men and 105 women; mean age: 44.7±10.3 years; overall response rate: 89%).

A structured questionnaire was administered to all health professionals aiming at self-assessing the current level of leadership competencies and the required/desirable level of leadership competencies for their current job position. As reported previously, the questionnaire consisted of 52 items grouped into eight competency domains (subscales) including (7): i) systems thinking; ii) political leadership; iii) collaborative leadership: building and leading interdisciplinary teams; iv) leadership and communication; v) leading change; vi) emotional intelligence and leadership in team-based organizations; vii) leadership, organizational learning and development, and; viii) ethics and professionalism

As explained elsewhere, each domain (subscale) of the instrument corresponds to one educational session within public health leadership curriculum (7,14).

Answers for each item of each subscale of the instrument ranged from 1 ("minimal competency level") to 5 ("maximal competency level"). An overall summary score (range: 52-260) and a subscale summary score for each domain were calculated for both, the current level of competencies and the required level of competencies.

The instrument was previously validated (cross-nationally adapted in the Albanian context) in a sample of 53 health professionals in Tirana in May 2014 (13), after a careful process of translation and back-translation of the original English version of the leadership competency questionnaire, following strict methodological rules (15).

Furthermore, the questionnaire included demographic information (age and sex of health professionals), place of work (urban areas vs. rural areas), type of diploma obtained (dichotomized into: health sciences vs. other diploma), years of working experience, as well as current job position (trichotomized into: high, middle and low managerial level).

Measures of central tendency and dispersion (mean values and standard deviations) were used to describe the distribution of age and working experience among male and female participants. Conversely, absolute numbers and their respective percentages were used to describe the distribution of place of work, diploma obtained and the job position of health professionals. Cronbach's alpha was used to assess the internal consistency for both the current level of competencies and the required level of competencies (16,17). On the other hand, Wilcoxon signed ranks test was used to compare the overall scores and the subscale scores of the current level of competencies and the required level of competencies among health professionals included in this study.

Results

Mean age in the male sample of health professionals (N=162) was 44.9±10.6 years, whereas in females (N=105) it was 44.4±9.9 years (Table 1). About 75% of health professionals were working in urban areas and 25% in rural areas of Albania.

Around 87% (N=233) of participants had received a diploma in health sciences (medicine, public health, nursing, pharmacy, or dentistry), whereas 13% (N=34) had other backgrounds (law, economics, social sciences, or engineering).

Overall, mean working experience was 19.6±10.1 years. About 21% (N=55) of health professionals were working in high-level managerial positions compared with 32% (N=84) who were operating in low-level positions.

Table 1. Baseline characteristics in a nationwide representative sample of health professionals in Albania, in 2014

Variable	Men (N=162)	Women (N=105)	Total (N=267)
Age (years)	44.9±10.6[*]	44.4±9.9	44.7±10.3
Place of work:			
Urban areas	111 (68.5)[†]	90 (85.7)	201 (75.3)
Rural areas	51 (31.5)	15 (14.3)	66 (24.7)
Diploma:			
Health sciences	142 (87.7)	91 (86.7)	233 (87.3)
Other	20 (12.3)	14 (13.3)	34 (12.7)
Working experience (years)	20.0±10.4	19.0±9.6	19.6±10.1
Job position:			
High managerial level	33 (20.4)	22 (21.0)	55 (20.6)
Middle managerial level	70 (43.2)	58 (55.2)	128 (47.9)
Low managerial level	59 (36.4)	25 (23.8)	84 (31.5)

[*] Mean values ± standard deviations.

[†] Numbers and column percentages (in parentheses).

The internal consistency of the overall scale (52 items) was Cronbach's alpha=0.86 for the current competency level and Cronbach's alpha=0.96 for the required competency level (Table 2). For the current competency level, Cronbach's alpha was the lowest for the "ethics and professionalism" domain (0.49) and the "leadership, organizational learning and development" subscale (0.55) and the highest for the "political leadership" domain (0.94). Similarly, for the required competency level, Cronbach's alpha was the lowest for the "ethics and professionalism" domain (0.65) and the highest for the "political leadership" domain (0.91).

Mean value of the overall summary score for the 52 items of the instrument was significantly lower for the current competency level compared with the required competency level (138.4±11.2 vs. 159.7±25.3, respectively; P<0.001) (Table 3). All the subscales' scores were significantly higher for the required competency level than for the current competency level, except for the "emotional intelligence and leadership in team-based organisations" and "leading change" domains (Table 3).

Table 2. Internal consistency of the leadership competency instrument administered in a representative sample of health professionals in Albania (N=267)

Domain (subscale)	Cronbach's alpha	
	Current competency level	Required competency level
Overall scale *(52 items)*	0.86	0.96
Systems thinking *(7 items)*	0.82	0.78
Political leadership *(8 items)*	0.94	0.91
Collaborative leadership: building and leading interdisciplinary teams *(5 items)*	0.89	0.85
Leadership and communication *(7 items)*	0.62	0.87
Leading change *(6 items)*	0.64	0.77
Emotional intelligence and leadership in team-based organizations *(6 items)*	0.83	0.83
Leadership, organizational learning and development *(7 items)*	0.55	0.79
Ethics and professionalism *(6 items)*	0.49	0.65

Table 3. Summary score of each domain (subscale) of the leadership competency instrument for the current and the required competency level of Albanian health professionals (N=267)

Domain (subscale)	Mean values ± standard deviations		P-value*
	Current competency level	Required competency level	
Overall scale *(52 items)*	138.4±11.2	159.7±25.3	<0.001
Systems thinking *(7 items)*	21.1±2.8	21.8±3.4	<0.001
Political leadership *(8 items)*	20.1±5.0	20.9±5.4	<0.001
Collaborative leadership: building and leading interdisciplinary teams *(5 items)*	11.7±2.9	12.9±3.6	<0.001
Leadership and communication *(7 items)*	16.5±2.2	17.9±4.3	<0.001
Leading change *(6 items)*	17.1±2.1	16.7±3.2	0.005
Emotional intelligence and leadership in team-based organizations *(6 items)*	18.1±2.4	17.3±3.6	<0.001
Leadership, organizational learning and development *(7 items)*	16.5±2.1	17.7±3.6	<0.001
Ethics and professionalism *(6 items)*	17.2±2.0	17.6±2.7	0.018

* Wilcoxon singed ranks test.

Discussion

This study provides useful evidence about the level and distribution of leadership competencies among health professionals in transitional Albania, based on a recently established international instrument, which was previously validated (cross-culturally adapted) in the Albanian context.

This measuring international instrument exhibited satisfactory internal consistency especially for assessment of the required (desirable) leadership competency level. During the previous

validation exercise, the tool had also displayed a high stability over time (i.e., a high test-retest reliability for the overall scale and for each of the subscales of the instrument) (13).
Main findings of this survey include a higher self-perceived level of the required leadership competencies than the current (existing) level of leadership competencies among health care professionals in post-communist Albania. Interestingly, most of the subscale scores were significantly higher for the required competency level compared with the current competency level in this nationwide representative sample of health professionals in Albania.
Findings of this study may help policymakers in Albania to identify the gap between the required and the current level of leadership competencies among health professionals.
As already reported elsewhere, the public health leadership competency-based curriculum was established in the framework of the LEPHIE project (7). Similarly, as Czabanowska et al. point out that a starting point is to identify the competency capacities of future leaders in relation to population health and well-being and apply the study results to inform education, training and culture change throughout the workforce (14), we considered that the description of the competencies supports the curriculum design and it can be used as a self-assessment instrument for students and public health professionals, helping them to reflect and identify gaps in their knowledge, skills and competencies (7). The teaching of leadership is still not common in public health training programmes around the world and seems particularly rare in countries experiencing intensive public health reforms. There is a need for substantial investment in leadership training for public health professionals (18).
In conclusion, we provide important evidence about the level and distribution of the leadership competency level among health professionals in Albania, a country embarked in the long journey towards accession into the European Union. Our survey informs about both the self-perceived leadership competency level and the required/desirable level of leadership competencies for the respective job positions of health care professionals in Albania.
Findings of our survey should be expanded further in large representative samples of health care professionals in the neighbouring countries in the Western Balkans and beyond. Similar to Albania, this type of survey will help to identify potential gaps in the level of existing leadership competencies and the required/desirable level of leadership competencies, which will ultimately inform the public health curricula about necessary content adjustments.

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ORIGINAL RESEARCH

Health seeking behaviour among caregivers of under-five children in Edo State, Nigeria

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Abstract

Aim: Timely and appropriate healthcare seeking behaviours if practiced by caregivers of under-five children can have a significant impact on child survival. This study assessed the knowledge of, and general health seeking practices among mothers of under-five children in Nigeria.

Methods: This descriptive cross-sectional study was carried out among caregivers of under-five children in Edo State, Nigeria, in 2013. A multi-staged sampling technique was used to recruit respondents. Data collection was done by means of a structured interviewer-administered questionnaire adapted from UNICEF/IMCI household baseline survey questionnaire.

Results: A total of 370 caregivers (mean age: 31.1±5.9 years) participated in the study. Almost all of them were females 368 (99.5%), 234 (63.2%) had secondary education and 283 (76.5%) were in the unskilled social class. Over 70%, 76%, 72%, 76% and 82% of participants did not know that being unable to eat/drink, fast breathing, blood in stool and convulsion, respectively, were symptoms of a child not feeling well. The place of primary care of children by caregivers was at home 142 (38.4%), chemist shop 91 (24.6%) and health facility 80 (21.6%). Cost and long waiting time were major reasons for not seeking care in health facilities.

Conclusion: This study showed poor health seeking practices among caregivers of under-five children in Edo State, Nigeria. There should be continuous education of caregivers on recognition of danger signs in children and the need to seek appropriate medical care in health facilities.

Keywords: caregivers, health seeking behaviour, Nigeria, under-five children.

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Conflicts of interest: None.

Introduction

Nigeria is facing huge challenges in meeting the Millennium Development Goal (MDG) 4 (1), due to high morbidity and mortality rates among under-five year old children. Although households and communities have a major responsibility in recognizing when children need treatment outside the home, a recent national survey found that this has not been the case due to poor health seeking knowledge and practices in households (2).

Generally, the poor health seeking practices among caregivers of under-five children, which is a consequence of poor knowledge among other factors such as poverty, lack of family support and competing work demands of carers, is one of the leading causes of the high infant and under-five mortality rates of 69/1,000 live births and 128/1000 live births respectively (2). In Edo State, Nigeria, infant and under-five mortality rates are reported to be higher (at 100/1000 and 191/1000 live births respectively) (3). The major causes of under-five morbidity and mortality in Nigeria are diseases like malaria (24%), pneumonia (20%), diarrhoea (16%), measles (6%), HIV (5%), neonatal conditions (26%), malnutrition and injuries (4,5). Diseases and deaths due to these causes are preventable through application of community-oriented cost-effective interventions in the households/communities, such as the UNICEF/WHO key household practices (1,4). In Nigeria, according to the National Demographic and Health Survey (NDHS) of 2013, slightly more than one-third (35%) of children with symptoms of acute respiratory infections (ARI) were taken for treatment to a health facility, 29% of children with diarrhoea were taken to a health facility, whereas 38% of the children with diarrhoea were treated with oral rehydration therapy (ORT) (2). The Edo State Strategic Health Plan assessment found that only 2% owned Insecticide Treated Nets (ITNs), only 6% of children under-five slept under a mosquito net and only 13% of children aged 12-23 months had received the recommended course of immunization (3). The Nigerian experience is part of wider problem, with a majority of child deaths in (developing countries) continuing to occur at home, often with no contact with a health care facility (6). It has been documented in some sub-Saharan Africa countries that factors such as lack of money, distance to health facility and perception of the illness not being serious were the major reasons why mothers and caregivers of under-five children do not seek care for their ill children (6,7).

Studies from India and Mexico have reported poor knowledge and practice of health seeking among mothers and caregivers of children less than five years mainly due to careers and not recognizing signs of childhood illness for seeking care immediately for common childhood diseases such as diarrhoea, respiratory tract infections and fevers (8,9). A study in Guatemala revealed that 63%-83% of mothers relied on home care the last time their children under the age of five suffered from diarrhoea, fever, cough, and the use of health services (western or traditional) was consistently low among them (10). The resultant effect of this is an increased morbidity and mortality among under-five children.

However, a qualitative study carried out in Germany among 11 mothers with Turkish background and nine mothers with German background showed that mothers had good knowledge of childhood fever and good practice of seeking care for their children's fever. The mothers perceive their child's fever not merely as elevated temperature, but as a potentially dangerous event. A deeply rooted urge to protect the child from harm was central to all participants' experience (11). This good knowledge and practice will make room for prompt and appropriate action thus reducing complications and mortality.

Studies have shown that timely and appropriate healthcare seeking behaviours can have a significant impact on child survival, if practiced by the majority of caregivers of children less than five years of age (2,3,6).

In this framework, our study sought to assess the knowledge of, and general health care seeking practice among mothers of under-five children in Edo State, Nigeria, with the aim of improving their health practices through the design of appropriate interventions.

Methods

Study design

A descriptive cross-sectional study using a questionnaire survey method was done.

Setting

The study was carried out in Edo State, Nigeria, in July 2013. Edo State, which is made up of 18 local government areas, is located in the heart of the tropical rain forest and it lies between longitudes 5^o E and 6^o 42" E and Latitudes 5^o 45" N and 7^o 35" N of the equator (12). The state has a total population of 3,233,366 with 1,633,946 males and 1,599,420 females, and a total land area of 19,819,277 square kilometres (13).

Study population

The study population consisted of caregivers of under-five children in Edo State, Nigeria.

Inclusion criteria: caregivers of under-five children who were presently caring for an under-five child (the biological parents, or the primary caregivers).

Sampling method: a multi-staged sampling technique was used in selecting the respondents for this study:

- *Stage one:* three Local Government Areas was selected by balloting from the three senatorial districts in Edo State.
- *Stage two:* From the three selected Local Government Areas, one ward in each was selected by simple random sampling using a table of random numbers from a list of all the wards in the selected Local Government Areas.
- *Stage three:* From the wards selected, one community in each was selected by simple random sampling using a table of random numbers from a list of all the communities in the selected wards.
- *Stage four:* In the three selected communities, a systematic sampling method was then used to select the houses corresponding to the total number of respondents allocated to the respective communities. The sampling interval was determined by dividing the total number of houses in the community with the sample size allocated to the community. The starting point was chosen by simple random sampling of the houses within the sampling interval starting for the house of the community head. The study unit was households with the informant being the primary caregiver. Where there was more than one household in a house, a single household was selected by simple random sampling. Where a caregiver was responsible for more than one under-five child, the youngest was selected as the index child for the study.

Sample size calculation: the sample size for this survey was calculated using the Cochran's formula (14) for sample size determination in a cross-sectional study ($n=z^2pq/d^2$). Using a prevalence of 68% (0.68) being the percentage of caregivers with poor knowledge of schedules of childhood immunization and diseases preventable by vaccines given to children in Kano state, Nigeria (15), and accounting for a 10% non response, the calculated sample size for this study was 370. The sample size was proportionately allocated to the three selected Local Government Areas according to their respective sizes.

Data collection

A structured interviewer-administered questionnaire adapted from UNICEF/IMCI household baseline survey questionnaire (16) and the IMCI Pictorial Counselling and Community Practices for Maternal, Newborn and Child Health booklet (17) were used for data collection. The questionnaire covered caregivers' general knowledge and practice of health seeking including recognition of a sick child, symptoms of illness in a child, recognition of when a child needs treatment outside the home and the primary care services for a sick child.

Ethical considerations: ethical approval was obtained from the Research Ethics Committee of the University Teaching Hospital of Benin. Permission was also sought from the administrators of the three selected Local Government Areas and the traditional heads. Confidentiality and privacy of the respondents was assured and respected during the interviews. A written informed consent was obtained from each respondent before conducting the questionnaire interviews. Health education on the various components of the key household practices was carried out at the end of the study.

Data analysis

The questionnaires were screened for completeness by the researcher, coded and entered into the Statistical Package for Social Sciences, version 16.0 (SPSS Inc. Chicago, Illinois, USA). Categorical data such as occupational and educational statuses were presented as percentages.

Results

A total of 370 respondents participated in the study. All the eligible respondents selected consented to the interview giving a response rate of 100%. Majority of the respondents (230, or 62%) were in the age-group of 25-34 years. Mean age of the respondents was 31.1±5.9 years. Almost all the respondents were females 368 (99.5%). Greater than four-fifths of the respondents (325, or 88%) were married, 38 (10%) were cohabiting, while 2 (0.5%) were single. Majority 338 (91%) of the respondents were Christians and 32 (9%) were Muslims. A greater proportion 234 (63%) had secondary education, 76 (21%) had primary education, 55 (15%) had tertiary education, while 5 (1%) had no education (data not shown in the tables).

Over three quarters (283, or 77%) of the respondents were in the unskilled social class, 79 (21%) were in the middle level social class and 8 (2%) were in the professional social class. Respondents of Esan, Afemai and Benin ethnicity made up 109 (29%), 92 (25%) and 76 (21%), respectively. More than a third 137 (37%) of children were in the age-group 12-23 months, followed by 88 (24%) in the 0-11 age-group. Mean age of the children was 21.8±1.5 months. More than half (209, or 57%) of the children were boys and 161 (43%) were girls.

Over 70%, 76%, 72%, 76% and 82% of respondents did not know that being unable to eat/drink, fast breathing, blood in stool and convulsion, respectively, were symptoms of a child not feeling well (Table 1).

Table 1. Respondents' correct knowledge of symptoms of illness in children

Symptoms	Number (N= 370)	Percent
Not playing normally	269	72.7
Fever for more than 24 hours	170	45.9
Vomiting	147	39.7
Fast breathing	103	27.8
Blood in stool	90	24.3
Unable to eat or drink	89	24.1
Convulsion	68	18.4
Drinks poorly	63	17.0

Over three quarters of the respondents (279, or 75%) were aware of the importance of consultation of medical personnel for advice for a sick child. Health personnel known to respondents that can be consulted were patent medicine dealer (115, or 41%), nurses (71, or 26%), and doctors (22, or 8%). A little below one third of the respondents (109, or 29%) knew the recommended distance to the nearest health facilities of less than 5 km (Table 2).

Table 2. Knowledge of primary care services among respondents

Variables	Number	Percent
Aware of the importance of consulting the health personnel (N=370):		
Yes	279	75.4
No	91	24.6
Categories of health personnel that can be consulted (N=279):		
Patent medicine dealer	115	41.2
Nurses	71	25.5
Community health workers	60	21.5
Doctors	22	7.9
Traditional birth attendants	11	3.9
Knowledge of the recommended distance to the nearest health facility (N=370):		
<5 km	109	29.4
5-10 km	28	7.6
>10 km	5	1.4
Do not know	228	61.6

Almost all of the respondents (354, or 96%) had heard of antenatal care. Respondents' major sources of information about antenatal care were from hospital/health workers (304, or 86%), television (31, or 9%), and from relatives (10, or 3%). The majority of the respondents (335, or 95%) knew the meaning of antenatal care and 19 (5%) reported that it was the use of concoctions and herbs during pregnancy. Over four-fifths (66%) of respondents who had heard of antenatal care were of the opinion that antenatal visits should take place as many times as possible, while only 28 (8%) of the respondents knew that antenatal care visits should be 3-4 times, and further 38 (11%) individuals did not know.

The major symptoms that prompt immediate treatment among respondents were vomiting 279 (75%), frequent stooling 261 (71%), fever 252 (68%), while fast breathing came forth with a little above half (189 or, 51% of respondents). Major reasons by respondents for not seeking treatment for children were child's condition not being serious (184, or 50%) and cost of treatment (154, or 41%) (Table 3).

The place of primary care by more than a third of the respondents (142, or 38%) was at home, followed by the chemist shop (91, or 25%), whereas the use of health facility was reported by less than a quarter of the respondents (80, or 22%). Sixty nine (86%) of the respondents did not carry out instructions of the health workers and the major reasons for caregivers not complying with instructions of health workers were the cost of treatment (53, or 77% of respondents) and the distance to the health facility (42, or 61% of participants) (Table 4).

Table 3. Symptoms that prompt care seeking and reasons for not seeking immediate treatment among respondents

Variables	Number (N=370)	Percent
Symptoms of ill health in a child that will prompt immediate treatment*:		
Drinks poorly	74	20.0
Fever	252	68.1
Vomiting	279	75.4
Frequent stooling	261	70.5
Fast breathing	101	27.3
Skin rashes	11	3.0
Playing	5	1.4
Poor oral hygiene	9	2.4
Scalp infection	7	1.9
Not eating well	4	1.1
Reasons for not seeking immediate treatment*:		
Condition not serious	184	49.7
Unavailability of nearby health provider	74	20.0
Cost	154	41.4
Long waiting time	18	4.9
Long distance	16	4.3
Dissatisfaction with medical care	6	1.6
Discouragement by family member	5	1.4
Competing domestic duties	5	1.4
Social traditions and values	2	0.5

* Multiple responses.

Table 4. Health seeking practices among respondents

Variables	Number	Percent
Respondents place of first treatment when child is ill (N=370):		
Home	142	38.4
Chemist shop	91	24.6
Health facility	80	21.6
Health care provider	53	14.3
Church	3	0.8
Traditional birth attendant (TBA)	1	0.3
Compliance to health workers instructions (N=80):		
Yes	11	13.8
No	69	86.2
Reasons for non compliance of health workers instructions* (N=69):		
Cost	53	76.8
Distance	42	60.8
Fear of bigger hospitals	26	37.7
Not sure of the health workers	7	10.1

* Multiple responses.

Discussion

In this study, there was poor knowledge of caregivers concerning recognition of children who were ill and when to seek medical care. Health personnel most known to caregivers that could be consulted were patent medicine dealers, whereas the major reasons by caregivers for not seeking treatment for ill children were child's condition not being serious, cost of treatment and long waiting time.

In our study, over two third of the respondents were in their mid twenties to early thirties, this is within the reproductive age group for women. The act of care giving for children is mainly the responsibility of females in Nigeria and other sub-Saharan African countries. Hence, it was not surprising that almost all the under-five caregivers in this study were females. A greater proportion of the caregivers had a secondary level of education, which is consistent with findings from the 2013 NDHS where a greater proportion of the respondents from Edo State had secondary education (2). This information will be helpful when it comes to health education of caregivers in order to improve their health care seeking knowledge and practice.

The finding of poor knowledge of caregivers concerning recognition of children who were ill was surprising. They could recognise vomiting and fever but could hardly recognise fast breathing and drinking poorly as symptoms for which to seek immediate medical care for their children. This is probably due to the fact that caregivers' knowledge of symptoms of danger sign for the different diseases differed, but it is expected that fast breathing in a child should be of great concern to a mother. Another possible reason could be that health care workers pay more attention to diseases like malaria and diarrhoea at the clinics during routine antenatal attendance since the major source of information for the caregivers was from the health care workers and the health centres. Therefore, healthcare professional need to pay more attention to other life threatening childhood conditions such as febrile convulsion and pneumonias in the health facilities during health education.

This finding of poor knowledge on recognition of disease symptoms by the respondents was similar to findings from studies carried out in Mexico (9) and in Nigeria (18-20), and also consistent with findings from the Multiple Indicator Cluster Survey (MICS) (21), in which only 10% of women knew of the two danger signs of pneumonia (fast and difficult breathing) that could prompt them seeking immediate care for their children. Appropriate knowledge and recognition of danger signs and symptoms in ill children by caregivers is necessary in seeking immediate and an appropriate management of disease conditions, thereby reducing complications and deaths in these children.

In our study, the health seeking practices of the caregivers with regards to using identified symptoms was also poor. The most commonly identified symptoms for taking a child to a health facility/health care provider were vomiting, fever and frequent stooling, whereas drinking poorly and fast breathing were less common. This finding is in agreement with the health seeking practice found in the MICS in which fever was the most commonly identified symptom for taking children to health facility by their caregivers and only 19% and 23% of mothers identified fast breathing and difficult breathing respectively as symptoms for taking children immediately to a health care provider (21). This could be a result of poor knowledge of the caregivers with regards to recognizing the dangers signs of ill health in these children and also taking for granted that these symptoms were not serious enough to warrant immediate treatment or intervention. This may also explain the reason why the first place of treatment by a greater proportion of the caregivers was at home and patent medicine stores rather than the hospitals/health facilities. Mothers' knowledge of the danger signs is an important determinant of care seeking behaviour and the secondary level of education of most of the caregivers in the study can be exploited to improve their health seeking practices.

Although majority of the respondents were aware of the importance of consulting medical personnel when their children were ill, only 14.3% of them consulted a health care provider for an ill child. The poor knowledge danger signs in a child that should necessitate health care seeking demonstrated by caregivers in this study may have contributed to this practice. This poor health seeking practice could also be due in part to the poor economic situation in Nigeria and by extension Edo State and the long waiting time in health facilities.

The main reason for not seeking immediate treatment by a greater proportion of respondents in this study was that the condition was not serious, followed by cost of treatment and unavailability of nearby health provider. This was compounded by the fact that most of the respondents who visited the health facilities do not carry out the instructions of the healthcare providers. This poor health seeking behaviour by the respondents will result in delays in obtaining proper treatment for the children and an increase in cases of complications from different disease conditions that are preventable. This ultimately will result in morbidities and mortality in the children, thereby hindering the attainment of MDG 4.

This poor health seeking behaviour is consistent with findings from a study in Anyigba, North-Central, Nigeria where the major reason for the delay in seeking treatment by more than half of respondents was the thought that they would get over the ailment without treatment, about a quarter of respondents delayed because of lack of money for treatment, while about one fifth of the respondents delayed seeking treatment due to the far distance to the health facility (18). It, however, contrasted the findings from a study in Igbeagu community in South-East Nigeria where the health centre was the most preferred choice for treatment (19). Good health seeking behaviour will reduce complications, morbidities and mortality in the households and promote family health especially maternal and child health.

In conclusion, this study showed poor health seeking practices among caregivers of under-five children in Edo State, Nigeria. The major factors associated with this poor health seeking behaviour were: poor recognition of danger signs, cost of treatment, and long waiting time in the health facilities. Appropriate knowledge of danger signs and symptoms of ill health in a child and prompt and proper treatment by caregivers is necessary to reduce morbidity and mortality among under-five children. Therefore, there should be continuous education of caregivers on recognition of danger signs in children and the need to seek appropriate medical care in health facilities.

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ORIGINAL RESEARCH

Anatomical variations of the circle of Willis and cerebrovascular accidents in transitional Albania

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Abstract

Aim: The purpose of this study was twofold: i) in a case-control design, to determine the relationship between anatomical variations of the circle of Willis and cerebrovascular accidents; ii) to assess the association between anatomical variations of the circle of Willis and aneurisms among patients with subarachnoid hemorrhage.

Methods: A case-control study was conducted in Albania in 2013-2014, including 100 patients with subarachnoid hemorrhage and 100 controls (individuals without cerebrovascular accidents). Patients with subarachnoid hemorrhage underwent a CT angiography procedure, whereas individuals in the control group underwent a magnetic resonance angiography procedure. Binary logistic regression was used to assess the association between cerebrovascular accidents and the anatomical variations of the circle of Willis. Conversely, Fisher's exact test was used to compare the prevalence of aneurisms between subarachnoid hemorrhage patients with and without anatomical variations of the circle of Willis.

Results: Among patients, there were 22 (22%) cases with anatomical variations of the circle of Willis compared with 10 (10%) individuals in the control group (P=0.033). There was no evidence of a statistically significant difference in the types of the anatomical variations of the circle of Willis between patients and controls (P=0.402). In age- and-sex adjusted logistic regression models, there was evidence of a significant positive association between cerebrovascular accidents and the anatomical variations of the circle of Willis (OR=1.87, 95%CI=1.03-4.68, P=0.048). Within the patients' group, of the 52 cases with aneurisms, there were 22 (42.3%) individuals with anatomical variations of the circle of Willis compared with no individuals with anatomical variations among the 48 patients without aneurisms (P<0.001).

Conclusion: This study provides useful evidence on the association between anatomical variations of the circle of Willis and cerebrovascular accidents in transitional Albania. Furthermore, findings from this study confirm the role of the anatomical variations of the circle of Willis in the occurrence of cerebral aneurisms.

Keywords: Albania, aneurism, cerebrovascular accidents, circle of Willis, subarachnoid hemorrhage.

Conflicts of interest: none.

Introduction

There is convincing evidence linking the anatomical variations of the circle of Willis with the development and harshness of cerebrovascular accidents including aneurysms, infarctions, or other vascular disorders which bear a significant negative health impact (1-3).

Normally, the circle of Willis consists of a symmetrical arterial circle, with a single anterior communicating artery and bilateral posterior communicating arteries (4-6). However, different types of anatomical variations of the circle of Willis have been described (1,4) including hypoplasia (of the posterior communicating artery, the circular part of the posterior cerebral artery, the circular part of the anterior cerebral artery, or the anterior communicating artery); accessory vessels (which are manifested as duplications or triplications of one of the components of the polygon); anomalous origin (persistence of the embryonic derivation of the posterior cerebral artery from the internal carotid); or absent vessels (of one or other posterior communicating arteries) (1,4).

Research has indicated that anatomical variations of the circle of Willis may be genetically determined and develop in early embryonic stage, persisting in postnatal life (1,7). In addition to development of cerebrovascular accidents, there has been suggested a possible link between the anomalies of the circle of Willis and mental illnesses and cerebrovascular catastrophe (1,8).

The available evidence about the prevalence and distribution of the anatomical variations of the circle of Willis in the adult population of Albania is scarce. After the collapse of the communist regime in early 1990s, Albania experienced a particularly rapid political and socioeconomic transition, which was associated with tremendous behavioral/lifestyle changes that have a significant health impact (9,10). Currently, almost twenty five years after the breakdown of its Stalinist regime, Albania remains one of the poorest countries in South Eastern Europe.

In this context, the aim of our study was twofold: i) in a case-control design, to determine the relationship between anatomical variations of the circle of Willis and cerebrovascular accidents; ii) to assess the association between anatomical variations of the circle of Willis and aneurisms among patients with subarachnoid hemorrhage.

Methods

A case-control study was conducted in Albania in 2013-2014, including 100 patients with subarachnoid hemorrhage (hospitalized at the University Hospital Centre "Mother Teresa") and 100 controls (individuals who showed up at the University Hospital Centre "Mother Teresa" without cerebrovascular accidents, but with signs of tension-type headache, or vertiginous syndrome).

All patients with subarachnoid hemorrhage underwent a CT angiography procedure. On the other hand, all individuals in the control group underwent a magnetic resonance angiography procedure either in Tirana, or at the Regional Hospital in Durres (second largest city in Albania). Based on these respective examinations, the presence of cerebrovascular accidents was determined, in addition to the presence and type of anatomical variation of the circle of Willis. Among patients with subarachnoid hemorrhage, the presence of aneurisms was additionally determined. Data on age and sex of participants were also collected.

Fisher's exact test was used to compare the prevalence and types of anatomical variations between cases and controls, and the prevalence of aneurisms between subarachnoid hemorrhage patients with and without anatomical variations of the circle of Willis. Conversely, Mann-Whitney U-test was used to compare the age distribution between patients

and controls. Binary logistic regression was used to assess the association between cerebrovascular accidents and the anatomical variations of the circle of Willis. Odds ratios (ORs), their respective 95% confidence intervals (CIs) and p-values were calculated. Initially, crude (unadjusted) ORs were calculated. Subsequently, age- and-sex adjusted ORs were calculated in a simultaneous multivariable-adjusted logistic regression model. The overall goodness-of-fit of the multivariate model was formally assessed through the Hosmer-Lemeshow test. For all the statistical tests, a p-value of ≤0.05 was considered as statistically significant. Statistical Package for Social Sciences (SPSS, version 17.0) was used for all the data analyses.

Results

Table 1 describes the demographic characteristics of the patients and controls included in this case-control study. Mean age was significantly higher among patients (53.4±9.8 years) compared with the control group (36.8±12.6 years) (Mann-Whitney U-test: P<0.001). There were 18 (18%) controls aged 50 years or older, compared with 47 (47%) individuals in the sample of patients. As for the sex distribution, 41 (41%) individuals in the control group were males and 59 (59%) were females, whereas in the sample of the patients there were 46 (46%) males and 54 (54%) females.

Table 1. Demographic characteristics of the patients with subarachnoid hemorrhage and the control group

Characteristic	Cases (N=100)	Controls (N=100)	P-value
Age *(years)*:			
Mean (SD)	53.4±9.8	36.8±12.6	<0.001*
Median (interquartile range)	55.0 (8.0)	35.5 (20.0)	
Range	24-74	16-63	
Age-group:			
<50 years	53 (53.0)†	82 (82.0)	<0.001‡
≥50 years	47 (47.0)	18 (18.0)	
Sex:			
Male	46 (46.0)	41 (41.0)	0.568‡
Female	54 (54.0)	59 (59.0)	

* Mann-Whitney U-test.

† Absolute numbers and column percentages (in parentheses).

‡ Fisher's exact test.

Table 2 presents the anatomical variations of the circle of Willis in the sample of patients and in the control group. In the sample of the patients, there were 22 (22%) cases with anatomical variations of the circle of Willis compared with 10 (10%) individuals in the control group, with a statistically significant difference between the two groups (Fisher's exact test: P=0.033). In the sample of patients with any type of anatomical variation (N=22), there were 10 (45.5%) cases with ACA (A1 segment) anomaly, 7 (31.8%) cases with A.Com.A. variation (anterior communicant artery), 3 (13.6%) case with P.Com.A. anomaly (posterior communicant artery) and 2 (9.1%) cases with PCA (P1 segment) variation. The distribution of these anomalies among individuals in the control group who presented any type of

anatomical variations of the circle of Willis (N=10) was as follows: 3 (30.0%), 2 (20.0%), 4 (40.0%) and 1 (10.0%), respectively – with no evidence of a statistically significant difference with the sample of the patients (Fisher's exact test: P=0.402) (Table 2).

Table 2. Anatomical variations of the circle of Willis in patients with subarachnoid hemorrhage and the control group

Characteristic	Cases	Controls	P-value†
Circle of Willis:			
Normal	78 (78.0)*	90 (90.0)	0.022
Variation	22 (22.0)	10 (10.0)	
Total	*100 (100.0)*	*100 (100.0)*	
Variation type:			
ACA (A1 segment)	10 (45.5)	3 (30.0)	
A.Com.A.	7 (31.8)	2 (20.0)	
P.Com.A.	3 (13.6)	4 (40.0)	0.402
PCA (P1 segment)	2 (9.1)	1 (10.0)	
Total	*22 (100.0)*	*10 (100.0)*	

* Absolute numbers and column percentages (in parentheses).

† Fisher's exact test.

Table 3 presents the relationship between cerebrovascular disorders with the anatomical variations of the circle of Willis. In unadjusted logistic regression models, there was evidence of a strong positive association between cerebrovascular accidents and the anatomical variations of the circle of Willis, which was statistically significant: OR=2.54, 95%CI=1.13-5.69, P=0.024) (Table 3, model 1). Findings were attenuated upon simultaneous adjustment for age and sex, but the significant positive association between cerebrovascular disorders and the anatomical variations of the circle of Willis was still evident (OR=1.87, 95%CI=1.03-4.68, P=0.048; Table 3, model 2).

Table 3. Association of cerebrovascular accidents with the anatomical variations of the circle of Willis; odds ratios (ORs) from binary logistic regression

Model	OR	95%CI	P-value
Model 1*			
Anatomical variations	2.54	1.13-5.69	0.024
Normal circle	1.00	reference	
Model 2†			
Anatomical variations	1.87	1.03-4.68	0.048
Normal circle	1.00	reference	

* Crude (unadjusted) models (OR: cases vs. controls).

† Age- and-sex adjusted models.

Within the patients' group, the prevalence of aneurisms was 52% (N=52). Of these, there were 22 (42.3%) cases with anatomical variations of the circle of Willis compared with no

cases with anatomical variations among the 48 patients without aneurisms – a finding which was highly statistically significant (P<0.001) (Table 4).

Table 4. Anatomical variations of the circle of Willis by presence of aneurisms among patients with subarachnoid hemorrhage

Characteristic	Without aneurisms	With aneurisms	P-value†
Circle of Willis:			
Normal	48 (100.0)*	30 (57.7)	<0.001
Variation	-	22 (42.3)	
Total	*48 (100.0)*	*52 (100.0)*	

* Absolute numbers and column percentages (in parentheses).

† Fisher's exact test.

Discussion

This study informs about the link between anatomical variations of the circle of Willis and cerebrovascular accidents consisting of subarachnoid hemorrhage in Albanian adults. In addition, this study provides important evidence on the association between anatomical variations of the circle of Willis and presence of aneurisms among patients with subarachnoid hemorrhage.

The main finding of this study relates to a positive association between the anatomical variations of the circle of Willis and subarachnoid hemorrhage. Furthermore, among individuals who experienced subarachnoid hemorrhage, there was a positive association between anatomical variations of the circle of Willis and the presence of aneurisms.

Our findings are compatible with previous international studies which have linked the anomalies of the circle of Willis with the development and severity of symptoms of different cerebrovascular accidents including infarctions, aneurysms, and several other vascular disorders (1,3). Based on the available scientific evidence, it is recommended to assess comprehensively the form of the circle of Willis in order to determine the capacity of the brain circulation in operations for cerebral aneurysms, as well as in interventions involving the internal carotid artery (1). In this regard, magnetic resonance angiography displays the functional morphology of the arterial circle (2,4,11-13) and additionally provides a useful means for hemodynamic assessment of blood flow and direction through different techniques and procedures (3,4,14). In particular, detailed information about the anatomical variations of the circle of Willis is rather valuable to surgeons for a suitable and rational planning of their operations, which involve complex situations associated with other serious co-morbid conditions (1).

In our study, all patients with anatomical variations of the circle of Willis had also aneurisms, a finding which confirms the evidence about the role of arterial variations of the circle of Willis as a leading factor for cerebral hemodynamic disorders which cause aneurisms (1-3). These, in turn, are a risk factor for cerebrovascular accidents. Indeed, in this sample of Albanian patients, aneurisms were involved in the occurrence of subarachnoid hemorrhage.

This study may have some limitations due to the relatively small sample size and the selection of the control group. During a two-year period, we included all consecutive patients

with subarachnoid hemorrhage hospitalized at the University Hospital Center "Mother Teresa", which is the only tertiary health care facility in Albania. However, the relatively small sample size may have influenced the stability of the estimates. On the other hand, we cannot entirely exclude the possibility of selection bias in the control group. Nonetheless, we included in the control group only individuals who did not had evidence of cerebrovascular disorders. In any case, if there is a positive link between cerebrovascular accidents and the anatomical variations of the circle of Willis and if there were a few cases of unnoticed negligible cerebrovascular disorders in the control group, these possibilities would tend to diminish the strength of the association observed instead of producing a spurious finding.

In conclusion, our study provides useful evidence on the association between anatomical variations of the circle of Willis and cerebrovascular accidents in transitional Albania. Furthermore, findings from this study confirm the role of the anatomical variations of the circle of Willis in the occurrence of cerebral aneurisms. As reported from previous studies on this topic, the anomalies of the circle of Willis play an important role in the occurrence, manifestation of symptoms, treatment options and recovery process of several cerebrovascular disorders (1).

Larger studies should be carried out in the future in Albania and other countries in order to confirm and extend the findings of the current case-control study.

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REVIEW ARTICLE

The South Eastern Europe Health Network: A model for regional collaboration in public health

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Abstract

Inter-country alliances, articulated through regional approaches, have increasingly been used to drive economic development and social progress in the past several decades. The South Eastern Europe Health Network (SEEHN) stands out among these types of initiatives for the tangible improvements it has achieved in regional governance for health, with several important lessons for public health leaders worldwide.

This review paper, written by several key participants in SEEHN operation, follows the main milestones in network development, including its foundation under the Stability Pact's Initiative for Social Cohesion and the three ministerial forums that have shaped its evolution, in order to show how it can constitute a model for regional collaboration in public health.

Herewith we summarise the main accomplishments of the network and highlight the keys to its success, drawing lessons that both international bodies and other regions may use in their own design of collaborative initiatives in health and in other areas of public policy.

Keywords: collaborative networks, health systems, public health, regional cooperation, South Eastern Europe.

Conflict of interest: None.

Introduction

Inter-country alliances, articulated through regional approaches, have increasingly been used to drive economic development and social progress in the past several decades. The European Union (EU), with its common currency, open borders and well-established governing institutions, is the most consolidated regional political alliance, but many other blocs have been established across the globe as a way to catalyse development and cooperation. Although founded primarily to promote free trade – not social cohesion or justice – their leaders have gradually begun to understand that social and economic development are inextricably linked.

The Charter of Fundamental Rights (part of the Treaty of Lisbon) set the stage for dozens – if not hundreds – of EU-led initiatives in public health and education, including the Black Sea Cooperation and the Union of the Mediterranean. Other regions have taken steps to articulate a common approach to public health as well, for example in Asia (1) and South America (2). The South Eastern Europe Health Network (SEEHN) stands out among these types of initiatives for the tangible improvements it has achieved in regional governance for health, with several important lessons for public health leaders worldwide.

This paper follows the main milestones in SEEHN development, including its founding and the ministerial forums that have shaped its evolution (http://www.myhistro.com/story/seehn-founding-story/147935/), in order to show how it can constitute a model for regional collaboration in public health. Herewith we highlight the keys to success and draw lessons that both international bodies and other regions may use in their own design of collaborative initiatives, in health and in other areas of public policy, paying due attention to the specific context of the region.

The roots of SEEHN development: Public health as a bridge to peace, reconciliation and development

In the decade following the disintegration of the Soviet Union and the neighbouring Yugoslavia, the South Eastern European (SEE) region plunged into a long period of turmoil, transitioning rapidly from a state-command to market economy amidst the violent combustion of ethnic tensions in the former Yugoslavia. The consequent financial instability, decline in social expenditures and inadequate organisational structures (3,4) led to a breakdown of already tenuous health and social care systems. When Albania, Bosnia and Herzegovina, Bulgaria, Croatia, the Republic of Macedonia, Romania and Yugoslavia signed the Stability Pact for South Eastern Europe in 1999, the health indicators in these regions reflected that crisis. As just one example, infant mortality in the SEE region nearly tripled that of the EU-15, at 13.9 deaths per 1000 live births (5).

Although the ―non-productive‖ social sector was deemed by the states as a consumer of income rather than as a producer of value (6), investing in public health was nevertheless considered a worthy way to maintain social unity. It was also considered as a particularly appropriate area for regional cooperation; after all, the tradition of public health in SEE dates back to one of the key architects in the creation of the World Health Organization (WHO), Dr. Andrija Štampar, a fitting symbol of how health can function as a force of peace and cooperation between otherwise fractious governments. In 2001, the SEEHN was established as part of the Stability Pact's Initiative for Social Cohesion, under the leadership of the Council of Europe, the Council of Europe Development Bank and the WHO Regional Office for Europe.

At the same time, the need to reconstruct the training programmes for public health professionals, especially in the successor states of the former Yugoslavia, became obvious.

Therefore the German sponsored section of the European Stability Pact agreed to fund the Forum for Public Health in South Eastern Europe (FPH-SEE) (7) from 2000-2008 with the following main objectives:

i. To develop up-to-date teaching materials for public health sciences;
ii. To determine and analyse comparable health indicators for South Eastern Europe;
iii. To support the institution building for public health, especially with regard to Schools of Public Health, Institutes of Public Health and Public Health Associations;
iv. To organise professional meetings, workshops and conferences in the South Eastern European Region.

During this period, six volumes with more than 3500 pages of teaching materials were published (8) and their utilisation analysed (9) with a 2nd online edition in 2014 (10); a revised shortlist of indicators was published in 2006 (11), and new Schools of Public Health were established in Belgrade, Bucharest, Chisinau, Novi Sad, Pleven, Skopje, Sofia, Tirana, and Varna. By 2008, more than 25 conferences and summer schools had been organised and more than 50 articles been published, beginning with Kovacic & Laaser in 2001 (12).

Public health thus became the common denominator of both a political and academic movement to improve the health and wellbeing of the SEE populations. The strong commitment of the Ministries of Health in the region surfaced as an urge to address the emerging changes across the societies; together with the strategic guidance of SEEHN's external partners and burgeoning academic communities, the Ministers of Health of seven countries[1] planted the seed for an exemplary initiative of regional cooperation.

Learning by doing: Forging partnerships in public health to protect the most vulnerable populations (2001–2005)

The WHO Regional Office for Europe, along with the Council of Europe and the Council of Europe Development Bank, eleven donor states (Belgium, France, Greece, Hungary, Italy, Norway, the Netherlands, Slovenia, Sweden, Switzerland and the United Kingdom) and the health ministers of the founding member states themselves, worked to shape an institutional model capable of empowering national leadership as well as regional collaboration. The achievement of this goal is a testament to Member States' commitment to SEEHN's goals, particularly that of professional exchange and regional partnership, but it is also a result of the wisdom of external leaders and donors, who knew how to make their role redundant in just seven years.

The founding Dubrovnik Pledge committed the states to mobilising human and financial resources to meet the needs of their most vulnerable citizens. Seven priorities were laid out: (i) enhanced access to quality health and public health services; (ii) development of community health services; (iii) regional self-sufficiency in the provision of safe blood and blood products; (iv) integrated and universal healthcare; (v) better surveillance and control of communicable diseases; (vi) food safety and security, and; (vii) regional exchange of social and health information (13).

This first Health Minister's Forum set the political vision for SEEHN policy, but technical policy and implementation also had to be developed. At the beginning, the technical side was also led by experts from the Council of Europe, the Council of Europe Development Bank

[1] The founding Dubrovnik Pledge included signatories from Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Romania, the Republic of Macedonia and Yugoslavia. However, the Republic of Moldova joined a year later (2002), and in 2006, two independent countries (Montenegro and the Republic of Serbia) from the former Yugoslavia formally pledged their adherence. Finally, Israel joined the network in 2011, bringing current SEEHN membership to ten countries.

and the WHO Regional Office, together with the national health coordinators (high-level officials designated by each Member State). By 2004, however, this structure had given way to a rotating presidency, held personally by health ministers for a six-month term. These leaders, along with representatives of the Regional Office and donors, would hold a regional meeting of the national health coordinators, high-level officials designated by each Member State. The regional meetings would forge the technical policy through consensus among all participants.

As for implementation, regional project offices were established in the lead country for each technical area. Since then, these offices have managed and coordinated technical work at a regional level, fostering a collaborative network of professionals region-wide. Member States have chosen the project areas they led from the start, thereby cultivating ownership and leadership in one area and providing a natural incentive to collaborate and learn from initiatives led by other countries (14).

The first major SEEHN project, on mental health, was led by Bosnia and Herzegovina (15). Initially planned for just two years, its success led to a four-year extension, which has now been consolidated and given continuity through the transformation of the Sarajevo regional project office into the network's first Regional Health Development Centre, or RHDC (box 1). The mental health project also provided an excellent model on which to base subsequent initiatives during the first period of SEEHN development, which have successfully tackled blood safety (16), food safety (17), tobacco (18) and other challenges.

Box 1. Tangible achievements in mental health through SEEHN

Three million Euros from external donors provided the resources that experts within SEE needed to implement SEEHN's flagship project, which started by establishing a regional project office in Sarajevo as well as national offices and teams in all of the member states. These professionals worked together to analyse existing mental health policies in their countries and to set a common vision and strategy for the region; this work led to the endorsement of new National Mental Health strategies and laws in all Member States.

The second phase began in 2005 and saw the establishment of pilot mental health centres in every country, which provided a practical basis for the development of a regional model of service provision, including firsthand and collaborative experience in developing care standards, leadership modules and case management systems. A monitoring and evaluation system was also established, facilitating the exchange of data that would prove crucial to external consultants and regional partners in the refinement of policy and practice. Eleven centres, serving a catchment area of over one million citizens, were fully integrated into the countries' primary health care system, contributing greatly to the de-institutionalisation of people with mental health disorders.

The final phase focused on training and advocacy programmes, which seeded the reform movement for mental health policy in the region. When SEE health ministers released a joint declaration on mental health in 2007 (19), all Member States responded by revising their mental health policy in line with its recommendations. Today, dozens of mental health centres operate in every SEE country, supported by a clearly articulated national policy and a coherent regional framework, which are all in line with current European recommendations (20).

Moving forward: Reforming health systems and public health services (2005–2011)

By the second Health Minister's Forum in 2005 in Skopje, a reservoir of regional trust, expertise and leadership had accumulated. In recognition of the enhanced regional capacity for managing the network, an Executive Committee was established to oversee implementation of the decisions made during the ministerial forums, facilitate regional action

and monitor progress. The Skopje Pledge (21) also saw the assumption of SEEHN ownership over all regional projects, marking a decisive turning point towards a pro-active leadership.
In 2008, and coinciding with the replacement of the Stability Pact by the Regional Cooperation Council, SEEHN's self-governance was consolidated through a Memorandum of Understanding. This document set new terms for network organization (Figure 1) and operation included by means of a formal Secretariat in Skopje (inaugurated in 2013) and a number of Regional Health Development Centres (RHDCs) across SEE. Starting in 2010, these were established to give continuity to the results achieved and to provide ongoing services and policy advice in particular areas of action. This structural configuration has allowed each country to benefit from the concentration of expertise in other Member States, without having to maintain national centres in all the technical areas at anything close to the same level. By pooling the resources, Member States all have access to world-class institutions in a variety of technical fields. These developments set the stage for SEE Member States to take full control of the network, although the WHO Regional Office and other partners would continue to provide technical input and guidance.

Figure 1. Governance of the SEE Health Network in 2014

The policy focus of SEEHN also shifted during this period. Without abandoning the strategic launch of individual projects in specific technical areas (indeed, the goals pursued in Dubrovnik were reiterated and affirmed), participants in Skopje pledged to apply the efforts of the SEEHN towards a comprehensive reform of public health capacities and services. Systematic problems in these areas had been identified during a study by the Council of Europe Development Bank and the Regional Office (22), including low levels of investment, poor workforce capacity, under-developed primary care services, and suboptimal follow-up and implementation of formal agreements. At the same time, the report highlighted the cascading effects of ill health on economic development, engaging the interest of the region's Finance Ministers. Together, the Ministers of Health and Finance in SEE recognised health as a vital part of the economic development and regional integration processes; they committed

to further regional collaboration, advocacy for intersectoral policy and empowerment of health professionals, in order to optimise the full economic potential of health as a means to increase productivity and decrease public expenditures related to ill-health.

The project that best illustrates this new focus was the Evaluation of Public Health Services in South Eastern Europe. A regional project manager in the Republic of Macedonia, along with the national focal points in other SEE states, collaborated at a technical level with the WHO Regional Office, which commissioned the development of an innovative web-based self-assessment tool to evaluate the delivery of ten Essential Public Health Operations. Assessments were carried out in all Member States in conjunction with technical experts from the WHO Regional Office, revealing a somewhat antiquated approach to public health services, which was still primarily focused on sanitation and hygiene rather than on a holistic integration of public health concepts throughout the health system and beyond. The final report (23) concluded with 11 specific recommendations for all SEE countries, as well as individual profiles on all Member States. These recommendations and observations have constituted the basis for sweeping reforms to public health services and capacities in the SEE region, which are still ongoing today. Likewise, the experience established SEE as a pioneer in efforts to strengthen public health services through a regional approach, setting an important precedent for the European Action Plan for Strengthening Public Health Capacities and Services (24), which would be eventually adopted by the 53 Member States of the WHO European Region in 2012.

Connecting the dots: Towards a whole-of-government, whole-of-society approach to public health (2011– present)

After conceptually consecrating public health's role as a pillar of the health system, the next milestone in the development of the network was to introduce a societal perspective. Given the social and economic diversity in the region and the rapidly changing national, European and global landscape, the SEEHN Ministers of Health sought to make health a priority on the agendas of all sectors and in all policies. The Third Ministerial Forum in 2011 brought the signing of the Banja Luka Pledge (25), with the ministers' unanimous commitment to sustain and strengthen the regional cooperation in public health in SEE; achieve equity and accountability in health; strengthen public health capacities and services; and foster intersectoral collaboration within national governments, with regional and international partners, and among all stakeholders interested in promoting sustainable health and wellbeing for the population.

Banja Luka marked the first ministerial forum in which the SEE countries had full control over the finances, policy direction and technical agenda, but rather than cut ties with international partners, the network strengthened them. The role of the Regional Cooperation Council was reaffirmed, and partnerships with almost all the important players from the international health and development scene were broadened. Indeed, this period has even seen a geographical expansion of SEEHN membership through the acceptance of Israel as a tenth Member State, a decision made to deepen the existing collaboration with that country, which had supported SEEHN since its inception. Likewise, the Banja Luka Pledge explicitly supported the vision of the WHO Regional Office and its main projects for strengthening public health, namely Health 2020 (26), the European Action Plan for Strengthening Public Health Capacities and Services (24), and the European Strategy for the Prevention and Control of Non-communicable Diseases (27).

At a technical level, the consolidation of managerial control and implementation structures in the hands of SEE experts has been very positive. The establishment of RHDCs has taken off,

and today, ten centres focus on mental health, antibiotic resistance, organ transplantation, human resources for health, blood safety, health care accreditation and quality improvement, public health services, communicable diseases, non-communicable diseases and healthy ageing. Together, the RHDCs represent a coherent, integrated, increasingly comprehensive response to the major public health challenges faced in the SEE region in the twenty-first century (14), both in the health sector and in the broader developmental agenda. Likewise, and thanks to SEEHN action, the recently adopted South Eastern Europe Growth Strategy 2020 (28) saw the incorporation of the health dimension as an integral part of inclusive growth, economic development and prosperity of the region. This politically important move has helped SEEHN follow through on its commitment to work for better health side-by-side with other sectors, including other government ministries, academia, civil society, and the private sector, to truly realize a whole-of-government, whole-of-society approach to public health.

Regional learning, global lessons

Among the many regional initiatives that give life to cooperation in South Eastern Europe, the ever-changing SEEHN, now in its second decade of life, emerges as an outstanding example of one that has implemented a wide range of successful initiatives with positive results in the realm of public health (Table 1). Its founding documents planted the seed for success, while strong political commitments from members and partners cemented its effectiveness and influence in the region.

Meanwhile, the political direction was shaped by local, regional, and global trends, especially those promoted by WHO, from the Health for All policy framework of 1998 (29) to the Health 2020 programme, currently under implementation. Isolated events (e.g., the 2014 floods affecting SEE, the H1N1 swine flu scare) have enabled a more mature understanding of the power the network embodies and of the moral obligation to cooperate for the benefit of the population.

In the SEE context, a network approach has a particular added value. The fact that Member States are relatively small, with limited leverage on the world stage, means that a unified position—in health or in health-related policies—amplifies their individual influence and power. This fact can be seen in international fora such as the WHO Regional Committee, where SEE countries speak with one voice. At the same time, the small size of these states may also constitute an advantage for governance, as involving relevant stakeholders and maintaining close links with the population is more straightforward than it would be in larger countries. Indeed, several countries were able to quickly mobilise assistance where it was most needed in response to the 2014 floods thanks to close connections with national social media networks (30). This lesson is relevant for other coalitions composed of small countries, for example the incipient sub-regional network of countries with less than one million inhabitants in the WHO European Region (still under development).

Table 1. Main accomplishments of the South Eastern Europe Health Network

TECHNICAL AREA	MAIN ACCOMPLISHMENTS
Mental health	• Establishment of ten pilot community mental health centres covering more than one million inhabitants as the basis for an entirely new mental health community-oriented system for SEE. • Decreased stigmatisation of mental health patients and increased acceptance in the community. • Establishment of information systems for community health services.
Antibiotic resistance	• Implementation of system for exchanging knowledge and expertise on antibiotic resistance and molecular diagnostics in SEE Member States.
Non-communicable diseases	• Ratification of the WHO Framework Convention on Tobacco Control and approval of tobacco control laws in all SEE states. • Passage of food safety laws and regulations to protect consumers.
Communicable diseases	• Development of regional hub for communicable diseases with online information portal and exchange platform (www.secids.com). • Strengthening of communicable diseases surveillance and response in SEE. • Support for implementation of the International Health Regulations, surveillance of communicable diseases and preparedness for disease threats and pandemics.
Organ donor and transplant medicine	• Establishment of regional centre of excellence for exchange of knowledge in organ donor and transplant medicine. • Expert missions for transfer of knowledge and skills in transplantation medicine (to Romania, Macedonia, Montenegro and Albania). • Bilateral collaboration in transplantation surgeries, with joint teams performing in Montenegro (deceased donor transplantation) and Macedonia (deceased donor and live kidney transplantations).
Accreditation and continuous quality improvement of healthcare	• Narrowing the gap with EU standards: promoting quality of care standards and patient safety in SEE. • Regular training of professionals on patient safety and accreditation procedures for hospitals and maternity wards.
Blood safety	• Increase in regional self-sufficiency of safer blood and blood components. • Narrowing the gap with EU standards: increasing blood availability and providing the highest donor and patient safety in transfusion therapy in emergency special circumstances.
Human resources in health	• Integrative and intersectoral approaches to provide excellence in human resources in health. • Leadership in profiling human resources in health across the region.
Public health services	• Expanded integration of public health services and increased outreach for health promotion and disease prevention. • Completion of a round of self-assessments of public health services of Member States as coordinated sub-regional action. • Development and updates of national strategies to improve maternal and neonatal health.
Healthy aging	• Work on participatory and empowering approaches, which include advocacy and stimulating activities for and with elderly people that result in ―healthy living/active aging‖. • Enhance the ability of SEE countries and communities to identify and implement effective strategies and programs to promote and protect the health of elderly. • Promotion of health and preservation of health-related quality of life for the elderly.

Although no regional public health alliance can be copy-pasted into a different geopolitical and socioeconomic context, there are a number of lessons for other coalitions, both in public health and in other areas of policy (Table 2).

Table 2. Keys to success in the South Eastern Europe Health Network

SEEHN STRENGTHS	DESCRIPTION
Structure	• Decision-making structures aligned with regional leadership capacity. • Balance of power among regional partners; countries lead in some areas and are led in others. • Continuity; project offices transformed into sustainable Regional Health Development Centres.
Promotion of ownership among national and local stakeholders	• Strong political commitment from national stakeholders required to move forward. • Political direction for network decided by national leaders. • Technical areas led by local/national stakeholders (with specific guidance solicited from external experts). • Explicit recognition of leaders and good practices, supported by excellent monitoring and evaluation of programmes.
Utilization of regional assets	• Good governance practices through pooling of human and financial resources. • Strong historic tradition in public health.
Adaptive capacity	• Dynamic organisation, with new decision-making structures emerging as experience accumulates. • Policies are responsive to regional needs. • New partnerships emerging on a continuous and ad hoc basis, without compromising regional ownership. • Proactive capitalisation on investments made over the course of the network. • Continuous efforts to mitigate challenges and limit the role of special interests.
Alignment with European and global movements	• Close collaboration with WHO Regional Office for Europe, including in implementation of European and global policy and programmes. • Common commitment among SEE countries to the political goal of integration into the European Union. • Effective synergy between political and technical spheres of the network.
Intersectoral action	• Evidence-based arguments tying health gains to economic development and security for the SEE region. • Integration of health into a broader agenda for growth.

The most decisive strength of the network, perhaps, has been the positive role of SEE's political institutions. Although the countries making up the region had limited experience in government (indeed, many of the Member States had only just achieved independence), their leaders still demonstrated a key quality necessary for good governance: the commitment to accomplish both political and technical objectives through collaborative learning. External donors and partners had an important role in guiding the network development at its inception, but it was the national stakeholders who knew how to take advantage of the guidance and achieve operational ownership of the initiative.

Today, both new and old challenges await the incoming SEEHN Secretariat. To strengthen network operation, the Skopje office must lead the renewal of political and financial commitments from SEE Member States as well as initiate contacts with other regional initiatives and partnerships as part of the Regional Cooperation Council, including with the WHO Regional Office and the European Commission. In the same way, the network itself must be renewed by engaging new talents and allies within SEE and beyond. The official SEEHN website (http://studiorum.org.mk/seehn/) will see further development as a platform to disseminate network achievements, and the Secretariat will also work to integrate SEEHN action into the daily work, not only of Ministries of Health, but also the authorities in charge of international affairs and trade. This new line of work in health diplomacy is incredibly

timely, as globalisation has increased interdependence in human and economic development as well as internationalising public health emergencies.

Imminent projects to tackle these new challenges will be the formation of an emergency coordination aid task force and the development of a strategy to address health professional mobility, as the network continues to pave new roads for regional cooperation in public health. By strengthening the bonds among SEEHN Member States through trust and shared governance for health, these countries will themselves become stronger and more capable of achieving common objectives. In essence, SEEHN exemplifies a positive policy cycle, in which population health, regional cooperation and economic development have mutually fed into each other for the benefit of everyone, from the most vulnerable populations all the way up to their highest elected officials.

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REVIEW ARTICLE

The history of European public health education accreditation in perspective

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Abstract

Aim: The aim of this paper is to investigate the history of accreditation of academic public health education and understand why there is a 65 year gap between the first system in America and the uptake of accreditation in Europe. The paper intends to search for parallels and dissimilarities between the development in America and Europe and then consider if any parallels could be used for determining the future role of accreditation in Europe.
Methods: The paper draws heavily upon a literature review and analysis and the examination and interpretation of primary and secondary sources. Firstly there is an exploration of the American development which is complemented by an evaluation of the developments in Europe.
Results: The paper demonstrates that there are two key features required for the development of accreditation: interstate collaboration and a liberalisation or opening up of the education market.
Conclusions: Since the Second World War, Europe has embraced interstate collaboration which has led to a liberalisation of certain economic markets. The future for sector based accreditation of public health education will be determined by the extent Europe pursues liberalisation and whether a competitive environment will bring into question the transparency and trust in state sponsored accreditation agencies.

Keywords: European Public Health Education Accreditation.

Conflict of interest: None.

The accreditation of higher education programmes and institutions has its roots in American higher education (1) and the history of accreditation of public health education is no exception. However histories do differ in the role of the state in education. In 18th and 19th century Europe, education was taken away from the church and placed under state control to reinforce the legitimacy of the emerging, and competing, European nation states (2). American political development differed from the European model and when the states came together to form the US, education was not among the functions specifically expressed as a federal responsibility (3). Europe continues to develop and embrace individual nation states with an increasing trend for laissez faire deregulation as a route to diminish barriers to free trade but it is yet unclear how this will affect the future of education and accreditation at a nation state level.

The research is based around a literature review and search of key websites including the American Journal of Public Health, Pubmed and Google scholar. The reviews took place between July and October 2014 based upon the search terms of "public health education accreditation". The analysis of key themes highlighted mainly American development and this was complemented for European development, by the use of the physical archives from the Association of Schools of Public Health in the European Region (ASPHER). The searches delivered over 150 separate books and articles covering the subject to varying degrees. Together these allowed for a demonstration and reflection of the origins of public health accreditation in both Europe and America.

The American laissez faire approach to federal governmental responsibility toward education was not without its detractors especially when combined with a comparable economic approach. In 1910 Abraham Flexner criticised the free market nature of medical education in America, *"over-production of ill trained men is due in the main to the existence of a very large number of commercial schools"* (4) and that, *"the schools were essentially private ventures, money-making in spirit and object"* (5). As a result, Flexner recommended that 120 of the 155 medical schools should close. Flexner was to become soon after the head of the general education board within the Rockefeller foundation (6). Five years after Flexner's report, Wycliffe Rose and William Welch submitted their views on the development of schools of public health to the Rockefeller foundation. Given the utter calamitous state of contemporary medical education it was no surprise that the authors recommended that schools of public health should not be part of medical schools. Apart from the notion that the public health worker was not identical with that of a practitioner of medicine no other reason for the independence of schools of public health was given in the report (7).

Institutionally splitting public health from medical education did not however allay concerns about the quality of public health training. In 1920, the American Public health Association (APHA) established a committee on the standardisation of public health training and one year later it reported on what it saw: *"the most serious defect in the whole system at present, however, lies in the fact that certain institutions give not only the Certificate in Public Health but even the Doctorate in Public Health for a course of a few weeks, while others require a period of almost three years, and it seems most desirable to effect some form of standardization in this field"* (8). Similar to the findings of Flexner, there were also complaints of profit-making public health training programmes of questionable quality offering public health degrees (9). An editorial in the American Journal of public health in 1924 noted that, *"as far as the medical end of this scandal goes the matter can be left to the strictly medical journals but unfortunately public health is also involved"* (10). This situation continued for the next twenty years with some schools being recognised as, *"merely seeking to attract students by deliberately and grossly misleading prospectuses"* (11).

It took 26 years from the origins of the committee on standardisation until the adoption of an accreditation system in 1946 which coincided with the Committee for Professional Education within APHA taking on the responsibility for monitoring standards. This committee was headed by William Shepard who strove for the recognition of public health as a profession, *"whether we fully*

realize it or not, public health has become a profession" (12). Accreditation would play a role in producing well trained individuals and supplying relevant data on the needs of the national public health, as Shepard noted, *"to my knowledge this is the first occasion in modern times that a learned profession has kept its educational house in order as it developed. Since becoming a recognized profession, we have been spared the developmental blight of having our ranks flooded with pseudo-trained people"* (12).

In 1946 there were 11 criteria which comprised the minimum requirements of institutions to be accredited to the master of public health (13). The criteria had been developed by another member of the Rockefeller board and pioneer of modern public health, Charles-Edward Wilmslow, who had deliberately kept the criteria flexible and small enough to allow time for schools to comply and maintained that too much standardisation was undesirable (12). The basis for Winslow's criteria came from the notion that *"public health is not a branch of medicine or of engineering, but a profession dedicated to a community service which involves the cooperative effort of a dozen different disciplines"* (14).

Accreditation at this point consisted of seven criteria which looked at the institution and a further four criteria which were course specific (13). Out of these latter four, one criterion stipulated the content, see Table 1. By 1974, when accreditation became housed within the Council on Education for Public Health (CEPH) (15), these criteria had evolved to express a mixture of educational and practical competencies (16), which saw the retraction of elements such as economics and parasitology but the addition of health systems. These criteria are kept in place into the modern period (17), albeit more succinctly phrased as biostatistics and epidemiology were included as part of investigation, measurement, and evaluation (18). The one omission is focussed on the biological features of the curriculum.

Table 1. Changes in American accreditation compulsory curricula contents 1946 to 2014

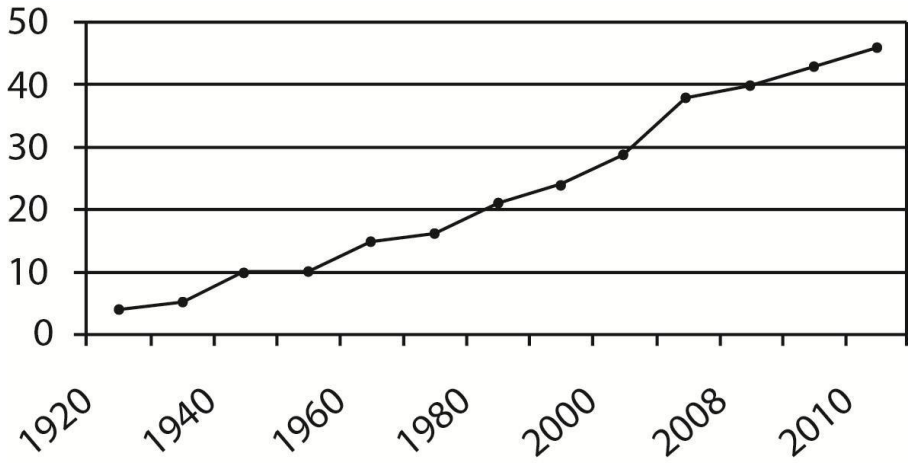
APHA 1946	CEPH 1974	CEPH 2014
1. The nature functioning of human organisms; 2. The nature behaviour of various forms of parasitic life; 3. The physical environment; 4. Social and economic factors; 5. The major source of quantitative information and its numerical presentation and analysis.	1. Biological, physical, and social factors; 2. Social and behavioural sciences; 3. Health service delivery systems, 4. Community health needs; 5. Information collection, storage, retrieval, analysis, and dissemination; 6. Environmental monitoring, analysis, and management.	1. Biostatistics, 2. Epidemiology, 3. Environmental health sciences, 4. Health services administration 5. Social and behavioural sciences.

The history of American accreditation therefore took root at a time when public health was beginning to find its feet as a profession and against a laissez faire backdrop, which saw many schools geared toward profit making above quality and this is perhaps a situation which continues in a sense today with the growth of unrecognized, illegitimate degree and accreditation mills that "sell" (19). Against these developments, were the architects of an alternative and earnest public health movement based on the research focus of the German schools and the practical training methods on the English schools (20). This period of development can be seen as 1916 to 1946, from the first Rockefeller School of Public Health to the implementation of a fully functioning accreditation scheme. This period directly coincides with an epoch engrossed in war.

Although initially the criteria had been kept flexible to allow more schools to participate, the arithmetic growth of accreditation in the U.S. was not overwhelming until around the turn of the twenty first century (21) see Figure 1. In 1946, there were nine schools of public health accredited in America (13). Nearly 30 years later, in 1975 after the move to the CEPH there were 19 schools

(22). This had risen to 27 in 2000 (23) and by 2014 there were over 50 schools accredited and over 100 programmes of public health accredited (17).

Figure 1. Accredited American SPHs by Decade (compiled by Rosenstock, L. *et al*)



After the Second World War, Europe began a process of reconciliation culminating in the present union enshrined through the 1992 Maastricht treaty where, under article 126, the role of union in education was to "encourage cooperation". It is in these post war collaborative movements where European accreditation, like its American counterpart, found its foothold. As one commentator phrased, *"there was an intensified development of accreditation during the 1990s in various European countries. This trend is parallel with the rapid growth in international and trans-national organisations after the Second World War"* (24). Moreover, the first large scale appearance of accreditation was a direct result of competition and the post communist transformation in the Central and Eastern European region where the markets were opened up to private and foreign providers (25).

This European movement of the 1980s and 1990s was to create a fertile environment for international collaborations at a public health school level with examples being, The European Training Consortium in Public Health (ETC-PH) (26), BRIMHEALTH (27) and the European Masters of Public Health (EMPH). The latter of these, the EMPH was a collaboration between ASPHER and the World Health Organisation (WHO) to develop a European master's degree in public health based on the WHO's 38 Health For All (HFA) principles (28). This followed from a momentum in European Public Health created by the elaboration of these principals into practice which was given the title of "new public health" (29). Although this term was not new, it was first coined in 1913 as a bacteriological approach (30) and again in 1923 as health promotion (31), it did reflect the more comprehensive view of public health which still resounds today. The EMPH embraced three distinct areas: a) it should be concerned with the masters level, b) it should reflect the philosophy of the WHOs HFA and c) students should be exposed to a European perspective (32). It was enthusiastically anticipated that the EMPH would raise the standards of education and training across the European region and would provide a "gold standard" of which other schools and programmes would eagerly follow (33). Alas, attempts to realise the programme failed.

The failure of the EMPH was a product of several reasons: credit transfer mechanisms were poorly developed; systems didn't accept qualifications from other institutions; the programme was too inflexible and did not respect the diversity and traditions of the countries; European content didn't need to be all encompassing as it could be could be integrated into existing courses; and moreover, given the heterogeneity of public health training programmes in Europe it was not possible to introduce a rigorous quality assessment and assurance (34). As a result of these failures the introduction of accreditation was seen as a necessary and fundamental step. However, accreditation

was not introduced but rather a process of mutual recognition of courses, modules, programmes and institutions was established entitled the Public Health Education European Review, more commonly known as the PEER review (35). The three central principals of this review were a reflection of its EMPH foundations (33):

- The course/module/programme/institution should be concerned with postgraduate training in public health.
- The course/module/programme should be based on the philosophy of the Health for All policy.
- The students should be exposed to a European perspective.

The PEER review was established by 1994 but it differed from accreditation as it was devised primarily as a quality improvement tool conducted through academic peers in a collegial manner. Although the initial anticipation was for a multi-agency quality assurance approach this did not materialise until the advent of accreditation proper which was proposed and accepted in 2001. This was exactly the same time that ASPHER began to use the PEER review for the establishment and quality improvement of new schools and programmes of public health in the Central and Eastern European region (36). This project gave valuable insights for accreditation (37) and also showed how PEER could be used as a framework for development.

In 2011, the Accreditation Agency was established and consisted of ASPHER and four other public health based NGOs, European Public Health Association (EUPHA), European Public Health Alliance (EPHA), European Health Management Association (EHMA) and EuroHealthNet. At the time of its establishment European accreditation focused solely upon the accreditation of postgraduate (so-called second cycle) public health degrees. Similar to the American model, the processes also contained specific criteria on core curricula content: introduction, methods, population health and its determinants, Health Policy, economics and management, Health Education and promotion, cross-disciplinary themes and culminating experiences. These areas were based on the core subject domains developed through earlier ASPHER work on Public Health Core Competencies (38).

In 2014, following a two-year review of its processes, APHEA introduced two new aspects in addition to programme accreditation. The first was a curriculum validation process which replaced its initial eligibility criteria by ensuring that curricula contain the basic structure and core content expected from a modern comprehensive public health offering. The second addition was to focus on institutional accreditation which would assess the relationship of an institution, in terms of education, research and service, to the specific local, national, regional or international environments in which they serve, their so-called "social accountability" (39). This development represents a reversal of the American model which started with institutional accreditation followed by programme level accreditation.

So far, the remit of APHEA was in keeping with the first and third central principals of the earlier PEER review. However, for future development, the postgraduate focus was also brought into question with proposals to develop accreditation for bachelor and PhD programmes, thus covering the whole spectrum of school based education in public health. APHEA also began consultations on the development of training accreditation which would cover smaller units from continuous personal development (CPD), MOOCs through to summer schools which can be delivered outside of school settings. Finally, the role of using the accreditation criteria as a framework for quality improvement and development also requires future scrutiny as the PEER review had worked exceptionally well in this regard (36).

The second central principle of the previous PEER review is based upon the health for all policies of the 1970s which has been superseded of late by the development of the WHOs Essential Public Health Operations (EPHOs) (40). An encompassing definition given for these is, *"a set of fundamental actions that address determinants of health, and maintain and protect population*

health through organized efforts of society" (41). The potential therefore lies in the ability to change the older HFA targets for these later EPHOs, for example, by translating the operations in to a series of competences and then assessing how these competences are integrated into the education of the workforce. However, care will need to be taken so that any system will be flexible enough to respect the diversity and traditions of different countries and thus, hopefully avoiding some of the reasons for the failure of the EMPH whilst learning the lessons from Charles-Edward Winslow's introduction of accreditation in America.

All of these activities however are predicated on the future potential for sector based professional accreditation and there are two areas within the history of Public Health accreditation which may help determine its future trajectory. The first area is one of collaboration and second, the liberalisation of the education sector. The origins of both the American and European models of accreditation appeared as a result of interstate or supranational collaboration and an opening up of markets in education. The realisation of Europe has installed significant economic liberalisation, especially in the service markets. Many services in Europe are now no longer a state responsibility but rather a subject of the free market and how far this free market extends remains to be seen. For example, what will be the influence of the mooted agreements between the North American Free Trade Area (NAFTA) and the European Union on the liberalisation of the educational market? In many ways perhaps the free movement of people already enshrined in the European project has created a quasi liberalised market with students being free to study in any country. This freedom of movement is often liberally extended to international students travelling the globe. Equally important for the forthcoming years will be the influence of technologies in teaching which allow for students to receive a foreign based education without the need or hindrance of travel. The result of these present and future changes is conceivably then one of burgeoning competition above that of collaboration where education systems both within and between states increasingly compete for students and their own subsequent economic survival. The origins of the Bologna declaration and the resultant European Higher Education Area is a cooperation based on mutual trust between education systems of the member states (42) but the reason why America had accreditation before Europe is because accreditation is not best suited to centralised governments (1). The question must then be raised, if collaboration turns in to competition, will the national state accreditation agencies be seen as a credible guardian of trust or will they be seen as protective of their national systems, anti-competitive and riddled with conflicts of interest?

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Foreword by Ulrich Laaser

Dr. Hans Stein has been on the European Union (EU)-Health stage for more than 25 years, starting with the very first Health Council in 1977. As an official of the German Health Ministry (Head of the EU Health Policy Unit) he represented Germany in countless EU (Council and Commission) committees and working groups concerning health policy and public health research. He not only organised the Health Council of four German EU presidencies, but also published a large number of articles mainly in international journals and books. After his retirement in 2002, Dr. Stein continued as a free lance consultant to a number of EU institutions and a lecturer in German, Dutch, Austrian, and English Schools of Public Health.

Personally, I probably met Hans Stein the first time in 1977 when in West Germany a discussion started about a "big" population study on cardiovascular health. He worked already for several years in the Ministry of Health (the name of the ministry at that time may have been more complex and I forgot it) but, different from many political administrators, he was fascinated by contents and not by formalities. He paved the way for the German Cardiovascular Prevention Study (GCP) targeting five regions with together around one million population for more than a decade (1979-1994). Hans Stein started his long chain of contributions to population health and health policy with a presentation in my then High Blood Pressure Department in Heidelberg and I remember how difficult it was to convince him to speak in public about prevention. That changed later completely when he became a European figure representing the German Government in the endless and tiring deliberations foregoing the milestone treaty of Maastricht. I shall never forget how Dr. Stein presented a historical dialogue with his former Dutch colleague Jos Draijer at the 25th anniversary of the Treaty at a celebration in the very city of Maastricht. Hans Stein remained an engaged sceptic with an insurmountable enthusiasm, truly a rare mélange, obvious also from his review below of the European health policy development since Maastricht.

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The Maastricht Treaty 1992: Taking stock of the past and looking at future perspectives

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Abstract

Aim: The article contains a personal view of the history as well as the future of the European Union‟s (EU) health policy. Describing and evaluating the developments on the road from the Treaty of Maastricht to a new Europe it asks and tries to answer the question if we – especially the EU Member States – really know where we want to go to and how to get there.

Method: Based on personal experiences, countless EU documents, as well as scientific publications the paper shows the impact EU Health policy has had in the Member States in the past.

Historical development: Considering that the legal basis for health has been and remains to be very weak limiting EU action to support, coordinate, and supplement actions of Member States – which, as a rule, still consider health to be first and foremost a national responsibility and therefore do not want interference from international institutions – the amount and content of EU health activities in the past years has been quite remarkable. Health policy may not be an EU priority and as a crosscutting policy sector it is dominated by many other EU policies. However, especially the "hard law" regulations and directives of the Internal Market give EU the power and competence to achieve health objectives. The size of this growing influence is shown by direct interventions, made possible by the legal acts to improve economic policy coordination. Health and health care in this context are considered as a key policy area for economic growth and EU macroeconomic policy. On the other hand, there is a risk that such regulations affecting health policy and population health may be dominated too much by economic institutions and their interests, whereas health authorities play only a minor role to date.

Conclusion: For the future of EU health policy it is essential that its position is considerably strengthened, in order to assure that health interests of the EU population are sufficiently safeguarded.

Keywords: European Union, future perspectives, health policy, Maastricht Treaty.

Conflict of interest: None.

Introduction

As a rule, a 20th anniversary, especially when it concerns an event considered to be a historical landmark, is a cause for celebration. The Treaty of Maastricht was finally negotiated in an intergovernmental conference by the Member States of the European Union (EU) and signed on the 7th of February 1992 in Maastricht, The Netherlands (1). It came into force on the 1st of November 1993 after it had been ratified in all Member States by national parliaments, in some cases adopted even by a population referendum.

It is not only a cornerstone in the general development of the European Union, comparable to the establishment of an economic and monetary union with a common currency, but it also contains for the first time a specific legal basis for health as a European issue. It is worthwhile noting that, this process was dominated by the governments of the Member States. Commission and European Parliament participated on the side lines with very limited power to influence content and process. Nevertheless, this event certainly would have deserves to be celebrated. But, surprisingly, except for some small meetings in Maastricht, initiated by local institutions, there were no celebrations by the European Union in Brussels, or in national capitals.

This situation should be a cause for concern. Is it considered to be so critical that nobody wants to be reminded of how, when and where European integration started? Were the experiences during the last 20 years in general, as well as with the implementation of the health mandate specifically that bad and negative? Has the European vision got lost or was it just forgotten? Has The European dream ended? Or, is it that the EU has too big difficulties occupying the minds in adapting itself to the present situation characterized by the economic crisis and globalisation?

Looking back as a base for future developments

It is the purpose of this article not only to describe how the EU health policy has developed in the 20 years since the Maastricht treaty was signed, but also to develop concepts for the future.

Whether and how much it was a success story and what future perspectives are needed and realistic, cannot be judged only by looking at health issues. No EU policy field develops in isolation. Especially in health with its horizontal character progress depends to a great deal on the overall EU development, its problems, and how these are solved. The present EU crisis, in many ways related to the economic situation, was not caused by health issues but health problems and even national health policies are affected by the crisis and the measures taken to improve the situation. "Health in all policies" (2) is not only a mandate, but also a description of the situation.

It will be shown how the newly created instruments to establish a "European Economic Governance" such as the European Semester (3), the Stability Pact (4) and others not only go far beyond the existing legal base, but will influence national health systems and policies by increasing the Commission"s power to intervene at a national level.

Lack of interest in the past

The existing lack of interest in the historic development of the European integration in general, and especially in the EU health policies may be regretted, but it can be explained by two interrelated developments:

- Lack of positive commitment of EU citizens to European unification, and;
- EU enlargement implies growing economic gap between Member States.

Lack of commitment by the citizens

The project of European unification faces presently the biggest existential crisis of its history. Nobody really knows when and how the crisis can be overcome or, at least, be mitigated. Timothy Garton Ash (5) in an essay "The Crisis of Europe" describes in great detail how the Union came together and why right now it seems to be falling apart. In his view "The project of European unification for about 40 years could rely on at least a passive consensus among most of Europe‟s national publics", today there is a lack of commitment to European integration nearly everywhere. It is obvious that a growing number of citizens in many countries do not believe anymore that the EU can at least contribute to solving their problems. Even worse, they consider the EU itself to be the problem. These sceptical and critical views about the EU have existed in many countries for quite a number of years. But, Eurobarometer (6) as well as national polls, especially the results of the elections 2014 for the European Parliament, show that a growing number of citizens in many countries have lost confidence in the EU. Surprisingly, this feeling exists even in Germany or the Netherlands, two signatory nations of the Maastricht Treaty, for a long time firm believers in European integration, including even a Political Union, countries that are not suffering from the present economic crisis.

European integration has been rightly described as a project of elites with little even indirect participation of the citizens. They were seldom asked if they agreed to European solutions. And they were certainly never asked, if they wanted European solutions in health matters. Had this been the case, a clear "No" would have been the answer, even if they could not have imagined how these solutions would look like.

EU enlargement and the economic gap

In 1993, only 12 Member States negotiated and signed the Maastricht Treaty. Since then, we have had three new treaties – of Amsterdam, Nice and the still valid one of Lisbon (7) – as well as a failed attempt to establish a European Constitution. More importantly, the EU has increased tremendously in size. From 1993 to 2014, altogether 16 new states have joined the EU and even more association negotiations are going on and will soon lead to even more Member States (MS). At the same time some MS – especially the United Kingdom – consider to leave the EU unless their special interests are taken care of. For the new MS, the date of their own accession as well as a solution of their present day problems are more important than a Treaty which was signed 20 years ago.

The astonishing and unexpected enlargement and expansion of the EU from original six to now 29 and possibly soon 35 Member States in a few years is not a question of numbers alone. Whereas EU structures and mechanisms, originally designed for only six MS have largely remained unchanged, this enormous growth combined with a financial and economic crisis has created big, yet unsolved problems. On the one hand, there is a growing small vs. big MS situation. Whereas eight MS have a population of five million or less (Luxemburg, Malta, and Cyprus being the smallest with only 0.5 million inhabitants), seven MS have a population between 6-10 million, and only 12 have more than 10 million. Small size populations lead to small size economies. There are enormous differences in the present economic situation of some, often new MS. In health, this means that not all MS have sufficient financial and personal resources to offer their population all health services that are needed. This has already led to a growing „health gap‟ (8). Reducing these health inequalities is essential in that it will contribute to social cohesion, i.e. reducing poverty and social exclusion. It requires a new dimension of EU solidarity including support and assistance. The classical EU instruments of cooperation and coordination are not sufficient any more to cope with the present situation.

Weaknesses and shortcomings of EU health policy

Health – an EU priority?

Health has never been a priority of European integration and it is highly improbable that it will ever become so in the future. Despite a number of positive achievements in the past, health has not become a central objective of EU policy making. Contrary to environmental policy or research – to name just two health-related similar policy areas – health has not been named in any of the various EU treaties as an EU objective. In Article 3 of the Treaty of Maastricht, where the purpose of the various EU policy areas has been described, it states about health as follows: *"A contribution to the attainment of a high level of health protection"*, which is not exactly a very ambitious objective.

On the contrary, whenever in the past years a reduction of EU activities and competence has been demanded by MS, health always has been a strong candidate, offered even by the Commission. With this background, it is not surprising that the power and influence of the Health Commissioner and his General Directorate has never been high. His responsibilities were always limited, and the financial and personal resources are small, especially when compared with areas like agriculture or research. It is not surprising that big Member States in the usual battle to get an influential Commissioner have never shown any interest to get this office. In the past twenty, years Health Commissioners have therefore come from smaller countries like Greece, Ireland, Cyprus, and Malta.

The same applies to the new Commission coming into power in September 2014. The new Commissioner for Health and Food Safety, Vytenis Andriukaitis, comes from Lithuania, also a small country. But, differing from all his predecessors, he has experience in EU matters as well as a very convincing health background: he is a surgeon and was Lithuanian Minister of Health and, as such, responsible for an impressive health agenda during the Lithuanian EU Presidency in 2013. As health remains an independent EU policy area – combined with food safety, for a long time a major EU priority – the expectation can be justified that health might become more powerful in the future.

The Commission has always been called the „Guardian of the Treaty" (9), from whom it was expected to work for more integration. However, as far as health is concerned, it has shown only little interest in the past to improve the status of health as a European topic. It appears that most if not all successful proposals have come from others; in 1977, for example, a Belgian initiative to establish a Health Council and in 1985 a French proposal in the Rome Summit to establish „Europe against Cancer" as a European responsibility (both, by the way, many years before health was established formally as a European task in the Maastricht Treaty). Furthermore, in 1995, the initiative of the European Parliament to strengthen the EU health Mandate and legal competence resulted in the Amsterdam Treaty 1997; and, finally, the many decisions of the European Court of Justice, beginning 1998 with the famous "Kohll and Decker" cases about patient mobility. The last phase started in 2012 with various summit decisions to establish a „European Economic Governance" with new instruments including *"Health care as an answer to the economic and financial crisis, going far beyond the existing EU legal base"* (10).

It seems that others discovered much earlier than the Commission the health potential of the main EU objective, namely the Internal Market.

Health and the internal market

It is often overlooked that national health systems, however differently they are organised and financed, are strongly related to and have been integrated into the Internal Market with its

four freedoms (11) embracing the free movement of goods (pharmaceuticals and health technology), free services (physicians, nurses), cross-border capital (e.g. investing in rehabilitation clinics), and people, i.e. patients looking for treatment outside their home country.

Right from the beginning, health systems have been influenced and even regulated to some extent by regulations and directives of the EU market and the competition therein. Health care is, and it has always been, a central element of European and national economies. It is a big, possibly the biggest part of the Internal Market and it is permanently growing. About 8.5% of the national gross domestic product is, on average, spent for health. In Germany, this means every year more than 250 billion Euro. Millions of people – especially doctors and nurses – work in the health care systems. In Germany, about 12% of the working population is employed in the health sector (12). Many of them, especially in the new MS, make increasingly use of their right of free movement and work in other EU countries. In the receiving countries this contributes to solving the existing shortage problems, whereas at the same time it leads to growing difficulties in their home countries.

The main objective of the regulations and directives, the most effective EU tools, is to establish a functional internal market (13).They apply fully to the health systems and influence the development and content of national health policy. In addition, they are a powerful treaty base for influencing and even removing those MS policies such as health that might interfere with the aims of the Internal Market.

Scott Greer (14) describes the results and consequences of the Maastricht Treaty in his essay „Glass half empty": *"The Euro zone and the Internal Market overshadow the health effects of Maastricht: It is comparatively easy to find the treaty authority for legislation promoting the internal market and EU law and courts are sceptical of public health or other rationales for legislation impeding the markets development"*. He names as prominent examples the patient mobility decisions of the European Court of Justice, which culminated in the Directive on Patients" Rights in Cross Border Mobility (15). Furthermore, the application of competition and the state law for health care providers, and the integration of pharmaceuticals" regulation around the European Medicines Agency. Finally, he summarises his considerations about the effects of the Maastricht Treaty on health as follows: *"The first mention of health was the harbinger of more effective promotion of health issues within EU policy making. In time, however, the Internal Market and the single currency have had the biggest health consequences"*. This was not really what the MS had in mind when in 1992 they established a specific EU Public Health Mandate.

Position and interests of Member States

Health has always been considered to be first and foremost a national responsibility. States all over the world with hardly any exception want to keep their complete and undiminished integrity and full autonomy to organize and run their health systems the way they want it. Health systems, different as they are, often are considered as a part of the national heritage and culture. Countries do not want any interference from outside, be it by the EU, or be it by the WHO, which by the way is more accepted than EU institutions, but not more effective. For many years national governments – in full agreement with their citizens and the medical professions – have jealously and on the whole successfully prevented the transfer of any substantial health policy issues to a supra-national level, except for the indirect effects of the Internal Market as discussed above. They, therefore, still have a great difficulty in accepting health policy as a matter of the EU concern. It seems that health policy is one of the last realms and retreats of national policy competence which had to be defended.

It seems also that health policy is a political sector which more than others absorbs and reflects national developments, traditions, and cultures. Health systems are seen as the result of decades of development and the individual response to a country‟s social situation and profile. The answers given a long time ago by Bismarck and later by Beveridge regarding health seem to be sacrosanct even if a lot has changed since their time. Safeguarding the pluralism of national health systems is considered to be a value by itself which has to be kept safeguarded at all costs against influence from outside even if the problems faced everywhere are quite identical and the solutions are at least similar. It seems to be overlooked that the EU might be a supporting strategic partner to overcome vested stakeholder interests that at the national level would not be possible.

These popular but nevertheless antiquated views neglect a number of essential facts important for health. Individual MS alone cannot cope sufficiently with outbreaks of infectious diseases like H1N1, food safety issues, biological or chemical terrorism and health threats from climate change. Growing new health dangers and threats which „don‟t respect borders‟ is a common saying, presently Ebola being an example (16). The development and evaluation of new technologies and pharmaceuticals especially combating rare diseases and the establishment of whole new areas such as e-health and telemedicine expand beyond the national level. Therefore, possibly the best argument for the need of an EU health policy is the undisputed fact that health is influenced and determined to a great extent by factors and policies far outside national health care systems namely environment, work, transport, education, research and, most importantly, the economic situation of society and the individual. As all these policy areas are shaped more and more at the EU or even global level in different ways by binding regulations or international treaties. Health interests have a chance of success against powerful industrial lobbies only at this international level.

The essential instrument for achieving this is "Health in all policies". It is not only named in the Article 35 of the EU Charter of Fundamental Rights (17), but it is also the most important part of the EU legal base for health. Even if today it is still more a vision and not a reality, there is hope that at the EU level it can become true. Commissioner David Byrne (18) expressed this as follows: *"The future of health is not characterized by national isolation but by international cooperation, governance, and partnership. A more cooperative, integrative and proactive health policy will lead to a more healthy society characterized by enhanced economic output and reduced strain on national health care systems".*

To make this hope come true, it not only needs political will, but also sufficient instruments. Does the EU have them? Can they be developed? The biggest obstacle is the MS‟ attitude as described below.

Development of health competence from Maastricht 1992 to Lisbon 2010

Article 129, Treaty of Maastricht, 1992

The EU "Public health" competence as laid down for the first time in Article 129 of the Treaty of Maastricht, often but never substantially changed in the subsequent treaties, fully reflects the defensive and negative position of MS. As only a „supportive competence‟ it always was and still is the weakest legal base possible – in great contrast to the other strong categories such as exclusive or shared competences. It gives the EU no power to establish binding legal regulations or directives. Its competence is limited to "carry out actions to support, coordinate or supplement the actions of the Member States" according to Article 6 of the Treaty on the functioning of the EU (Treaty of Lisbon). The "protection and improvement of human health" is on the same unsatisfactory level such as culture or tourism.

The establishment of a legal base for EU health policy has never been the object of an overall plan or strategy of any EU institution. Right from the beginning, there have been permanent

conflicts between European activities and differing national positions on the one hand, and economic interests versus health needs on the other. In these conflicts, health interests find only little support.

The Europeanization of health policy and the implementation of EU Health competence were *"A dynamic but still rather unplanned process of policy harmonization and policy adaption. It offers an example of effective and inspired muddling through, rather than of a consistent and clear cut European concerted strategy"* (19). It is worthwhile to take a look at the evolution of the legal base of the EU Public Health mandate, especially as today treaty changes are being discussed to reduce EU power in favour of increased national responsibility.

Before the Treaty of Maastricht in 1992, there was no specific legal base for public health activities. The first EU action program „Europe against cancer" 1985 initiated by a Summit in Rome and, therefore, had to be based on a catch of legal base, in that a Commission proposal could be agreed unanimously if the Treaties did not provide the necessary power. This legal base still exists today in the Article 352 of the Lisbon Treaty, but it cannot be applied to health any more, as there is a specific legal base for public health, established in the Article 129 of the Treaty of Maastricht in 1992.

The main components of Article 129 were slightly reworded in the following treaties, but essentially are still valid:

- Community action should encourage and support MS" cooperation in order to achieve a high level of health protection, and;
- Community action should be directed towards preventing human illnesses, especially by promoting research into their causes, their transmission, as well as health information and education.

The only instrument to achieve this, were supportive activities. Consequently the only activities that took place were „Action programmes" and „Recommendations". Any binding legal measures such as regulations or directives are impossible. Health Care was not even mentioned and MS, especially the new ones, watched very carefully that EU action did not go an inch beyond these agreements.

Quite soon, it became obvious that this very limited and weak mandate and its legal base were not sufficient to enable the EU to react appropriately to new challenges or at least to contribute sufficiently to their solution. Examples for these new problems, which most MS were unable to cope with alone, included new health threats such as AIDS, SARS or Ebola, the economic crisis and its effects on health systems, as well as bio-terrorism, to name just a few. Regarding one threat, the BSE crisis and the Jacob-Creutzfeld Disease, the Commission handling it was paying more attention to the commercial interests of farmers than to health risks for humans, which led the European Parliament to demand a strengthening of the public health legal base, which took place in a new strengthened formulation in the Article 152 of the Treaty of Amsterdam (20), which was not only upheld, but even strengthened in all further Treaty changes (Nice 2003, Lisbon 2010).

The Lisbon Treaty 2010

Many years later, in 2010, the Lisbon Treaty was agreed to and ratified. Its ratification was relatively easy because it was not a completely new text but just modified the pre-existing Treaty of Nice. It consists of two parts (Treaty of the EU containing common provisions and principals and Treaty on the EU functioning) containing the strengthened competences of the Commission as proposed in the failed attempt to agree on a European constitution in 2004.

Despite the permanently ongoing discussion about increasing or decreasing EU competences, the necessary changes of the Lisbon Treaty seem highly improbable because the needed unanimous agreement and ratification by 28 MS and even more in the future. As the Lisbon

Treaty will be the legal base of all EU action for a long time, it is appropriate to look at the changes in the health provisions to see how far future challenges could be met by EU activities.

The provisions in the Treaty on the functioning of the EU are peculiar, difficult to understand, and even contradictory. Whereas Article 4 mentions health aspects as an area of shared competence: *"Common safety concerns in public health matters for the aspects defined in this Treaty"* [2k], the Article 6 also names it as the first area for supportive, coordinative and supplementary competence : (a) "protection and improvement of human health".

Health is the only policy area mentioned in two different competence categories. Is there a difference between public health and human health? Is there a difference between common safety and protection? Most likely this is a badly formulated remnant of the foregoing discussion around a constitution, where health as a whole was originally planned to be a „shared competence", which many MS did not want. The background for a potential shared competence was the threat of „Bio-terrorism", which was considered to be a common safety concern to society and not just a health threat.

Whatever the explanation may be, as the EU-related contents of Public Health are described in great detail in the Title XIV of Article 168, it is obvious that with few exceptions Public Health continues to be only a supportive competence, which aims at encouraging and supporting MS cooperation. In spite of the detailed description in the Article 168, this leads to less and not more clarity. In comparison to the lengthy elaboration of one page in Article 168, the really important area Internal Market consists of involves only some lines in Article 26.

The well-known MS position to keep the EU as far away as possible from influencing their health policy is fully upheld. There is no harmonization of systems in any way. There still is hardly any possibility for binding hard law legislation (exceptions: Article 168 No. 4 dealing with quality and safety of organs and blood, veterinary and phytosanitary fields with direct relation to public health, and quality and safety of medicinal products as well as devices).

However, there are at least some small improvements. The scope and content of the Commission support of cooperation, i.e. financing, is increased by naming concrete possibilities such as establishment of guidelines and indicators – both basic for the establishment of a permanent EU health information system – as well as the organisation of the exchange of best practices, periodic monitoring and evaluation. Furthermore, the door for the first time is slightly opened for health care as there are positive words about improving the complementarities of health services in cross-border areas, something that has been happening for a long time in many „EUREGIOS" without Commission participation or support.

Health in all Policies (HiaP)

The most important change, however, is the new first sentence introducing Article 168, also contained in Article 35 of the EU Charter of Fundamental Rights:

"A high level of human health protection shall be insured in the definition and implementation of all the Unions policies and activities".

This very clear statement, which gives the EU an undisputable legal right und political mandate, is quite unique as it is not contained in any national constitution or bill of human rights. It not only means that all other policies have to avoid or at least limit negative health effects, but it also provides a legal base to use all policies directly or at least indirectly for binding and obligatory "health legislation". It gives the EU the power and the competence to establish „hard law", to achieve health aims and targets.

The EU fight against tobacco was the biggest EU health policy success story; it was made possible because „hard law", based on Internal Market competences, was used to establish the

needed binding directives. They were disputed and fought bitterly by the active and powerful tobacco lobby, but despite of all their attempts expressively legally confirmed and even promoted by a number of European Court decisions.

Despite of this encouraging example, Health in all Policies today is mainly a vision and far away from being an overall reality. It is tremendously difficult to apply and implement it, as other policies which want to achieve their own aims and health impacts, as a rule, are of little concern to them. Last but not least, powerful stakeholders – not only industry but also social partners – have foremost economic and not health interests and, at a political level, it is the economy that counts.

As an example, the EU strategy to „Reduce alcohol-related harm" failed to a great extent because of the negative consequences for various other EU policies and regulations (agricultural subsidies, harmonisation of taxation and the removal of trade barriers in the Internal Market). It is the most prominent example of failure of the HiaP principle. Despite the undisputable fact that alcohol is a main cause for diseases and health, the economic interests were stronger and prevailed. The EU is worldwide the biggest alcohol producer in a growing and very profitable market which had to be safeguarded. Thus, the EU market laws weakened the restrictive alcohol policy in the Nordic countries with the result that drinking alcohol already in adolescence became their biggest health problem.

To transform the Health in all Policies principle from vision to reality it is essential to be able to compete with and to influence countervailing economic and industrial powers. This requires adequate organisational structures as well as institutional mechanisms for resolving conflicts and the development and permanent use of support tools such as health impact assessment. Above all, it is essential that those who are responsible for health in the Commission (Health Commissioner and Health Directorate) and in the MS (Health Ministries and stakeholders) have the political will, as well as the power to do it. All of that is missing nowadays in the EU.

Achievements and impact of EU Health Policy

After more than 20 years, it is justified to ask two simple questions:

i. Have EU activities led to better health in the EU?
ii. Have EU health actions and health-related legal regulations had a noticeable impact in the MS and on the national health policies?

Both questions may be simple, but are difficult to answer. A short, but honest, answer would be: We just do not know! As, up to now, no overall evaluation (Health Impact Assessment) of EU activities has been made in the EU or in any MS, we can only give some general indications based on EU/WHO/OECD health information systems and health monitoring, mostly created by EU funding and networks. This enormous increase of knowledge about the health situation and health systems and their development, easily available to everyone, is possible the biggest achievement of EU health policy, to date. We know today more than ever before, but the central question remains: are EU and national policies based on this knowledge?

Health Status

European countries have achieved major gains in population health in recent decades. The situation in the EU is better than in most of the other parts of the world. *"Life expectancy at birth in the EU has increased by more than six years than 1980 to reach 79 years in 2010, while premature mortality has reduced dramatically. Over three quarters of these years can be expected to be lived free of activity limitation"* (21). On average, across the EU, life expectancy at birth for the three-year period 2008-10 was 75. 3 years for men and 81.7 years

for women. The report explains this situation by *"Improved living and working conditions and some health-related behaviours, but better access to care and quality of care also deserves much credit"*.

The question is, if and how much these factors have been influenced by EU policies. A scientific evaluation in 2003 of the EU "Europe against Cancer Program" (22) comes to the conclusion, that this programme appears to have been associated with the avoidance of 92,573 cancer deaths in the year 2000, or a reduction of about 10% of the EU overall. These exact figures might be questioned, but the phrase „appears to have been associated" is applicable also to the positive EU influence on the overall improvement of the health status of EU citizens. There can be little doubt that many EU activities that have been directed at reducing risk factors to health, be it tobacco smoking, alcohol consumption or overweight, have contributed at least to some extent to their reduction. The reduction of tobacco consumption by adults in most EU Member States (examples: 15% in Sweden and Iceland from 30% in 1980, but still over 30% in Greece, Bulgaria, Ireland and others) would not have happened without the EU activities such as public awareness campaigns, advertising bans, and increased taxation. Indeed, the reduction of smoking is the biggest EU Health success story until now.

By influencing mainly non-medical factors, the EU has contributed quite substantially to the present positive health status, whereas „governance of health care" factors such as proper access to health care, number of doctors and nurses, health care spending and the like have hardly been effected by the EU.

Even if the health status within the EU can be considered to have improved overall, there still is the unsolved problem of large and still growing inequalities between different countries. The gap between EU-MS with the highest and lowest life expectancy at birth is around eight years for women and 12 years for men. But, there is also a large gap within countries mainly between socio-economic groups. However, the EU has tried to reduce these gaps, where it was not successful.

Impact in Member States

The process of transforming visions into reality, of developing EU health policy and implementing it in the MS had to overcome countless barriers, was not very transparent and still is very slow. It has been described by Lamping (19), a German political scientist as *"Discontinuing, incoherent sometimes fairly accidental and even undemocratic with little logic and rationality , self dynamic, not political but technocratic, determined by interest groups, based mainly on voluntary cooperation with little room for binding legal acts"*.

On the same lines, Hervey and Vanhercke (22) describe EU health policy as *"A patch work of actors and institutions which decide and implement law, policy, and governance"*. They name five different domains as components of EU health policy that MS have to improve: Public Health, Research (both are soft law areas with no binding obligations to MS), Internal Market, Competition, and Social laws. There is no overall leadership and more competition than cooperation. Whereas national health policy as a rule is the domain of one political administration (the Health Ministry), supported by health experts, the EU health patch work consists of institutional structures and procedures that often were developed for domains that have no health interest at all. As a consequence, EU health is not only not an EU priority but also a highly contested area with a permanent conflict between health and economic interests. Also, there is only little transparency. EU Health policy is mainly a field for experts with little citizens" participation. Scott Greer (15) called it a „secret garden" which should be turned into a „public park".

Considering the weak legal base, the lack of political commitment and interest of the MS but also within the Commission, and the limited financial and personal resources available, the amount of health and health-related activities that have been developed and undertaken by this „patch work" is quite astonishing. Starting with its first programme "Europe against Cancer" in 1985, a countless number of soft law activities (strategies, recommendations, programmes, projects, studies, networks, frameworks, concerted actions, establishment of agencies, platforms, and committees etc.) have taken place. The amount of binding legislations (hard law) is of course much smaller, the most important being those on tobacco issues including advertising, blood safety, pharmaceuticals, medical devices, professional qualifications, food safety and – the first small step into health care – the "Patient"s Rights" directive on cross-border health care. The latter was enforced by a number of decisions of the European Court of Justice. There is hardly any health problem or major disease that has not been the object of EU activities.

The most comprehensive overview is contained in a "Welcome Package Public Health", prepared in 2009 by the Policy Department "Economic and Scientific Policy" (23) of the European Parliament, to serve as a reference tool for incoming Members of the European Parliament. A similar document seemingly was not produced for the new European Parliament 2014. In more than 120 pages, this document, available on the Internet, names and describes all past, ongoing and planned EU activities. The integration of health into other policies, however, is described on just one page and these other policies are not even named. Furthermore, the document says nothing about the impact on the MS. This is to some degree understandable because there is hardly any knowledge about the actual impact of EU health-related activities on the MS. There is no overall evaluation, no general Health Impact Assessment. Of course the many different activities, strategies, programs, and projects, as a rule are evaluated, but these evaluations say nothing about their impact. Health impact assessments of Health in All Policies are conducted in a small number when new policies and regulations are being prepared, not when they have been implemented.

There is hope for at least a partial improvement in the future. The "Patient Mobility Directive 2011" not only had to be implemented by the MS until the end of 2013; they also have to report to the Commission about what they have done. These reports have to include detailed information about patient movements and the cooperation between MS in border regions, European reference networks, rare diseases, e-health, and health-technology assessment. As of 2015 the Commission has to give an overall report to the Council and the European Parliament, we will then know a little more about national impact, at least in some areas. Today, we still know only little, actually too little, about the impact of EU Health policy. Only a few documents contain information about success or failure:

i. The most negative report is an evaluation conducted by the European Court of Auditors in 2009 of the 3rd EU Public Health Programme 2007-2013 (24). This report considered it a waste of money, because it contained no strategy, was badly implemented, the projects funded had little policy connection, and there was no follow up. The Commission accepted this harsh criticism and promised positive changes in its future programmes, especially in the following next 4th programme. Also, from author"s experience as a project evaluator it seems justified to say that since 1978 the many hundreds, even thousands of projects funded in the various Public Health as well as Research Programmes very rarely had relations to political activities, be it in the EU, be it in the individual MS. Although it was the expressive aim of all these programmes that the funded projects should contribute to the improvement of health of the European citizens, it was never really evaluated if and how they achieved this. Many of the projects improved knowledge, but only a few led to political action.

ii. Surprisingly the most positive document is the "Review of the balance of competences between the United Kingdom and the European Union in Health", published 2013 by the UK Government (25). It is part of a comprehensive examination of the balance of competences between the UK and the EU to analyse what UK membership means to national interest. These documents were prepared for all EU policies to serve as a base for negotiations with the EU about a reduction of EU competences, which – if not successful – might even lead to the UK to leave the EU. This health review is quite remarkable for a number of reasons. It is the only document prepared by any MS government describing and evaluating the national impact of EU health activities. It not only contains the view of the UK government, but also – this is really unique – the views of UK citizens, industry and stakeholders, who were asked to give their opinion. Altogether, it was recognized that with very few exceptions the EU in health matters had a positive impact especially in Public Health (tobacco use, tackling obesity, alcohol abuse), as well as health security (where even more efforts were welcomed), sharing of information and data, as well as research funding. Benefits were also seen in Internal Market health care measures including the free movement of patients and of health professionals, to reduce shortages. Only in a few areas adverse consequences of cross sector EU legislation were noted: The directives on clinical trials, data protection, and working time. The current balance of competences between EU and UK were considered appropriate, but should not be extended further. Considering these positive views in a country where generally the EU is looked at in a negative and critical way, it may be good to have similar surveys in other countries.

iii. A midterm evaluation about the implementation and impact of the EU Health Strategy 2008-2013 (26) contains some key conclusions that could be applied to the EU Health policy as a whole. It acknowledges that there is a high level of activities at EU and Member State level, but it is uncertain if the outputs at MS level can be attributed directly or exclusively to the EU Health Strategy. Thematic or structural similarities between EU and MS activities were identified but considered to be a reflection of similar priorities, a discernable direct of EU measures was not found, its influence an national strategies was considered limited. The main value of the EU Health Strategy was described as follows: *"It acts as a guiding framework and to some extent as a catalyst for action"*.

These findings coincide with the results of a conference on "European Public Health, 20 years of Maastricht Treaty", 2013 in Maastricht (27). It names a number of positive developments as the result of EU health policies:

- Building of a public health infrastructure (agencies & permanent networks);
- Establishment of the EU as a reference point for policy makers/professionals, i.e. the establishment of a change agent for innovation;
- Demand for capacity building initiating a boom of new education;
- Development of European-oriented knowledge and skills.

It seems that the highly fragmented EU health policy as it is gradually taking shape has up to now only limited, indirect, and even unintended affects often on national health systems and policies. It has, however, contributed considerably to the development of Public Health, an area which in many MS is underdeveloped and needs this support.

Health and the EU Crisis

The present EU crisis was not caused by health, but it influences EU health policy and the national health systems. The crisis started as a financial and economic one, but it has led to a general EU crisis. It still is uncertain, when and how it will be solved, but very likely the measures taken to control it will change EU objectives, structures, competences and instruments. The future EU will be quite different to the one existing in 2014.

As early as in April 2012, the former EU Health Commissioner John Dalli, who later was forced to retire under still not clarified circumstances, said at a COCIR conference in Brussels (28): *"A key challenge we are facing today is to prevent the economic crisis from triggering a health crisis. This may sound dramatic but the risk of this should not be underestimated"*. Largely unnoticed by the media, the public opinion, and by the Public Health Community as well, a health crisis soon became a reality in many EU-MS, especially in those which because of their critical economic situation received financial aid through the "Economic Adjustment Programmes". Examples of impact and extent of the health crisis are shown by the following figures in the "Briefing notes" of the European Public Health Alliance (29):

- Rise in unemployment in the EU-28 from 7.2% in 2007 to 9.7% in 2010 and 11.0% in 2013 (Greece 27.5%, Spain 26.2%, and Croatia 17.6%), especially the deterioration of youth employment which in 19 of the 28 MS stood at over 20% in 2013.
- Mental health and suicides rates, which until 2007 had been consistently decreasing rose in the EU from 11.4 % in 2007 to 11.8% in 2012, alarming in some MS such as Greece, Spain, Ireland and Italy.
- Cutting health budgets as well as other resources and frequent measures to reduce costs in nearly all MS have reduced the availability of frontline services and institutions.
- Austerity measures concerning health professionals such as reducing salaries (pay cuts between 10-40%) have led to a growing migration which endangered health services in some countries.

All these measures concerning the organisation and delivery of health services belong fully to the responsibility of MS, which the European Commission has to respect. Although the Treaty and therefore the limited EU health competence – excluding most aspects of health care – remain unchanged, the balance of power between the EU and MS in health care is changing in favour of the EU as a number of new instruments were created since 2011. They are intended to strengthen the EU governance of economic policy but have of course an impact also in the health sector. The new instruments should enable the Commission to intervene directly in national health care policies from a financial perspective and force national health systems to contribute to the achievement of the economic EU goals. These interventions concern not only "crisis states" receiving financial aid from EU, the International Monetary Fund, and the European Central Bank, but all MS in the context of a common macroeconomic policy.

Direct interventions by international into national health systems are not within the EU competences. In the past, this kind of interventions has been restricted to developing countries receiving financial aid. However, those countries receiving financial aid from the EU "Economic Adjustment Programmes" are in a quite similar situation. They have been obliged to undertake a wide range of austerity health actions demanded by the so-called TROIKA. These austerity measures are not always fully in line with widely accepted health values such as full access for everyone and good quality of medical services.

There are, on the other hand, also EU initiatives that address health care reforms in all MS in the context of a common economic policy. These direct interventions are slowly turning into a systematic EU surveillance, backed by the power to issue early warnings and to apply even sanctions. The most important new legal act that makes this possible is the so-called Fiscal

Pact *("Treaty on Stability, Coordination and Governance in the Economic and Monetary Union")*, agreed by only 25 EU-MS as an intergovernmental agreement which does not replace the EU Treaty, but is nevertheless enforced by the Commission.

The most important tool to improve policy coordination of macro-economic structural issues in key policy areas is the "European Semester for economic policy coordination" that was launched in 2011. At that time, health was not considered to be a key policy area that had to be included. But, this changed in the same year when the Ecofin Council demanded the Commission to include health. Since 2012, Health Care is included and considered to be a key policy area for economic growth and a permanent part of its five components. Since then, it is described in the Annual Growth Survey (AGS), presented every year by the Commission, a part of Strategic Advice & Orientations, contained in the "National Reform & Stability Convergence Programmes of the Member States", and the object of Country Specific Recommendations given by the Commission and the Ecofin Council (30-33).

Although the EU Health Competence as laid down in the Treaty is and will remain weak and limited mainly to Public Health, denying any EU actions in health care and health systems, it is firmly established as a key policy area of EU macroeconomic policy. All decisions are dominated and made by economic actors and structures in all of the European institutions with mainly economic interests in mind. Those responsible for health play a minor role in the decision making process.

Future perspectives

An article about the past developments in the EU would not be complete without taking a look at future options and perspectives. There is a large number of publications describing and criticising EU health policy, but there are hardly any books or scenarios about its possible future. Scenarios of the future are manifold. As far as health is concerned, three factors have to be taken into account:

i. The future EU
ii. New challenges and new solutions
iii. The role of health in a future EU

The future EU

The EU is here to stay. There will be changes. The number of its members will continue to grow – there seems to be almost no limit. Industrial ties and economic interests will guarantee its pertaining future existence. Some countries may leave the EU, the main candidate at the moment being the United Kingdom. This for many reasons would have negative effects on both sides, especially in Public Health, as the English Public Health Community appears to be the strongest one. Growth, however, will also continue to increase problems in two ways. On the on hand, the differences between MS such as size, population, economic situation, resources and the like, will lead to more inequality, for many aspects including health. On the other hand, the EU will have to cope with its growth with structures and instruments that were designed for a small community of six countries, all of which similar regarding their economic situation.

In order to adapt the EU to be able to better master new challenges and tasks, it is essential to change not only its objectives and priorities but also its competences, structures and instruments, including a new balance of power between the three institutions - the Council, the Commission, and the European Parliament. This normally could only be done by a fundamental change of the Lisbon Treaty, however, that is almost impossible, not only right now, but also in a foreseeable future. It needs unanimity by all MS and ratification – partly by a national referendum – again by all MS. Because of this, the debate about a new treaty,

including the establishment of a Political Union, has stopped. We will have to live with the Treaty of Lisbon for a long time.

The answer possible at the moment – and for some time – can only be a Europe of two speeds, in no way a new development. We already have an EU of at least two speeds in areas in which not all MS could agree on a common way forward. The Schengen agreement on border regulations and the creation of a Monetary Union, establishing the new currency EURO in most but not all countries, are the most prominent examples. Lately, and more relevant for the health, is the creation of the Fiscal Union (Treaty on Stability, Coordination and Governance) agreed up to 2012 by only 25 MS as an intergovernmental agreement, part of a new economic governance framework. In the future, supranational and intergovernmental agreements of this kind outside the EU "Acquis communautaire" and its legal base will partly replace the existing EU instruments and influence national policies more than ever before in many areas including health.

The impact of this new situation on national welfare, social as well as health systems, has not been considered sufficiently yet. To date, EU and national health authorities play only a minor role in this process dominated by economic interests. There is a danger that health values and interests could be neglected, especially when they clash directly with economic interests. For the future of health it is essential, even vital, to ensure that those responsible and accountable for health policy at the EU as well as national level take part in this process with sufficient power to safeguard health interests.

New challenges and new solutions

Presently, EU Health policy is faced with two main, totally different challenges:

- The overall EU crisis mainly caused by economic and financial problems;
- The outbreak of Ebola, one of the biggest health threats ever.

In both cases, the EU has done too little and too late. Especially in the case of Ebola, the EU was badly prepared and, so far, is largely invisible (16). Even the new European Centre for Disease Control, founded in 2005, was much too weak to create a common anti-Ebola policy of the European Institutions and the MS. As difficult as it may be to master these problems, they are at the same time an opportunity to move forward. The development of the EU health policy has often been crisis driven. There is justified hope that the new situation will lead to new solutions, only possible in a time of crisis.

In the past, the progress of EU health policy was triggered by new challenges and dangers which could not be tackled sufficiently on the grounds of the existing legal base, structures and instruments. Communicable disease outbreaks (AIDS and HIV-blood contamination, CJD, SARS, and especially BSE posed severe threats to health, similar to bio-terrorism) are prominent examples enabling progress that otherwise would not had taken place:

- Treaty changes strengthening the EU legal base for Public Health;
- The EU Health strategy with strategic objectives and principles;
- New organisational structures within the EU;
- Shift of competences (food, pharmaceuticals) to health institutions;
- Intensification & institutionalisation of new cooperation capacities;
- Creation of comprehensive databases & information systems;
- Establishment of agencies in health-related areas (altogether nine);
- The new instrument of "Open method of Coordination (OMC)", applied to health;
- Closer cooperation of the EU with WHO and OECD.

Most importantly, they brought about changes in the attitude of MS. These were influenced to some extent by the needs and expectations of new MS which considered it essential to add

health care and finance issues to the EU health agenda. MS still consider health to be, first and foremost, national responsibility but there is a slowly growing feeling *"…that health policy should no longer be discussed exclusively in terms of national autonomy and sovereignty"* (19). EU power and influence related to "All Other Policies" has already changed the environment in which national health policy takes place. As there is also a feeling that many problems, be it in health care or fighting new health threats cannot be solved effectively at the national level, it is increasingly recognized that the EU health policy is not simply a continuation of national health policies, but it is in many ways different.

The legal basis

A new and more precise formulation of the EU health competence (Article 168) is needed, but obviously not possible as it would require a change of the Treaty. However, a new consensus could and should be achieved as to how the Article 168 should be interpreted and implemented. The EU should not continue to be active in every possible health arena, many of which are already sufficiently covered by national health policies. It should concentrate and limit itself to those issues, where MS need EU support, because the objectives of the action cannot be sufficiently achieved by the MS. This is not new, but simply the subsidiarity principle as laid down in the Article 5 of the Treaty, which in the past has been neglected too often. If this is done, there is no need to continue the permanent debate about giving EU health competences back to the MS. A renationalisation desired by many would take place automatically.

Internal structural reforms

To be better prepared for facing future challenges, structural reforms are essential, which include but go far beyond „Complementing national policies" and „Encouraging cooperation between MS", without intending a harmonisation of national health systems.

These should include:

i. The internal reorganisation of the Commission which should increase and not decrease the areas for which the Health Commissioner is responsible, including all those with a priority health interest.
ii. Increasing, stabilizing, and institutionalising the EU problem-solving capacities by establishing new health agencies (examples: health technology assessment, rare diseases, E-health, or health information systems), strengthening the administrative power of the existing ones, and creating new observatories and permanent networks in order to improve the diffusion of best practices.
iii. Advance, even institutionalise, a closer cooperation with WHO and OECD making use of their reputation, knowledge, experiences, manpower, worldwide resources and avoid double work. In the long run, this should result in a common institutionalised Global Health Policy with many partners.

The role of health in a future European Union

Again, EU health policy is here to stay. It is no longer questioned any more that Public Health should remain to be an EU policy of its own. Nobody is demanding any more a total renationalisation. Nevertheless, the EU Public Health Policy as such is far away from being or becoming a European priority. It is, at best, only a side issue on the European stage with little power and low resources.

But, this is not even half of the story. Health as an issue, not as a policy, has been transformed during the past years from a non-topic to one of the most important EU fields. In the main stream of EU politics, i.e. policy coordination on macro-economic issues, health has become

and will remain a key policy area. This elevation is fully justified considering its economic implications and its position in the four freedoms of the Internal Market.
Nevertheless, the EU Health Policy is and will remain a patch work consisting of many different parts and partners. It is a complex cross-cutting policy sector and is part of and regulated in a multitude of other policy sectors like environment, consumer protection, industry, research, transport, agriculture, competition, information and – most importantly – the EU Internal Market policy. Health policy and especially health care are an intrinsic and relevant part of the European Market of goods and services, which are affected and partly even harmonized via simple market compatibility. The decisions are taken issue-specific, fragmented, not very transparent, and mostly guided by economic interests. The EU is foremost an economic union and partly even a political one, but not a social union. Health, contrary to social progress or environment, is not mentioned as an EU objective in the Lisbon Treaty. Health, as a key policy area, is only of interest as long as it is part of another policy and has positive or negative economic implications.
Health authorities within the EU-Commission, the European Parliament, and the Council of MS, at best, play only a minor role in the economy dominated decision making process. It is obvious that health values and interests could easily be neglected, especially when there is a clash with economic interests. It is essential and vital for the role of health in a future EU to ensure that those accountable and responsible for health at the EU and national levels take an active part in this decision making process with sufficient power to safeguard health interests. In the past, this was partly achieved by shifting more competences within the Commission from agriculture (food), or the Internal Market (free movement of patients and professionals, pharmaceuticals) to the Health Directorate. This was much more than just an internal organisational act by the Commission because it had consequences for the decision-making process in other EU institutions. Whatever belonged to the tasks of the Health Directorate was automatically decided by the Health Council and the Health Committee of the European Parliament.

Conclusion

EU health policy as a whole has not been an unequivocal success story: there are weaknesses but also strengths. Its main strength is that it has become a permanent part of the European integration process. Hardly anyone is demanding its renationalisation anymore. Considering its weak legal base, the restrictive position of the MS, and the activities of recognised international organisations such as WHO or OECD, it is astonishing to observe what has been achieved. A „non-topic‟ has developed into a key policy area of the EU economic policy. This is not due to a sudden discovery of the value of Public Health – the esteem for EU action in this area is still low – but relies entirely on its economic consequences. However, there is also the danger and even to some degree a tendency that the EU health policy might be reduced to narrow Public Health issues alone. Therefore, public health activities should not only be continued but, in due time, considerably broadened and strengthened. In the future, the main task will be to safeguard health interests in „All Areas‟ including economy, to ensure that economic interests do not precede health. This task should not be left to Non-Governmental Groups, as valuable as their contributions will continue to be, but should be the task of health authorities within the Commission and in the MS. To be successful, this requires political power as well as adequate organisational structures, giving health authorities more power instead of taking it away from them. In addition, it needs scientific evidence that could be provided by the EU-funded public health actions and research. If this happens, there is no reason to have doubts about a positive future of the EU health policy.

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REVIEW ARTICLE

The rise and fall of the "Massively Open Online Courses"

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Abstract

The paper summarizes the actual debate about "massive open online courses" (MOOC), a concept that swept over like a "Tsunami" to European educators and universities since its first development in 2008. The definition of the so-called MOOCs, also referred to as a "disruptive educational innovation", however, is not very precise and has led to some irritations and scepticism. Therefore, the ideas MOOCs rely on, will be described and the pedagogical and technological background will be explained by detailed descriptions of concrete examples.

After setting the scene, the factors responsible for the initial hype about MOOCs will be analyzed as well as the upcoming criticism raised against the arguments of the MOOC proponents. The model of the Gartner hype cycle serves as a useful illustration of the ups and downs of expectations related to the introduction of educational innovations. The discussion will be supplemented by a brief flash back on prior developments in distance education. Furthermore, some recent empirical data retrieved from Google Trends are presented to underline that MOOCs are already on the descent.

Finally, the conditions for a survival of some specific applications of MOOCs at "the plateau of the cycle of expectations" will be outlined. In conclusion, MOOCs seem to have promoted, especially in the US, the use of online teaching and learning as well as the reflection about open educational resources. However, the blurred definition of the term MOOC combined with exaggerated expectations turned down the initial hype about a "disruptive innovative concept of teaching and learning" to a more modest consideration of its potential.

Keywords: connectivism, hype cycle, massive open online courses, MOOC, online learning.

Conflict of interest: None.

Definition and origin of "Massively Open Online Course" (MOOC)

MOOC stands for "Massively Open Online Course". Hence, there are four criteria: massive, open, online and course. It all began with the offers of two young Canadian researchers, who tutored in 2008 a course about "connectivism and connectivist knowledge" at Manitoba University. The young researchers were George Siemens and Steven Downes, both not having a PHD at that time with a very mixed study background, but often called the founders of MOOCs. However, two other researchers namely David Wiley and Alec Couros were a little bit faster in running an MOOC (1). The idea was to supply the students with the basic framework for the course and then lead from behind. The students were not confined to a prescribed online learning platform; they were encouraged to figure out what environment suited them. Some Spanish-speaking students even created places in "Second Life", a virtual world, where they could hold discussions in their own language. The course, called "Connectivism and Connectivist Knowledge", ended up attracting about 2,300 non-paying, non-credit students in addition to the 25 students who took it for credit through the University of Manitoba.

The learning theory that pretends to back up their approach was called "Connectivism" and is described by Siemens (2) as being composed by the following key features:

- Learning and knowledge rest in diversity of opinions.
- Learning is a process of connecting specialized nodes or information sources.
- Learning may reside in non-human appliances.
- The capacity to know more is more critical than what is currently known.
- Nurturing and maintaining connections is needed to facilitate continual learning.
- The ability to see connections between fields, ideas, and concepts is a core skill.

However, to call connectivism a "learning theory" has been criticised by many researchers as not fulfilling the requirements of a learning theory and for neglecting the work of previous scientists (3-6).

Different types of MOOCs

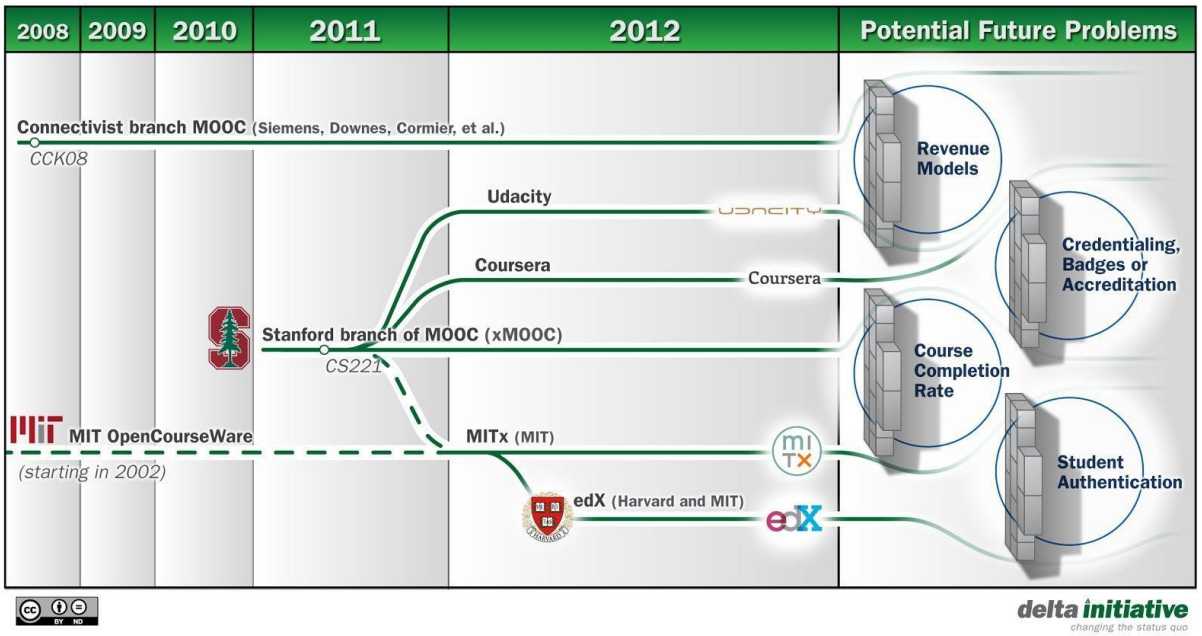
The connectivist background of MOOCs disappeared to some extent when in 2011 a second type of MOOC emerged, namely the xMOOCs. These courses were primarily based on interactive media, such as lectures, videos and text. The xMOOCs adopted a more behaviourist pedagogical approach, with the emphasis on individual learning, rather than on learning through peers. A number of companies were launched in the US to run xMOOCs, such as: Udacity, EdX and Coursera. The courses tend to be offered by prestigious institutions, such as Harvard and Stanford. The emphasis is on delivery of content via professors from these institutions (7). Actually, there are different types of MOOCs and a number of additional abbreviating letters. To make a difference, the connective MOOCs were called then cMOOCs. If Moocs are imbedded into traditional classroom activities in a blended learning mode, the respective MOOCs are labelled bMOOCs, which increases the variety of the "MOOC Alphabet", but not the clarity of the meaning of MOOC.

Figure 1 summarizes the MOOC types, however, without reference to the blended settings.

In the meantime, a new variant came from Harvard University: SPOCs (small, private online courses). The different concepts of MOOCs mentioned are not clearly defined and overlap to a great extent with both, traditional terminology of distance education and definition of teaching environments in classroom-based conventional teaching.

Similar to the invention of the new theory of learning "Connectivism", the concept of MOOCs created a lot of repercussions in academic debates. Before going into details, the pedagogical concepts and technical settings of past MOOCs will be briefly described.

Figure 1. Different types of MOOCs
(Source: Delta Initiative: EvolutionCombine20120927)



Pedagogical settings of cMOOCs

In 2012, the University of Frankfurt ran one of the first MOOCs in Germany about "Trends in eTeaching" (8,9). The participation was free of charge and all interested participants were admitted. At the beginning of each two weeks, interval participants could listen to a video streaming lecture of one hour duration with subsequent discussion. To prepare for the expert lectures, participants received some bibliographic references related to the respective topics. As the MOOC was not part of an academic curriculum, participants could ask at the end of the course for badges that characterize their contribution and role across the entire course. Three types of badges were available: Observer (following discussions and video lectures), Commentator (giving at least three comments related to different topics by blog, video, audio, or other media), and Curator (contributing significantly to the organization and content production of the course, e.g. summing up discussions, leading subgroups etc.) (9). An example of detailed differentiation of badges is shown in Figure 2. Mozilla offers also workflows to design individual digital badges (10).

Except of the certification by badges, no exams could be taken during or at the end of the MOOC. Participants were asked to aggregate the content offered, to remix information, to contribute by writing down own ideas and to share their knowledge. They could use the tools of their own personal learning environment such as blogs, wikis, twitter posts, or Facebook. The organizers summarized the main discussion threads at the end of the two weeks rhythm and let students access them via the course website.

Figure 2. Example of badge design
(Source: http://beuthbadges.files.wordpress.com/2012/12/ple-badges1.png?w=560&h=930)
(modified by: Wolfram Laaser)

Technical requirements of cMOOCs

Which are the technical requirements to run this type of comic, which kind of programs support students and organizers in their activities to create, to certify, to assess, to collaborate, to deploy and to analyze? In a SlideShare presentation of the software used in his MOOC, Downes listed the following software components (11):

- A course WiKi on the project website provided general information about participation, topics and other general issues.
- A course Blog (to motivate discussion and give additional inputs by the tutors).
- A Moodle Forum (to run common discussions).
- PageFlakes (to add widgets for RSS (Rich Site Summary) feeds to a web page).
- Elluminate (group video conferencing tool).
- Ustream (live streaming of contributions).
- Twitter (to tweet with an identifying course tag).
- gRSShopper (harvesting content input coming from RSS feeds).
- LTC (language translation software).

Furthermore, students could subscribe to a newsletter with RSS feed and use additional software for Infographics (e.g. Wordle), formation of working groups (Google groups), storytelling (Word of Mouth), music integrator (Orchard), virtual worlds (Second life), social bookmarking, tags (11), or to create student‟s Blogs (Wordpress). This selection of software tools is based on available tools during the years of running the course in 2007-2008.

Currently, in many cases, different tools can be used for the various purposes mentioned (12).

Comparing cMOOCS with xMOOCs

Among the most active MOOC providers today is Coursera, a start-up that offers some 200 online courses to 1.5 million students. It does so by providing a technical platform to 33 educational institutions, including the University of Pennsylvania. According to Daphne Koller, *"Coursera is still a hugely interactive experience in terms of working with the material, which is not just video. There are a lot of exercises and assessments. Furthermore, an educational community is created based on students interacting with each other."* (13).

However, when the author (WL) picked just randomly an economics course offered by Columbia University via Coursera to look at the course description with respect to pedagogical design, it was found to resemble a traditional distance education course. The course description says: *"The class will consist of lecture videos, shot live in the classroom but then edited down into digestible segments, with integrated quiz questions and animated slide videos added. There will also be weekly quizzes and a final exam."* (14). But, there is no mention of interaction with teachers or tutors. The only difference is that anybody is admitted; there is no fee and that there is no recognized degree available. Usually, only short courses on relatively specific topics are offered. They have to be selected independently of any curriculum. Just some general remarks about necessary pre-knowledge are mentioned.

Daphne Koller (Coursera), continuing her interview responses, states: *"I think that it"s wonderful for students around the world to have access to content from those universities as well. This arrangement between institutions provides economies of scale, since a single platform is an expensive and complicated thing to develop. We have almost 200 courses right now and more coming up on this hub. That"s why we have 1.5 million students, and the population is growing."* (13).

Opposing to the setting of the xMOOCs, one of the cMOOC protagonists, Downes, commented on xMOOCs as follows: *"Look what they"ve done to my Mooc: as deployed by commercial providers they resemble television shows or digital textbooks with – at best – an online quiz component."* (15).

The hype about MOOCs

So, why those types of course setting became so popular and much discussed during the last six years? There are a number of reasons to explain this phenomenon. First of all, the young researchers did not hesitate to give a label in abbreviated form to their experiment "Massively Open Online Courses" equal to MOOC to make it sound already a widely known course concept. Abbreviations are known for chatting among young people and tend to hide a clear definition of what the terms exactly mean, e.g. eLearning, and mLearning. Furthermore, they related their concept to another newly invented label called "Connectivism", which they claimed to offer a learning theory for the 21st century. Buzz words are mostly part of a marketing strategy. By contrast, the effort to ground the concept and theoretical background on prior research is kept quite limited.

A second important factor might be the proximity to the spread of the Open Educational Resources movement, as MOOCs are actually free of matriculation fees and open to anybody regardless of the academic background. Thus, at the same time it shares the problem of covering costs with the Open Educational Resources.

As a third point, movements such as the "Edupunk" and "Do it yourself University" (16), or "P2P University"(17) can be mentioned. All these ideas claim that peers learn best from

each-other according to their specific interests and needs. The expert teacher becomes obsolete (18).

A fourth argument lies in the economic interests of multinationals to market educational content to a worldwide audience. Multinationals try to overcome cultural and national borders by introducing their courses at zero prices in an initial phase. Therefore, it is not surprising that MOOC development was supported by the US and Canadian Government as well as by organizations like Bill Gates and Linda Gates foundation or the Hewlett Packard Foundation.

Another interesting source of hidden revenue is the selling of student data to advertising companies or potential employers (19). Finally, as economic pressure and new models of education are bringing competition to the traditional models of higher education, institutions are looking for ways to control costs while still providing a high quality of service. Hence, participating in accreditation of MOOCs as part of their curriculum, economic cost reductions are expected.

The necessity to economize resources on a worldwide level is also stressed by M. Waldrop (20): *"Bricks-and-mortar campuses are unlikely to keep up with the demand for advanced education: according to one widely quoted calculation, the world would have to construct more than four new 30,000-student universities per week to accommodate the children who will reach enrolment age by 2025, let alone the millions of adults looking for further education or career training. Colleges and universities are also under tremendous financial pressure, especially in the US, where rocketing tuition fees and ever-expanding student debts have resulted in a backlash from politicians, parents and students demanding to know what their money is going towards".*

Expectations and forecasts

"MOOCs have gained public awareness with a ferocity not seen for some time. World-renowned universities, as well as innovative start-ups such as Udacity jumped into the marketplace with huge splashes, and have garnered a tremendous amount of attention - and imitation. Designed to provide high quality online learning, offered to people regardless of their location or educational background, MOOCs have been met with enthusiasm because of their potential to reach a previously unimaginable number of learners. The notion of thousands and even tens of thousands of students participating in a single course, working at their own pace, relying on their own style of learning, and assessing each other‟s progress has changed the landscape of online learning. This statement was given under the heading: *"MOOCs on the Move: How Coursera Is Disrupting the Traditional Classroom"* (13).

Though the term MOOC was hardly a thought bubble for the New Media Consortium (NMC) during the discussions in 2012, the opinion of the experts changed already in their 2013 report (21). In the Horizon Report 2013, it is assumed that the time for global adoption of MOOCs in Higher Education (20% of all national educational institutions) will be a year or less (20). However, the methodology of the NMC Horizon Reports and the yearly revisions of previous forecasts have been heavily criticized by Jon Baggaley (3,4). The British Open University suggested in its innovation report a timeframe of one to two years (22). Other forecasters were more cautious and commented more in detail the factors that influence medium term trends (23).

Hence, are we in the rising part of the hype cycle? Norway, recently announced proudly a national initiative for MOOC development to promote online education and to develop a national MOOC platform (24).

Critical views about MOOCs

G. Siemens - according to Parr 2013 (15) - believes that attitudes towards MOOCs are in a period of flux and that criticism is mounting because of what he calls the "biggest failing of the big MOOC providers"; from this point of view, they are simply repackaging what is already known rather than encouraging creativity and innovation: *"There has been a growing backlash against MOOCs over the past year. If 2012 was the „Year of the MOOC", 2013 is shaping up as the „Year of the anti-MOOC."*

Schulmeister, a German pedagogue, after participation in several xMOOCs summed up the following critical points (19):

- Lack of feedback and low interaction.
- High drop-out rates.
- No reliable checking of learning outcomes and peer reviews.
- Many different subjects, but no curriculum.

To these points, the information overload in terms of quality and structure might be added especially for cMOOCs. It is not really surprising that NMC experts did not provide correct orientations of future MOOC perspectives. According to a study of the Babson Survey Research group (25), only a very small segment of higher education institutions in the US are now experimenting with MOOCs with a somewhat larger number in the planning stages. Most institutions remain undecided. According to them, only 2.6% of higher education institutions in the US currently have a MOOC, and another 9.4% which report MOOCs are in the planning stages. The majority of institutions (55.4%) report they are still undecided about MOOCs, while less than one-third (32.7%) state that they have no plans for an MOOC. Academic leaders are not concerned about MOOC instruction being accepted in the workplace, but do have concerns that credentials for MOOC completion will cause confusion about higher education degrees (problem of recognizing badges).

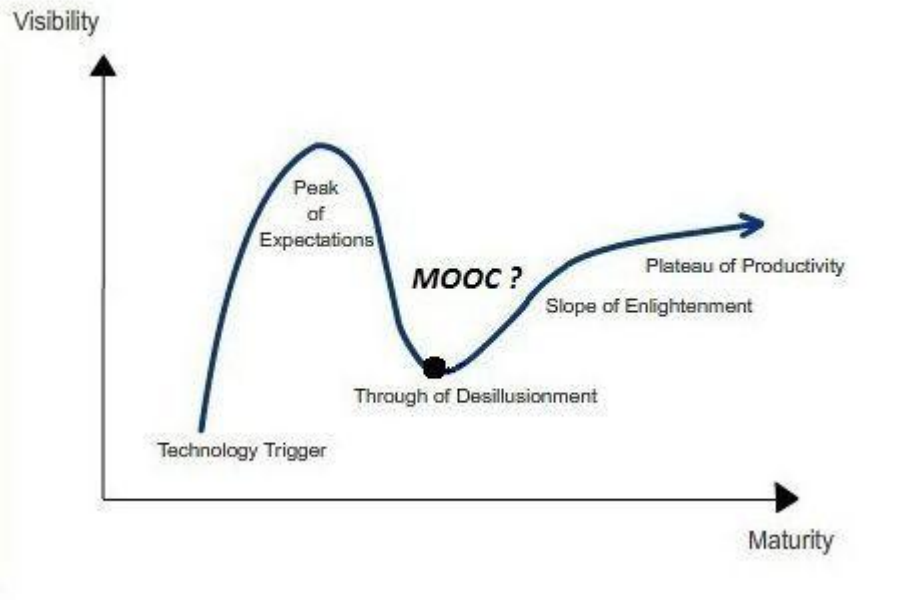
In a recent paper, the Conference of German University"s Rectors stressed, that the use of external MOOC platforms may reduce the "visibility" of the educational institution and that the fragmentation of educational offers could lead to a "Mac Donaldization" of teaching (26). Though, no clear cut position is taken, mainly "pros" and "cons" are discussed.

As a final quotation we will mention Sebastian Thrun, who, after his first optimism about the tremendous enrolment rates for his Udacity course on "Artificial Intelligence" states later with resignation: *"We were on the front pages of newspapers and magazines, and at the same time, I was realizing, we don"t educate people as others wished, or as I wished. We have a lousy product."* (27). Since Udacity was one of the first MOOC companies, and Sebastian Thrun its founder, his admission came as a shock. It signalled the decline of the MOOC empire: from 2012 when The New York Times declared it "The Year of the MOOC" to now, when its very champions, who had built their reputation and companies around the theory that free, huge, online college classes were the way to fix education, were conceding failure. Thrun retained that MOOCs were a bad product because less than ten percent of the MOOC students managed to complete each class. *"How can classes revolutionize education if no one is finishing them?"*.

The first hype about MOOCs is somehow difficult to follow as in pedagogical terms the early application of televised courses 30 years back in the US did not differ much from today"s xMOOCS. About that time, the author of this paper wrote, that *"In 1984, the National Technological University began to offer courses for upgrading engineers. A consortium of 22 universities distributed their courses through the system. Classes are given as live lectures by staff of the associated universities in especially equipped classrooms and transmitted via satellite. The student at his workplace has options to pose questions via direct*

telephone links." (28). The question remains whether MOOCs represent really a disruptive innovation (see also 29).
So, is the position of MOOCs on the hype cycle rather like the one indicated in figure 3?

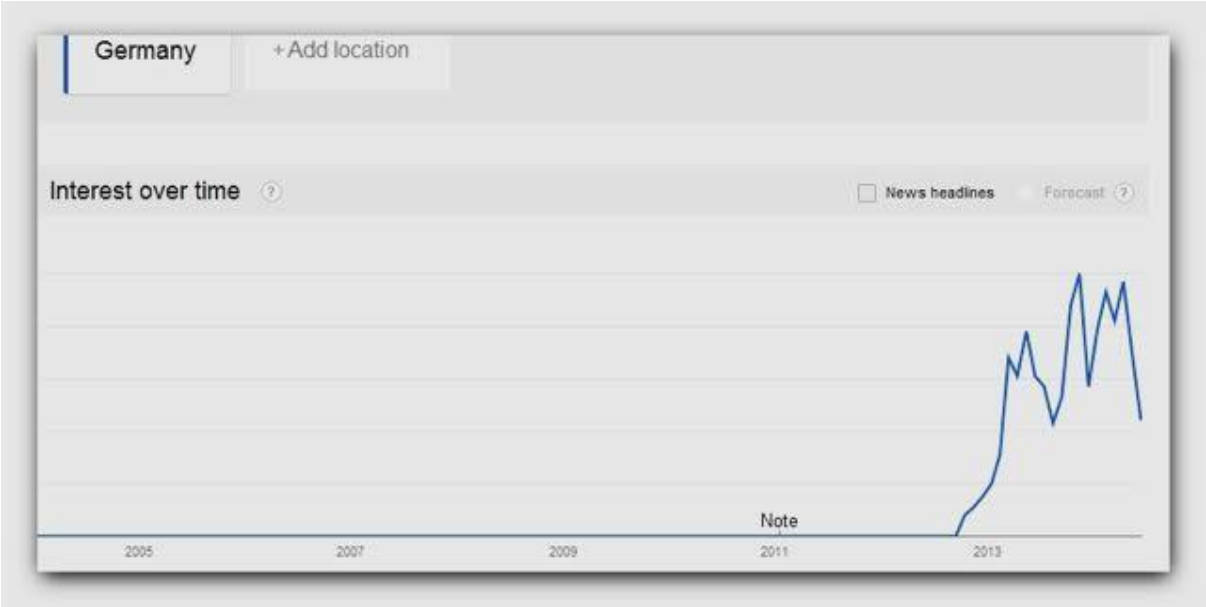
Figure 3. The tentative position of MOOCs in the hype cycle

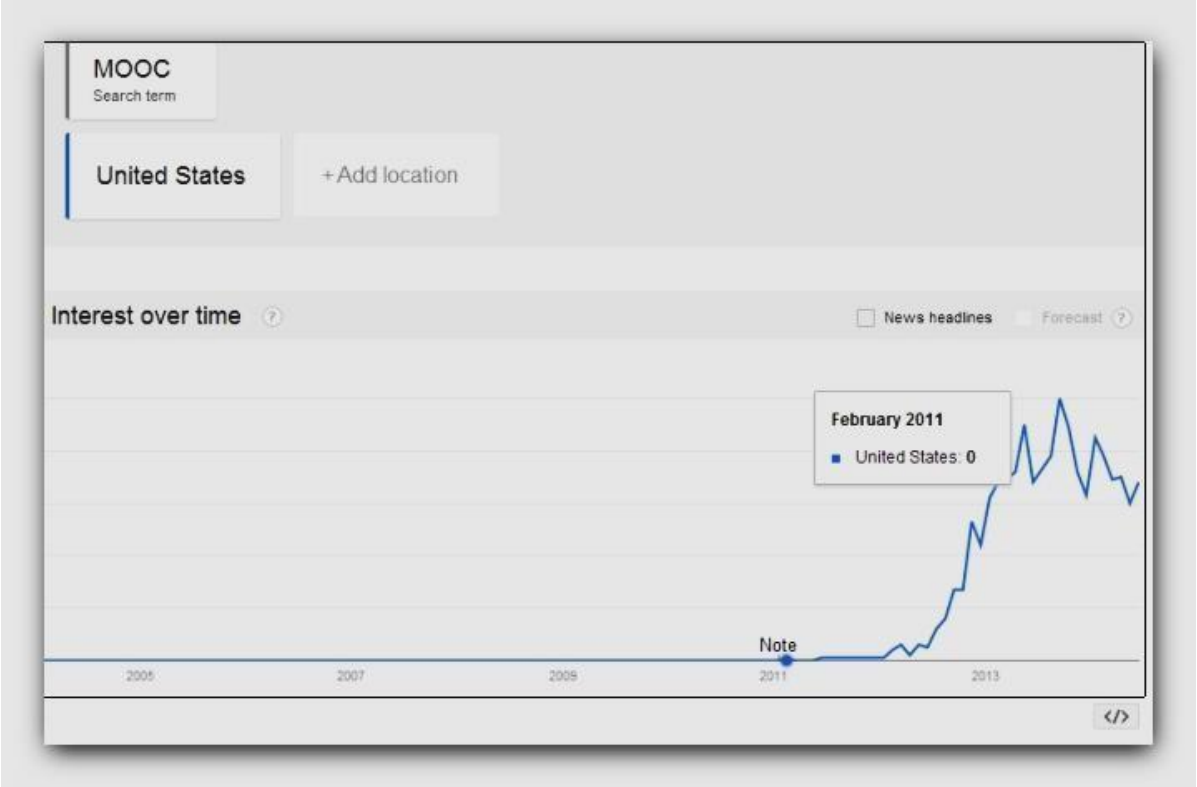


If we use the frequency of searches in Google as an indicator using Google Trends, we can observe that the interest in MOOCs started in Germany with a delay compared to the US and after reaching its highest values declines faster than in the US. The interest in MOOCs in general seems to be still declining in contrast to all exaggerated expectations and forecasts.

Remaining perspectives of MOOCs
There are a number of aspects relevant for the future survival and usefulness of MOOCs. First of all, an economic solution has to be found to finance MOOCs if they are offered free of charge. However this is a problem that MOOCs have in common with any Open Educational Resource. As our economic system is based on private property rights, it will always be difficult to offer private goods for free, or as the American economist Milton Friedman expressed: *"there is nothing like a free lunch"*.
So far, several business models have been developed to charge not the course, but the connected services or certifications (Coursera charges now for the certificate). Udacity will charge in the future for tutoring support. The remaining possibilities are the financing by donations or membership contributions. *"Obviously, if sustainable models for the support of open content initiatives cannot be found in the relatively near future, most are doomed to be left by the wayside when their initial funding ceases."* (30).

Figures 4a and b. Frequency of searches in Google Trends in the US and Germany, generated in June 2014





Secondly, the unique possibility to dispose about "Big Data" by using MOOCs is of great relevance to research projects. MOOCs represent by their huge international clientele a fantastic field for research studies such as learning analytics, collaboration formats and automated support of large student numbers, spontaneous formation of groups and communities of practice, behaviour of peers in online environments and analysis of intercultural communication patterns. Actual research experiences and best practise "in and around Moocs" are presented in a special edition of eLearning Papers (31). Another relevant source for Mooc research are the proceedings of the European MOOC Stakeholder Summit 2014 (32). Research topics dealt with are models, built to forecast drop-out rates, eye tracking studies, or analysis of video usage and design patterns.

To date, MOOCs have been offered usually for small courses with special content areas selected. In the future, complete degree courses will be probably offered and this will be affordable mainly for institutions that can invest huge amounts of money in attractive course presentation and marketing. This holds primarily true for xMOOCs. The future of cMOOCs seems to be even more uncertain, but future developments might show up new ways to teach specific subjects to huge and extremely heterogeneous groups of learners.

Annex

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REVIEW ARTICLE

The German-Jewish paediatrician Albert Eckstein (1891-1950) exiled to Turkey: Pioneering modern paediatric care and social hygiene (health sciences) during World War II

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Abstract

During the thirties of the twentieth century, German medical doctors immigrated to Turkey. Among them, was the German-Jewish paediatrician Albert Eckstein. In this short biography, the richness of the literature, written by or about Eckstein, will be presented, and altogether combined.

Starting from 1937 and further on, Albert Eckstein undertook scientific surveys on children's state of health and health care in the most remote areas of Anatolia. The value of the social-hygienic approach could be recognized, even in this early stage, starting with epidemiological analysis and followed by basic comprehensive health care. Social hygiene, as a young branch of health sciences at the time, was in the position even then to model the health care system for large population groups, at least in countries actively developing health care, as was Turkey of that time.

Albert Eckstein and his co-workers, such as Ihsan Dogramaci, stand out as founders of the modern Turkish health care system today and health sciences in this country.

Keywords: Albert Eckstein, Anatolia, health sciences, Ihsan Dogramaci, paediatrics, public health, social hygiene.

Conflict of interest: None.

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Introduction

During the great remodelling of the Turkish nation under the government of Kemal Atatürk (1881-1938), the German-Jewish physician and emigrant Albert Eckstein (1891-1950), also often mentioned as *"Architect of the modern Turkish health-care system"* (1), made significant efforts in lowering child mortality. At the end of 1920s, the German scientist Gerhard Domagk had discovered the healing effects of *sulfonamide* and started the era of chemotherapy. He was awarded the Nobel Prize in Medicine in 1939. Albert Eckstein left his homeland under pursue from national-socialists in 1935, with Domagk's new therapeutic instruments in his luggage and headed for Ankara, the emerging capital of modern Turkey, which at that time was a country with high child mortality.

Biographical background

In the years before Eckstein arrived to Ankara, he had finished studies in the elite German medical schools. He worked during his medical studies with Johannes von Kries and Eugen Fisher on scientific research in the Freiburg Institute of Physiology and Anatomy. After 1920, Eckstein turned his interests to Paediatrics and obtained a degree in this field three years later under Carl Noeggerath in Freiburg. Since 1925, Eckstein worked for years as a senior medical doctor under the social-hygienist Arthur Schlossmann in the Paediatric Clinic at the Medical Academy in Düsseldorf. The textbook on Social Hygiene and Medical Care edited by Arthur Schlossmann together with the most famous social-hygienists Adolf Gottstein and Ludwig Teleky in the midst of the twenties, was a milestone in developing modern health sciences (2), thus supplying young German doctors with the latest scientific findings on those newly endeavoured fields.

The young researcher we are speaking of found entrance to his director's family through marriage with his daughter Dr. Erna Schlossmann. She led the Auguste-Viktoria Children's Home, and was also engaged in social hygiene. In the times coming, she will be of great help as associate on his undertakings in exile. Being associated professor with Schlossmann since 1925, Eckstein was the permanent deputy of his father in law and – after his master's death in 1932 – he followed him both on clinical and academic positions[1] (3-6). Until 1935, Eckstein worked on infective diseases and tuberculosis and wrote a chapter on smallpox for the Textbook of Internal Medicine (7).

Historical background

Basically, one can explain Eckstein's path, a paradox turn in the carrier of this 45 year old man, through two historical phenomena: Anti-Semitism in Germany on one side, and government and community reconstruction in Turkey of the period, on the other. Already in 1924, Kemal Atatürk signed a Treaty of Friendship with Germany and a second one followed in 1941 (4). Following the "Seizure of Power" in 1933, Eckstein managed to stay only two and a half years more at his workplace in Düsseldorf. After a year of harassment and humiliation by the regime, colleagues, and students, a decree signed by Hitler and Göring forced him to leave Germany (3). In those years, Germany and Turkey were working together under an agreement on helping the young (Turkish) republic on rebuilding new government structures and forming the University in Istanbul and a new University in Ankara (4). Through this programme, in which Germans without Jewish roots could work as well, national-socialists let high-profiled German-Jewish scientists seek exile in Turkey (3,8).

[1] Erichsen R (2012) Exil Tuerkei: Der Pädiater Albert Eckstein – wie er aus Deutschland vertrieben wurde und was er in die Tuerkei mitbrachte; and: Erichsen R (2012) Zwei Pädiater im tuerkischen Exil: Erna und Albert Eckstein halfen Kindern im ländlichen Anatolien und fotografierten ihre Welt. Deutsch-Tuerkische Gesellschaft (DTG), Bonn 03.05.2012.

Eckstein was *"the last Jewish professor at the Medical Academy in Düsseldorf"* (4,9). Within a few weeks, Eckstein arranged with the Turkish government that he would be assigned first as *"Head of the Paediatric Department in the city hospital Nümune Hastanesi in Ankara"* (4), the only hospital in Ankara with its population of 125,000 residents (10). Later, in 1945, he advanced to a full professor of Paediatrics and Director of the Paediatric Clinic in the newly formed University. Eckstein developed from earlier, small-scale medical scientific projects, the largest social-hygienic project of the time – an analysis of infant and small children care in Turkey with its population of then 16 million (11).

Research in rural Anatolia

After the reorganisation of the newly established University Paediatric Clinic in Ankara (4) the couple Eckstein went twice in the period from 1936 to 1938 on three-month voyages through regions of west and central Anatolia, accompanied by their Turkish assistant Dr. Salahaddin Cevdet Tekand (see below) (5,11). They tended especially to pass the rural areas and reach "the remotest villages" where men, mothers, wives, and children *"have never seen medical doctors"* (12,13). The workgroup undertook systematic scientific investigations and offered "on the spot" medical care for those in need. The procedure corresponded to a classical demographic and statistical survey, which led to an epidemiology of childhood diseases in Anatolia as basis for the creation of a comprehensive paediatric health care system (4,5,11). As in some of the visited provinces survey techniques could not be fully used, the solution was found in the *"monographic, exemplary description of single villages"* (5,14). The mutual relationship between the state of health of the individual and the population, a typical case of the social-hygienic double perspective (15), could be found here as a model for the first time in a project on large-scale.

The Turkish Health Minister Refik Saydam, later also Turkish Prime Minister, became friend with Eckstein and agreed that Eckstein visited first the rural areas and produced a report on illness and health among children of Anatolia as a basis for reform proposals: *"I would .... like you to prepare a report on .... children's health and diseases in Turkey .... However a German approach may not be suitable for our country .... Visit and examine all of Anatolia and (return) with your proposals"* (10,16,17).

According to Akar (1), malaria and necrotic ulcerative stomatitis or Noma were the major illnesses for the paediatrician in Turkey to treat. Whereas for malaria prophylaxis as well as therapy was available, Noma required the treatment of the mucous membrane of the mouth in children with a weak immune system and malnutrition, sometimes showing also progressive facial necrosis, which represented a daunting therapeutic challenge (18). The list of illnesses comprised in addition: diarrhoea, malnutrition, rickets, typhoid fever, tuberculosis, gonorrhoea, ascariasis, anaemia, trachoma, measles, bronchitis, injuries, scarlet fever, and diphtheria (4,5,11). Eckstein's inquiry in locally typical disease manifestations included basic social-hygienic data as diet, quality of water, hygienic habits, care for infants, and social status. Observations were recorded in *"detailed daily journals"* (3), as a prerequisite for developing new structures of medical care (5).

The research trips led Eckstein and his small team especially into the central and western regions of Anatolia. During only two years, they visited altogether 188 villages in 25 provinces, interviewing almost 25.000 women (4,5,11). The examination began usually with social-hygienic and demographic, and population data gathering. Furthermore, the group studied the dominating diseases and the social conditions determining the rural environment in which families in Anatolia typically lived (11), with a special focus on childhood diseases. Living conditions and living standards (water and milk supply, fruit and vegetable growing) of the rural population stayed regularly in focus. The so-called *"Centres for fighting malaria"*

(4,5) were transformed into Health Centers (Dispensaires) that provided consultations for mothers and health care for infants and, as such, formed footing for the future paediatric services (4,5).
Diarrheic diseases were – different from Western Europe – predominantly of bacterial origin, therefore, diarrhoea during the summer months required antibacterial medication (sulfonamide), or serum therapy (3,4). Because of Eckstein's work before he returned to Germany in 1949, the mortality among children in Turkey deceased from 35%-40% to 12% (4,5,10,13). However, the Ecksteins themselves indicated some statistical weaknesses in this account (4,13).

Workday routine
How a typical workday for the two Ecksteins looked like, we can see from the 44 page daily journal covering their visit to Anatolia in 1937, published in 2005 by Buergel (19). The Ecksteins needed not to get alone on the road trough undeveloped parts of the land in order to reach mothers and children who lived in villages there. For transportation they used one Ford cabriolet, bus lines, railroad, Taurus-express, occasionally with sleeping car. But, they also travelled *"using taxi, jeep, or horse"* (12). Primarily, Albert Eckstein described the strange remains of antic architecture spread throughout an ever changing landscape, its utilization, management, climate, living conditions, the diet of the population, conditions of accommodation, occupations, and standards of living. Often he used the hospitality of the population in Anatolia as advantage in building his own social network in the field. There were rarely days that would end without celebrations of new friendships. Almost everywhere they were received by higher health service representatives, who would take them to residential areas. First ones to come to him were children, followed by women who openly showed their empathy, and at the end came the sick. The social-hygienic research work started latest at 11:00 in the morning and lasted until late involving visits, tuberculin vaccinations and their controls, gathering data on birth rates and child mortality, after that "polyclinic consultations" for malaria treatment including quinine prophylaxis for enteritis, rickets, ascariasis, measles, and whooping cough.

Eckstein's personality
It is out of question that this highly engaged and charismatic paediatrician with his efficient work and approach to people also won the hearts and managed to generate deep empathy by the population Eckstein worked with. Even today, Eckstein's name is mentioned in Ankara and Istanbul (20). The extraordinary personality as observed by his Turkish colleagues and patients, his energy and happiness in life, genius, and a feeling for the right moment, eidetic disposition (descriptive representation of the undertaken voyages, surprisingly changing scenery of landscapes in Anatolia), incredible memory, adaptability, promptness of his thoughts and team spirit. Dr. Salahaddin Cevded Tekand pointed out in 1998 that those who spoke about Eckstein always indicate his success, while he was referring always to "us" (16,17). The "enthusiastic doctor" managed to combine two things together *"that made him very popular and beloved"*: his "calm responsibility" and "affectionate way" in which he was treating both children and parents (21). Their children along with other children in Ankara were vaccinated against smallpox, measles, typhus, received therapy for malaria or prophylaxis with quinine, and sulfonamide for diarrhoea. Jülide Gülizar was explicit when she in the Cumhuriyet magazine expressed her feelings: *"He left behind a lot of research and studies about Turkish children and the special throne he built in the hearts of their mothers"* (10). Typical for the deeply grateful Turkish people was the triumphal farewell which Eckstein's fans organised in 1950 at Ankara's central train station. Just before the departure of

the train *"Hundreds of Turkish people, many of them with babies and children in arms, came to the train station, one more time to wave him farewell"*. As reported later in the magazine, this was one of the greatest "red carpet treatment" Ankara had experienced ever (13). As Turkey declared war against Germany in February 1945, all Germans in the country were interned, only Eckstein and his family escaped this measure because of his previous remarkable services (3).

Eckstein's Turkish assistants

The Turkish state realised the contractual agreements of hiring additional hands very reluctantly and attached assistants only one by one. In their historical sequence (Dr.'s): Bahtiyar Demirag, who from 1950 on carried forward the work of his teacher in Ankara (10); Neriman Olgür (16,17) and Sabiha Cura (10), just like Selahattin Cevded Tekand and Ihsan Dogramaci (see for both below). Eckstein met Ihsan Dogramaci (1915-2010) by chance during his "Anatolian voyage" in 1938. The tall young doctor grew up in the highest society, was nephew to the local governor, and lived in the governor's palace. This is where he received and hosted Eckstein with his co-workers. Upon return, Eckstein invited him to accompany them as a paediatrician on a five-day research trip through the province and to become a paediatrician (10,13,16,17). After this trip, the young Ihsan Dogramaci became the third in the row of Turkish assistants; later, he worked as a clinician in Ankara. Ihsan stayed in this position until 1940 when he went on his way to the United States and Baghdad (10). One year later, signed with both names, the essay on *"Treatment of summer diarrhoea with bacteriophages"* was published (22), which was a result of joint research work in the new capital of Turkey. After that, the Turkish paediatrician stayed some more time in Washington D.C. and Boston for studies from which he returned in 1949 to Ankara for postdoctoral studies. Dogramaci obviously like other friends shared the enthusiasm of his teacher for the appropriation of his new homeland by photography and film (5)[2]. He played an important role as a professor in instituting the new university. He was founder of the Hacettepe university clinic in 1958 (which later became part of the university baring the same name) (16) and in 1984 of the private Bilkent University (10), *"the first full-fledged private university in Turkey"* (17), both of those in Ankara, a city with three universities in total (19). By the end of the fifties of the last century, the German-Jewish paediatrician and his "former student" (Figure 1) stood among the most prominent persons, founders of the new institutions in Ankara.

Eckstein already tried to provide safe and sustained care for children in the entire Middle East by building the powdered milk factory in eastern Turkey (4). Later, it was Dogramaci who provided this milk distribution in Turkey and thus was able to considerably decrease the infant and child mortality in his country. The friendship between the two German and Turkish paediatricians went even further: in 1954, almost two decades after his first assistant position, Dogramaci gave to Dr. Erna Eckstein-Schlossmann the administrative position in the new Haccettepe Paediatric Clinic, responsible for equipping the facilities. That led to the return of Eckstein's widow Erna Eckstein-Schlossmann to Ankara where she stayed for the next five years until 1961 (4,6). The Lifetime Achievement Award, which was awarded to Dogramaci in Istanbul in 2009 at the 12th World Congress of Public Health by the World Federation of Public Health Associations (WFPHA), came – after numerous earlier awards – as a last point after the extraordinary work of this great man (20).

[2] Dogramaci, Burzu: Die Aneignung der Exil-Heimat durch Photographie und Film. Vortrag gehalten bei der Konrad-Adenauer-Stiftung, Bonn am 22. September 1968.

Figure 1. Dr. Eckstein and Dr. Dogramaci
(Screenshot taken from: http://www.ep.liu.se/ej/hygiea/v7/i1/a3/hygiea08v7i1a3.pdf)

Eckstein's first Turkish assistant was his "travelling assistant", namely Dr. Salahaddin Cevdet Tekand. Although his professional career did not compare to Dogramaci, Eckstein had to rely especially during his travelling through the rural provinces on his francophone assistant (13) and gave him credit for part of his success (19), especially with regard to the establishment of easy contacts with the Turkish peasants and their "warm" and "often touching" hospitality. Tekand gathered over the years as a field doctor an impressive array of experiences. He became the head of the Paediatric Clinic in his hometown Izmir and worked there on children welfare programmes until 1997 (19).

The scientific work

The main question we are interested in here is whether we can agree with the claim made by Henry Sigerist in 1947 that findings and work of social-hygienic assailants acted worldwide as an accelerator in the development of health sciences (23). The unprecedented successes of Eckstein prove that the amended social-hygienic model that he used had the potential for population wide health care. Using this approach experts displaced from Germany triggered innovations in the health services of their host countries.

The essential factor for success of the assailants in the field of social-hygiene was the developmental status of the target countries. Many of these were countries under development such as Turkey, Palestine, and Latin America, where they could use their know-how in health sciences. On the other hand, they failed to achieve the same in industrialised developed countries, mostly because of the high professional competition. Two factors were predominant in decision making of the German-Jewish assailants: the degree of persecution in Germany and the legislation regulating the medical profession in host countries. Eckstein was

afraid of the lack of social security in the US, wherefrom he got an invitation, but he was not afraid of the need to learn Turkish. That was a new and strange language, in which he soon wrote a textbook, the first textbook in Turkish on infant diseases (3). Eckstein was led by a powerful urge to write. During almost 15 years in Turkey, during long working days, on the road, along with never ending planning, helping, creating new guidelines, and organising other staff, he wrote 50 publications. Many of those publications are even today relevant due to their clarity and realism. Many of the data in these publications originated from the comprehensive research which started in 1940.

In Turkey, the still undeveloped country at the gates of Asia, he was always following his favourite thesis about "quite different, non-textbook conditions" of otherwise well known paediatric diseases, especially in the rural villages they visited on their trips: *"Diseases and their forms show partially a different course from those we can find described in our textbooks. Other diseases - such as the examples of malaria or necrotic ulcerative stomatitis - can confront the paediatrician with the task, to find new ways as... the specificities of childhood must be taken into account"* (19). Insight in scientific gains made by Eckstein on his voyages could be seen in his monograph "Malaria in childhood" (24), published in 1946. On the front page of this publication the author and professor in Ankara described himself, 11 years after his flight from Germany, still as *"former full professor... at the Medical Academy in Düsseldorf"*. Here he dedicated a 100-page chapter of the text to Arthur Schlossmann. The text was written on never before systematically described forms of diseases, here "non-textbook" forms of malaria among children that Eckstein learned to diagnose and treat during the decade he travelled deeply into the Turkish countryside. Unusual forms of malaria among children revealed occasionally just strong thirst or insomnia with strange behaviour and consciousness disorders. Lethality was strangely high and made up for a large part of total mortality in the population. Child mortality from diarrhoea could be largely reduced in malaria regions through "energetic treatment" with anti-malarial drugs. With 90 case reports, Eckstein showed some common childhood diseases with symptoms, temperature charts, differential diagnoses, congenital illness, and malaria among infants, complications, protracted and foudroyant coma, recurrence, combinations with other diseases, especially with typhus abdominalis and tuberculosis, chronic malaria, consequences and therapy. Even more, he compiled *"more than 1000 clinical observations of interest"* from his survey research.

Already in one earlier publication "Encephalitis in the children's age", published in 1929 (25), he collected with the same objective different forms of encephalitis among children and how they were described in the literature. This was a compilation of new observations which contributed to the understanding of encephalitis among children, to be distinguished from the clinical picture in adults. As an example, during chronic encephalitis in adults, physical changes manifest as immobility and lethargy, while among children and young people different types of asocial behaviour can be found. Almost all cases of acute encephalitis among children lead to incomplete healing and transfer over time into chronic forms of illness.

Concluding remark

For 14 years, Eckstein lived and worked in Ankara. After 1945, for the successful assailant, the question of remigration appeared. A number of honours from post-war Germany indicated that Eckstein not only was remembered, but he was also needed. The Medical Academy in Düsseldorf awarded Eckstein the honourable citizenship in 1948 (9,26), and that same university as well as four other German universities offered him a full university professorship in paediatrics. At the end, Eckstein accepted the sixth offer from Hamburg. His inaugural lecture covered the theme *"Problems of paediatric care in Turkey"* (3,4). In 1949,

Albert Eckstein came back to Germany [no more than 5% of the German-Jewish émigrés returned to the country of their origin (27)], but one year later he died at the age of 59. Among the exiled German-Jewish professors, Eckstein was the most outstanding professional in the field of social-hygiene and early health sciences, and vice versa, he was its classical product – if one can say so. Eckstein stands among the assailed scientists in Turkey as *"grotesque deviation of history"* to those who most impressively reflected back the *"shameful expulsion"* (28).

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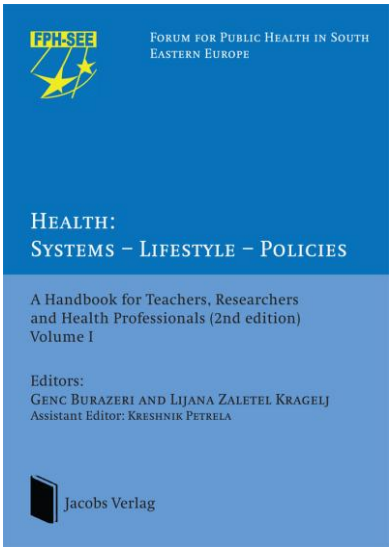
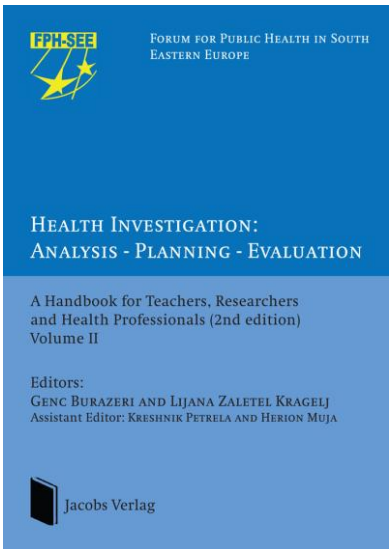


Health: Systems – Lifestyle – Policies

Forum for Public Health in Southeastern Europe Vol I A Handbook for Teachers, Researchers and Health Professio-nals (2nd edition) Editors: Genc Burazeri and Lijana Zaletel Kragelj Assistant editor: Kreshnik Petrela. Lage 2013, 455 p., ISBN 978-3-89918-806-6, free of charge



Health Investigation: Analysis – Planning – Evaluation

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