

GEOGRAPHIC INFORMATIC SYSTEMS

Ladinia ARDEU, Dorin BARDAC
 “Lucian Blaga” University of Sibiu

ABSTRACT. The **hypothesis** of this study consists in demonstrating based on statistic data, if the patients' anxiety and the frequency of dysfunctional thoughts can be decreased with psychotherapeutic interventions and the observation of influences on arterial tension values as well as the influence on the C-reactive protein. **Methods:** The test specimen includes 89 patients with collagen illnesses associated with specific cardiovascular illnesses. The patients were recruited from the Internal Medicine department of the Emergency County Hospital Reșița, diagnosed with collagenosis (PR, SA, LED, DM, Sdr. Sjogren) associated with specific cardiovascular illnesses (HTA, FA, BRD, BRS, Angina pectorala, IM). Our test specimen included 33 patients with collagen illnesses and related cardiovascular illnesses that are exposed to psychological questionnaires (ATQ and HARS), coming from urban and also rural areas, with ages from 24 to 70, among which 15 are males and 18 are females (fig. 1b). All the patients agreed to participate in this study and all of them gave their approval. The study and the application of evidence had in its vision obedience of the ethical norms and professional ontology. **Results:** the influence of psychic factors on collagen illnesses associated with cardiovascular illnesses. **Conclusions:** On the studied group it was observed that most of the people with collagen illnesses are also affected by cardiovascular diseases that, as a result from clinical and paraclinical tests, are estimated to be a risk factor for the studied patients and also through psychological interventions we can identify the neurotic patients' psychological pattern.

Keywords: psychic factors, cardiovascular illnesses, collagen illnesses, psychological questionnaires.

INTRODUCTION

It started from the premise that, through development of methods and algorithms for automatic and semiautomatic selection of data it can be obtained conclusive connections regarding the determination of areolas of presence for: diagnostic and treatment units in occupational medicine field and professional diseases connected through professions in Arad County, but also at national level.

MATERIAL AND METHOD

Identifying the problem:

The research made regarding the utilizations of geographic informatics systems worldwide and in Romania shows a decreased utilization of a SIG for activities concerning occupational medicine in Romania.

Possible causes of the problem may be related to the components SIG that were not developed in occupational medicine system in Romania:

- staff: there isn't any staff trained to utilize the concepts and methods SIG and who can perform data

acquisition, manipulation and analysis, presentation of data;

- hardware and software;

- spatial data;

- law regarding occupational work doesn't stimulate, but nor prohibits utilization SIG for setting priorities, evaluation of health actions, presentation of data;

- it doesn't exist any institute from Healthcare System with attributions expressly to promote the use of SIG;

- it doesn't exist projects SIG which can prove viability and which can be the basis of legislation applicable in occupational medicine system.

Alternative solutions:

To increase the use of geographic informatics systems in occupational medicine in Romania I consider that we need to include staff training activities, information to policy makers and legislative action.

Creation of geographic informatics system with data regarding occupational medicine in Arad County, considers county-level information system analysis, existing software versions and how to input data and calculating indicators based on data format.



Source: Digital database of Romania: 1:10 000 Arad County, ESRI Romania

Action – Projecting SIG

Identification of objectives

Creation of geographic informatics system with data and indicators for occupational medicine in Arad County is the main objective. Currently there aren't performed any data analyzes and presentations of occupational health based on SIG.

Creating the project database

- To project the database includes identification of necessary spatial data based on analyzes intentions, determination of entities attributes included, delimitation of study geographic zone and selection of which coordinating system will be used;
- Electronic data processing involves digitizing or converting data from other systems and formats into a usable format, and data verification and correction of errors;
- Database management which involves verifying coordinate system and intersection adjacent layers.

Creating the project database is the most critical and time consuming from the whole project. Accuracy of data included in the project determinates the results accuracy.

Delimitation of the zone and population studied

Physical and geographical conditions

Model GIS for occupational medicine in Arad County considers the present existing territorization and which is distinguished through the:

- Physical and geographical conditions;
- Hydrology;
- Climate.

Physical and geographical conditions:

Located on the west side of the country, Arad county lies from the hurt of Apuseni Mountains till the

wide and plain filed, formed by Mures and White Cris, being crossed by important routes of national and international communication.

Geographical position of the region is extremely advantageous, being at the crossing of important European roads, where the cultures and civilizations of Occident interferes with the Orient.

Arad County occupies an area of 7754 square kilometers, equivalent to 3.65% of the Romanian territory, being the sixth district of Romania regarding the surface.

Regarding administrative way, the territory is bordered by Bihor County on North, Hunedoara and Alba in East, Timis in the South part and on the border with Hungary.

Variety of the landscape: alternation hill-plain-mountain: Mures Valley, White Cris, mountain zone Moneasa, Halmagiu, Zărand, the landscape from Codru Moma mountains (Bats Cave, The cave with water from the mill), lakes (Ghioroc, Taut), vineyards zones (Podgoria Aradului, Târnova, Ineu).

Hydrology

In terms of hydrology, Arad is distinguished by the presence of three major rivers that cross the county from east to west: Mureș which drains the southern part of the county over a distance of 250 Km, registering on these covered a bump of about 78 m and a catchment area of about 4800 km, Cris White and Black, in the north of the county, bordering Bihar county. It is noteworthy that all these rivers and borders have a transboundary character. Arad has numerous lakes, many in Mureș Floodplain, and lakes that can remind anthropogenic accumulation of the Taut.



Climate

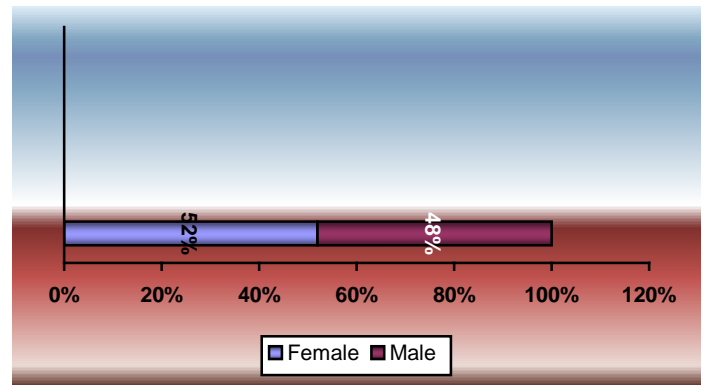
The natural landscape of Arad County is characterized by the existence of a temperate continental climate with oceanic influences. The average of temperatures oscillates between 8°C on mountains and 11°C at plain. Winters are mild and summer are hot. The average annual precipitation recorded values between 600-1000 mm / m. Winds are conditioned by relief distribution, movements of air masses with guidance from south to east.

Selection of data and occupational medicine indicators at county level.

Economical data:

The Arad County population has 454.073 habitants

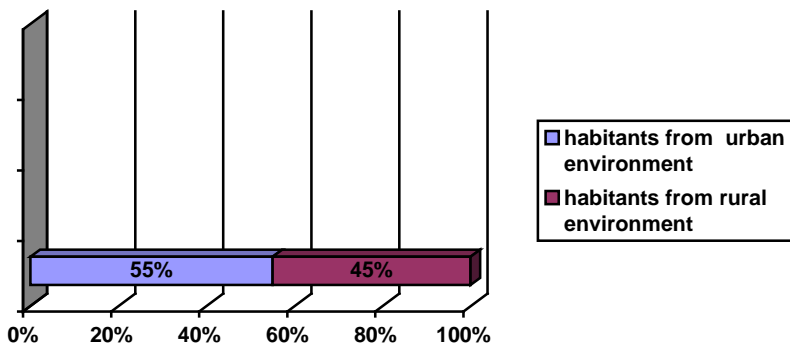
- Density is about 59 habitants/km²
- Population repartition by gender: 48% male and 52% female



Repartition of population after living environment:

- 55% habitants from urban environment
- 45% habitants from rural environment

Repartition of population after living environment



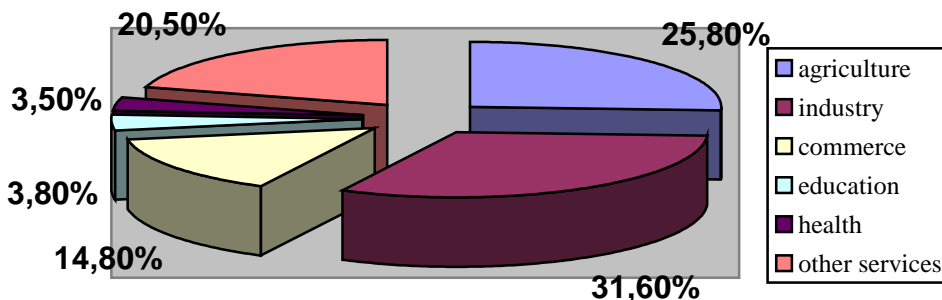
- From which 167.024 active population



Repartition of population after activity sector:

- agriculture 25,8%
- industry 31,6%
- commerce 14,8 %
- education 3,8%
- health 3,5%
- other services 20,5%

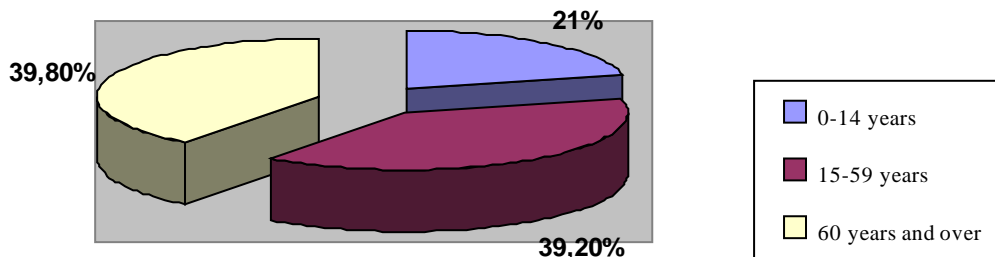
Repartition of population after activity sector



Repartition of population after age groups:

- 0-14 years 21%
- 15-59 years 39,2%
- 60 years and over 39,8 %

Repartition of population after age groups



Main industrial branches and the most representative companies from Arad:

- Truks - Astra Trinty si vagoane de călători - Astra Vagoane Călători;
- Furniture and accessories for furniture: Imar, MGA, Cotta International, Feroneria;
- Confections and textiles: Sabina & Co, Moda, TEBA, Manitoaba;
- Food industry: Petra, Indagrara, Arvinex, Arbema - Brau Union Romania;
- Motor industry components: Leoni Wiring, Takata-Petri Romania;
- Electronic components: Eastern Technology;
- Counter: Contor Zenner, Victoria;
- Footwear: West Shoes Industry;
- Paramedical equipment: Sanevit.

Morbidity dates: professional and related to profession

Occupational diseases are diseases that occur as a result of the exercise of a trade or profession nuisances caused by physical, chemical, biological or psychosocial job characteristics, and the overuse of various appliances and systems in the body work process, regardless of type of employment contract exists between the employer and employee

There are considered professional diseases those produced in the conditions mentioned above, diseases suffered by pupils, students, and apprentice during practice.

Specific appearance of professional morbidity in Romania, on social economical field in 2009 is shown on Table Nr.1.

Table Nr.1

Branch	Nr of new cases	Nr of workers	Incidence at 100,000 workers
Total	1065	4.774.000	22,31
Agriculture, forestry and fishing	17	110.000	15,45
Extractive Industry	115	75.000	153,33
Processing Industry	655	1.118.000	58,59
Production and supplying electric and thermic energy, gas, hot water and air conditioner.	30	78.000	38,46
Water distribution; sanitation, refuse administration, decontamination activities	0	100.000	0,00
Constructions	25	404.000	6,19
Commerce actions; reparation of motor vehicles and motorcycles	7	816.000	0,86
Transport and storage	52	282.000	18,44
Hotels an restaurants	2	118.000	1,69
Information and communication	3	114.000	2,63
Financial and insurance agencies	1	107.000	0,93
Real estate transactions	0	29.000	0,00
Professional activities, scientific and technical	4	134.000	2,99
Administrative professional and support activities	4	192.000	2,08
Public administration and defense; social insurance form public system	5	225.000	2,22
Education	7	394.000	1,78
Health care and social assistance §	62	378.000	16,40
Show activities, cultural and entertaining	21	56.000	37,50
Other activities from national economy	5	44.000	11,36

Source – National Institute of Public Health Bucharest, 2009

Average number of employees in 2009, on national economical activities as for Statistic Romanian Year Book- time series, 2009.

Is ascertained a maximum incidence in: extractive industry, followed by processing industry, production and supplying with electric and thermic energy.

Situation of new cases regarding professional diseases, declared in Romania between 1981and 2010, is introduced in table Nr. 2, respectively, between 1989 and 2010, in table Nr.1.

Evolution of new cases regarding professional diseases in Romania, between 1981 and 2010:

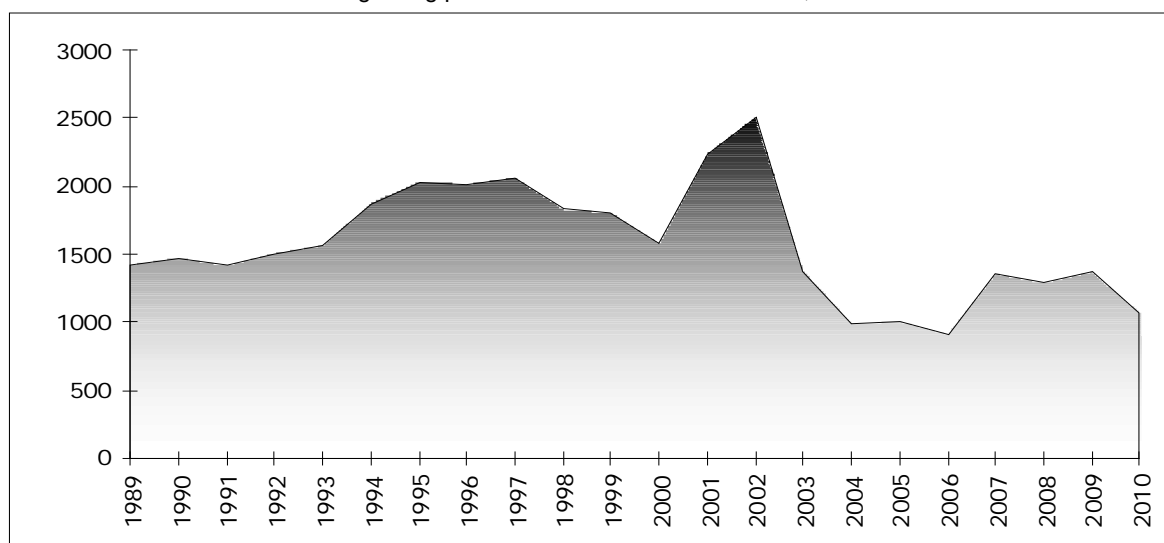
Table. Nr. 2

Year	Nr. of new cases	Year	Nr. of new cases
1981	2568	1996	2015
1982	2464	1997	2060
1983	2231	1998	1828
1984	1683	1999	1802
1985	1498	2000	1576

Year	Nr. of new cases	Year	Nr. of new cases
1986	1426	2001	2238
1987	1384	2002	2508
1988	1294	2003	1376
1989	1423	2004	990
1990	1470	2005	1002
1991	1414	2006	910
1992	1506	2007	1353
1993	1562	2008	1286
1994	1875	2009	1366
1995	2031	2010	1065

Source – National Institute of Public Health Bucharest, 2009

Table Nr. 1- Evolution of new cases regarding professional diseases in Romania, declared between 1989 and 2010



Source – National Institute of Public Health Bucharest, 2010

Is ascertained that the maximum number of declared professional diseases in Romania was registered between: 1981 and 1983, 2001 and 2002 and 1995 and 1997, respectively over 2000 cases.

Occupational health services connected with Pension House

I suggested the analyze of services from occupational medicine, existing in Arad County. The dates were extracted from the current situations and included in table format with related columns, suitable for each territorial administrative unit with the number of suppliers on categories and financing, again on categories. **Definition and analyze of dates category**

Statistic dates are a part of current report from Arad County Statistic Board, and also from National Institute of Public Health Bucharest, National Centre of Risks Supervision from community environment, Department Occupational Health and Work Environment.

Stable population at 1th of July represents the population consists of people from a certain locality, with residence and place to live, in that locality at that moment. According to database from the last census there are calculating the

external clearance migration, the movement clearance migration with the change of residence, and also the movement migration of where someone lives, phenomenon registered between census and that moment.

Work represents a full-conscious activity, leading to the development of goods and works for the material and spiritual needs of people. It can be done individually or in a team and always has, directly or indirectly, a social character.

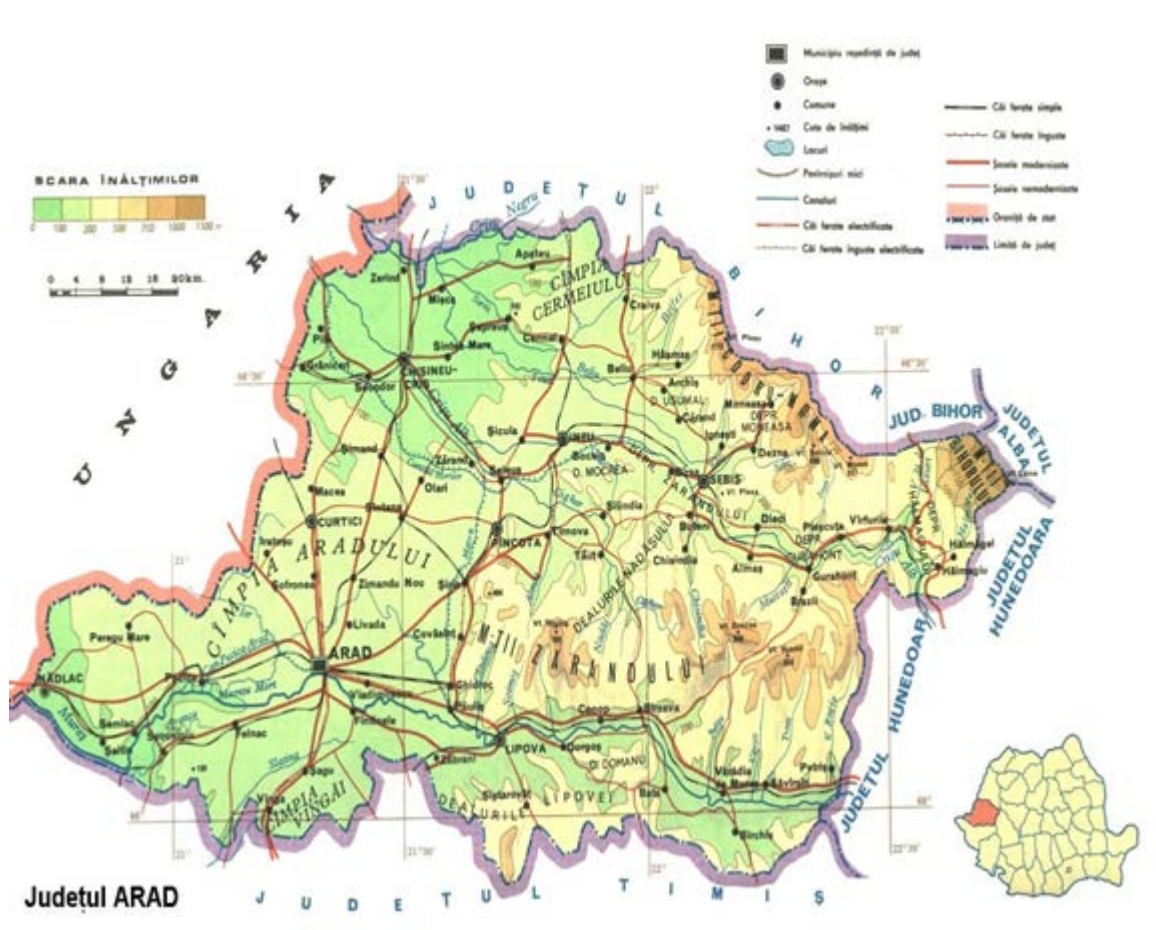
Profession requires acquisition of theoretical and practical knowledge to enable development work in a particular field.

Occupational disease is a condition whose etiology is a harmful agent in the workplace linked to the exercise of a profession. In this case, agents working environment have chronic actions that prolonged exercise at low concentration. For an agent from the working environment to be recognized as an etiologic factor of occupational disease, there must be evidence of a relationship between substance absorbed in the body and it's adverse effects produced by this.

Organization of data and indicators in electronic format

For elaborating the maps which will be presented further on, it was used the public cartographic support scanned. The scale used is 1:100000. There were elaborated the map of territorial-administrative units for the whole Arad County, localities centers, roads, railways,

hydrographic network through digitalization of topographic maps. There are presented in the next two maps physical and geographical features- Map of Arad County (Map 1) and delimitation of territorial-administrative units in Arad County (Map 2).



Map 1 – Arad County- Physical and geographical features



Map 2 –Territorial-administrative units from Arad County

Final results waited from SIG project

- Occupation risk factors
- Standard rate of professional diseases incidence and those related to profession, on localities, in 2010
- Number of Occupational Medicine Physicians at 1000 habitants in 2010
- Number of Occupational Medicine consulting rooms at 1000 habitants in 2010

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