

## Recognition of Geographical diffusion Esophagus Cancer in Southwestern of Caspian Sea

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**Abstract:** Esophagus Cancer is an important disease in Iran and has second rank of death after heart disease, in north of Iran this disease has maximum diffusion and has arrangement of Iran in Asian belt of this disease. Environmental and climatically conditions in each area could be helpful toward diffusion and out breaking diseases, like as Esophagus Cancer. Rate of appearing this disease in recent years in Iran and especially in Gilan province (Southwestern of Caspian Sea) has increased that this problem could be very importance by cost ill and its problems. The aim of this paper is recognition of geographically diffusion of Esophagus Cancer in Gilan and presents it by map. The research method of this paper has used from medical documents diseases from hospital, library document studies (Soil, Geology and climate) and field work from 2001-2005 years. Results of this paper has showed that Esophagus Cancer (most rate) rather than on mans ,and it has more diffusions in central area in province of Gilan (Talesh, Lahijan, Someh sara and Rasht) and environmental factors such as, soil factor (Lithosel and Brown forest , climatically factors (season and cold course) and has relationship effectives on Esophagus Cancer diffusions and its presenting by map. This paper has written in framework at Geography of Health (Medical geography) that Geographical scattering an important of this paper, than this essay must be complete by other specialists (Environmental and medicines).

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### 1. Introduction

Esophagus Cancer is the ninth prevalent cancer in the world and one of those diseases that has become prevalent among the people of the world in the recent years, and after cardiovascular diseases is in the second degree of importance (Hoda, 2003, P. 84). Between each nine death in the world, one of them is because of cancer (Rezvani, 1995, P. 1). About 70000 cases of a new cancer happen in Iran, annually, that 450 cases are head and neck cancer, and in the world, 500,000 persons catch this cancer that about 300,000 persons of them die (Harirchi, 2007, P. 6). Mechanism of this disease (Esophagus Cancer) has not been known up to now (Mirhosseini, 1998, P. 100). Cancer of digestion system diseases that Esophagus Cancer is in the first rank, is in the first rank in northern side of Iran and Iran is located at the Asian Belt of this disease (Porahmad & Yavar, 2001, P. 14). Geographical distribution of this disease is surrounded between western coasts of Caspian Sea and China in the eastern side. Some regions in Iran, regions of central part of Asia, former Soviet Union, Afghanistan, Siberia and Mongolia are those regions where are consisted by this disease. In China, the first reason of death is Esophagus Cancer among all different types of cancers. This belt passes across the northern side of Iran and south side of Caspian Sea,

and in the highest level in Torkaman Sahra. Outbreak of this cancer is 130 persons per each 100 thousands persons in China and 114 persons per each 100 thousands persons in Coastal Parts of Caspian Sea (Rabinz, 1990, P. 17, 18).

Rampancy of this disease has been known related to environmental factors and type of nutrition. Introduction to geographical spreading out of this disease and its relation with human environment is one of interesting specialist cases for geographers that is classified in Medical Geography Branch or Health Geography, such a way that with consideration to the dependence of human to the environment and its gradual effect on human body physic, dependence of health and sickness in human life, is one of environmental important roles. Therefore, a physician may treat accurately through knowing the geographical environment and its related factors for diagnosis of a disease. As Boghrat said, "Each person who is eager in Medicine Science, must pay attention to the effects of seasons." (Shokouhi, 1975, P. 345, Houshvar, 2002, P. 10). Effect of climate conditions on diseases is called by researchers of Medicine Science as Meteor-pathology, Climo-pathology and Bio-climatology Medicine (Houshvar, 1998, P. 6). Duty of the Medical Geographer is discovery of the center of the

disease, determination of geographical dispersion of the disease, determination of those geographical reasons and factors that cause to appearance and distribution of the disease, and also the natural dams (such as sea, mountain, plain, desert, wave, coldness and so on) against each epidemic disease (Houshvar, 2002, P. 6-28). Regarding to this matter, Mac Gelashen has discussed about the environmental facts and elements in its all dimensions, human and disease and health, and in a two-way relation for human health and disease societies, in Medical Geography Book, and more than the other facts, climate and weather factors has been paid attention (Jafarpour, 1996, P. 153), and for drawing up of the relation between human and nature, Topo-clima factors and preparation of the related maps for diagnosis of disease have been known very important (Meloinhou, 1970 and Janioso, 2003 and Graham, 2004). In Ghanoun, Medical encyclopedia, Ebn-e-Sina, geographical distributions of a lot of contagious and non-contagious diseases, and climatic conditions on health and sickness, even type of disease and its outbreak have been explained (Khatami, 2004, P. 755). Different studies related to types of cancers indicate the importance of the effect of environmental and genetic facts on sickness, whereas, identification of the genetic facts is so hard, it seems that through changing of environmental conditions, prevention of cancer diseases may be possible in a wide range (Mirhosseini, 1994, P. 101) such a way that the environmental facts have been considered up to 80-90% for all types of human cancers. Mirhosseini during study on health and standard of disease thinks that a high ratio of cancers is related to the environment facts. Primary study of this disease indicates that it is related to five factors: Atmosphere, soil, natural geography, living creatures and time, such a way that shortage of vitamin and Tanon in foodstuffs, Mo. (Molybdenum) in soil, increase of Ammoniac and Nitrate in the air and water may cause to increase of Nitrosamine (Mirhosseini, 1994, P. 103).

The most important environmental facts that are known related to Esophagus Cancer consist of:

1. Cigarette, Alcohol and Opium
2. Ray radiation and usage of alkaline
3. Social-economical status (shortage of some vitamins such as A and B2)
4. Different kinds of pickles, hot drinks and foodstuffs (hot tea)
5. Pollution of foodstuffs with Silica (Si) crystals and polluted fugues in corns.

Food shortage of Molybdenum, Zinc and Vitamin A cause to increase of this disease. As Molybdenum would be in low amount in soil (less than 0.2 micro-gram, availability of Molybdenum is

measured by soil PH. Soils with PH more than 6-6.5, rarely need to Mo., soils with PH less than 6, because of surface absorption with hydrous oxides, are low and critical amount in alkaline soils, is 0.95 micro-gram in the lieu of one gram soil, too (Tandon, 2004, P. 73), change of Nitrate Amine increases in the plant (Rabinz, 1969, P. 18). Accumulation of Nitro Amine in stomach of people will cause to increase the probability of cancer and through increasing of Molybdenum to the soil it change to the form of Molybdate Ammonium that will decrease the danger of cancer (Malakouti & Kahrati, 2005, P. 170). Increase of Nitrosamine in foodstuffs may cause to be increased in cheese, mutton, yoghurt, baked bread and paste indicate its high outbreak. With consideration to this matter that Esophagus Cancer is the ninth prevalent cancer in the world, and in developing countries is in the fifth rank (Rezaei, 2001, P. 113) and in most European countries such as United Kingdom, Fenland, Island, Australia, Eastern South part of Africa, Brazil, Kenya, Malawi, France, Kourachao (in western north side of Venezuela) it may be seen and is in the high degree of importance in the view of introduction to sickness, relation between sickness and environmental facts and its prevalent (Paoliko, 2004, P. 420).

6- Environmental pollution (Azote and Nitrate fertilizers): Azote fertilizers and usage of them in agriculture may cause to increase Nitrate in soil, botanic, human and animal organisms. Experiments indicate that accumulation of Nitrate in potato is very high with consideration to usage of Azote fertilizers.

7- Radiation of radioactivity of isotopes in mother stones, specially, acidic stones is very high, those soils with heavy and clayey structure that are radiator are of light soils, in gravelly soils, amount of Molybdenum is low, and in soils made of clayey and Ganity minerals, amount of Molybdenum is high. In new volcanic soils and those soils that have high organic materials, amount of Molybdenum is high (Shakouri, 2004, P. 134-140).

Target in the present research is introduction to geographical distribution of Esophagus Cancer outbreak and its relation with geographical environmental facts in Guilan Province.

## 2. Material and Methods

Study method of the research is usage of field observations, analyzing and description. At first, through drawing up of questionnaires and related tables, direct observance of medical files in hospitals, repeated reference to medical-treatment centers, and interview with specialists, statistic of patients during

statistical period between (2001-2005) has been gathered that totally 351 cases of this sickness, confirmed by specialists (physician) has been selected (Hanife, 2006, pp 45). Then, with consideration to the responds to the related questioners and requirement to the present research, the responds have been classified and geographical variance of Esophagus Cancer sickness in Guilan province, on the basis of the place of residence, gender, monthly and seasonal references, the related maps has been prepared using the software of data systems. Then, with consideration to the weather and meteorology statistics and using the soil map (required elements of this disease (Molybdenum)), also using the type of effective soil, the related map has been prepared and by gathering the maps, the probable centers for its prevalent have been known and also the relation between the location of sickness (region) and environmental conditions in the maps has been determined.

### 3. Results

Registered statistical society (population) has been the numbers of suffering persons to Esophagus Cancer in Guilan Province, as from year: 2001 to 2005, who were 351 cases and has an notable increasing process that between these persons, about 77 cases, their places of birth and residence are not clear. The most rampancy of this disease is related to the year: 2005 (35%) and the less statistic is related to the year: 201 (6%). The form based on the age and gender, out of total cases of affliction to Esophagus Cancer during the statistical period is 210 men (60%) and 141 women (40%). Esophagus Cancer in the ages between 61-80 years are more prevalent, and in age group of 51-60, affliction rampancy in two genders (female and male) has a small difference. But in higher ages, affliction of the men is more than the women (Table 1,2).

**Table 1.** Affliction rampancy to Esophagus Cancer in Guilan Province (/2001-2005)

Total %	Number	Year
6	23	2001
7	24	2002
24	83	2003
28	98	2004
35	123	2005
100	351	Total

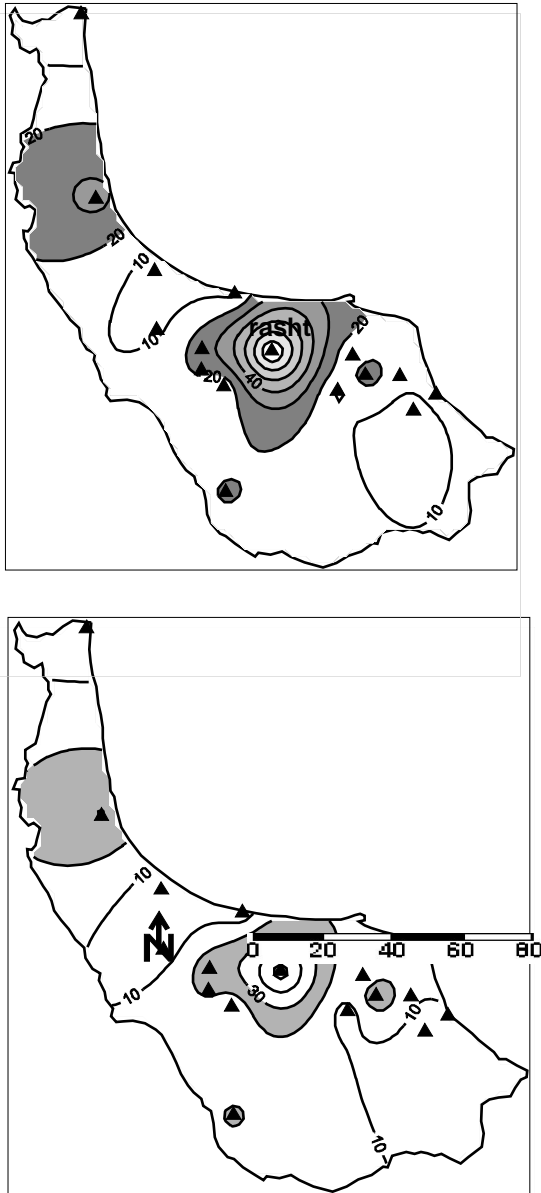
**Table 2.** Number and percentage of rampancy of the patients suffering from Esophagus Cancer, divided to the gender and age (2001-2005)

Age Groups	Numbers of observed cases					
	Tot al	Tot al %	Wom en	Wom en %	Men %	Men
0-10	-	-	-	-	-	-
11-20	-	-	-	-	-	-
21-30	2	0.7	1	0.3	0.3	1
31-40	14	4	10	2.7	1.2	4
41-50	39	11	13	3.7	7.4	26
51-60	56	16	26	7.4	8.6	30
61-70	110	31	44	12.5	18.8	66
71-80	114	32.6	38	10.8	21.7	76
81-90	13	3.7	8	2.3	1.4	5
91-100	3	1	1	0.3	0.6	2
101-110	-	1	-	-	-	-
	351	100 %	141	40%	60%	210

Out of the entire statistical society (population), 274 cases, their place of birth were clear. Number of 17 cases (6%), place of their birth were out of the province, and the most rampancy of the place of birth of the patients suffering from Esophagus Cancer are in Rasht, Talesh, Lahijan, Fouman, Somehsara and Roudbar.

Out of the entire statistical society (population), 300 cases, their residence place were clear. The most rampancy of the place of residence has been in Rasht, Talesh, Lahijan, Somehsara and Fouman. It seems that Esophagus Cancer has had more outbreak among those persons that was born in their residence places, and on the other hand, genetic transfer of this disease indicates that must be studied by medicine specialists (Figure 1).

In the view of the season of suffering patients from Esophagus Cancer, the most reference has been in autumn season (26.49%) and the less reference has been in winter season (23.36%) (Table 3) that in another similar research in the eastern side of Mazandaran, the reference season has been as the same as seasonal distribution in Guilan province (Farzanehfar, 206, P. 83).



**Figure 1** Geographical rampancy of Esophagus Cancer in Gilan Province on the basis of the ( place of birth ) residence (2001-2005)

**Table 3.** Seasonal distribution of the patients suffering from Esophagus Cancer

Season	Total numbers	Men	Women
Spring	87	53	34
Summer	89	55	34
Autumn	93	56	37
Winter	82	46	36
	351	210	141

In the view of spatial and seasonal rampancy, reference of the patients to the hospital in winter season, in Talesh and Rasht counties, and in autumn season in Roudbar and Roudsar counties, in summer in Astaneh Ashrafieh and Anzali counties, and in spring season in Roudsar and Rasht counties are seen that its geographical distribution, except Rasht city, is in the most level in southern regions of the province (autumn season), western north regions (winter season), northern regions (summer) and eastern regions (spring season), (Table:4).

**Table 4.** Seasonal percentage of the numbers of the patients suffering from Esophagus Cancer in the counties

	Winter	Autumn	Summer	Spring
Talesh	36	20	28	16
Lahijan	40	15	30	15
Anzali	12.5	12.5	50	-
Roudsar	8	31	23	28
Rasht	28	27	20	25
Roudbar	22	33	33	12
Astaneh	9	18	73	-
Ashrafieh				

In order to study of the relation between regional elements and spreading out of the numbers of the patients suffering from Esophagus Cancer, the monthly changes of the regional elements and numbers of the patients have been used. In order to usage of Pierson Correlation Method and introduction to the type of the relation between regional parameters and the sickness, the statistics of those cities were used that had the most or the less numbers of the patients. P-Value method was used for the related test. Whereas, the subject of the research is related to the human life, the least relation (weak correlation) has been important and meaningful for the researcher, such a way that in some cases P-Value would be more than 1%, there is not any sufficient reason in  $\alpha=1\%$  that correlation is zero (Negahban, 2001, P. 71).

In the view of monthly changes in rainfall and numbers of the male and female patients suffering from Esophagus Cancer in Rasht city, indicate that in those months that the amount of rainfall decreases, references of the male and female patients decrease. Monthly changes of temperature and numbers of the male and female patients indicate that in those months that the temperature is in increasing process, reference of the patients decrease, visa versa, in those months that the humidity increases, references of the patients decrease and visa versa. Such a way that in another research that was

about the Topo-clima relation of the cardiovascular patients of Rasht and Manjil has been studied, increase of relative humidity has had a converse relation with cardiovascular patients that this matter needs to more investigation in the medical and genetically view. It must be added that this research has been fulfilled in the geographical-medical (health) view and need to more specialty studies (regional data are in daily aspect) (Ramezani, 2005, P. 26, Table 5).

**Table 5** Final relationship between regional elements and numbers of male and female patients suffering from Esophagus Cancer in some counties in Guilan Province (1=positive relation), (-1=negative relation) and (0=without relationship)

	Rainfall	Max. Temp.	Min. Temp.	Max. Humidity	Min. Humidity
Total in Talesh	1	-1	-1	0	1
Male in Talesh	1	1	1	-1	-1
Female in Talesh	1	-1	-1	1	1
Total in Rasht	-1	-1	-1	-1	1
Male in Rasht	-1	-1	-1	-1	-1
Female in Rasht	1	-1	-1	-1	1
Total in Lahijan	1	-1	-1	1	1
Male in Lahijan	1	-1	-1	1	1
Female in Lahijan	-1	-1	-1	1	1
Total in Roudbar	-1	-1	1	-1	1
Male in Roudbar	-1	1	1	-1	-1
Female in Roudbar	-1	-1	-1	1	1

In the view of relation of the soil with spreading out of those patients suffering from Esophagus Cancer in the Province indicates that the amount of Molybdenum in the soil is one of environmental facts that is effective on development of Esophagus Cancer. Such a way that its low amount in soils will cause to increase the absorption of Nitrosamine and consequently to increase the Esophagus Cancer. In an experiment that has been fulfilled on one gram of soil indicates that when the amount of Mo would be less than 0.2 micro gram, in the lieu of 1 gram of soil, that type of soil is classified in those soils that have shortage. In the case of dispersion of type of soils in different regions in the

province, in the view of the amount of PH and consequently, availability of Mo in them, we can say that in the regions of Astara, Talesh, totally, western side of Guilan Province, Lahijan and Roudsar regions, because of high rainfall and mass botanic covering, and consequently accumulation of organic materials in the surface of the soil, the interaction of the soil is acidic and is variable between 4.5 to 6.7. In eastern side of Guilan Province, (Sepidroud delta, as from Rasht to Astaneh Ashrafieh) interaction of the soils are neutral to a little alkaline and is variable between 7 to 7.8, because the resource of its precipitates originate from aquiferous basin of Sepidroud and out of the province. Consequently, its original materials are limy and because of being new of the precipitates, cleaning of the lime is low and does not continue in high depth, but also it has happened on the surface of the soil.

forests

#### 4. Discussions

Study of geographical spreading out of Esophagus Cancer in Guilan Province indicates that in the view of gender, outbreak of this sickness among men is more than women. Difference of affliction of this sickness in men and women, about Stomach Cancer is less. Esophagus Cancer happens in age group of 61-80 years old, more. The most reference of patients suffering from this sickness to treatment centers has been in Oct, Feb of Autumn and Summer seasons, and the least reference is in winter. We can say that this sickness is related to the seasonal outbreak arising the environmental facts that needs to be studied through more specialty studies.

Dispersion of the type of soil and its relation in those regions that Esophagus Cancer is more prevalent in there, a wide area of these regions are covered by soft alluvial soils, humid and semi-humid grassy soils, forestall gray and brown soils, and Lithosel soil consisting of external stones. And in those regions that this sickness is seen less, are covered by Lithosel soils in the regions of forestall brown soils, Lithosel consisting of external stones in the regions of brown soils, limy Lithosel and Sirozem in the region of brown soils. We can say that the soils, in the view of physical and chemical specifications, may affect on geographical spreading out of Esophagus Cancer, such a way that the most outbreak of this sickness can be seen in the around of those regions that are covered by Pouzolick red soils, alluvial and semi-marshy soils, and the regions that the sickness can be seen in the least degree, are those regions that are covered by limy and brown Lithosel soils and forestall Lithosel soils. This matter should be completed by more researches and studies of the related specialists.

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