The social determinants of cancer: the case of Eastern Morocco

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ABSTRACT

The article focuses on the links between cancer and socio-demography and socio-economy from an epidemiological point of view. The relative contribution of various risk factors in the frequency of these cancers significantly demonstrated inequalities. A large part of the paper is devoted to a description of cancer according to socioeconomic, demographic and geographic levels, and to the locations of the dominant cancers in Eastern Morocco. Social inequalities in the field of cancer are particularly important. A total sample of 6428 cases of various cancers detected at the Regional Center of Oncology of Oujda was analyzed between years 2005 and 2010. Women were dominant with 4317 persons (67%) versus men with 2111 persons (33%). Most of these cancers were found in the two large cities of the eastern region, namely Oujda and Nador, and mainly affected the poor, most of which (80%) were out of work and generally over the age of 41. Among the cancers listed, those in southern cities were fewer than those of other cities. Several determinants were noted for their connection with cancer, including socio-economic wealth, cultural level, lifestyle, genetic and environmental situations. Reduced levels of exposure to certain risk factors, especially in disadvantaged groups, ought to reduce the inequalities in incidence, and hence inequalities in mortality. At the same time, a better information on the inequalities in healthcare in the broadest sense (including early detection), would help identifying successful interventions for reducing social inequalities in cancer prevalence. This implies that the social situation of patients, specifically the level of education or socio-professional category, be systematically documented. People with higher income and education levels are more likely to participate in cancer screening.

Keywords: Regional Center of Oncology, social situation

INTRODUCTION

Cancer is a disease that, worldwide, weighs enormously both in terms of human suffering seen from the point of view of health economics. It is a major cause of death worldwide, of which over 70% occur in low- or middle-income countries (WHO, 2006). It is responsible for 7.4 million deaths in 2004, 13% of global mortality. This number is expected to increase to 12 million in 2030 worldwide (WHO, 2009); 27 million new cases and 17.5 million deaths in 2050 (Sasco, 2007)[1]. Similarly, according to the report Globocan 2008 (IARC, 2010)[2], the incidence of cancer diseases on the globe for 2008 is estimated at 12.7 million new cases and 7.6 million deaths globally. Table I gives examples of incidence and mortality in Africa and Europe.

In Morocco, this disease is currently one of the major public health problems (Maamri, 2015a)[3]. Despite recent therapeutic progress these years, cancer mortality remains high because the diagnosis is often delayed and the management is difficult and often expensive.

Much of these cancers can be avoided; others can be detected and treated at an early stage. To effectively fight against this serious disease and that weighs heavily on the health of our citizens and the economy of our country, it is essential to have reliable and accurate data to determine the epidemiological profile of each region in order to establish a strategy adapted to fight. Similarly, knowing the risk factors for this disease remains one of the key solutions as a means of prevention and fight against this scourge. Indeed, smoking and unhealthy lifestyle are some risk factors predominate and cause frequent deaths. The environmental factors are also singled out and are for a non-negligible part behind several cancers.

According to data from the Cancer Registry of the Greater Casablanca Region (RCRC), the national annual cancer incidence is estimated at 101.7 new cases per 100 000 inhabitants, which corresponds to 30,500 new cases of cancer each year. This register specifies a percentage of 36.12% for breast cancer and 12.82% for cervical cancer, relative to the total cancer (RCRC, 2004) [4], with women being more affected than men. The latter are more affected by lung cancer and non-Hodgkin's lymphoma (RCRC, 2004)[4].

In eastern Morocco, epidemiological and cancer statistics are very limited given the absence of a national registry and / or regional and given the scarcity of scientific research in this area (Arfin et al. 2006).

The study we are conducting here is the first in Eastern Morocco, it aims to describe some cancers registered at the Regional Center of Oncology Oujda (CRO Hospital Hassan II) but also to explain or reconcile the development of certain cancers of some risk factors.

I- STUDY DESIGN

The study was conducted in Eastern Morocco. This is a quantitative descriptive retrospective study to better understand the epidemiological situation of more than 37 cancers (Figure. 1). It gathers data from the descriptive and analytical epidemiology for this condition at the Regional Oncology Center of Oujda (CRO).
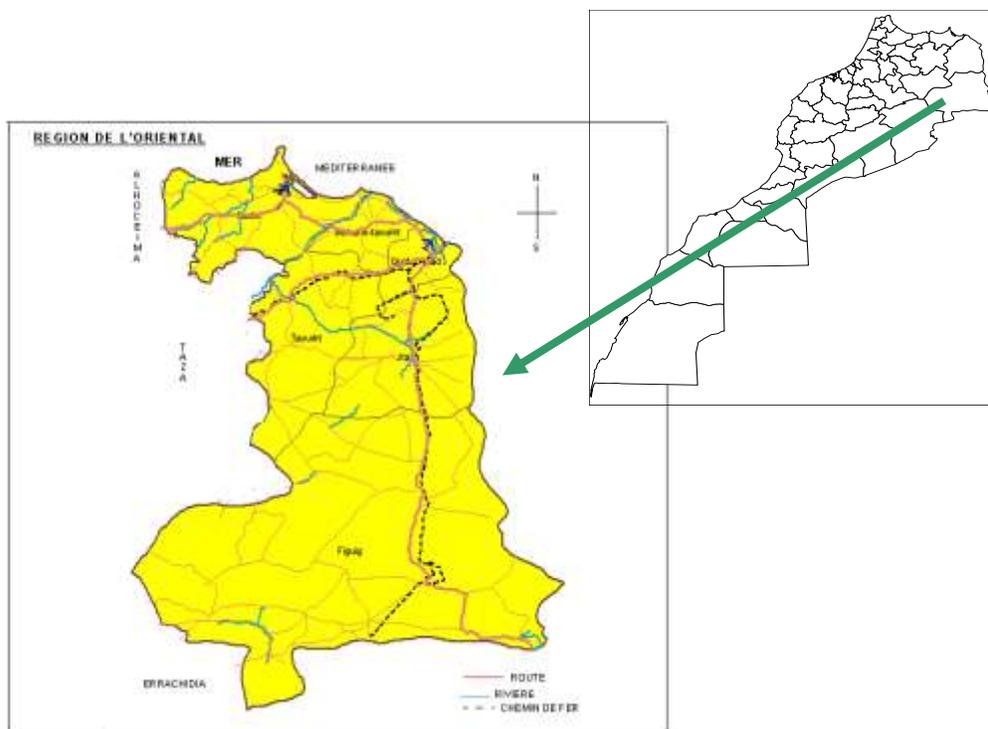

Figure 1: Location of the Eastern Region of Morocco

The population of the Oriental Region represents 6.4% of the total population of Morocco. The annual growth rate of population is 0.8% in the Region, against 1.4% on average for the whole of the Kingdom. The decline in rural population partly explains the low population growth rates in the Region. Oujda is the main urban city center of the region. It occupies an area of 7000 ha. The population density is relatively low: 68 inhabitants per km².

The prefecture of Oujda-Angad has 477,100 inhabitants or 25% of the total population of the Oriental Region. The province with strong administrative and commercial vocation of the city of Oujda, the rural population is relatively low. Indeed, it represents only 14% of the total population of the province.

II- STUDY OF REGIONAL ONCOLOGY CENTER (CRO)

This study was conducted during the period from October 2005 to December 2010 at the Hassan II regional oncology center specializing in the treatment of cancer and is located 7 km from the town of Oujda. This part relates to the descriptive and analytical component of cancer pathology at the East according to different statistical cancer diagnosed in this center.

This center was founded in 2005 as the only hotel in the area of oncology. It includes several units: chemotherapy, external beam radiotherapy, brachytherapy, surgery, therapy will...

Target population

We have considered all the records of patients diagnosed with cancer at the center since October 2005 until December 2010. We have analyzed 6428 medical records of cancer patients treated in the center.

Data collection

We used data records of Oncology establishes regional center since October 2005 until December 2010. At these registries, folder was created for each new patient and contains vital patient, location of the tumor, its nature and degree of extension and the Protocol and monitoring of treatment, his phone and his home address. As well as information on the method of payment and management (certificate of poverty, AMO, CNSS).

The seven variables that we are interested:

- Sex – Age - the profession - The origin (city) - Place of residence (urban / rural) - Location of the cancer (tumor site) - Marital status

Data collection tools

Data collection was done with the use of statistical records and a database of existing Excel at the CRO.

Statistical processing of data

The statistical analysis was performed using SPSS Version 17.1 software.

Ethical considerations

For this descriptive study of cancer pathology at the CRO and for confidentiality reasons, the names and addresses of patients were eliminated. Any information gathered about individuals is kept confidential and anonymous.

RESULTS AND DISCUSSION

The data recorded during the six years of study are presented in tables and graphs according to cancer site, region of residence, sex, age group and time period of the time of diagnosis.

Regional data are presented by cities. They are then broken down into 37 major groupings of cancer as the most common cancer sites.

1- According to the study year

Table I: Distribution of cancer cases frequency per year between 2005 and 2010

Years	Frequency	Percentage	Cumulated Percentage
2005	261	4,1	4,1
2006	1445	22,5	26,5
2007	1137	17,7	44,2
2008	1204	18,7	63,0
2009	1091	17,0	79,9
2010	1290	20,1	100,0
Total	6428	100,0	

With the exception of 2005 (CRO only began operating as during the last quarter of 2005) where the number of cases of patients is very low, other years show numbers that exceed 1,000 cases per year. No statistically significant differences can be noted between the years (p> 0.05).

The annual change in the number of new cases of cancers treated in the center studied from 2005 until 2010, shows that the number was low in 2005, increased in 2006 and stabilized between 2007 and 2010 (Table I). The decrease in 2009 is explained by the opening of the center of Al Hoceima Oncology.

2- Repartition of cancer by sex, Urban/rural localization, profession, age, town house, marital status:

A total sample of 6428 cases was analyzed between 2005 and 2010. Women dominate 4317 with a percentage of 67% compared to men representing 2111 cases or 33%. The difference is highly significant (p <0.0001), more than two thirds of women who frequented the CRO are affected by cancer than men (Table II). Whatever the city from patients, women remain the most affected by cancer than men (2/3 F VS 1/3) (Table III).

Table II: Distribution of cancer cases by Gender (W: Women / M: Man)

Gender	Frequency	Percentage
W	4317	67
M	2111	33
Total	6428	100,0

Table III: Distribution of patients CRO by province / prefecture and sex

		SEX		
		W	M	Total
City	Autre	62,6%	37,4%	100,0%
	Berkane	69,4%	30,6%	100,0%

Bouarfa	72,5%	27,5%	100,0%
Figuig	73,7%	26,3%	100,0%
Jerada	66,3%	33,7%	100,0%
Nador	66,2%	33,8%	100,0%
Oujda	68,8%	31,2%	100,0%
Taourirt	71,1%	28,9%	100,0%

Acording to Urban / Rural provenance, almost 60% of cancer patients are from the urban cities. The remaining 40% are from rural areas (p <0.05) (Figure. 1A).

Table IV: Distribution of cancer cases by province and environment 'R/U'

		Middle unknown	Rural 'R'	Urban 'U'	Total
City	Other	6.9%	50.4%	42.7%	100%
	Berkane	0,2%	47,1%	52,6%	100%
	Bouarfa	0,0%	60,0%	40,0%	100%
	Figuig	0,0%	50,9%	49,1%	100%
	Jerrada	0,0%	52,4%	47,6%	100%
	Nador	0,1%	65,8%	34,1%	100%
	Oujda	0,7%	9,6%	89,7%	100%
	Taourirt	0,5%	48,1%	51,5%	100%

A Oujda predominantly urban city, city dwellers are largely affected by cancer as countrymen. A Nador, Bouarfa and Jerrada, the inhabitants of rural areas that are most affected (Tab. IV). Also note that Berkane and Taourirt, despite the predominantly rural, the number of cancer is slightly in favor of the urban zone.

According to the profession, the sample is characterized by a clear dominance of an impoverished population with cancer attending the CRO. Indeed, no professions are in the majority with 81%. This group is followed by pensioners (5%), government officials and independent functions with 4%. It is noteworthy that farmers occupy such a place even importance of cancer patients with 3% of all patients in the eastern (Figure. 2B).

According to marital status, Cancer is a disease that affects everyone regardless of marital status. Married however, remain the most affected with 50% followed by unmarried 33% (Fig. 2C).

By city, The breakdown of cases of cancer as their city of origin shows that the dominant origin is the prefecture of Oujda Angads (34%) followed with 21% of Nador and Berkane 16%. The southern provinces of the eastern (Bouarfa and Figuig) have the lowest values respectively 2% and 1%. (Figure. 2D). The cities of Jerrada and Taourirt centrally located display intermediate values.

According to **Social security's** we remarks that 90% of patients are without medical cover. At this time, RAMED has not yet been generalized (Figure. 2E).
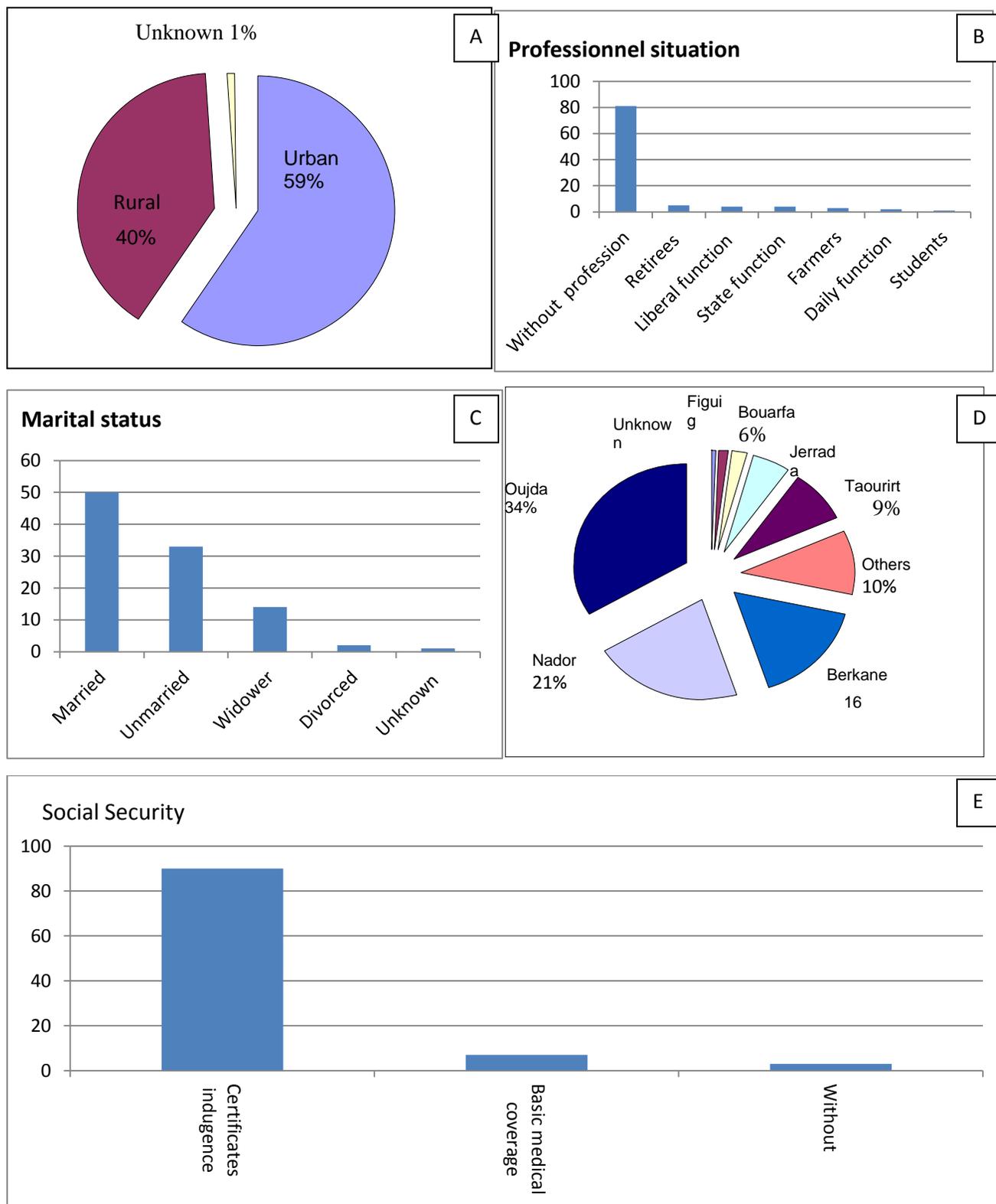

Figure 2: Distribution of cancer patients according to: A- Rural/urban, B-profession, C-marital status and D-city provenance, E- Social security of patients

The prevalence of cancer cases diagnosed in the CRO provides the same findings with figures of 0.8 (Oujda) to the north and 0.15 (Bouarfa and Figuig) to the south (Figure. 3).

Figure 3: Distribution of frequency of cancer of the eastern town on a north gradient / south

(? Values are in% of prevalence of cancer cases diagnosed in only CRO).

5- Age group:

Table V: Average age of people with cancer in Eastern Morocco

SEX	Mean	Standard deviation	overall average	Mode	Medium
W	51.58	13.96	53.20	50	52
M	56.64	16.62			

Depending on the age groups, women are affected to an advanced age by cancer than men (p <0.0001). The most affected age groups are found between 40 and 60 years (Figure. 4).
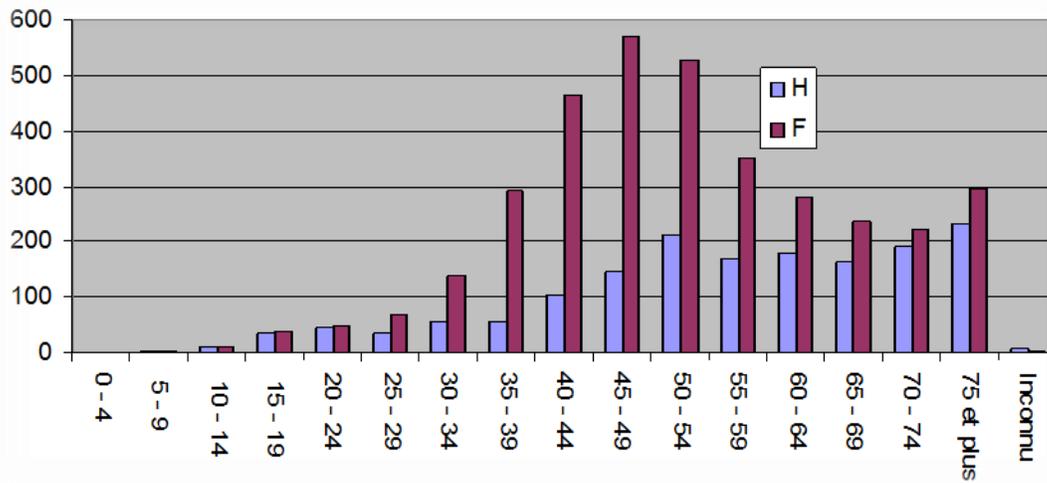
Figure 4: Distribution of cancer according to age group for both sexes

In details, we see that the age group [45-49ans) is the most affected by all cancers for women with 570 cases followed by the age group [50- 54 years old) with 528 cases. As for males, the most affected age group is that of [50-54 years) with 211 cases followed by the 60-64 age group (Figure. 4).

II- Crossing cancer cases with the variables under study

Through a CAT-PCA (PCA categorical components, a nonlinear ACP), the following results were obtained:

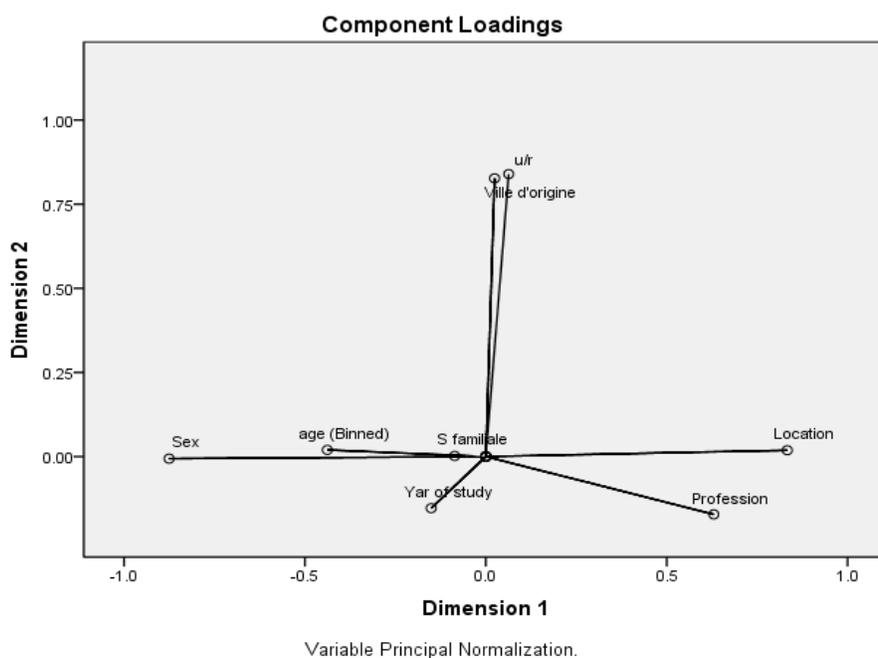|	Dimensions	
	1	2
Age groups	**-,438**	,020
City	,024	,827
Family situation	-,086	,002
Location cancer	,833	,019
Years of study	-,151	-,153
sex	-,875	-,006
profession	,630	-,172
Urban / rural	,063	,840

Figure 5: Matrices' of Correlated variables on one of the two-dimensional

Correlated variables are those that have more values (loading) on one of the two-dimensional (main components), and is> 0.3 correlated to this dimension. These values are yellow. Thus, age and sex are negatively correlated to the location of the cancer, sex and occupation, while the City is correlated with urban / rural (Tab.VI). More clearly, the variables that contribute to the breakdown of cancer at the CRO are age, sex, cancer site, occupation one side and the city and the environment on the other side.

Figure 6 shows that we can be content with two axes F1 and F2 that explain more than 80% of the variable information. The F1 axis separates the young adult sick children while the axis F2 separates adulated left the elderly right. These seniors are the most affected group (Figure. 6).
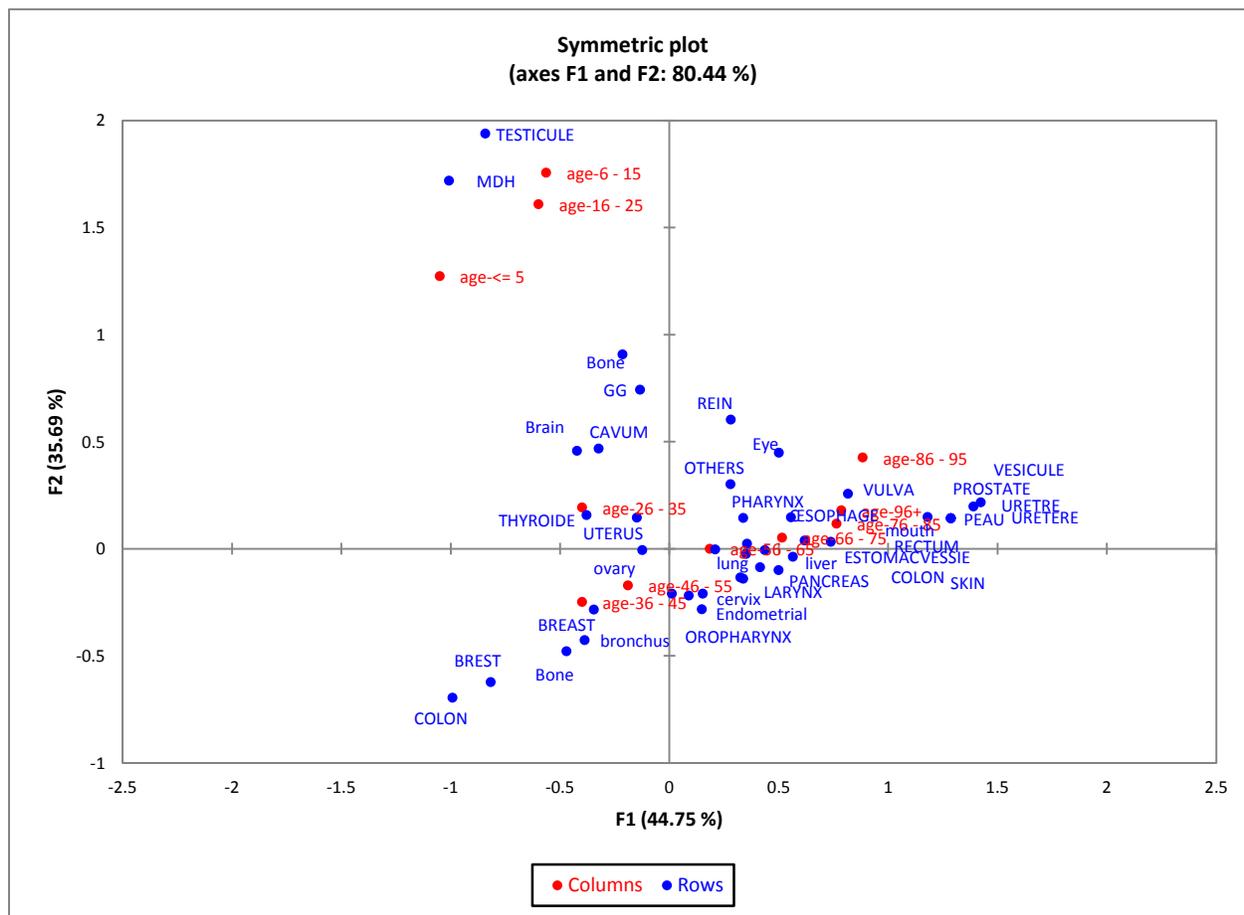
Figure 6: Projected cancer seats according to age classes according F1xF2 axes.

It follows from this distribution, three separate groups we named according to the age category:

- Children and adolescents and youth groups characterized by age groups between 5 and 35 years. This group is characterized by specific cancers such as GG, kidney; bones, MDH, testicular and nasopharynx

- Adulated group which includes age groups between 36 and 55 years marked by a clear dominance of the breast, cervix, colon, bone and bronchus

- The senior group characterized by advanced age beyond 60 years and where most other cancers arise.

  • Some cancers affect very specific socio-economic groups such as the prostate that affects more retirees

  • Farmers and laborers more affected by cancer of the larynx, lung, bladder and nasopharynx.

  • Young rather affected by bone cancer, nasopharyngeal, testicles and GG

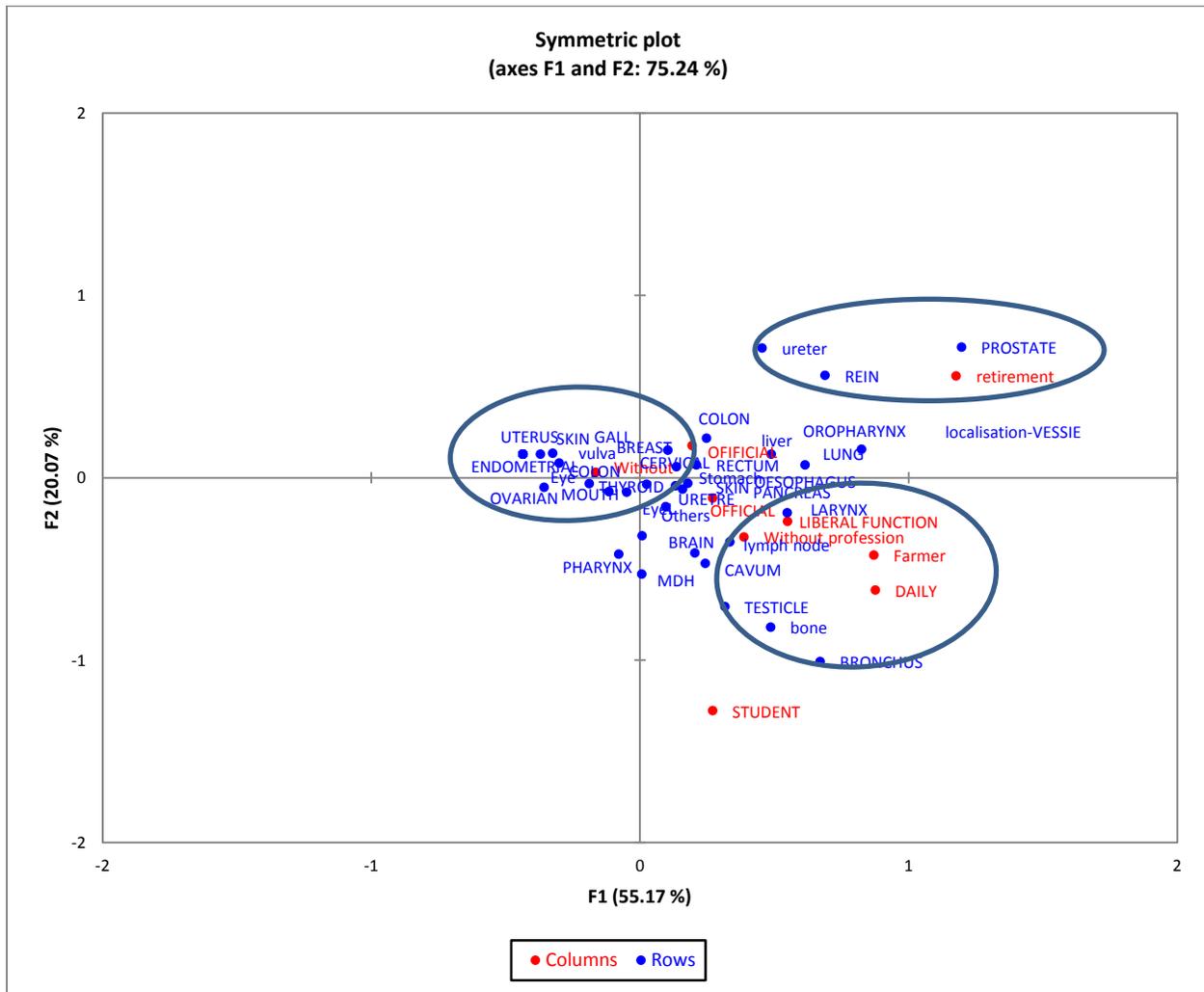• And a third type of cancer that affects some people regardless of age, socio-economic and cultural level.

Figure 7: Distribution of Cancer seat to the profession

To distinguish two large groups: there is a strong relationship between certain cancer sites and profession.

- The prostate particularly affects people in retirement.

- The fellahin, daily functions and liberal professionals are affected by type of cancers such as nasopharyngeal, lung ... MDH.

The axis F1 gives 100% explanation as to the distribution of cancers according to the male / female (Figure. 8). Some cancers are almost feminine (breast cancer), others on the contrary affecting more men than women (lung cancer).
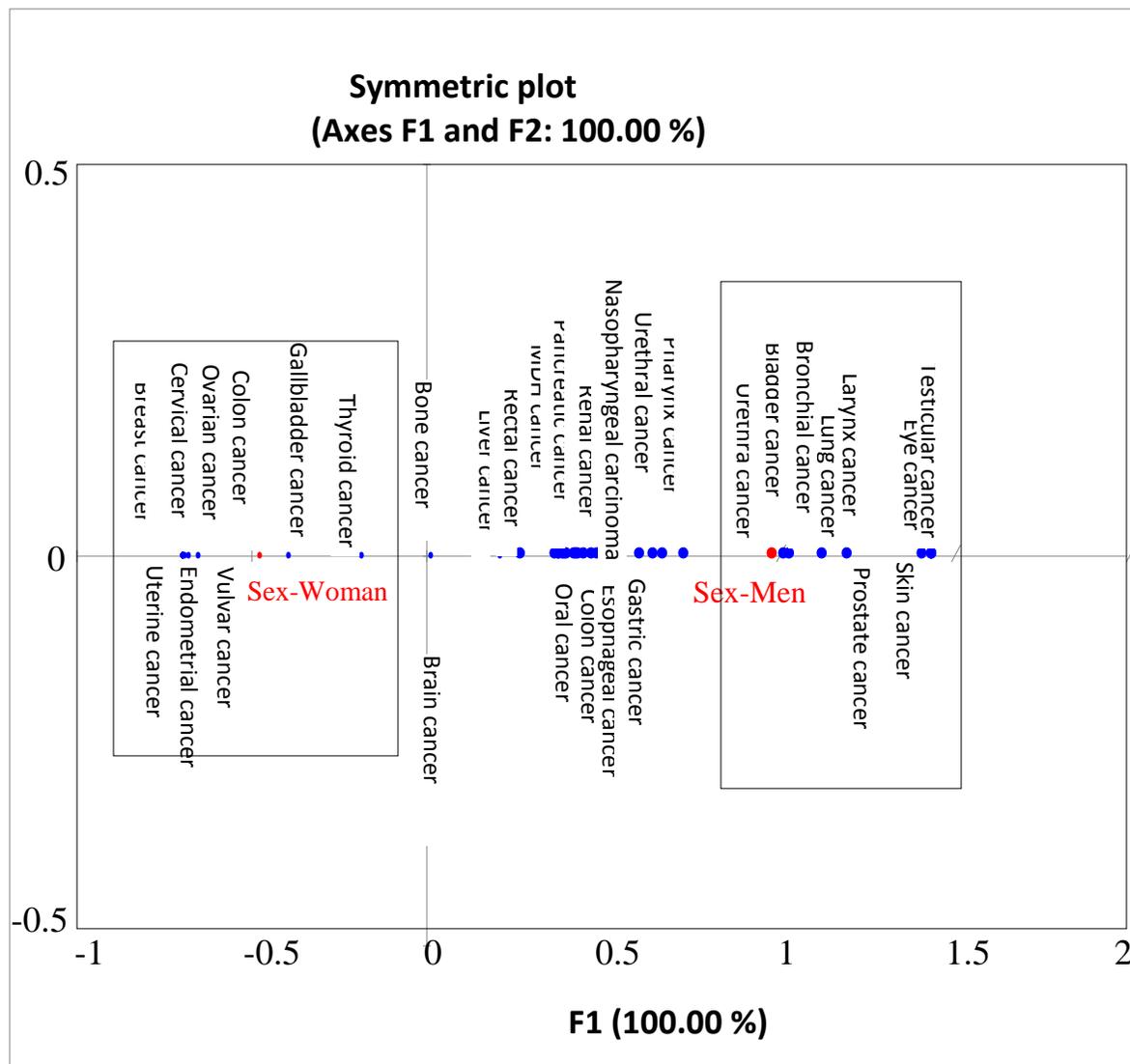
Figure 8: Projected by sex cancers according axis F1F2

The group of male cancers is dominated by that of the skin, bladder, prostate, testes, lungs, bronchi and larynx. Those of women are dominated by breast cancer, cervix, ovary, uterus, vulva, endometrial, thyroid and Gallbladder cancer. Other cancers are in the middle of the axis F1 (Figure 8).

DISCUSSION

Urban vs. rural

The place where a person lives (geographic location) may affect the risk of cancer. The reasons why the geographical location could play a role in the risk of cancer are very complex and are probably related to a number of factors such as diet, income or environmental exposures.

The urban population is the most affected by the cancers (59% of the entire study population). At the prefecture of Oujda Angads, 93% of patients are from urban areas. The physical, economic and socio-cultural accessibility, the degree of awareness of the disease and the need to consult in health care service and specialized environment are probably the first explanations for this difference between urban and rural areas. In their review of comparative literature between the populations of Cancer rural vs urban, Monroe et al. (1992)[5] found that this disease is more common in urban than rural. Conversely, patients from rural areas are often diagnosed at an advanced stage than those in urban areas. This suggests, according to the same authors, as rural patients are disadvantaged compared to their urban counterparts about the care services for accessibility. Smailyte & Kurtinaitis (1994)[6] found that cancer mortality rates among urban residents are down sharply compared to those in rural Lithuania. They explained this result to higher levels of poverty and a lower level of education in rural areas. But above all by a lack of rural prevention programs and the unavailability of specialized care services in oncology. Therefore, it is essential to develop effective methods of prevention and early detection for rural populations. Valerianova et al. (1994)[7] had found that Bulgaria has undergone considerable social changes especially in the last 40 years characterized by a transition 75% of rural population to 75% in urban areas. These changes had a significant impact in terms of rates of illness from cancer. Thus, the rate of lung, colon, prostate and bladder in humans have increased significantly over the period, with an average annual increase of 0.4%, 2.9%, 1.3% and 2, 3% respectively. In women, breast cancer rates, cervical and uterine body increased significantly, with an annual average of 1.3%, 1.9% and 2.9% respectively. In both sexes, the incidence of stomach cancer has declined significantly, to 3% per year for men and 3.6% per year for women. Rural cancer rates were lower than urban rates for most cancers, particularly in elderly groups. The fall in stomach cancer rates for men was significant in rural areas. Increases in lung cancer rates and cancer of the prostate in men and colorectal cancer and breast cancer in women were the most important in urban areas. Similarly, Friedenreich et al. (2001)[8] in their summary report on the review of breast cancer risk factors related to lifestyle and environment have shown that in Canada, by place of residence, the risk increases to 1.1 2 both urban and rural areas. Between 1987 and 1999, Yang et al. (2003)[9] found in China that the standardized mortality rate by age for all cancers combined has decreased slightly in rural areas, but has increased since 1996 in urban areas. The mortality rate for cancers of the esophagus, stomach, cervix, leukemia (except for men in urban areas after 1996) and nasopharynx were declined, while lung cancer and cancer female

breast have shown increasing trends both in urban and rural areas and for both sexes. Observed trends mainly reflect the dramatic changes in socio-economic circumstances and lifestyles in China in the past two decades. Smoking remains a major problem, with increases in lung cancer mortality. Improved socioeconomic status, diet and nutrition can be responsible for the reduced risk of certain cancers (esophagus, stomach and nasopharynx), while increasing the risk to others (breast and colon -rectum). Screening programs (particularly cervical cancer), and modern medical facilities more accessible for the treatment of cancer, were contributed probably to reduce mortality for several cancers.

Lifestyles

The lifestyle that influenced the urban food and sedentary lifestyle are among the other factors behind this sharp urban dominance of cancer. WHO (2005) states that the cancers are more the result of an unhealthy lifestyle and behavior harmful to health, like tobacco, alcohol, physical inactivity, high fat diet, pollution and stress factors who are dominant in urban than rural areas.

In 2000, it was estimated in France that overweight and obesity are responsible for about 2300 deaths from cancer.

In Morocco, over the past two decades, the prevalence of obesity and overweight has increased significantly while the proportion of underweight decreased in all categories. The prevalence of obesity and overweight increased from 4.1% and 21.4% respectively in 1984/85 to 10.3% and 25.2% in 1998/99 while that of malnutrition decreased from 9.8% in 1984 / 85 to 5.3% in 1998/99. For both periods, obesity and overweight were more frequent in females and in urban areas while malnutrition was more common in men and in rural areas (El Ghazi 2010)[11].

Excessive consumption of red meats and meats increases the risk of cancer of the colon and rectum (Inserm, 2008)[10].

These two types of cancers rank fourth in our region (Maamri, 2016)[12]. They can be avoided anything that adopting a balanced diet. Indeed, the use of data in the prevalence of risk factors to estimate at 72-96% the proportion of cancers that can be prevented in the north country by eliminating risk factors (El Ghazi, 2010)[11].

The risk of overweight or obesity is diminished significantly by the practice of physical activity and probable way by eating foods with low energy density. The report of the joint expert panel of the World Cancer Research Fund (WCRF) and the American Institute for

Cancer Research (AICR), an estimated 30 to 40% in the incidence of cancers can be prevented through diet healthy, balanced weight and the appropriate physical activity (El Rhazi, 2010)[11].

Geographical effects

In eastern Morocco, physical accessibility may also explain the higher rate of cancer recorded for Oujda population because this city contain the Oncology center. Oujda city is also the great metropolis of the region. So it makes sense to have a cancer rate proportional to the number of inhabitants. This result is supported by the position of Nador city who occupies the second metropolis with 21%, Berkane with 16%, Taourirt 9%, Jerrada 6% and 2% and finally Bouarfa/Figuig with 1%. It is thus found that a north south gradient is established on the distribution of cancer in the East. The cancer rate in Morocco Oriental tends to decrease in southbound. In this sense, a study conducted between 1985 and 2000 to INO in Rabat revealed that the cancer rate is much less known in the Sahara provinces than in the rest of Morocco with a clear progressive decrease in a north south gradient (Maamri, 2006)[13]. This is probably due to the fact that people's lifestyle in southern areas is not yet westernized (less sedentary lifestyle and eating habits still traditional and authentic and hard physical work). Therefore, cancers are much less answered than in other northern prefectures and provinces where many customs have changed including the diet that has clearly Westernized (El Rhazi, 2010)[11].

This gradient is also found in other regions. In metropolitan France, cancer mortality, reveals sharp regional disparities vis-à-vis the risk of getting cancer, revealing that northern populations remain particularly vulnerable as Southern (INCA, 2008). Indeed, the Northwest and the Northeast recorded the highest mortality rate in contrast to the West Central and Southwest that show the lowest mortality rate (INCA, 2008).

According to the French network of cancer registries, there is a north-south gradient in the incidence of colorectal cancer. The protective effect of a diet rich in vegetables may explain this gradient (INCA, 2005).

From north to south of Europe, in women, France is among the countries with an average rate, higher than the rates observed in southern European countries. This is the case in particular breast cancer and melanomas of the skin that have a north-south gradient with high rates in northern Europe (INCA, 2005). The lowest rates of incidence are observed in the countries of eastern Europe, higher in North and Western Europe (Sweden, Netherlands). In Italy, the incidence of the southern regions is reduced by half compared to the northern regions; the north-south gradient can probably be explained in part by a differentiated distribution of risk factors in the regions (InVS, 2005)[14.]

These geographical differences can be attributed in part to dietary habits that explain the gradient north / south in the frequency of breast cancer especially in Europe: the north has five times more cases than the south, whose diet richer in vegetable fats, fresh fruits and vegetables seems to protect Mediterranean women. Several studies in the literature have also shown that the geographical location significantly involved in the distribution of the effects of breast cancer mortality (Oukili, 2006)[15].

In their study on food and environmental factors in the risk of cancer of the nasopharynx in Morocco and its geographic distribution, Ammor et al. (2003)[16] have highlighted the existence of a south-north gradient, mainly due to poor living conditions and habitat, food preservation and hygiene. The activity related to agriculture and livestock, frequent contact with toxic substances from the outside or in the workplace, with domestic fumes, non daily disposal of domestic waste, proximity to animals, uncontrolled water consumption, lighting with candles, toilet and the absence of the practice of traditional medicine were also explanatory causes of this gradient.

The geography effect was demonstrated, too, following the migration of populations. These geographical migrations have also demonstrated the role of environmental factors in the incidence of breast cancer. For example, Japanese people who migrated to the USA showed after 2 to 3 generations of the same epidemiological profile than the rest of the US population. The same is true for young people who have emigrated from a country with low risk (Stanford et al. 1995)[17].

In Morocco, a study on nutritional status in terms of overweight / obesity and eating behavior of the Moroccan adult population as well as the associated socio-demographic and lifestyle factors, has revealed the following findings:

-        Obesity and overweight are very common in the adult population Moroccan with a rapid increase in their prevalence which would represent a serious public health problem and further increase the risk of chronic diseases including cancer.

-        westernized models, is another argument that Morocco is in the early stages

-        The Mediterranean diet, as defined in the literature, is not commonly followed by the Moroccan population. This implies a distancing of part of this population of its supposed traditional Mediterranean diet until now be in favor of another Western diet. There are certainly similarities such as the consumption of fruit, vegetables and cereals, but also variants such types of oil used, alcohol, method of cooking and conservation ... This probably explains the removal of part of the Moroccan population of predefined Mediterranean diet.

- 　　　The existence within the same population of several profiles representing both traditional and of the nutrition transition.

- 　　　Rather westernized food patterns that have been identified, affecting both the urban and rural areas and are characterized by the introduction of more and more of meat and dairy products.

- 　　　The impact of these new eating habits on chronic disease risk factors were perceived through the frequency of obesity and overweight.

In eastern Morocco, there are important disparities between cities from north to south. tradition and diet also vary between the eastern cities. Indeed, much of the population of the two major cities of Oujda and Nador region adopted a regime increasingly westernized with the growth of fast food consumption of frozen foods...

In Tunisia, Ben Romdhane et al. (2002)[18] confirmed that the demographic transition and epidemiological transition has been accompanied in their country to a change in lifestyles, in the foreground which the eating habits and physical activity. This usually leads dietary transition from a traditional diet of cereals and pulses, to a diet that includes more animal products, and tends to become excessive in relation to the energy needs of a sedentary life. It can thus trigger a nutrition transition in which gradually changing from a decrease in the malnutrition of young children, to a greater frequency of overweight and obesity in adults, especially in the urban environment. This food transition can caused several diseases like diabetes, cardiovascular and cerebrovascular and certain cancers.

Ages

Cancer affects Moroccans population at all ages. However, the cancer risk increases significantly with age (p<0.05). The number of new cancer cases continues to rise as the Moroccan population ages. In fact, over 70% of all new cases of cancer affecting Moroccan older than 50 years. This increase in cancer rates can be attributed to combination of factors, such as prolonged exposure to substances that cause cancer (carcinogens) and weakening of the immune system with age.

At the eastern Morocco, all age groups are affected by cancer; however, over 93% have more than 31 years, peaking in the 41-50 age group is 27%. Firstly, because for childhood cancers, the situation is slightly different. It is a rare disease. The childhood cancers represent only 0.5% of all cancers in France as an example (INCA, 2009)[19]. Moreover, in Oujda city, these cancers are treated in the Al Farabi Hospital. But also because cancer, in general, is defined by its cumulative nature, broke out in the 20 years or more after exposure to environmental

factors (Inserm, 2008) and / or the adoption of a fashion healthy life badly, which would correspond more frequently in adulthood and senior age.

Indeed, the effect gets older in the eastern by the distribution of cancer in three distinct categories:

- Phase children and adolescents : characterized by a low number of cancer

- Adult phase between 40 and 60 years with average rates of cancer

- Old-phase beyond 60 years marked by the installation of most cancers particularly after retirement age.

Global statistics particularly in developed countries indicate that the rate of cancer increases with age due to population growth and aging of the population. Indeed, because of earlier diagnoses and more effective treatments, survival of people with cancer tends to be lengthen. The incidence of cancer is increasing in parallel, and is more common beyond 65 years. These mismatched data with our results that mark a peak for the 41-50 age group and decrease gradually with increasing age. This is probably due to an under diagnosis in comparison with the developed countries in the elderly, unlike life expectancy that is significantly higher in developed countries. Unquestionably, literature reports that high cancer rates among the elderly are explained in part by the age factor and the development of screening means (Inserm, 2008)[10].

However, in our Moroccan context, it is legitimate to think that probably some of the elderly do not seek help beyond a certain age and they accept their illness (linked to sociocultural and religious principles of Moroccan people).

Socioeconomic level

Socioeconomic status (SES) is often based on a person's income, level of education, occupation and other factors, like where she lives. These factors are interrelated, so they do not act independently of each other (Maamri, 2015b)[20]. It is well established that the socio-economic status is an important causal factor for many cancers (Maamri, 2015b)[20]. In fact, many professional circles research studies have identified various chemicals and exposures associated with cancer. Some particularly workers may be more likely to come into contact with carcinogens. Among these are the construction workers, wood workers, miners, artists, and people working with pesticides or in the chemical, rubber or dyes. The arsenic, asbestos, benzene, beryllium, cadmium, chromium, ionizing radiation, nickel compounds, radon and polyvinyl chloride are examples of carcinogens substances which people can to be exposed in their work. In this sense, a study done by ARST in 2005 showed large variations in risk by

socioeconomic level. The workers have a strong increased risk of cancer that is known to be linked to tobacco and alcohol. In particular, they are twice as likely to be diagnosed with cancer of the pharynx, esophagus, lung, larynx that executives. It is known that the prevalence of risk behaviors varies by socioeconomic level. In particular, the proportion of male smokers is currently higher in lower socioeconomic categories.

In the USA, studies on the socio-economic disparity linked to breast cancer have been demonstrated by comparing the socio-economic level, lower among African Americans than whites or Hispanics (Albain et al. 2009; Berz et al. 2009; Chu et al. 2009; Yang et al. 2009; Haas et al. 2008)[21-25]. After diagnosis, social inequality will be manifested in access to care and in the different phases of treatment. Socioeconomic level was described by most studies as a major determinant of women participation in cancer screening. It can be measured by household income, occupational status, or educational attainment. The low socioeconomic level may have a role in screening participation by playing on access to care, particularly in countries where there is no health insurance. Women could not pay mammography, or would live in low-density neighborhoods making medical achieving mammography more difficult. The low socioeconomic level is often associated with poorer health status that could result in opinions and attitudes to less favorable prevention. In eastern Morocco, several patients with cancer are poor and analphabets. Menvielle et al. (2008)[26] have demonstrated a close relationship between cancer mortality and socioeconomic level. Pornet et al. (2008) in a multilevel study to detect geographic areas of low participation correlated with areas of high social vulnerability. Mitra et al. (2015) found a risk gradient of lung cancer in all age groups. Lung cancer risk was highest among men and women 45 to 64 years belonging to the lowest income quintile. Lung cancer incidence rates were highest among workers and unskilled workers or without occupation, and lowest in men and women in management positions.

Gender (being male or female)

The sex of a person (being a man or woman) can be a risk factor for cancer. Some types of cancer affect more often the man while other cancers occur more often in women. Overall, cancer incidence is higher in women than in men (especially for gynecological breast cancers). The gap between the two sexes has decreased in recent years. In eastern Morocco, 2/3 of all new cancer cases affect women compared to 1/3% for men. Some cancers affect more men than women. For example, the proportion of male smokers is currently higher in lower socioeconomic categories (ARST, 2005). This study shows wide variations by gender cancers frequency. The workers mostly laborers, have a big increase in cancers that are known to be

linked to tobacco and alcohol. In particular, they have twice risk of being affected with a cancer of the pharynx, esophagus, lung, larynx than women.

Marital status

Marital status is also decisive in the distribution of cancers at the Eastern Morocco. Our sample is dominated by 50% of married and 33% of unmarried.

Marital status was advanced as a risk factor for unmarried women for breast cancer and a risk factor for cervical cancer to married women. Thus, according to a Canadian study examining breast cancer risk factors related to lifestyle and environment, the breast cancer risk increases from 1.1 to 2 for a non married woman than a married woman. Kato et al. (1992) in countries with low incidence, the increased incidence of breast cancer is the result of a Westernization of the women's lifestyle concerning reproductive life, diet, physical activity and other factors. It should be recalled here that it is accepted long ago that early puberty and / or a first pregnancy at a late age and / or not breastfeeding are the main risk factors associated with reproductive life for women. Generally in developing countries, women are protected by a late puberty, premature birth and a first high parity which generates often a long period of breastfeeding. Some researchers question the first child for a woman is of extreme importance. In North Africa, with the new generations, the behavior of reproductive life has evolved significantly: the first birth is very late, often rarely or not breastfeeding (Ben Abdellah et al., 2009)[27]. Shapiro et al. (2000) noted that there were associations between the risk of breast cancer and family history, low parity and high socioeconomic status.

In Morocco, the HCP (2010)[28] had reported that the average age at first marriage for females between 1960 and 2010 increased from 17.5 years to 26.6 years for the total of both urban and rural areas. In urban areas, this age increased to 27.4 years. Taking into account this new socio-cultural context of our country where the age of marriage has become increasingly late, later first pregnancy more time and therefore a delayed birth with all that this may cause in terms the reduction in the number of pregnancy and prolonged breastfeeding women are at risk of growing. Moreover, it seems that the age of puberty becomes more and earlier over the years (Sakka & Chelly, 2000). This is also the case of many countries, including Morocco where the lifestyle has changed following the Western influences but also because of the delay in marriage age.

CONCLUSION

There are very few cancers for which a single cause is recognized. Most cancers appear to be

the result of a complex combination of many risk factors, which may play different roles in the development of cancer and stimulation of their growth. The determinants of these cancers are numerous and those linked to socio-economic, cultural and demographic factors are as important as one might think. Prevent cancers in our region inevitably involves the improving the living conditions of the population through the development of family income, the fight against illiteracy, increase access to care through the generalization of medical cover and also the fight against substandard housing.

REFERENCES

1. MS, 2007.- Santé en chiffres. 2007, ed. DPRF (www.sante.org.ma)

2. IARC, 2010.- http://www.iarc.fr/indexfr.php

3. Maamri A., 2015a.- Données épidémiologiques sur le cancer au Maroc et dans le monde. Données bibliographiques. Annales des Sciences de la santé, 1 : 20-29. DOI: 10.13140/RG.2.1.1183.7520.

4. RCRC 2004.- Registre des cancers de la région du Grand Casablanca : Année 2004. Edit. Associa. Lalla Salma de lutte contre le cancer 2007. 75p.

5. Monroe AC, Ricketts TC., Savitz LA. 1992.- Cancer in rural versus urban populations: a review. J Rural Health.Summer;8(3):212-20.

6. Smailyte G. & Kurtinaitis J., 1994.- Cancer mortality differences among urban and rural residents in Lithuania. Stroke. 25(6):1165-9.

7. Valerianova Z, Gill C, Duffy SW, Danon SE. 1994.- Trends in incidence of various cancers in Bulgaria, 1981-1990. Int J Epidemiol. 23(6):1117-26.

8. Friedenreich MC, Bryant HE., Courneya KS., 2001.- Case control study of life time physical activity and breast cancer risk. Am. J. Epidemiology, 154: 336-54.

9. Yang L, Parkin DM, Li L, Chen Y.2003-. Time trends in cancer mortality in China: Int J Cancer,1987-1999. 106(5):771-83.

10. INSERM, 2008.- Cancers et environnement, une expertise collective. Paris : Edition INSERM, 887 p.

11. El Rhazi K., 2010.- Transition nutritionnelle, facteurs associés et émergence des maladies chroniques au Maroc : étude transversale en population générale adulte. Université Sidi Mohamed BenAbdillah, Fac. Sci. Dhar Almehraz, Fès, 116p.

12. Maamri A., 2016.- Le Cancer au Maroc Oriental : Etat et évolution entre 2005 et 2010. Annales des sciences de la santé, 5 (1) : 3-18.

13. Maamri A., 2006.- Pathologie cancéreuse au niveau de l'oriental, schéma régional de l'offre de soins. Rapport DRS, 48p.

14. INVS, 2005.- Estimation de l'impact de dépistage organisé sur la mortalité par cancer du sein : contexte, méthodologie et faisabilité. St Maurice, 122p.

15. Oukili M.A., 2006.- Epidémiologie et facteurs de risqué du cancer du sein à propos de 816 cas. Thèse univ. Med V, Fac. Med. et pharma. Rabat, 115p.

16. Ammor S., Baali A., Hubert A. & Cherkaoui M., 2003.- Approche épidémiologique du cancer du rhino-pharynxdans la région de Marrakech.Antropo, 5 : 39-47. www.didac.ehu.es/antropo.

17. Stanford JL, Weiss NS, Voigt LF, Daling JR, Habel LA, Rossing MA. 1995.- Combined estrogen and progestin hormone replacement therapy in relation to risk of breast cancer in middle-aged women. JAMA. 274(2):137-42.

18. Ben Romdhane H., Khaldi R., Oueslati A.& Skhiri H., 2002.- Transition épidémiologique et transition alimentaire et nutritionnelle en Tunisie. Options Méditerranéennes, Sér. B / n°41.

19. INCa, 2009.- La situation du cancer en France en 2009. Collection Rapports & synthèses, ouvrage collectif édité par l'INCa, Boulogne-Billancourt. 205p.

20. Maamri A., 2015b. - Towards the Establishment of a Reference Framework for Cancer. Open journal of preventive medicine. 5: 426-433. http://dx.doi.org/10.4236/ojpm.2015.510047.

21. Albain KS, Unger JM, Crowley JJ, Coltman CA, Jr., Hershman DL., 2009.- Racial disparities in cancer survival among randomized clinical trials patients of the Southwest Oncology Group. J Nat. Cancer Inst 101: 984-992

22. Berz JP, Johnston K, Backus B, Doros G, Rose AJ, Pierre S, Battaglia TA., 2009.- The influence of black race on treatment and mortality for early-stage breast cancer. Med Care 47: 986-992

23. Chu QD, Smith MH, Williams M, Panu L, Johnson LW, Shi R, Li B Glass J., 2009.- Race/Ethnicity has no effect on outcome for breast cancer patients treated at an academic center with a public hospital. Cancer Epidemiol Biomarkers Prev 18: 2157-2161

24. Yang R, Cheung MC, Franceschi D, Hurley J, Huang Y, Livingstone AS, Koniaris LG., 2009.- African-American and low-socioeconomic status patients have a worse

prognosis for invasive ductal and lobular breast carcinoma: do screening criteria need to change? J Am Coll Surg. 208: 853-868.

25. Haas JS, Earle CC, Orav JE, Brawarsky P, Keohane M, Neville BA, Williams DR., 2008.- Racial segregation and disparities in breast cancer care and mortality. Cancer 113: 2166-2172

26. Menvielle G, Leclerc A., Chastang JF., Luce D., 2008.- Inégalités sociales de mortalité par cancer en France : état des lieux et évolution temporelle. BEH. 33: 289-292

27. Ben Abdallah M., Achour N., Saadi A., Boussen H., Ben Romdhane K., Hechiche M., Hsairi M, Maalej M, Zehani S, Ben Ayed F., 2009.- Cancer du sein en Tunisie : caractéristiques épidémiologiques et tendance évolutive de l'incidence. La Tunisie médicale. 87 : 417 – 425.

28. HCP 2010.- http://www.omdh.hcp.ma/