

# Basic study of a breast cancer epidemiology among the female patients using a regional data source: Case of Chlef region, Algeria

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## Research Article

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# Abstract

## Purpose

Breast cancer is a public health problem. Its impact given several, important consequences for reducing this disease. We did this study to know the situation of breast cancer and the development of cancer registry.

## Methods

Epidemiological, statistical and computer tools are used to collect, analysis and process of the data, we used the medical records to know the data information on female breast cancer patients, by collaboration with of Bedje Sisters Public Hospitalise of Chlef (BSPHC) and the Oran Cancer Registry.

## Results

We collected approximately 177 cases of female breast cancer, and approximately 601595 female populations during the year 2016 for Chlef region. The incidence rate is more than 29 cases of female breast cancer patients per 100000 female populations for each year. Female breast cancer patients of Chlef region is a major public health problem according to the 2016 study. Incidence rates this disease are greatly increased between 55 years and 75 years old.

## Conclusion

Prevention, early diagnostic and different care and treatment play an important role in reducing this chronic disease in this region and why not over the worldwide?

## 1. Introduction

Breast cancer is recognised as a major public health problem in developing countries (Augustin Balekouzou & al., 2016; M. Hamdi Cherif et al., 2010), breast cancer (BC) has become the most common cancer in women worldwide in both developed and developing countries (Nadine Zielonke & al., 2020; Jing-Yi & al., 2019), and female breast cancer is among the cancers of Arab countries, with maximum incidence among women of the world. The concepts of the etiology of breast cancer are changing rapidly, and physicians need to be aware of these changes (M.J.M. BROEDERS and A.L.M. VERBEEK, 2000), and the risk factors that is associated with the development of breast cancer (Soley Bayraktar and Banu K. Arun, 2016), whereas the age between 60 years and 70 years old. On the other hand, the maximum incidence among breast cancer patients in developed countries between 75 and 79 years. Breast cancer incidence increases with age. Whereas the worldwide incidence is 14.0 per 100000 women who are 15–39 years old, breast cancer is much more common in the age of 65–69 is 159.1/100000 (Alicia Brunßen

& al., 2016). Patient- and tumour-related data, including patient age and tumour characteristics were collected and documented, patient information and test results were anonymous (Josef Rüschoff & al., 2020). In Algeria, there are currently about

7500 new case of breast cancer registered, around 19 % of all cancers recorded each year (M. Hamdi Cherif et al., 2010). Male breast cancer is a rare disease and accounts for less than 1% of all breast cancers in the developed countries (Paul Ndom & al., 2012). Breast cancer is the leading cause of death in Algerian women. Some risk factors, such as family history of breast cancer and genetic mutations including those in the BRCA2 gene, are well established for male breast cancer (Tjasa Oblak, 2019). Screening women in Algeria between the ages of 50 year and 70 years leads to a reduction in the risk of death. Other age bands are smaller. In Algeria in 2014, breast cancer was the first cancer of women with 59% of all female cancers. The standardized incidence rate of breast cancer was 65.5 per 100000 women (Fadhila Mansour & al., 2018). Its incidence is increasing worldwide who will develop breast cancer during his life. The incidence is low up to 40 years, rises sharply at 40 years and then increases with age (P. SCHAFFER et al., 1996; M. Hamdi Cherif et al., 2010 ; A. Lebris et al., 2014; B. Séradour et al., 2000). Its natural history is known and its prognosis depends on the tumor volume at the time of diagnosis.

The population of the Chlef region in Algeria contains many cases of this non-communicable disease. Screening and diagnostic devices like mammography, galactographie, Ultrasound and MRI and other techniques play an effective and fundamental role in the screening and diagnosis of breast cancer in women, these data after several of the prevention trials in previous work (P. SCHAFFER et al., 1996). Early and initial diagnosis of this disease by radiologists before the transition to the second stage of diagnosis by other specialist's especially clinical oncologists at the level of clinical and biological laboratories. These latter laboratories play a very important role in the discovery of breast cancer and their types prior to initiation of treatment by various methodical procedures and different techniques such as chemotherapy, radiation therapy comprises an important aspect of treatment (Mausam Patel & al., 2020), radiotherapy is integral in the management of breast cancer (Kamran A. Ahmed & al., 2018), breast self-examination (BSE) and mammography are the measures that may prove of great help in early detection of breast cancer (Sm Faysal Bellah & al., 2016), hormone therapy and surgery result in improved survival and can reduce mortality and breast cancer incidence rate among women in the Chlef region from Algeria. The goal of this study was to determine the incidence (Adam S. Komorowski & al., 2019) rate and some risk factors of breast cancer in women with various subtypes and stages, to identify subgroup(s) that might potentially benefit from a breast cancer.

## **2. Materials And Methodology**

### **2.1. Study area**

Algeria is a country of North Africa West side, the region of Chlef is a small area from this country, and it is approximately 120 km in length and around 90 km wide. This study was conducted at Hassiba Benbouali University of Chlef (HBUC) in collaboration with Bedje Sisters Hospital Public Establishment of

Chlef (BSHPEC) & University Hospital Center of Oran (UHCO), Algeria. The study area was selected purposively because of following reasons: - The communication with BSHPEC & UHCO was good.- Professor, Associate Professor, Assistant Professor, Laboratory technician, nurses and well trained doctors were available here. For that, we chose BSHPEC & UHCO as sources of data collection.

## 2.2. Study population

This was retrospective study based on the primary data collected through patient's recorders from the Bedje Sisters Hospital Public Establishment of Chlef (BSHPEC), oncology and epidemiology services from BSHPEC, Epidemiology service from University Hospital Center of Oran (UHCO), Algeria. The cases were confirmed by histological or cytological analysis during the study period from January 1<sup>st</sup> to December 31<sup>st</sup>, 2017 and all female breast cancer patients admitted in BSHPEC & UHCO. With more than 1.2 million of population. This study is based on the total number of the population in this region studied among the Algerian population. The population size is 1206626 inhabitants and among this total number we have 601595 women from the Chlef region on the basis of the year 2016. Various cancers, we used the cancer registry of Oran, and it was collected clinical data: Demographics included date at diagnosis, gender, race, marital status, street address, and health insurance coverage (Jinghui Dong & al., 2019). We decided that the breast index is the person who is clinically diagnosed for the patient, because if the diagnostic patterns of breast cancer is identical, then the breast index is the one whose cancer most dangerous by histological type, respectively, size, grade (A. Lebris et al., 2014).

## 2.3. Sample size

The required sample size of this cross-sectional study was calculated by using the following formula:  $n = Pq Z_{\alpha}^2 / i^2$ . Where, n = required sample size, P = prevalence = 31% = 0.31 (although there is no community based cancer registry report regarding prevalence of breast cancer but it is found from oncology and epidemiology services 2016 of Bedje Sisters Hospital Public Establishment and University Hospital Center of Oran that around 31 % of the female patients from chlef region attended there were the sufferer of breast cancer).  $q = 1 - P = 1 - 0.31 = 0.69$ , ;  $Z_{0.1} = 1.645$  at 90 % Level of confidence, i = error limit (10%) = 0.1. So,  $n = 031 (1 - 0.31) \times (1.645)^2 / (0.06)^2 = 160.78 = 161$ . The required sample size was 161.

To reduce the error & maximum validity we took 10 % more samples in addition. And the estimated sample size was 161 + 16 = 177. So, for convenience a total of 177 respondents were selected. All simple samples taken with female breast cancer patients were found in the two aforementioned institutions.

### A. Inclusion Criteria

- All the female patients admitted at BSHPEC & UHCO;
- Willingly participate to the study;

- Female patients only were suffering from breast cancer.

## **B. Exclusion Criteria**

-Female patients suffering from other cancers.

-Those patients who refuse to give informed consent.

## **2.4. Data Collection Tools**

Semi-Structured Questionnaire.

## **2.5. Data Collection Technique**

Prior to data collection both verbal and written consent was taken from the respondents and the researcher himself took the interview face to face from the patients.

## **2.6. Data Management and Analysis Plan**

Statistical calculation such as mean, standard deviation and appropriate test was performed by Microsoft Excel computer program. The descriptive and inferential statistics was also used accordingly. Tabular and graphical presentation and chart was presented.

## **2.7. Quality Control and Quality Assurance**

The investigator has enough knowledge on designated study, hence the study area and underneath issues was keenly explored by him. The format of the questionnaire is purely semi-structured, thus it has chance to construct definitive answer. The questionnaire was developed with regards through literature search.

## **2.8. Limitations of Study**

A- Only BSHPEC & UHCO was the study hospital so the study findings will not reflect the whole breast cancer situation of Algeria.

B- As the sample size was relatively small so the results could not be generalized.

C- The study faced from recall and information biases.

D- The time period for the study was very short.

E- There was no monetary support for conducting the study.

# **3. Results**

## **3.1. Epidemiology**

Breast cancer is the first cancer of women with 177 new cases during the year 2016 of the Chlef region in Algeria, this type of cancer is represented approximately 31 % in the new cases among all Cancers and more than 0.49 % in new individual of female population of the Chlef region during the year 2016. This value of breast cancer of women is age-specific and contains about five types and three grades of breast cancer with different percentages in patients with this type of cancer.

Recent results show that the specific incidence of breast cancer according to the age distribution of the female population began to increase from age 30 year until age 65 year. Between 60 year and 80 year the risk is generally homogeneous. The average age of the patients studied is about 50.42 years and the confidence interval of the percentage of patients is between 49.54 and 51.30 years for a 95 % safety rate, so the average age of the female population in this study is 26.68 years old safety rate in the year 2016.

The incidence rate of breast cancer per 100000 female population living in the Chlef region from Algeria is 38.95 for the young woman under 40 years, the age of 40 to 50 years, we have more than 83.12, and was about 103.60 between 50 and 60 years, the highest specific incidence rate was between the age group 60 and 70 years and it was 232.45 years. The specific incidence per 100000 female populations was 131.26 between 70 and 80 years, and 55.10 more than the age 80 years (figure 1 and 2). For the age of patients under 50 year of age, the specific incidence per 100000 female inhabitants is approximately 17.40 and 135.05 for patients aged 50 years and over during the period studied.

## **3.2. Specific Risk Factors**

### **3.2.1. Age**

Age is among the most important risk factors for female breast cancer patients in the Chlef region, Algeria. The incidence rate of female breast cancer patients has an age-dependent curve, where the risk increases with increasing age. For the young woman under 20 years no case of breast cancer according the table. For example, the standardized incidence of breast cancer per 100000 female populations living in the Chlef area is about the order of 6.64 before the age of 40 year, its 8.98 between 40 and 50 years, its 6.32 between 50 and 60 years, and 5.82 between 60 and 70 years, 1.66 for more than 80 years. More than 29 female breast cancer patients per 100000 women living in the Chlef region of Algeria during the year 2016. More than 125 patients aged 50 years and over for every 100000 women living in the previous region. Knowing that the average age of this sample is studying patients with breast cancer in this region and during this period of study has been more than 50 years.

In this curve, we distinguish two different phases, the first between the Age of birth and up to the average age of the female population 26.68 years, whereas, we observe the increase of this population according to the Age. On the other hand, for the second phase, that is to say between the average age of the studied female population and until more than 85 years, we observe the decrease of this population according to the Age.

**Table:** The number distribution of female breast cancer patients by age group and the Standardized female population in the year 2016.

Age group (Yeats)	Standardized Female Population P (%)	Female Breast Cancer Patients n (%)
00-09	18894 (19)	0 (0)
10-19	20593 (21)	0 (0)
20-29	22897 (23)	4 (2)
30-39	16599 (17)	36 (20)
40-49	10800 (11)	54 (31)
50-59	6097 (6)	38 (21)
60-69	2503 (3)	35 (20)
70-79	1013 (1)	8 (5)
+ 80	603 (1)	2 (1)
Total	100000	177

In this curve, we distinguish four different phases, the first concerning the young woman below the age of 25 years, where we notice that the number of patients is very small. For the second phase

between 25 years and 45 years, whereas, we observe an increase in patients according to age. In the third phase, between the ages of 45 years and 65years, there was an average decrease in patients under age 55 years and stability in patients between 55 year and 65 years of age. The last phase, there was a rapid decrease from the age 65 years and up to the high age.

In this figure 5, we have noticed that the female population, before the age group between 32 and 36 years, the number of the female breast cancer patients is no, from this average age, it was noticed that the proportion of the female patients is very high in relation to the percentage of the female population.

### 3.2.2. Environmental factors

The main environmental factors involved in breast cancer risk are ionizing radiation, which is a known carcinogen, and night / shift work with disturbances of circadian rhythms, probably classified as carcinogenic (Centre Léon BERARD, 2017).The daily exposure of solar radiation on the population of the Chlef region especially during the summer months of every year, work in an irradiated environment for the woman. All these radiation causes, whereas among that we have breast cancer.

Night shift / shift workers are at higher risk of developing breast cancer. Several of the definitions of night / shift work differ between studies. For example, Lie et al, defined shift work as any shift between the time 12:00 hour and 6:00 hour am while Pesch et al., this is the period of full-time work between midnight and 5:00 hour am (J.C. Benabu et al., 2015; Centre Léon BERARD, 2017).

### **3.2.3. Geographical origin of women**

The geographical origin of women also appears to be a factor to be taken into consideration. Li et al., Showed that the majority of Asian studies of Chinese populations had different results from Caucasian studies in the United States and Scandinavia in the year 2015 (J.C. Benabu , F & al., 2015). Indeed, the study of breast cancer of the female population of this region during the year 2016 showed that patients geographically very far to the mountains and the Mediterranean Sea. There are two important areas in the Chlef region in Algeria, the first less hot and very close to the Mediterranean Sea or mountains or both, the relative risk of female breast cancer in the order of 0,007 %, that is to say 7 patients per 100000 women living in this area of Chlef. The second zone is warmer and far from the mountains and the Mediterranean Sea, where the relative risk of breast cancer is 0,045 %, that is to say 45 patients per 100000 women living in the latter zone. So, the geographical origin plays a very important role in reducing breast cancer. This study showed that higher breast cancer in warmer regions.

### **3.3. Grades of Breast cancer**

There are three grades of female breast cancer patients in the Chlef region, the absolute risk of developing first-grade breast cancer is 14.51% of the total number of patients in the year 2016, that is to say more than 4 patients out of 100000 women living in the Chlef area. The second grade is the most common and represents an absolute factor of 62.36 % of total patients that is to say more than 19 patients out of 100000 women. The last grade and most dangerous is a metastatic grade and represents an absolute risk of 23.11% of total patients, that is to say more than 7 out of every 100000 women in this region (Figure8).

### **3.4. Types of breast cancer**

There are five types of breast cancer in this study. The first type of breast cancer is invasive ductal carcinoma (IDC), which is the most common type of breast cancer and represents 73.02 % of all female patients, that is to say, there are approximately 23 female patients per 100000 female populations living in the Chlef region. The second type of breast cancer is invasive lobular carcinoma (ILC), this type of breast cancer manifests itself as a vague thickening of the mammary gland. It represents in this study 11.11 % of all diagnoses female patients; that is to say, we have more than 3 female breast cancer patients per 100000 women living in Chlef region. Other types of breast cancer in this region, they represent 15.87% of all diagnoses female patients, that is to say, we have about 5 patients per 100000 women living in the region of Chlef in Algeria (Figure.9).

## **4. Discussion**

In this study, we showed a statistically significant stepwise increase in proportion of patients with (Nicole Casasanta & al., 2020) breast cancer. The Women who has menopause after age 50 years, she has an increased risk of breast cancer, compared to women whose menses stop early. The risk of breast cancer increases by about 3 % in Algeria, for each additional year, from the presumed age of menopause (D.

ADNANE et al., 2015). Given that multiple modalities are used in the preoperative evaluation of patients with breast cancer, there is concern in clinical practice regarding the criteria that should be used to evaluate these patients (Gyeongmin Park & al., 2019). The association between age and risk of breast cancer in this case is similar, that menopause occurred naturally. The higher the number of breast cancer that results, will be important.

Age is the most important risk factor for breast cancer. This disease is rare in women under 30 years old, the risk increases from 50 years old. The risk of breast cancer increases with the level of breast tissue density in mammography. For women with dense breasts in mammography, the risk is multiplied by two to six times. This increase in risk is independent of the effect of other risk factors. It is estimated that 30% of breast cancer cases are attributable to breast mammography density greater than 50 % of the overall average (A. Tardivon et al., 2009; D. ADNANE et al., 2015). The geographic location of the woman plays an important role either positive, it is a protective factor, or negative, it is a risk factor. The biological mechanisms by which physical activity is associated with reduced risk involve reducing estrogen production and maintaining energy balance.

**Perspectives:** The analysis of risk factors for breast cancer shows us that primary prevention is not currently possible for major factors and only secondary prevention should be considered in this study area of Chlef in Algeria (D. ADNANE et al., 2015), practice of systematic screening to be introduced. In our study (Fadhila Mansour & al., 2018), the incidence rate of breast cancer per 100000 female populations living in the Chlef region from Algeria is 29.42.

## 5. Conclusion

The Breast cancer screening provides a reduction of this disease. For the young woman under 40 years, we found that the incidence was very low, but for the elderly woman the incidence was very high. The Women live very close to the Mediterranean Sea and the mountains contain a very low incidence, but other women have a high incidence rate because their region is hot and far from the mountains and the Mediterranean and it bears depending on the effects of different risk factors in these areas. A non-metastatic breast cancer of 76% and another grade of metastatic breast cancer of approximately 24% are distinguished. The most common type of breast cancer is invasive ductal carcinoma about 73%, the other types of this disease about 27%. Health education can be given along with regular breast cancer screening to women - especially post-menopausal women, and early and regular screening for women in reproductive age group; it will help in early diagnosis and prompt treatment (Pragati Sharma & al., 2018). To reduce this disease, it is necessary to use several means, Early diagnostic, techniques of treatment and prevention by protective factors before, during and after in Algeria and the worldwide.

## Declarations

**Disclaimer:** This manuscript was not funded by anyone, but was done in friendly conditions with all the competent departments in the studied area. The manuscript was designed and the data analysed and the

decision to publish it was made by the main author.

### **Competing Interests:**

**Conflict of interest:** The author, Mr. MAAMAR BOUKABCHA, announces that this manuscript is part of the personal project that I started working since 2015, as it was approved by the Directorate of Scientific Research in Algeria, and he also stated that there is no conflict of interest related to this Manuscript.

**Human and animal rights and informed consent:** This manuscript does not contain any experiments performed on humans or animals by any of the authors.

### **Author statements**

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We would like to thank all the alumni who participated in the survey.

#### Ethical approval

The questionnaire was anonymous, with no name or identity. The survey did not include any sensitive issues. Ethical approval was therefore not deemed necessary.

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#### Competing interests

The authors declare that they have no competing interests.

#### Availability of data and material

Not applicable.

#### Consent for publication

Not applicable.

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## Figures

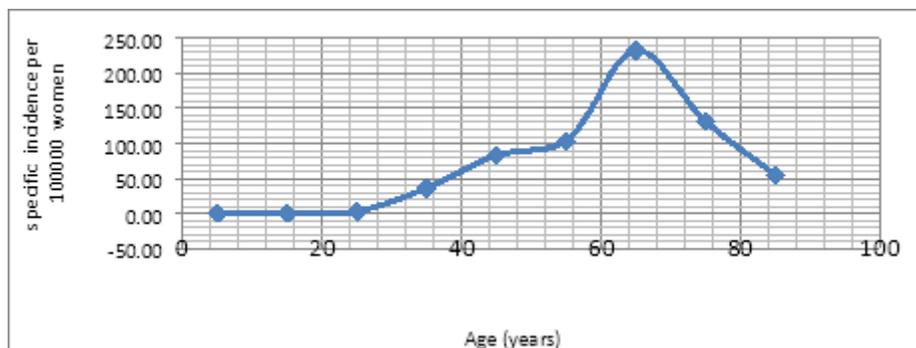
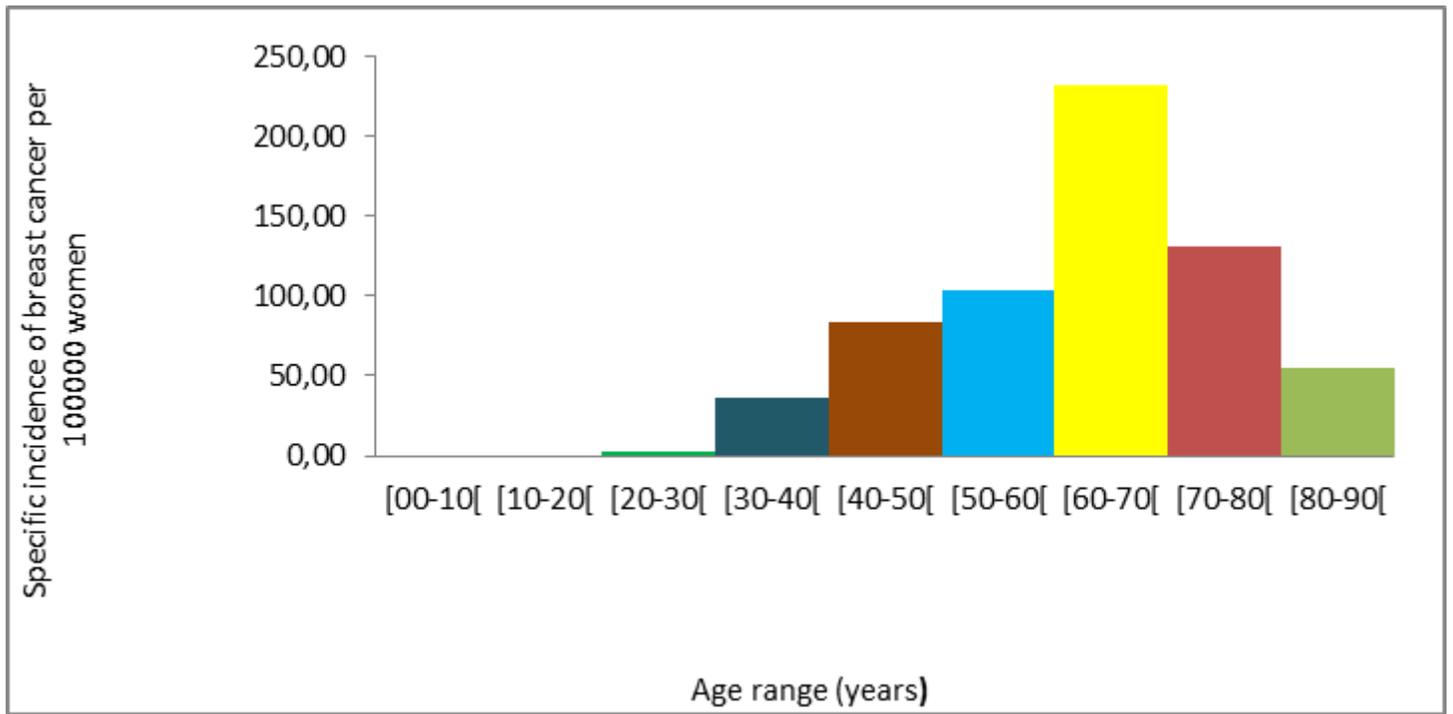


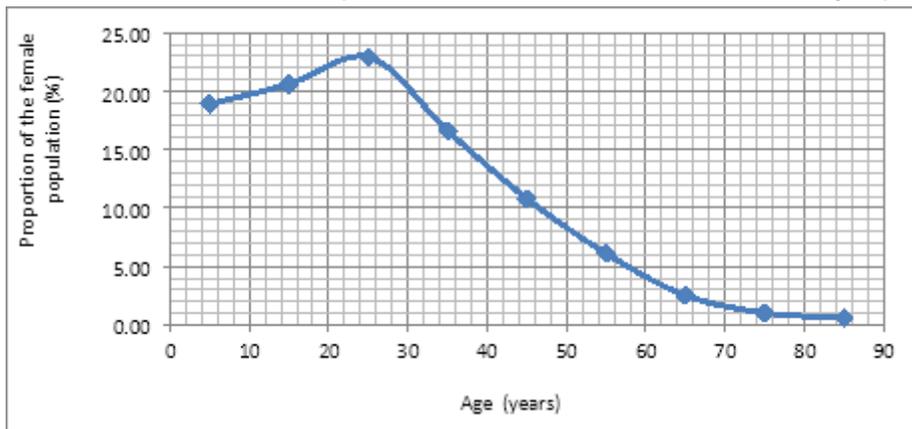
Figure 1

Specific Incidence of Female Breast Cancer per 100000 women of the year 2016.



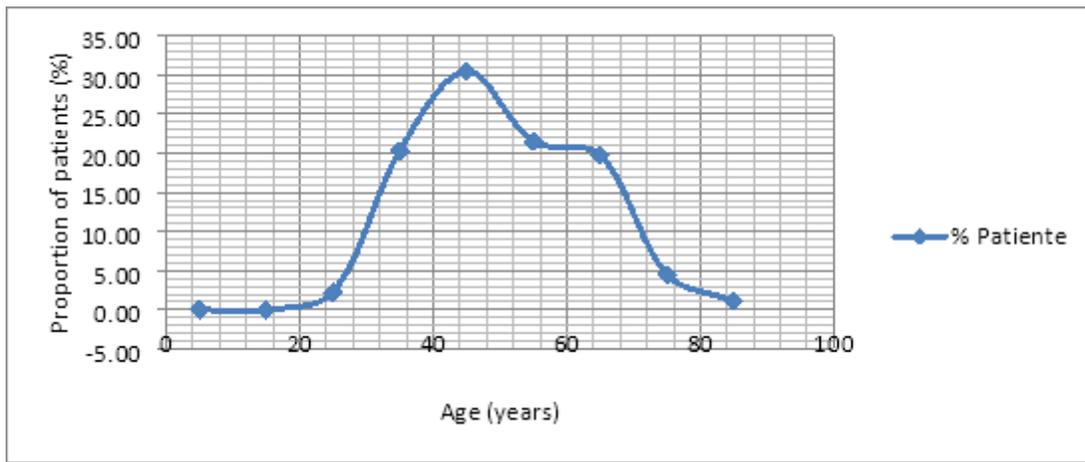
**Figure 2**

The distribution of the specific incidence of breast cancer by age group in 2016.



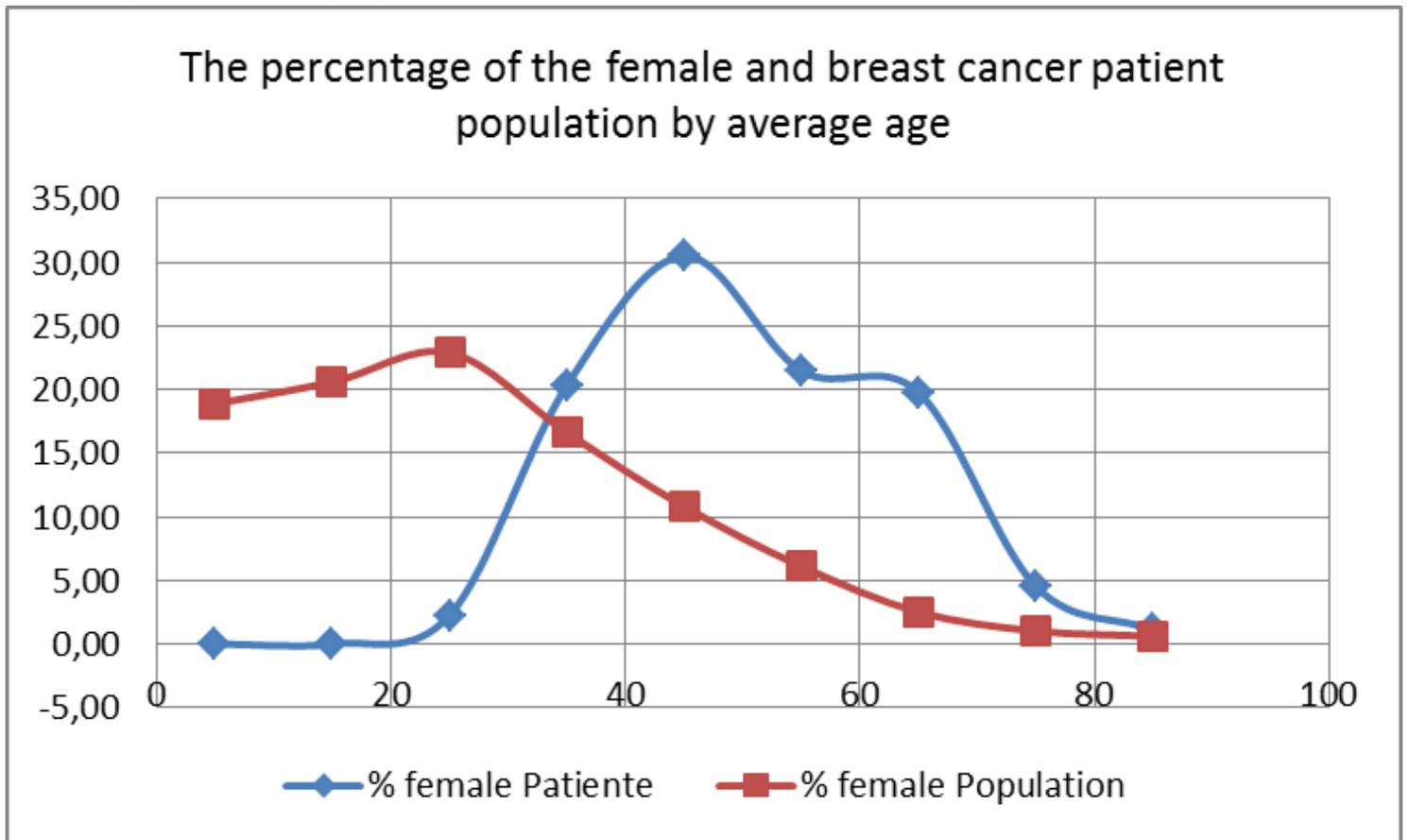
**Figure 3**

Percentage of the population by age.



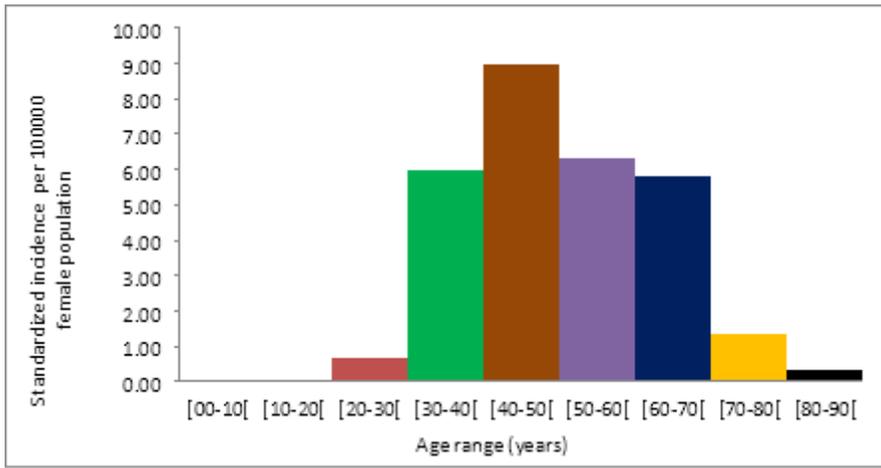
**Figure 4**

Percentage of patients by age.



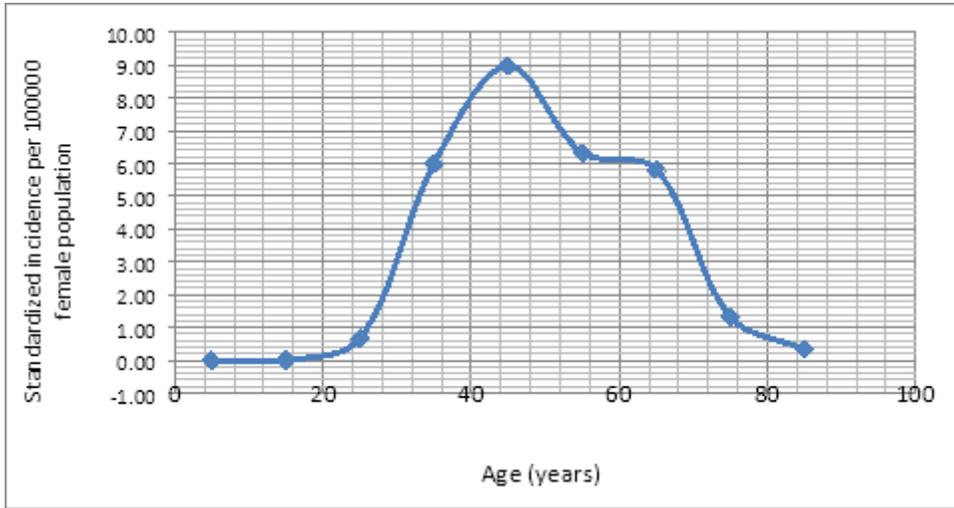
**Figure 5**

The relationship between the distribution of the female population and patients by age.



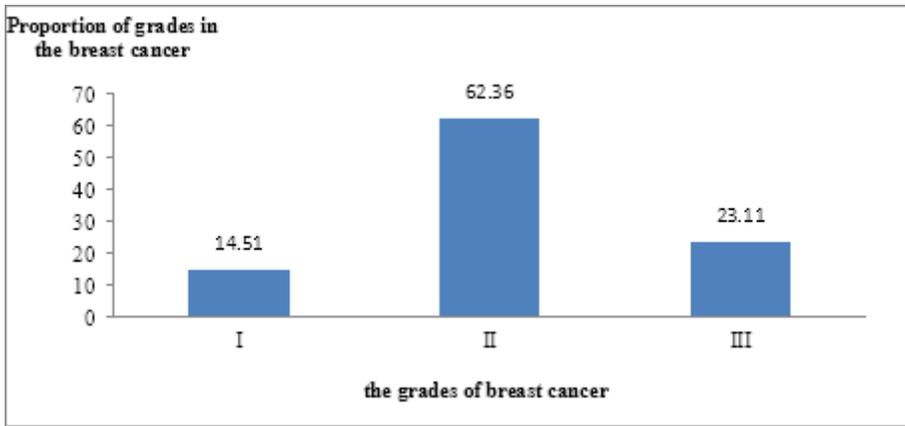
**Figure 6**

Standardized incidence according to Age Group.



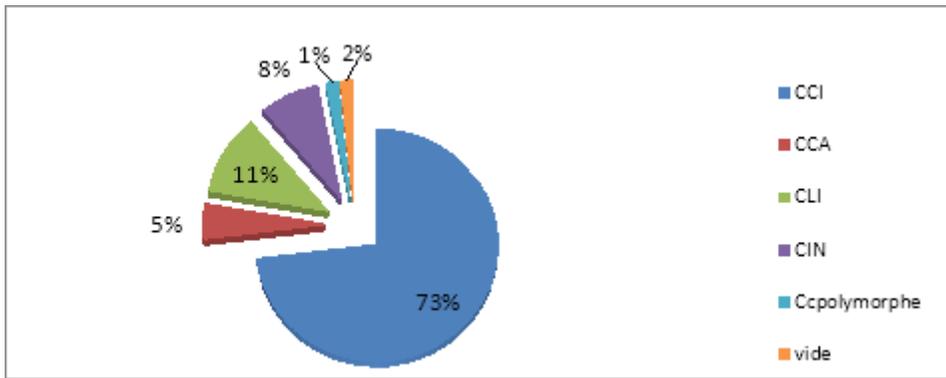
**Figure 7**

Standardized incidence according to age.



**Figure 8**

### Proportion of breast cancer grades



**Figure 9**

Proportion of female Breast Cancer patients Types in Chlef region, Algeria