Skin neoplasm in a reference hospital of Campos dos Goytacazes municipality: record integration and its interface with the health policy

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Abstract
Given its importance and multidimensionality, health plays an essential role in the public policy field. Skin cancer is the most common type of neoplasm found in Brazil and is considered a public health problem. In this regard, this research addresses the issue of skin cancer with a diagnosis of its incidence in the municipality of Campos dos Goytacazes, Rio de Janeiro State, Brazil, based on the Hospital Cancer Registry (RHC, abbreviation in Portuguese). These records obtained data from all patients seen at a reference hospital (Hospital Escola Álvaro Alvim) who were diagnosed with skin cancer between 2012 and 2017, totaling 656 cases. A descriptive statistical analysis of variables such as age, occupation, tumor location, neighborhood, and gender was used to profile skin cancer patients in the municipality, identifying the sectors of the area where the local population is most affected by the disease, besides any environmental factors that may be related and the most affected race. The results of the study demonstrate that the light-skinned population (69.1%) and the age group over 55 years old (predominantly from 70 to 74 years for basal cell carcinomas and from 80 to 84 years for squamous cell carcinomas) constitute the most affected group by skin cancer. This information should support public policies and campaigns among the population aiming to improve strategies for its prevention and early diagnosis.
Keywords: Basal cell carcinoma. Squamous cell carcinoma. Public policy. Melanoma. Skin cancer.

Neoplasias cutâneas em hospital de referência em Campos dos Goytacazes: integração dos registros e sua interface com a política em saúde

Resumo

Dada sua importância e multidimensionalidade, a saúde ocupa lugar de destaque na área de políticas públicas. O câncer de pele é o tipo de neoplasia mais frequentemente encontrado no Brasil e é considerado um problema de saúde pública. Neste sentido, a presente pesquisa aborda a temática do câncer de pele, sendo realizado um diagnóstico da sua incidência no município de Campos dos Goytacazes – RJ, por meio do Registro Hospitalar de Câncer (RHC). Esses registros obtiveram dados de todos os pacientes atendidos em um hospital de referência (Hospital Escola Álvaro Alvim), que apresentavam diagnóstico confirmado do câncer de pele entre os anos de 2012 e 2017, totalizando 656 casos. Através da análise estatística descritiva de variáveis como idade, profissão, local do tumor, bairro e sexo foi possível traçar um perfil dos pacientes acometidos pelo câncer de pele no município, detectando setores da área onde a população local é mais afetada pela doença, além de fatores ambientais que possam estar relacionados e a raça mais acometida. Os resultados do estudo evidenciam que a população de pele clara (69,1%) e a faixa etária acima de 55 anos de idade (com idade predominante dos 70 a 74 anos para os carcinomas basocelulares e dos 80 a 84 anos para os carcinomas espinocelulares), configuram o grupo mais acometido pelo câncer de pele. As informações obtidas desses registros seriam capazes de auxiliar nas políticas públicas e campanhas junto à população, visando melhorar as estratégias para sua prevenção e diagnóstico precoce.

Palavras–chave: Carcinoma basocelular. Carcinoma de células escamosas. Políticas públicas. Melanoma. Câncer de pele.

Neoplasias cutáneas en un hospital de referencia de Campos dos Goytacazes: integración de los historiales médicos y su interrelación con la política sanitaria

Resumen

Dada su importancia y multidimensionalidad, la salud ocupa un lugar destacado en el ámbito de las políticas públicas. El cáncer de piel es el tipo de neoplasia más común que se encuentra en Brasil y se considera un problema de salud pública. En este sentido, esta investigación aborda la temática del cáncer de piel, con un diagnóstico de su incidencia en el municipio de Campos dos Goytacazes - RJ, a través del Registro Hospitalario de Cáncer (RHC). Estos registros obtuvieron datos de todos los pacientes atendidos en un hospital de referencia (Hospital Escola Álvaro Alvim), que tenían un diagnóstico confirmado de cáncer de piel entre 2012 y 2017, totalizando 656 casos. Mediante el análisis estadístico descriptivo de variables como edad, profesión, localización del tumor, barrio y sexo, se pudo trazar un perfil de pacientes afectados por cáncer de piel en el municipio, detectando sectores de la zona donde la población local es más afectada por el cáncer de piel, además de los factores ambientales que pueden estar relacionados y la raza más afectada. Los resultados del estudio muestran que la población de piel clara (69,1%) y el grupo de edad de más de 55 años (con una edad predominante de 70 a 74 años para los carcinomas de células basales y de 80 a 84 años para los carcinomas de células escamosas) constituyen el grupo más afectado por el cáncer de piel. La información obtenida de estos registros podría ayudar en políticas públicas y campañas entre la población con el objetivo de mejorar las estrategias para su prevención y diagnóstico precoz.

Palabras clave: Carcinoma basocelular. Carcinoma de células escamosas. Políticas públicas. Melanoma. Cáncer de piel.

1 Introduction

The global industrialization process, mainly in the last century, has led to the increasing integration of economies and societies in a number of countries, causing the redefinition of living standards with the uniformization of working conditions, nutrition, and consumption. Simultaneously, a significant change in world demography took place due to the reduction in mortality and birth rates, with an increase in life expectancy and population aging. This global reorganization process has determined a major transformation in the patterns of health and disease worldwide. This epidemiological transition was characterized by a change in the mortality profile, with a decrease in the rate of infectious diseases and a concomitant increase in the rate of chronic degenerative diseases and cancer. In Latin American countries, however, differently from developed countries, this epidemiological transition has not been completed yet, with increasing numbers of chronic degenerative diseases, while the frequency of infectious diseases remains high (GUERRA; GALLO, MENDONÇA, 2005).

Cancer is a major public health problem on a global level and is ranked among the four main causes of death in patients under the age of 70. Cancer incidence and mortality have been shown to be increasing worldwide, partly because of population aging, as mentioned above, but also as a result of population growth and changes in the distribution and prevalence of risk factors for cancer development, especially the ones associated with socioeconomic development. In this way, the main types of cancer in developing countries have also been undergoing a transition, with a decline in types associated with infections and an increase in those related to improved socioeconomic conditions, with incorporating habits and attitudes linked to urbanization, such as sedentary lifestyles and inadequate diet (BRAY et al., 2018).

Governments in many parts of the world have called for more research to particularly assist middle- and low-income countries in developing policies and programs to improve cancer control. To address these requests, the World Health Organization (WHO) and the International Agency for Research on Cancer (IARC) have published two studies. The first of them, "Report on cancer: setting priorities, investing wisely and providing care for all" was conducted by WHO and aims to set the global cancer agenda, mobilize partners and assist countries in establishing priorities in cancer control investment and universal health coverage. The second study, which was conducted by IARC, "World Cancer Report: Cancer research for cancer prevention", focuses on cancer prevention and provides a comprehensive overview of the most relevant research available. The WHO also emphasizes the need for an intensification of cancer services in low- and middle-income countries, since, if they stay the same, the world will witness a 60% increase in cancer cases in the coming two decades. This increase would be, primarily, at the cost of new cases in low- and middle-income countries, where survival rates are currently at their lowest. This is mainly because they have been focusing limited health resources on fighting infectious diseases and improving maternal and child health, leaving health services without adequate resources to prevent, diagnose, and treat cancer (INCA, 2020).

In Brazil, the Population-Based Cancer Registries (PBCR) provide information on the impact of cancer on communities, which is a necessary condition for the planning and evaluation of cancer prevention and control actions. The PBCR, the Hospital Cancer Registries (RHC), and the Mortality Information System (MIS) of the Unified Health System Informatics Department (DataSUS, abbreviation in Portuguese) together constitute the structural axis for cancer surveillance and the development of research in related areas (INCA, 2020).

A recent global estimate, from 2018, indicates 18 million new cancer cases worldwide (17 million not including non-melanoma skin cancers) and 9.6 million deaths (9.5 million excluding non-melanoma skin cancers). Lung cancer is the most common cancer throughout the world (2.09 million), with breast cancer (2.08 million), colon and rectum (1.8 million), and prostate cancer (1.3 million) coming next. For both genders combined, it is estimated that almost half of the world's cancer cases and more than half of the world's cancer deaths took place in Asia in 2018, partly because nearly 60% of the global population lives there (BRAY et al., 2018; INCA, 2020).

Skin cancer is the most common cancer worldwide, with melanoma, basal cell carcinoma, and squamous cell carcinoma being the most frequent types of the disease, the last two classified as 'non-melanoma' (AMERICAN CANCER SOCIETY, 2016 apud INCA, 2018). In 2018, there were about 1.04 million (5.8%) recent cases of non-melanoma skin cancer and 290,000 (1.6%) cases of melanoma skin cancer in the world. The highest incidence rates of non-melanoma skin cancer are in Australia and New Zealand, North America, and Western European countries for both men and women. For melanoma skin cancer, the highest incidences are in Australia and New Zealand and in Northern, Central, and Eastern European countries (BRAY et al., 2018; FERLAY et al., 2018).

Ultraviolet (UV) light has been identified as the major environmental factor in the development of skin cancer, and epidemiological and laboratory studies show that sun exposure is the primary risk factor. It is estimated that 90% of non-melanoma skin cancer cases and 65% of melanomas in the world are associated with exposure to UV radiation. Sunscreen use is a crucial factor in preventing this cancer, but other means, such as wearing appropriate clothing, hats, and avoiding the sun at its hottest time, should not be neglected (THOMAS-GAVELAN et al., 2011; AZULAY, 2017).

Just as there are campaigns and guidelines for the prevention and early diagnosis of several types of cancer, such as breast, prostate, and bowel cancer, implementing public policies to reduce the incidence of skin cancer, being the most common type, would impact the population. It should be emphasized that, because no additional tests are usually needed, the prevention and early detection of skin cancer may be achieved by simple and low-cost measures.

This context corroborates the relevance of statistical analyses about primary skin tumors by providing useful epidemiological tools for identifying risk subgroups and promoting prevention as a unique measure in this scenario.

2 Objectives

This research intends to collect data, via the Hospital Cancer Registry, on patients with a confirmed diagnosis of cancer seen at the reference hospital to be studied. Based on this analysis, its goal is to detect sectors of the area in which the local population is more affected by the disease, environmental factors that may be related, and to identify more affected ethnic groups. The information from these records may also assist in public policies and campaigns for the early detection and prevention of cancer in the community.

3 Study area: the municipality of Campos dos Goytacazes

The municipality of Campos dos Goytacazes is in the northern part of Rio de Janeiro State, between the State of Espírito Santo and the regions of the northwestern part of Rio de Janeiro, the mountains, and the Baixada Litorânea (in the lowland coastal region of Rio). The northern region comprises eight municipalities: Macaé, Conceição de Macabu, Carapebus and Quissamã, Campos dos Goytacazes, São Fidélis, São João da Barra, and São Francisco do Itabapoana. This region corresponds to 21% of the total area of the state, and the municipality of Campos dos Goytacazes accounts for 44% of it (IBGE, 2020).

According to the 2010 Territorial and Demographic Census (IBGE, 2020), Campos dos Goytacazes has an estimated population of 507,548 inhabitants and an area of 4,032.487 km^2 and is considered the largest municipality in the state in area.

4 Sampling Population and Sample

This is an epidemiological, descriptive, and retrospective study conducted at the Álvaro Alvim School Hospital in the municipality of Campos dos Goytacazes, Rio de Janeiro State, where it is the High Complexity Oncology Care Unit (UNACON, abbreviation in Portuguese). This is one of the hospital units with adequate technical conditions, physical facilities, equipment, and human resources to provide highly complex specialized care for the definitive diagnosis and treatment of the most prevalent cancers.

5 Analysis of results and discussion

Although partially, the study sample provides the epidemiological profile of the most common types of skin cancer under the retrospective statistical analysis of a teaching hospital in Campos dos Goytacazes. This institution plays a reference role for many local services, being a screening place for several cases of neoplasms, making this analysis a potential mirror of reality.

Of the 4,259 patients registered in the Hospital Cancer Registry database of the Álvaro Alvim School Hospital from January 2012 to December 2017, a sample of 656 cases (15.4%) of skin cancer (total skin cancer cases registered in that period) was selected for the study. As shown in Figure 1, of these 656 tumors, 455 (69.4%) were cases of basal cell carcinoma, 113 (17.2%) of squamous cell carcinoma, and 69

(10.5%) of melanoma. Other skin tumors were also included in the study, corresponding to 19 cases (2.9%).

Figure 1– Distribution of new cases of skin cancer by clinical type
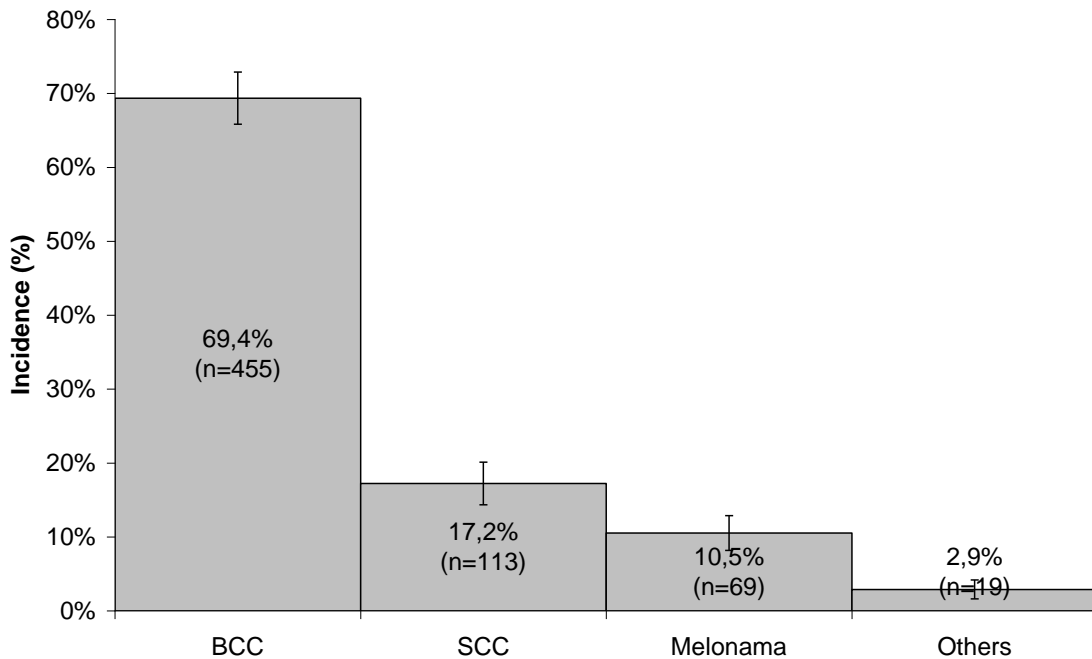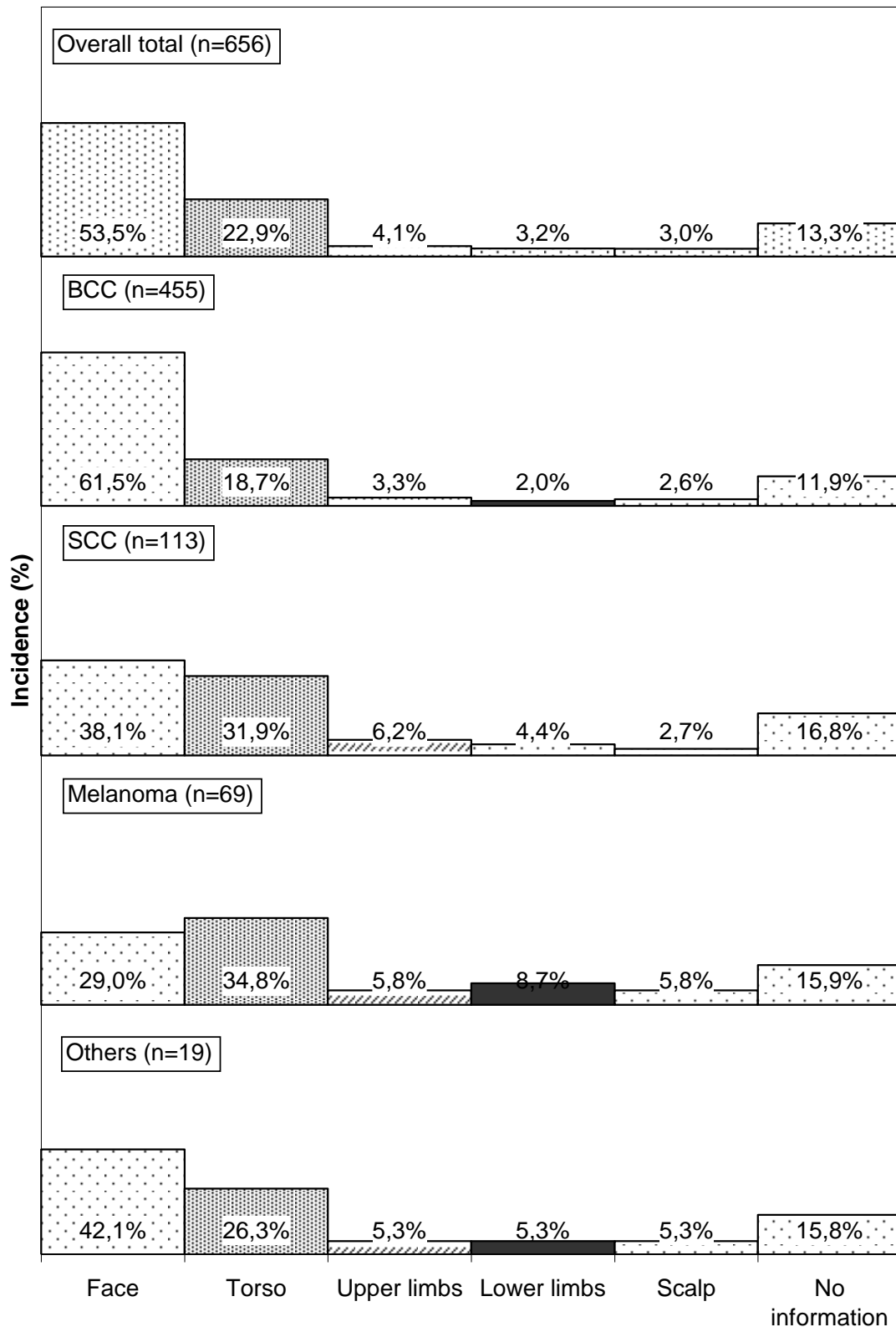

BCC: basal cell carcinoma, SCC: squamous cell carcinoma, Others: other skin tumors
Source: Hospital Cancer Registry database (2020).

The vast literature on the prevalence of malignant skin tumors states that BCC is the most frequent subtype, accounting for 70-80% of all cases (CHINEM; MIOT, 2011). Cameron et al. (2019) support this estimate and show, in a study conducted, that BCCs can reach up to 80% of tumors of keratinocyte origin.

As observed in Figure 2, there was, in general, a variation in the involvement of the different anatomical sites, and, about BCC, the largest number of cases occurred on the face (61.5%), followed by the torso (18.7%) and upper limbs (3.3%). Regarding SCCs, the face was the most affected site (38.1%) as well, followed by the torso (31.9%) and upper limbs (6.2%). Melanoma had a higher incidence in the torso (34.8%) followed by the face (29.0%) and lower limbs (8.7%).

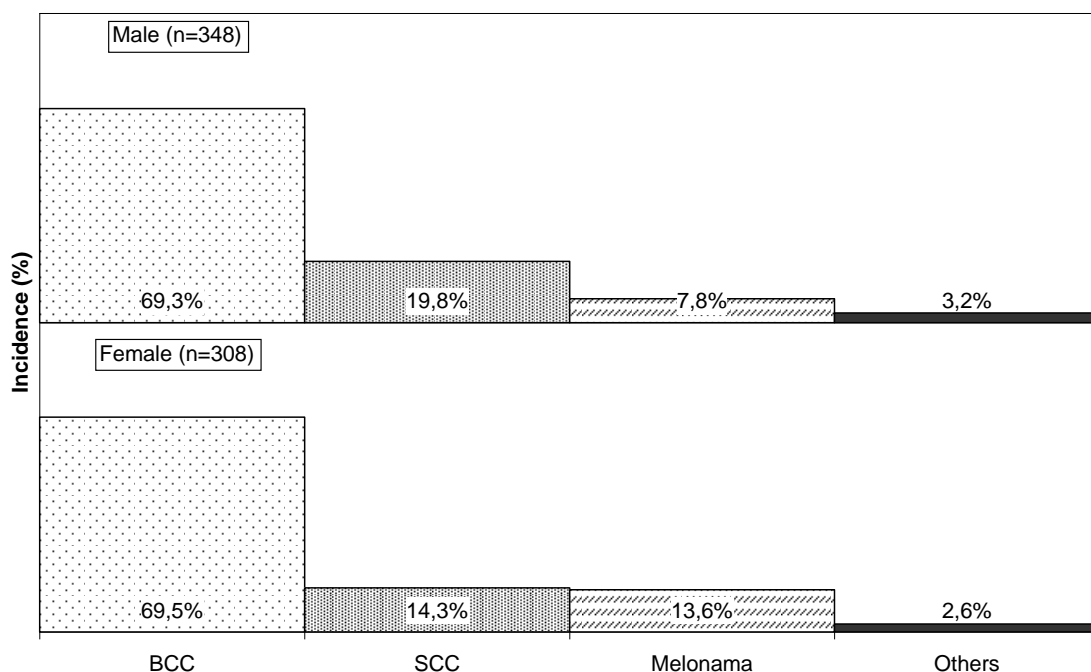Figure 2– Distribution of skin cancer type by anatomical site

BCC: basal cell carcinoma, SCC: squamous cell carcinoma, Others: other skin tumors

Source: Hospital Cancer Registry database (2020).

The prevalence of neoplasms in areas considered being photoexposed, such as the face, limbs, and scalp, supports the important role of ultraviolet radiation in the genesis of these tumors (INCA, 2019). It should be stressed a representative amount of the total number of skin neoplasms recorded without location information (13.3%).

As depicted in Figure 3, the distribution by gender shows that, as far as BCC is concerned, there was an almost equal proportion of women (69.5%) and men (69.3%). Among squamous cell carcinomas, males were the most affected, accounting for 19.8% of the cases, compared to females, who were affected in 14.3%. In melanomas, the opposite occurred, with women (13.6%) being more affected than men (7.8%).

Figure 3– Distribution of skin cancer type by gender

Source: Hospital Cancer Registry database (2020).

When the race is compared with each type of skin cancer, it is seen, as shown in Figure 4, that, in all races, basal cell carcinoma was the most prevalent, mainly among white patients, representing 74.3% of the cases. Squamous cell carcinoma was the second most common in brown and white patients, with 19.1% and 14.2%, respectively. Among black patients, there was neither incidence of squamous cell carcinoma nor melanoma, but a significant representation of other tumors was reported (42.9%).

Figure 4– Distribution of races by skin cancer type
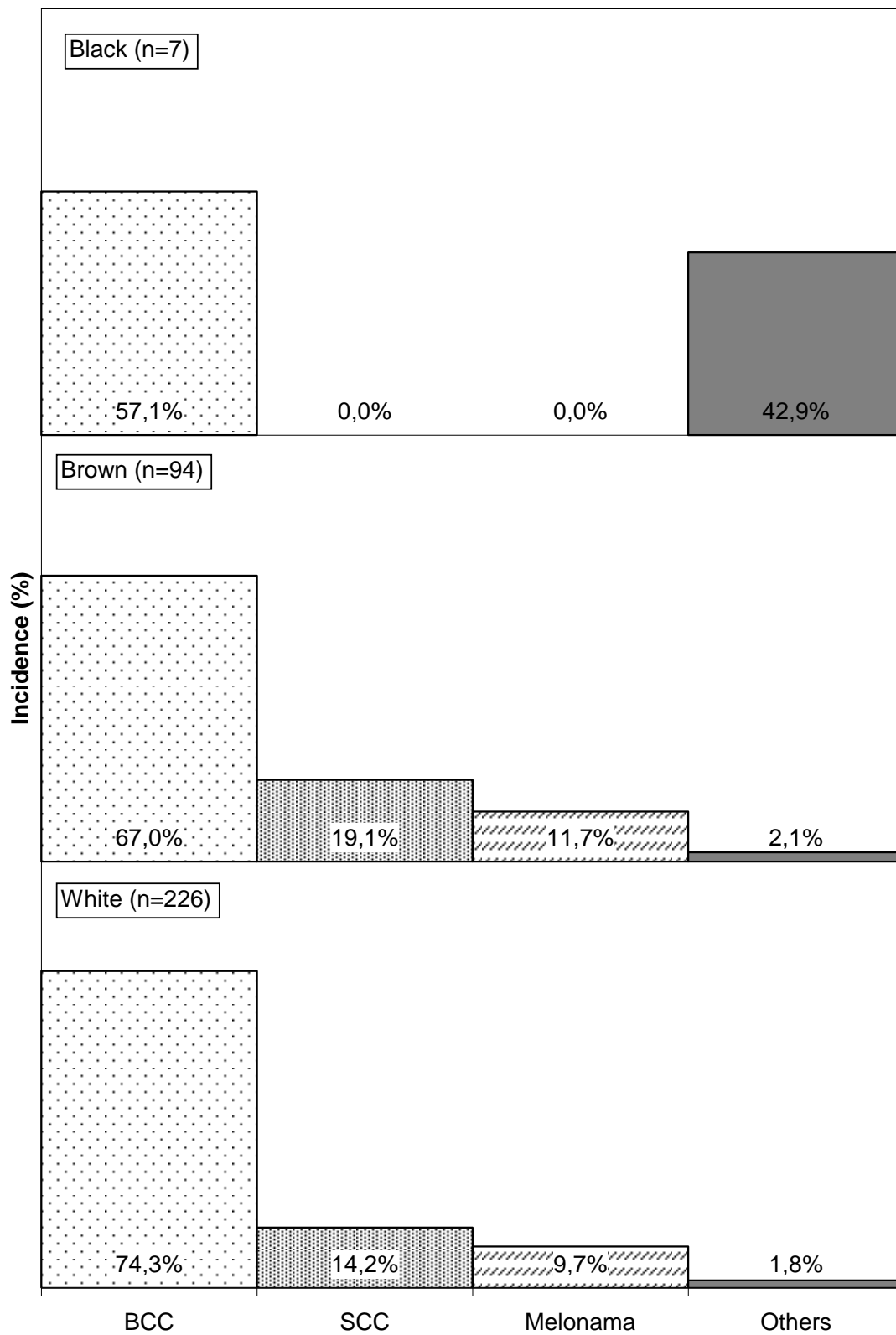
BCC: basal cell carcinoma, SCC: squamous cell carcinoma, Others: other skin tumors

Source: Hospital Cancer Registry database (2020).

In the literature, it is defined that light-skinned people have an increased risk of developing skin cancer, especially when exposed at a higher intensity to ultraviolet radiation, with both melanoma and non-melanoma skin cancer being the most common types in white populations (LEITER, 2014). The low incidence of skin neoplasms in darker skin groups is mostly due to the photoprotection provided by the greater amount of epidermal melanin, which gives black people greater natural protection. In black patients, epidermal melanin filters out twice as much UVB radiation when compared to Caucasians (NARAYANAN, 2010).

As seen in Figure 5, the highest number of cases of basal cell carcinoma and squamous cell carcinoma was found in patients 55 years and older, most significantly among BCCs aged 70 to 74 years (69 cases), and among SCCs aged 80 to 84 years (24 cases). Melanoma is distributed in almost all age groups included in the study.

Figure 5– Distribution of skin cancer type by age group

BCC: basal cell carcinoma, SCC: squamous cell carcinoma, Others: other skin tumors

Source: Hospital Cancer Registry database (2020).

In terms of age group, it should be considered that aging involves the accumulation of changes in the human being throughout time, encompassing physical, psychological, and social changes. Aging is among the greatest known risk factors for most diseases and is one of the primary risk factors for cancer (RIBEIRO et al., 2018). The most affected age group in this study was over 55 years old, which was similar to several publications in the literature, proving that older individuals suffer a cumulative effect of sun exposure.

Correlating the geographic areas of the municipality of Campos dos Goytacazes with the incidence of skin cancer, the residential area with the highest

number of registered cases was the downtown area (55), followed by Goytacazes (37), and Farol de São Thomé and Jockey Club (29) with the same number of cases.

This finding is supported by Table 3, which shows the most affected occupations in these neighborhoods. In downtown and in Goytacazes, housemaker patients were the most affected, with 70.4% and 60.0%, respectively, while in Farol de São Thomé, fishing was the most affected by skin cancer incidence, corresponding to 44.4% of these patients' occupation.

Table 1– Distribution of occupation by neighborhood

Neighborhood	Homemaker	Farmer	maid	Carpenter	Fisherman	Policeman	Driver	Mason	Merchant	Cook	Construction worker	Others
Centro	70,4%	7,4%	11,1%	0,0%	0,0%	0,0%	7,4%	0,0%	0,0%	0,0%	0,0%	3,7%
Goytacazes	60,0%	20,0%	0,0%	0,0%	0,0%	0,0%	5,0%	0,0%	0,0%	0,0%	10,0%	5,0%
Farol São Thomé	27,7%	5,6%	0,0%	0,0%	44,4%	0,0%	5,6%	0,0%	5,6%	0,0%	0,0%	11,1%
Penha	22,2%	0,0%	0,0%	44,4%	0,0%	5,6%	0,0%	0,0%	16,7%	0,0%	0,0%	11,1%
Jockey Club	76,4%	0,0%	5,9%	0,0%	0,0%	0,0%	0,0%	0,0%	5,9%	5,9%	0,0%	5,9%
Eldorado	46,7%	26,7%	26,7%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Morro Côco	73,3%	0,0%	0,0%	26,7%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Prazeres	53,8%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	46,2%	0,0%	0,0%	0,0%	0,0%
Turf Club	76,9%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	7,7%	15,4%
Guarus	58,4%	8,3%	16,7%	0,0%	0,0%	0,0%	8,3%	0,0%	0,0%	8,3%	0,0%	0,0%
Travessão	66,7%	8,3%	0,0%	0,0%	0,0%	0,0%	16,7%	0,0%	0,0%	8,3%	0,0%	0,0%
Jardim Carioca	63,6%	0,0%	18,2%	0,0%	0,0%	0,0%	0,0%	9,1%	0,0%	0,0%	0,0%	9,1%
Pecuária	27,3%	0,0%	9,1%	0,0%	0,0%	63,6%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
TOTAL	55,8%	6,4%	6,4%	5,9%	4,0%	4,0%	3,5%	3,5%	2,5%	1,5%	1,5%	5,0%

Source: Hospital Cancer Registry database (2020).

In this neighborhood analysis, it is noteworthy that Farol de São Thomé, the third one most affected, occupying the same position as Jockey Club, has fishing as a major economic activity. The fishing population would be more exposed to ultraviolet radiation, being part of a higher risk group for skin cancer development, and should be considered a target group for implementing public policies focused on prevention and guidance for this population.

As evidenced in this study, solar exposure to ultraviolet radiation is the primary risk factor for skin cancer development. A European study by Trakatelli et al. (2016) corroborates this. The authors demonstrated that outdoor workers had higher risk behaviors, with more UV exposure (occupational and leisure) and less sunscreen use, leading to higher sun exposure, with more photodamage and an increased risk of developing pre-neoplasms and skin neoplasms. This study is consistent with the results of what was found regarding the most sun-exposed occupations, showing a greater predisposition to the risk of skin cancer development.

In agreement with the data already highlighted concerning the occupations with the greatest sun exposure and, consequently, the greatest risk of developing skin cancer, it was seen in Figure 20 that housemaker patients (57.6%), maids (6.2%), farmers (5.5%), masons (4.1%), carpenters (3.4%), and drivers (3.4%) were the most affected. Of the many occupations enumerated in the study, the ones with a greater habit of sun exposure are the primary ones listed, thus making clear the association between the occupations with risk of developing skin cancer.

In an article published by Sena et al. (2016), outdoor workers are more vulnerable to developing occupational skin cancer, estimating that professionals with low education levels and European ancestry are at a higher risk of developing this cancer. For this reason, companies need to invest more in workers' health by providing protective equipment, thereby preventing occupational skin cancer.

6 The importance of adopting public policies in planning

The data collected for this work using the HCR database and under the custody of the National Cancer Institute (INCA) – which is a mandatory registry for hospitals qualified for the Specialized Oncology Care of the Unified Health System (SUS) – shows the need to adopt public policies that may lead to faster and more objective care for the populations that are shown to be more vulnerable to skin cancer development.

This work focuses on the municipality of Campos dos Goytacazes, but may also be developed for others using the same database.

It should be pointed out that the data made available by SUS for both skin cancer and other diseases has high capillarity and is significantly structuring in the organization and dynamics of urban networks, enabling investments to be made in a more consistent way, creating jobs and income, besides strengthening regional development trajectories at various scales (GADELHA et al., 2011; FEITOSA; GUIMARÃES, 2015).

By defining health as a right of all and a duty of the State, article 196 of the Federal Constitution (Brazil, 1988) establishes its guarantee by means of "social and economic policies aimed at reducing the risk of disease and other illnesses and at universal and equal access to actions and services for its promotion, protection, and recovery". Article 198 states that the actions and public health services must constitute a regionalized and hierarchical network integrating a single system, which organization must be guided as follows: (i) decentralization, with a single direction in each sphere of government; (ii) comprehensive care, with priority for preventive activities, without prejudicing care services; and (iii) community participation (RIBEIRO; OLIVEIRA; RODRIGUES, 2022).

Considering the aforementioned and the RHC data, it is suggested that a regional planning of public policies be adopted, which could serve both the sick and act in the prevention of diseases such as skin cancer.

7 Conclusion

Since skin cancer is the most common neoplasm in Brazil and in the world, it is worth deep consideration. This study obtained relevant data to characterize the population affected by this disease.

Ana Paula Moura de Almeida, Eduardo Shimoda

Monitoring cancer morbidity and mortality must be incorporated into the routine of health management so as to be a vital tool to establish prevention and control actions against cancer and its risk factors. This monitoring encompasses the supervision and evaluation of programs as necessary to understand the situation and the impact on the morbidity and mortality profile of the population, and the maintenance of a monitoring system with appropriate and quality information to support epidemiological analysis for decision making.

This immediate need to improve prevention strategies is supported by the increasing statistics of skin cancer cases and the evidence of the economic costs associated mainly with the treatments of this type of neoplasm. Besides financial implications, prevention could avoid mutilating surgeries or surgeries with undesirable cosmetic results. This is why public policies strongly emphasizing prevention are required to make the population aware of the risks regarding inadequate exposure to ultraviolet radiation.

It is of utmost importance to have a plan for preventing and diagnosing skin cancer that should include the dissemination of information on photoprotection in schools, companies, and health system agencies, along with screening and early detection of cases by trained health professionals. Preventive education aims to introduce these habits into the population's daily lives to further reduce the morbidity and mortality of the population due to this health problem and, consequently, reduce the treatment costs for this cancer, which accounts for the largest number of people affected in Brazil.

The current cancer risk picture in Brazil and its trends show relevance to public health and highlight the need for continued research on this issue, which is essential for developing proper health policies aimed at cancer control. An effective policy to control this neoplasm should also consider the socio-economic situation and the inequalities existing in the various regions of Brazil.

It should be emphasized that this study is a valuable tool in helping control the disease in the municipality. There is, however, a need to promote measures to obtain an earlier diagnosis of the disease. Moreover, the institution of appropriate treatment and the expansion of access to information about this disease and its forms of prevention are essential requirements for its successful control.

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14

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