

Cancer in Faisalabad and Nankana Sahib, Pakistan: 2017-2019; An Observational Study

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Received: 17 January 2023/Accepted: 16 June 2023



OPEN ACCESS

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Citation: Badar F, Yousaf A, Ahmad A, Hameed S, Chughtai O, Fahim-ur-Rehman M, Loya A. Cancer in Faisalabad and Nankana Sahib, Pakistan: 2017-2019; An Observational Study. J Cancer Allied Spec [Internet]. 2023;9(2):1-7. <https://doi.org/10.37029/jcas.v9i2.529>

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Funding: None.

Competing interest: The registry is a member of the International Association of Cancer Registries, France, and is registered under Pakistan's Societies Registration Act. The registry is supported by the Shaukat Khanum Memorial Trust.

Abstract

Introduction: The Punjab Cancer Registry's catchment area includes the districts of Faisalabad and Nankana Sahib. It is an observational and descriptive study that covers the 3 years from 2017 to 2019, evaluating the distribution of cancer in these two districts. **Material and Methods:** Data on incident cancer cases diagnosed between 2017 and 2019 among residents of Faisalabad and Nankana Sahib in Pakistan, reported by the participating centres of the Registry, were reviewed retrospectively. Figures and proportions for adults, children and adolescents were computed. **Results:** During 2017 and 2019, 5678 cases were reported from Faisalabad and 390 from Nankana Sahib, with over 50% seen in females. In both districts combined, among adult females, cancers of the breast, reproductive system, and hepatobiliary system were commonly diagnosed, while cancer of the lip/oral cavity/pharynx, hepatobiliary system and non-Hodgkin lymphoma were the leading diagnoses among adult males. In children and young adults (0-19 years), acute lymphoblastic leukaemia, Hodgkin lymphoma and non-Hodgkin lymphoma were the most common diagnoses. **Conclusion:** The cancer distribution reported from Faisalabad and Nankana Sahib is of utmost importance. However, the underreporting of cancer cases cannot be ruled out. More input from the collaborators is needed to ensure the completeness of cancer surveillance in the region.

Keywords: Cancer, epidemiology, Faisalabad, Nankana Sahib, Punjab Cancer Registry

Introduction

There are 36 districts in the province of Punjab, Punjab, Pakistan, as shown in the map (Figure 1)^[1]. One of these districts is Sheikhpura, which is adjacent to Lahore. Another neighbouring district is Nankana Sahib, and contiguous to it is Faisalabad.^[1] Administratively, the district of Faisalabad comprises six, whereas Nankana Sahib consists of four tehsils. According to the 2017 population figures released by the Census Bureau, the population of the Faisalabad district was well above 7.8 million, and that of Nankana Sahib was over 1.3 million. Table 1 shows the population details of the districts mentioned above, as released by the Census Bureau of Pakistan, and of two other districts discussed in the previous reports.^[2-6]

Topographically, the district of Nankana Sahib lies between the districts of Lahore and Faisalabad. The Faisalabad district is heavily populated and has the District Head Quarter (DHQ) hospital and other teaching hospitals, catering to the needs of its population.^[7] Faisalabad has one oncology centre, the Punjab Institute of Nuclear Medicine, affiliated with the Pakistan Atomic Energy Commission,^[8] and two adult oncology centres at Allied Hospital associated with Faisalabad Medical University. Children's Hospital and Institute of Child Health,

Faisalabad, has one paediatric oncology unit. The Nankana Sahib district has a DHQ hospital but no oncology centre. Surgeries are performed at the DHQs, and samples are sent to private laboratories for pathological review. In Faisalabad, the laboratory diagnosis is facilitated by one diagnostic set up of Chughtai Lab, and its nine collection centres; 11 regional sample collection centres of Shaukat Khanum Memorial Cancer Hospital and Research Center (SKMCH&RC); six of Aga Khan University Hospital; and other private laboratories, which include Meezan, Excel and Biocare. In Nankana Sahib, there are three collection centres representing Chughtai Lab.

Faisalabad and Nankana Sahib are in the catchment area of the Punjab Cancer Registry, a population-based cancer registry set up in 2005 in Lahore.^[9] This study provides an overview of the cancer cases reported over 3 years in Faisalabad and Nankana Sahib.

Materials and Methods

The registry has over 20 collaborating centres in the province.^[9] In routine, data are collected on forms specifically designed for data capture. The collaborating centres share the forms with the coordinating office located within SKMCH&RC.

Table 1: Districts of Punjab studied in the current study and previous studies

2017 estimates	Current report		Previous reports	
District	Faisalabad	Nankana Sahib	Sheikhpura	Lahore
Area (sq. km.)	5857	2216	3744	1772
Urban population (%)	47.79	18.09	34.73	100
Population 2017	7,882,444	1,354,986	3,460,004	11,119,985
Male	4,038,932	690,274	1,786,383	5,813,987
Female	3,842,684	664,558	1,673,242	5,303,982
Transgender	828	154	379	2,016
Population density (per sq. km.)	1,345.82	611.46	924.15	6275.39
Tehsils	Six: Chak Jhumra, Faisalabad City, Faisalabad Sadar, Jaranwala, Sammundri, and Tandlian Wala.	Four: Nankana Sahib, Shah Kot, Sangla Hill, and Safdarabad.	Five: Ferozewala, Muridke, Safdarabad, Sheikhpura, and Sharak Pur.	Five: Lahore Cantt., Lahore City, Model Town, Raiwind, and Shalimar

The data items required are the identifiers (name, sex, age, or date of birth, and city or address) and tumour-related specifics such as the incidence date, most valid basis of diagnosis, topography, morphology, behaviour, and the source of information, when available.^[10] The data are entered into the electronic database of the Registry at SKMCH&RC.

A retrospective review of the records was conducted to retrieve the information on cases belonging to Faisalabad and Nankana Sahib, saved in the database. An observational study was conducted to determine the cancer counts and proportions by sex and age category. The age groups included children (0-14), adolescents (15-19) and adults (≥ 20 years).

Duplication was checked using a combination of variables. A check for multiple primaries was conducted using the guidelines set by the International Agency for Research on Cancer.^[10]

Moreover, the 2019 population estimates were computed separately for Faisalabad and Nankana Sahib, using the average annual growth rate provided by the government. Thus, crude rates were determined by the cancer site.

In conducting this study, no experiment was conducted. Since a retrospective review of the records was done, the results were compiled, and the results were presented in the manuscript using anonymised data. No individual patient consent was required for this study. Informing the patients retrospectively about the study was not deemed appropriate. The SKMCH&RC Institutional Review Board (IRB), officially known as the 'Institutional Review Board, Shaukat Khanum Memorial Cancer Hospital and Research Centre', reviewed the study and granted it an exempt status, eliminating the need for informed consent (Reference No. EX-02-08-22-01-A1). The same IRB authorised the study (Reference No. EX-02-08-22-01-A1). The IRB is listed with the OHRP as 'IRB00005898 - Shaukat Khanum Mem Cancer Hosp'.

Microsoft Excel V.2016 was used to analyse data.

Results

Faisalabad

In 3 years, between 2017 and 2019, 5678 cases were reported. There were 3187 females (56.13%) and 2491 males (43.87%); 5209 adults (91.7%) and 469 (8.3%) children and adolescents. The mean age at presentation was 47.94 years (SD 18.20), with a median of 50 years and a mode of 50 years (6.2%). Approximately 93% of the cases were histologically confirmed.

In Faisalabad, among adult females ($N=3,031$), breast cancer accounted for 54% of the cases. Other frequently reported malignancies were those of the reproductive system (ovary and adnexa/corpus uteri/cervix uteri [11.7%]), lip/oral cavity/pharynx (5.3%), non-Hodgkin lymphoma (NHL) 3.6%), hepatobiliary system (3.2%) and lower gastrointestinal tract (2.9%). In adult males ($N=2,178$), cancer of the lip/oral cavity/pharynx (11.5%) contributed significantly to the total, followed by the hepatobiliary system (11.3%), NHL (7.9%), lower gastrointestinal tract (7.5%), bladder and larynx each (6.6%), and prostate (5.7%).

Among children and adolescents, acute lymphoblastic leukaemia (ALL) accounted for 25.2% of the total cases ($N=469$), Hodgkin lymphoma 11.5%, NHL 7.9%, germ cell tumour (GCT) and osteosarcoma each 6.2% and acute myeloid leukaemia (AML) and rhabdomyosarcoma each 4.7%.

Nankana sahib

There were 390 cases from Nankana Sahib (204 females (52.3%) and 186 males (47.7%), with 315 (87%) adults and 75 (13%) children and adolescents. The mean age was 42.62 years (SD 20.25), the median was 46.0 years and the mode was 60 years (3.8%). Nearly 83% of the cases were histologically confirmed.

In adult females, breast cancer accounted for 54.4%

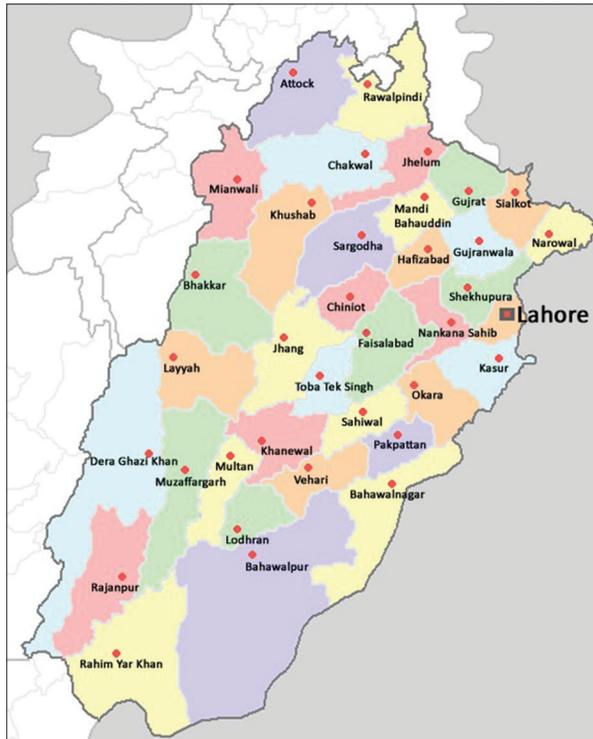


Figure 1: Map of Punjab, Pakistan, showing the districts of the province.

of the cases (N=180), tumours of the reproductive system 11%, lip/oral cavity/pharynx 4.4%, gall bladder 2.8%, hepatobiliary system, skin and leukemia 2.2% each.

In adult males (N=135), the hepatobiliary system accounted for 15.6% of the cases, leukaemia 9.6%, lip/oral cavity/pharynx 8.9%, NHL 7.4%, trachea/bronchus/lung 5.9%, larynx 5.2% and bladder and skin tumours 4.4% each.

In the 0-19-year age group, 75 cases were reported. ALL accounted for 33.3% of the total, Hodgkin's lymphoma 13.3%, AML 9.3% and leukaemia, neuroblastoma and neuroblastoma 4% each.

Figures 2 and 3 show the proportional distribution of cancer cases in adult females in Faisalabad and Nankana Sahib, respectively. Figures 4 and 5 show these statistics among adult males in Faisalabad and Nankana Sahib. Figures 6 and 7 show cancers

in children and adolescents in Faisalabad and Nankana Sahib, respectively.

The crude rates were computed for each of the two districts using the population denominators estimated for the 3 years under consideration. However, the rates were low, an indication of underreporting of the cases. Therefore, these rates are not presented in this paper.

Discussion

In the present study, over 3 years (2017-2019), 390 cases from Nankana Sahib and 5678 cases from Faisalabad were reported to the Registry. A 2007-2009 report from Meezan Lab, Faisalabad, noted that 564 cancers were diagnosed at the laboratory.^[11] On searching the literature further, no additional reports were found for these two districts.

In Faisalabad, among adult women, breast cancer was a commonly diagnosed malignancy, which is comparable to what has been seen in Lahore. Cancers of the female reproductive organs (uterus, cervix, and ovary), lip/oral cavity/pharynx and hepatobiliary system were also commonly diagnosed in both districts. Studies on the incidence of the hepatitis C virus and the human papillomavirus for cervical cancer could be crucial in the area because both infectious agents are thought to play a role in the aetiology of some cancers. At the same time, it would be beneficial to conduct similar research in other districts. In adult males, cancers of the lip/oral cavity/pharynx, hepatobiliary organs, leukaemia and NHL were common. Since tobacco is implicated in the aetiology of leading tumours, a review of the tobacco control policy and its implementation is warranted.

In children and adolescents, acute lymphoblastic leukaemia and Hodgkin lymphoma accounted for a high proportion of the cases in both districts.

A significant difference in cancer counts between Faisalabad and Nankana Sahib versus Lahore has

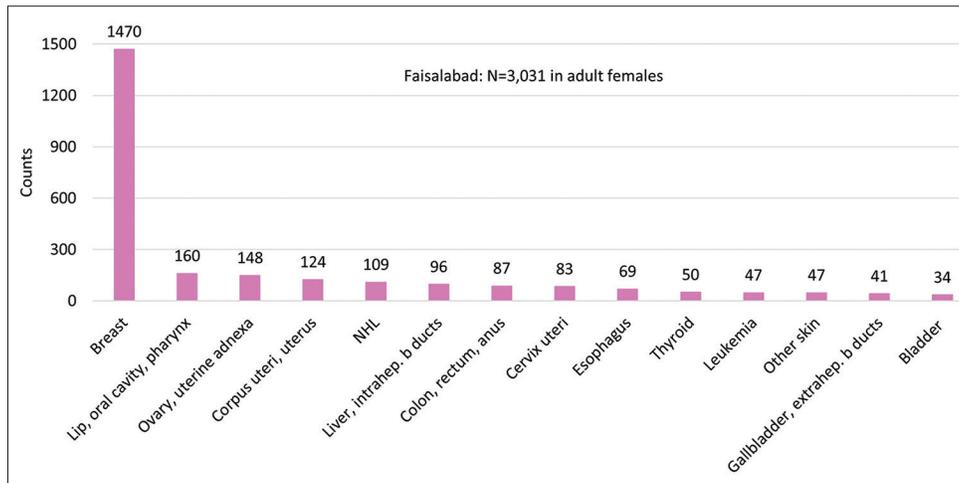


Figure 2: Cancer distribution of leading cancers in adult females (≥ 20 years), 2017-2019, Faisalabad (N=3,031), Pakistan.

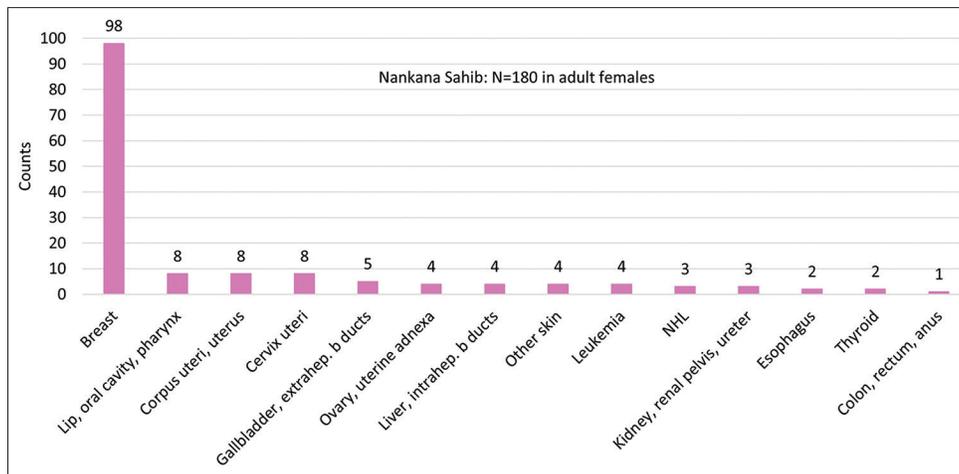


Figure 3: Cancer distribution of leading cancers in adult females (≥ 20 years), 2017-2019, Nankana Sahib (N=180), Pakistan.

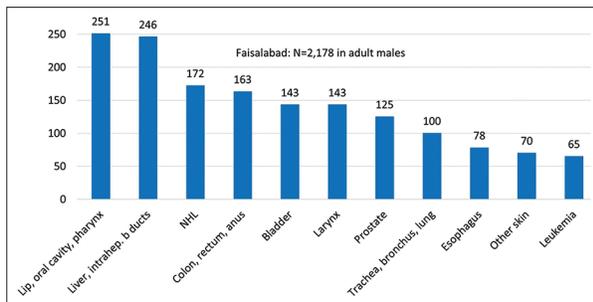


Figure 4: Cancer distribution of leading cancers in adult males (≥ 20 years), 2017-2019, Faisalabad (N=2,178), Pakistan.

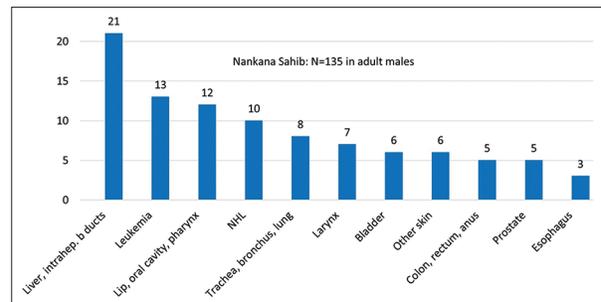


Figure 5: Cancer distribution of leading cancers in adult males (≥ 20 years), 2017-2019, Nankana Sahib (N=135), Pakistan.

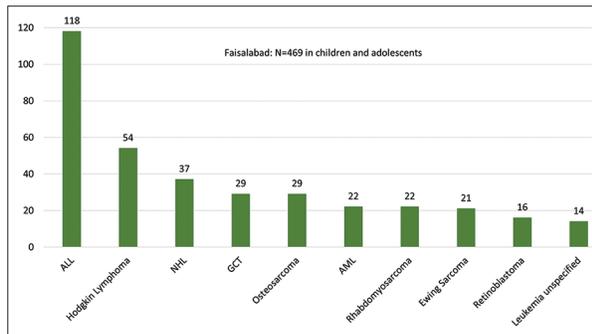


Figure 6: Cancer distribution of leading cancers in children and adolescents (0-19 years), 2017-2019, Faisalabad (N=469), Pakistan.

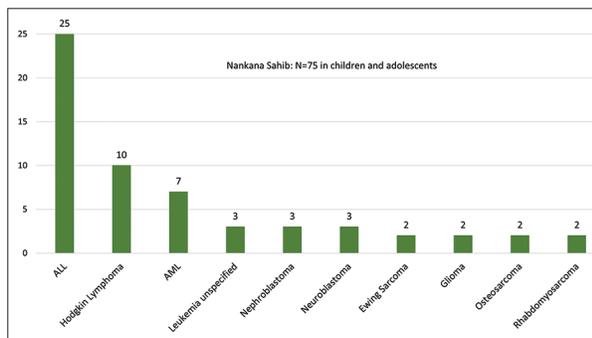


Figure 7: Cancer distribution of leading cancers in children and adolescents (0-19 years), 2017-2019, and Nankana Sahib (N=75), Pakistan.

been reported. Lahore is completely urbanised, with a population of around 11 million and a high population density, where over 19,000 cases were diagnosed in 2017-2019. A marked difference in the total count could be explained partially by a disparity in the rural-urban divide in the region. Nevertheless, underreporting appears to be the major contributing factor to this dissimilarity.

In Lahore, 58,394 incident cases were recorded over 10 years from 2010 to 2019, making an annual average of approximately 5800.^[10] The count is significantly different from what was seen for other districts in the study and suggests that Lahore has an efficient surveillance system. However, the leading cancers in these districts were more similar than different from one another and included cancers of the breast, gynaecologic system, gastrointestinal tract, lip/oral cavity, and

NHL in adult females; prostate, urinary bladder, respiratory tract, gastrointestinal system, and NHL in adult males and leukaemia, brain tumour, Hodgkin lymphoma, NHL, and bone tumour in children and adolescents.

This is the first report that provides an overview of cancer registration in Faisalabad and Nankana Sahib as part of the monitoring programme for non-communicable diseases in Punjab. Even though the extent of reporting is unknown at this stage and detailed statistics cannot be released, the information that has been collected for the districts is invaluable. This could be improved further by increasing the level of awareness about cancer registration in the community and by the active involvement of caregivers, diagnosticians, and public health representatives in disease surveillance.

It must be emphasised once more that every district in the province needs a data collection centre with trained personnel under the supervision of the local stakeholders to guarantee prompt data collection and reporting of the cases to the coordinating office located at SKMCH&RC. This approach may be practicable and effective in the country's densely populated Punjab area.

Acknowledgment

We would like to express our gratitude to the members of the Punjab Cancer Registry and the employees of the Shaukat Khanum Memorial Cancer's Hospital and Research Centre Cancer Registry and Clinical Data Management section for their contributions to this study.

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Author Contributions

Conceived and designed the analysis: FB; Collected the data: AY, AA, SH, ORC and MFR; Contributed data or analysis tools: AY, AA, AL, SH, ORC and MFR and AL; Performed the analysis: FB and AL; Wrote the paper: FB