1. INTRODUCTION

During 2007, the activities of the National Cancer Registry (NCR) in Lebanon have been integrated into the Epidemiological Surveillance Unit (ESU) within the Ministry of Public Health (MOPH). NCR activities are supervised by an oversight Committee officially set-up in 2005 by a decree 230/1 from the PH Minister Mohammad Jawad Khalifeh (Annex 3), updated by decree 1/141. Since inception in 2002, funds for NCR have been provided by the Italian Cooperation in Lebanon, and managed since 2004 by the Lebanese Cancer Society (LCS). Additional contributions have also been obtained from the Office of the WHO Representative in Lebanon.

As in previous years, NCR data are still derived from a passive "capture" system and an active "recapture" system. Passive capture reporting originates from the MOPH Drug Dispensing Center (DDC) which provides cancer drugs free of charge to patients with no health coverage, estimated at 50% of the population. All eligible cancer patients who elect to use the DDC services have to bring a completed report form which is then received and entered at NCR. With the beginning of 2008, a revised and unified data form has been adopted in conjunction with DDC (Annex 2). Whenever possible, hospitals are invited to adopt the same form for their own cancer registries, to facilitate yearly pooling of national data. Reports emanating from other public health agencies are received by the capture system as well. These include the medical arms of the Army, the Internal Security Forces, the National Social Security Fund (NSSF) and the Government Employees Cooperative.

The passive system alone cannot ensure a complete reporting of all cancer cases in Lebanon. It has to be complemented by an active, more comprehensive "recapture system". A decree 511/1 from the PH Minister in June 2002 (Annex 5) has been used as the legal framework to start elaborating this system. The recapture system pools data from all pathology and hematology laboratories and practitioners involved in cancer diagnosis in Lebanon (Annex 1-2).

This "Cancer in Lebanon 2004" report consists of the reconciliation of data from the two surveillance sources. Duplicates have been carefully expunged, as well as cases which had been diagnosed prior to January 1, 2004. Cases reported as residing outside Lebanon (Syria, Jordan, etc…) were also removed from the count. Cases residing in Lebanon were all included regardless of their nationality. The coverage of this 2004 report surpasses 95% of all incident cases in Lebanon in that year, with only a negligible portion of misclassified prevalent cases diagnosed in earlier years.

In addition to reporting on incident cancer cases in Lebanon in 2004, this report will also include an update of the Cancer 2003 report. This update was made necessary by an official decision of the Central Agency for Statistics (CAS) to modify the basis on which the population of Lebanon is estimated. This meant that the population originally estimated at about 4.4 millions was redefined at 3.6 millions. This major modification in denominators invited a reassessment of incidence rates in 2003. When the update process started, the NCR team used this opportunity to conduct a quality control on previously included cases, some of which were not incident in 2003. Detecting non-incident cases is becoming increasingly possible because of the accumulation of data within NCR, a direct positive result of continuity of work since 2005.

2. POPULATION OF LEBANON

In the absence of an accurate census of the Lebanese population, incidence calculations in this report were performed using figures derived by CAS from a national survey conducted in 1997, and for regional distributions from a survey conducted by the Ministry of Social Affairs (MOSA) in 1996, and adjusted for national growth rates proposed by UNPD for that period (Epinews, 2005). They are the best-estimates of the Lebanese population inclusive of permanent residents and Palestinian residents. In 2004, the population of Lebanon was estimated at about 3.9 millions, distributed in 25 cazas in six mohafazats in 2004 as presented in table 2004-1 (Figure 1: mohafazats in Lebanon). Table 2004-2 presents the distribution of the population in the same period by age-groups, along with the same distribution in the WHO standard population. In 2004, 50.5% of the population were females, 29% were children aged less than 15 and 7% were senior citizens aged 65 or more. Figure 2 shows the age-pyramid in Lebanon in 2004.

3. RESULTS

3.1. Total count and sources of data

A total of 7716 incident cases of cancer were reported to NCR for the calendar year 2004. This total count included 519 cases of non-melanoma skin cancers (6.7%) which were analyzed in a separate table (Table 2004-12) at the end of the report, and were included neither in the relative frequency nor in the incidence rate calculations. The rest of the analysis will address the 7197 non-skin incident cancer cases diagnosed in 2004. Of those 7197 cases, 1504 were obtained through the capture system only (20.9%), 5277 (73.3%) through the recapture system only, and 416 (5.9%) were captured and recaptured.

3.2. Demographic characteristics of cancer cases

Of 7,197 cases, 3606 (50%) were in women and 3586 (50%) in men, with 5 cases missing any gender indication. Mean age of cases was 56.6 years (SD=18.3; median 59 years), with a significant difference on average ($p<0.05$) between men (58.6 ± 18.9 years) and women (54.5 ± 17.3 years). The median age at diagnosis for women was 56 years versus 63 for men. The younger age of diagnosis in women compared to men has been a consistent finding in Lebanon since the 1960s. Demographic details are shown in Table 2004-3. The overall age-distribution showed the usual ascending trend after 40 (Figure 3).

Sex differences in age at diagnosis are presented in details in table 2004-4 for the most common types of cancers. The median age of diagnosis for breast cancer was 52.5 in women, versus 67.5 in men (n= 32 cases) ($p<0.01$). Age at diagnosis was significantly higher in men compared to women in bladder, colorectal, and leukemia cases. There were no median age differences by gender in lung and Hodgkin's lymphoma. The median age was significantly higher in women only in Non-Hodgkin's lymphomas (NHL). In almost all cancers, diagnosis occurred predominantly after 60 years. Apart from breast cancers in women, exceptions included NHL at a median age of 58, Hodgkin's lymphomas at a median age of 32.5 years, and leukemia of all types at 46 years.

3.3. Geographic distribution of cancer in 2004

Of all registered cases, only 2380 (33.1%) came with a mention of place of residence. The distribution of those cases by mohafazats (and corresponding cazas) of residence is presented in table 2004-5. This distribution is compared to the relative distribution of the Lebanese population based on voting registration lists. The voting lists do not correspond to the actual living distribution of the population, which is impossible to assess at this time in Lebanon. Consequently, all attempts to measure cancer incidence by caza is currently not valid. However, for the sake of gross comparisons, the relative distribution of the voting population may give some insight into the relative dimensions of the population subgroups expected in each administrative unit.
The relative proportions of cancer locations show expectedly highest case-loads in the mohafazat of

Beirut and surrounding Metn and Baabda cazas (about 48%), compared to their representation of about 25% of the voting population. These districts are part of the Greater-Beirut area, where more than 50% of the population of Lebanon is actually concentrated. In almost all other administrative units, relative proportions of cancer cases were smaller than the corresponding proportion of the voting population.

3.4. Anatomical cancer sites in adults and children

Anatomical cancer sites are presented by gender in table 2004-6. The five most frequently diagnosed cancer sites of 3586 cases in men in 2004 were: lung and bronchus (C33-24) (15.7%), bladder (C67) (15.6%), prostate (C61) (15.4%), colo-rectum (C18-20) (8.6%) and NHL (C82-85) (7.6%). Most common sites among the 3606 cases in women were: breast (C50) (38.2%), colo-rectum (7.8%), NHL (5.9%), lung and bronchus (5.9%) and ovary (C56) (4.6%). In 2004, breast cancer remains the most commonly diagnosed cancer in Lebanon (19.7% of 7197 cases). About 4 in 10 of all cancers diagnosed in women is now a breast cancer, 1 in 5 for the entire cancer case-load. Of all cancers, second most commonly diagnosed were lung and bronchus (10.8%), followed by bladder (9.3%), colo-rectum (8.2%) and prostate (7.7%). Cancers with ill-defined sites (C76) constituted 1.2% of the total case-load in 2004 (n= 87).

3.5. Pediatric cancers in 2004

Table 2004-7 presents the details of pediatric cancer sites in 2004. In the age-group 15 or less, 195 cases were diagnosed of which most common cases were leukemias (32.3%), brain cancers (11.8%) and NHL (10.3%). Recent findings indicate that young adult (16-20) cancer patients may benefit from specific protocols, particularly in Leukenia, that are usually prescribed to pediatric cases. In addition, young adults require specialized care facilities. Consequently, starting 2004, a breakdown of cases in that age-group will also be proposed with pediatric cancers.

3.6. Pathology of selected cancer types

Table 2004-8 presents pathology data for selected, frequently recorded cancers.

3.7. Incidence rates among males in 2004

Highest age-standardized incidence rates were found for lung cancer, followed by bladder and prostate cancers. The total age-standardized incidence rate for men in 2004 was 179.3 new cases per 100,000. Details are presented in Table 2004-9.

3.8. Incidence rates among females in 2004

The highest age-standardized incidence rate was that of breast cancer, followed by far by lung and NH lymphomas. The total age-standardized incidence rate for women in 2004 was 180.30 new cases per 100,000. Details are presented in Table 2004-10.

3.9. Age-specific and age-adjusted rates for all in 2004

As expected, the age-specific incidence rates (ASIR) increase with age in both sexes. While incidences at older age are higher in men, the rise is steeper in women. The overall crude incidence rate for all ages and sexes in 2004 was 179.8 per 100,000 (Table 2004-11).

3.10. Characteristics of skin cancers diagnosed in 2004

Table 2004-12 presents details on the 518 incident cases of skin cancers in 2004, which were excluded from the rest of the analysis. Skin cancers cases occurred more frequently among men (58.6%) than women (41.4%). Age at diagnosis was lower in women than men, but the difference was not statistically significant. The majority of skin cancer cases were basal cell carcinomas (73.4%) followed by squamous cell carcinomas (22.4%). Most cases were reported with unspecified locations, though the most common specified location by far was the face (34%).

4. BRIEF UPDATE ON CANCER 2003 REPORT

4.1. Population of Lebanon by age-groups in 2003

Updating the Cancer 2003 report was prompted primarily by a change in the official estimates of the Lebanese population in 2003 (table 2003-1), which would directly affect all incidence rates estimation. The official total population in 2003 was 3,599,555.

4.2. Demographic characteristics of 2003 incident cancer cases

Following a critical review of all cases originally reported in 2003, it was determined that the total case-load was 7556 cases, of which 414 (5.5%) consisted of non-melanoma skin cancers. These cases were subsequently omitted from the analysis. Of 7142 cases recorded, 3565 (49.9%) occurred in men (Table 2003-2).

4.3. Relative frequencies of cancer sites

Among men, most common cancer sites were: prostate (16.5%), bladder (16%), lungs (15.8%), colorectum (7.9%) and NH lymphoma (4.8%). Among women, most common locations were: breast (40.2%), colorectum (7.6%), lung (6.6%), NH lymphoma (4.1%) and bladder (3.1%). In Lebanon in 2003, most diagnosed cancers were breast, lung, bladder, prostate and colorectum. The proportion of cancers of ill-defined origin or unknown primaries was 1.3% of the entire case-load. Locations of cancers are presented in details for men and women in table 2003-3.

4.4. Incidence of cancer in Lebanon in 2003

Tables 2003- 4 to 2003-6 present crude and age-standardized incidence rates among males and females, and by age-groups. In 2003, the age-standardized incidence rates was 191.29 per 100,000 in men, 190.70 in women and 190.99 for all.

5. EDITORIAL COMMENTS

5.1. Cancer in Lebanon in 2003-2004: Public health implications

Patterns of cancer cases diagnosed in 2003 (n= 7142) and 2004 (n= 7197) have been relatively stable, both in terms of relative frequencies and overall incidence rates. At that point, about 180-190 new cases were being diagnosed per 100,000 yearly. Breast cancer remained the most frequently diagnosed cancer in Lebanon: about 1 of 4 or 5 cancers was a case of breast cancers. Among women, 3 to 4 out of every 10 cancers was located in the breast. The sheer importance of breast cancers highlights the importance of continuing and improving the annual breast cancer screening programs, and of funding the surveillance of mammography utilization in the country.

The role of tobacco smoke as a primary risk factor for cancer is evidenced by the relative prominence of lung and bladder cancers, in both sexes but more so in men than in women. More than 1/3 of all cases may be prevented by more restrictive policies on cigarette and nargileh smoking. It is hoped that the political situation will allow Parliament to focus again on issues directly related to the public interest, and to enact Executive regulations to the Tobacco Control Act voted in 2005. More research is invited to elicit potential confactors, genetic or environmental, which contribute with tobacco metabolites to the continued rise in bladder cancer incidence over the past ten years.

Colo-rectal cancers compose 8% of all cancers in Lebanon. This frequency warrants a debate among experts to define a prevention and screening policy which would be affordable and feasible in Lebanon. Other issues which need to be addressed in the context of a comprehensive Cancer Control and Prevention Program are national guidelines for the detection and treatment of prostate cancer, melanomas, ovarian cancers and lymphomas.

5.2 Managerial issues regarding NCR

The desire to improve the quality of NCR reports has prompted our team to run a review of the 2003 data, in parallel to analyzing and presenting the 2004 data. This concomitant process has demonstrated two important points:

1. The case count was almost similar between the two years, indicating that the combined approach for data collection is reaching its aim to account for all cases.

2. Missing data have decreased from 2003 to 2004, indicating that data sources have accepted the idea of reporting cancer cases and are improving their own records, prior to sending them to the NCR. More needs to be done on complete reports of cases ages and places of residence. In addition, cancer staging have been remarkably inconsistent, and a major effort needs to be done to obtain those data.

Now that NCR is integrated within the frame of the ESP-MOPH, it is hoped that the momentum acquired will not be lost, that data sources will continue to cooperate at a higher level of validity and accuracy. The collection and analysis of data for years 2002-2006 or 2003-2007 in the near future would allow the emergence of Lebanese data for the first time in the upcoming IARC publication of "Cancer Incidence in Five Continents".

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