Epidemiology of Male Urogenital Cancer in Jordan 2004-2008
Objective


Methodology

Analysis of all the registered male Urogenital cancer cases in JCR from 2004-2008.

Results were calculated as

- Distribution of male Urogenital cancer cases
- Average Age-Specific Incidence rate (ASIR) and Age standardized rate (ASR) per 100,000 for the most common Urogenital cancer (bladder, prostate, kidney, testes)
- Morphology male Urogenital cancer cases
Sources of Data

- National Population-Based Cancer Registries:
  - Gulf Center for Cancer Registration, 2002
  - Oman, 2005
  - Kingdom of Saudi Arabia, 2003
  - Lebanon, 2004
  - Jordan, 2004-2008

- Regional Population-Based Cancer Registries:
  - Egypt: Gharbiah, 2000-2002
  - Tunisia, 2004
  - Algeria
  - Libya
  - All others Globocan 2002, IARC.

- US-SEER (white population) 1999-2001
- Cancer in the Arab World: Magnitude of the Problem, Inas Elattar, NCI, Egypt UICC, March 21-25, 2005
- Pub Med
- Cancer incidence in MECC countries Laurence, Fredman et al 2006
Background

Urogenital male cancers in Jordan accounted for 20% out of total registered male cancers (1934 / 9765) during the period 2004-2008.

Urinary bladder cancer is one of the most common cancers worldwide, with the highest incidence in industrialized countries.

Age-standardized incidence rates (ASR) higher than 40 per 100,000 for males were reported from Europe (Belgium, 42.5; Italy, 41.0). In most European countries, the United States, and Canada, rates are between 20 and 30.

Bladder cancer incidence is lowest in Asia and South America, approximately 70% lower than in Western industrialized countries.

Nonetheless, because of its high recurrence rate, the actual prevalence of active bladder cancer is estimated to be about 10 times the number of new cases.
### Top Fives Cancers among Males
Jordan as compared with other countries

<table>
<thead>
<tr>
<th>Egypt</th>
<th>Tunisia</th>
<th>Lebanon</th>
<th>Jordan</th>
<th>Kuwait</th>
</tr>
</thead>
<tbody>
<tr>
<td>U. Bladder</td>
<td>Lung</td>
<td>Prostate</td>
<td>Lung</td>
<td>Colorectal</td>
</tr>
<tr>
<td>14.6%</td>
<td>18%</td>
<td>10.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NHL</td>
<td>U. Bladder</td>
<td>Lung</td>
<td>Colorectal</td>
<td>NHL</td>
</tr>
<tr>
<td></td>
<td>16%</td>
<td>9.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liver</td>
<td>Prostate</td>
<td>U. Bladder</td>
<td>Leukemia</td>
<td>Prostate</td>
</tr>
<tr>
<td></td>
<td>15%</td>
<td>9.3%</td>
<td>9.8%</td>
<td>9.8%</td>
</tr>
<tr>
<td>Lung</td>
<td>Larynx</td>
<td>Colorectal</td>
<td>U. Bladder</td>
<td>Lung</td>
</tr>
<tr>
<td></td>
<td>8%</td>
<td>8.6%</td>
<td>7.4%</td>
<td></td>
</tr>
<tr>
<td>Leukemia</td>
<td>Colorectal</td>
<td>Lymphomas</td>
<td>Prostate</td>
<td>Liver</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7%</td>
<td>7.4%</td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>ALGERIA</td>
<td>UAE</td>
<td>Bahrain</td>
<td>Oman</td>
</tr>
<tr>
<td>-------------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>-------</td>
</tr>
<tr>
<td>Lung</td>
<td>30%</td>
<td>Lung</td>
<td>Lung</td>
<td>NHL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.4%</td>
<td>16.9%</td>
<td>10.7%</td>
</tr>
<tr>
<td>Colorectal</td>
<td>15%</td>
<td>Leukemia</td>
<td>Colorectal</td>
<td>Leukemia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9.2%</td>
<td>9.4%</td>
<td>10.3%</td>
</tr>
<tr>
<td>Bladder</td>
<td>13%</td>
<td>Stomach</td>
<td>Prostate</td>
<td>Stomach</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.9%</td>
<td>6.6%</td>
<td>7.7%</td>
</tr>
<tr>
<td>Prostate</td>
<td>12%</td>
<td>NHL</td>
<td>NHL</td>
<td>Lung</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.9%</td>
<td>6.6%</td>
<td>7.1%</td>
</tr>
<tr>
<td>Stomach</td>
<td>10%</td>
<td>Prostate</td>
<td>U. Bladder</td>
<td>Prostate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.3%</td>
<td>6.1%</td>
<td>6.6%</td>
</tr>
</tbody>
</table>
Distribution of Male Urogenital Cancer cases, 2004-2008, Jordan

Male to female Urogenital cancer ratio 8:1
Total Number of Registered Male Urogenital Cancer Cases, 1934
Distribution of Male Urogenital cancers by age-group, Jordan

[Graph showing the distribution of male urogenital cancers by age-group in Jordan. The graph indicates a peak in cancer cases around the age group of 65-69.]
## Median age at diagnosis

<table>
<thead>
<tr>
<th></th>
<th>Jordan</th>
<th>Palestine</th>
<th>Egypt</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>U. Bladder</td>
<td>62.3</td>
<td>65.2</td>
<td>61.2</td>
<td>72.5</td>
</tr>
<tr>
<td>Prostate</td>
<td>69</td>
<td>62.3</td>
<td>68.7</td>
<td>70.1</td>
</tr>
<tr>
<td>Kidney</td>
<td>57</td>
<td>----</td>
<td>---</td>
<td>----</td>
</tr>
<tr>
<td>Testes</td>
<td>28</td>
<td>----</td>
<td>----</td>
<td>-----</td>
</tr>
</tbody>
</table>

**Graph:**
- **Testis:** 28
- **Kidney:** 57
- **Prostate:** 69
- **U. Bladder:** 63
Median ages followed the same pattern for most of the Arab countries, without too much difference between the sexes. This could be a reflection of the age structure of the Arab populations (Egyptians, Jordanians, Palestinians) which relatively young compared with Westerns countries.

This relatively low median age for Arab populations, with 50% younger than age 60 years, has serious public health implications due to productive years of life lost due to bladder cancer.
ASR of Prostate Cancer in Arab World

- Egypt: 6.6
- Tunisia: 8.7
- Algeria: 5.6
- Qatar: 11.8
- Oman: 8.7
- Bahrain: 19.3
- UAE: 8
- Saudi Arabia: 3.6
- Kuwait (5th): 12.6
- Jordan: 10.6
- USA: 124.8

Rates/100,000
ASR of Bladder Cancer in Arab World

- **Egypt**: 26.9 (Males), 5.5 (Females)
- **Tunisia**: 13.5 (Males), 1.1 (Females)
- **Alegría**: 8.1 (Males), 1.1 (Females)
- **Qatar**: 21.2 (Males), 3.6 (Females)
- **Oman**: 3.6 (Males), 1.5 (Females)
- **Bahrain**: 14.5 (Males), 3.7 (Females)
- **UAE**: 4.7 (Males), 3.9 (Females)
- **Saudi Arabia**: 3.7 (Males), 1 (Females)
- **Kuwait (5th)**: 8.1 (Males), 3.9 (Females)
- **Jordan**: 13.3 (Males), 1.5 (Females)
- **USA**: 24.5 (Males), 6.5 (Females)
Histological Types

Two main histological types of bladder cancer are identified:

1- The transitional cell carcinomas (TCC), related to cigarette smoking and most prevalent in Western and industrialized countries.

2- The squamous cell carcinomas (SCC), which are more frequently seen in some Middle Eastern and African countries, where urinary schistosomiasis is an endemic disease.

* Rare types of bladder cancer include small cell carcinoma, carcinosarcoma, primary lymphoma, and sarcoma.
In industrialized Western countries, transitional cell tumors comprise 90%-95% of bladder tumors; 3%-7% are squamous cell, and 1%-2% are adenocarcinomas.

Transitional cell carcinomas may show evidence of squamous or adenocarcinomatous differentiation.

Well-differentiated tumors tend to recur, and the poorly differentiated tumors not only recur but also tend to invade locally and may metastasize. 
• In developing countries in certain locations, up to 75% of cases are squamous cell carcinomas associated with *Schistosoma haematobium* infestation.

• They most often form in the setting of a chronic inflammation, such as in patients with long-term catheters, or are the *haematobium* type of schistosomiasis and tend to be of high grade.

These squamous cell carcinomas are highly malignant, with poor prognosis.

Success in treating these cancers relies heavily on early detection and aggressive surgical management.
1- Cigarettes.
Cigarette smoking, including exposure to secondhand smoke, is estimated to account for two-thirds of bladder cancers in males and one-third in females. There is strong correlation between the number of pack-years and the risk of developing bladder cancer.

Quitting smoking decreases the risk, but the risk never returns to that of a nonsmoker. This situation is not unexpected, given the average 20-year latency between carcinogen exposure and bladder cancer development.
In the Middle East region, cigarette smoking could be considered a time bomb. According to the World Health Organization (WHO) statistics, Middle East countries had a higher percentage of male smokers in 1998-1999, ranging from between 35.0% in Israel to 49.0% in Jordan, compared with 25.7% in the United States.
Chistosomiasis

Evidence that supports the association between Schistosomiasis and bladder cancer includes the geographical correlation between the 2 conditions, the distinctive patterns of sex and age at diagnosis, the clinicopathological identity of Schistosome associated bladder cancer (SABC), and extensive evidence in Experimentally infected animals.

Due to the previous lack of Population based registries in Egypt, data published so far have been mostly retrospective relative frequencies, with their inherent limitations.
An age-standardized mortality rate for bladder cancer of 10.8 in males placed Egypt at the top of the list of the 54 countries that provided data for the 1987 WHO database, and supported the hypothesis that *S. haematobium* infection predisposes to malignant bladder neoplasms.

This population based study documents, for the first time, the effect of changes in schistosomiasis control on bladder cancer incidence.

Egyptian literature describes a special profile for SABC, with marked male predominance, relatively young age at diagnosis, predominance of squamous cell carcinoma (75% or more), severe urinary tract infection and calcification, and special predilection to farmers.
The early onset of this type of bladder cancer might reflect the latent period of carcinogenesis that takes 20-30 years after the peak of schistosomal infestation in the third decade of life.

In Egyptian hospital series, the mean age at diagnosis of SABC was 41 years, about 5 years younger than patients with non Schistosomal bladder cancer, with a male-to-female Ratio that ranged from 5:1 to 9:1.
Other risk factors

Certain organic chemicals: such as naphthalene, benzidine, aniline dyes, are known Bladder carcinogens and have helped identify high-risk occupations, including petroleum chemical/rubber workers, hairdressers, painters, textile workers, truck drivers, and Aluminum electroplaters.

Bladder cancer may also result from pelvic radiotherapy, phenacetin use, and cyclophosphamide exposure, resulting in a four- to five-fold relative risk increase, particularly when exposure is in a chronic low-dose form.
Age and sex are additional risk factors.

Bladder cancer is 2 to 3 times more common in males.

People over the age of 70 years develop the disease 2 to 3 times more often than those aged 55-69 years, and 15 to 20 times more often than those aged 30-54 years.
<table>
<thead>
<tr>
<th>Grade</th>
<th>U. Bladder</th>
<th>Prostate</th>
<th>Kidney</th>
<th>Testis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well differentiated</td>
<td>120</td>
<td>62</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>15.7 %</td>
<td>8.5 %</td>
<td>2.8 %</td>
<td>1.1 %</td>
</tr>
<tr>
<td>Moderate differentiation</td>
<td>114</td>
<td>107</td>
<td>36</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>14.9 %</td>
<td>14.7 %</td>
<td>14.5 %</td>
<td>1.1 %</td>
</tr>
<tr>
<td>Poor differentiation</td>
<td>287</td>
<td>237</td>
<td>63</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>37.5 %</td>
<td>32.5 %</td>
<td>25.4 %</td>
<td>7.3 %</td>
</tr>
<tr>
<td>Anaplastic</td>
<td>9</td>
<td>20</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>1.2 %</td>
<td>2.7 %</td>
<td>2.8 %</td>
<td>2.8 %</td>
</tr>
<tr>
<td>Unknown</td>
<td>235</td>
<td>304</td>
<td>135</td>
<td>157</td>
</tr>
<tr>
<td></td>
<td>30.7 %</td>
<td>41.6 %</td>
<td>54.4 %</td>
<td>87.7 %</td>
</tr>
<tr>
<td>Total</td>
<td>765</td>
<td>730</td>
<td>248</td>
<td>179</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Morphology of U. Bladder Cancer

### Jordan

- TCC: 3.4%
- SCC: 3.1%
- Adenocarcinoma: 1.6%
- Others: 91.9%

### Egypt

- In Situ: 2.0%
- TCC: 67.0%
- SCC: 4.0%
- Adenocarcinoma: 5.0%
- Other types: 22.0%
- Others: 67.0%
Reports from many registries except Egypt showed a very low frequency of squamous cell carcinoma. In Egypt, SCC represented 22 % and 41.6% of male and female bladder cancers, respectively.

Previous reports from Egypt indicated a higher frequency of SCC that reached 75% of bladder malignancies.

This lower frequency of SCC relative to previous reports supports the etiological relationship to urinary schistosomiasis in Egypt and the effect of successful control measures of the endemic disease.

The increase in frequency of TCC and decrease in frequency of SCC relative to previous reports indicate a transition phase from the SABC to the Western type of bladder cancer related to smoking.
Grade Distribution of Bladder Cancer

**Jordan**

- Well differentiated: 37.5%
- Moderate differentiation: 15.7%
- Poor differentiation: 14.9%
- Anaplastic: 1.2%
- Unknown: 30.7%

**Egypt**

- Grade 1: 9.5%
- Grade 2: 7.9%
- Grade 3: 33.3%
- Grade 4: 49.3%

Grade not mentioned: 30.7% in Jordan, 16.4% in Egypt.
Morphology of Prostate Cancer - Jordan

- adenocarcinoma: 91.1%
- carcinoma: 5.9%
- papillary carcinoma: 1.1%
- others: 1.9%
Renal cell carcinoma: 56.0%
Clear cell carcinoma: 11.3%
Papillary transitional cell carcinoma: 3.6%
Nephroblastoma: 8.1%
Transitional cell carcinoma: 13.7%
Other types: 7.3%
The highest incidence occurs in males over age 60 years and females over age 70; however, even teenage males have a finite chance of bladder cancer, while it is very rare to see bladder cancer in a female under the age of 40.
Summary And Conclusions

• Bladder cancer is one of the more common cancers in the Middle East countries.

• Egypt had both the highest frequency and incidence rates and had a different histological pattern than other Arab countries. This could be attributed to the relationship between bladder cancer and *S. haematobium*, a parasitic disease that used to be endemic in Egypt, and which is currently under control, with complete eradication in certain districts.
Egypt was the only country that showed a high frequency and incidence of squamous cell carcinoma, which is the histologic type related to schistosomiasis.

Egypt also showed an earlier peak of age-specific incidence rates, possibly due to the early age at schistosomal infection and the latent time needed for carcinogenesis.
Thank You

Save The Date
First Clinical Trials MENA area Conference
March 4-5 2011
AMMAN - Jordan
Among the Middle East countries registries and US SEER, the male-to Female ratio for bladder cancer incidence was highest in Jordanians (7.4:1), followed by Palestinians (6.9:1) and Cypriots (5.3:1). Ratios in Egyptians (4.2:1).

The US ratio was the lowest (2.9:1). This male predominance could be attributed to cigarette smoking, which is more common among males than females. Nonetheless, previous reports from Egypt indicated a higher male-to female ratio as one of the features of SABC.

Currently the lower ratio observed for Egypt favors the transition from SABC to the Western type, TCC, which is mostly related to cigarette smoking.