Cancer in the EUNAM countries

EUNAM meeting in Tunisia, Mar.12. 2012

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Prof. Kari Hemminki, MD, PhD
Molecular and Genetic Epidemiology, German Cancer Research Center, Heidelberg, Germany
Estimated age-standardised incidence rate per 100,000
All cancers excl. non-melanoma skin cancer: male, all ages
Estimated age-standardised incidence rate per 100,000
All cancers excl. non-melanoma skin cancer: female, all ages

GLOBOCAN 2008 (IARC) - 7.2.2012
Estimated age-standardised mortality rate per 100,000
All cancers excl. non-melanoma skin cancer: male, all ages
Estimated age-standardised mortality rate per 100,000
All cancers excl. non-melanoma skin cancer: female, all ages

GLOBOCAN 2008 (IARC) - 29.2.2012
Estimated incidence and mortality from All sites but non-melanoma skin cancer in men, 2008; Age Standardized Rate (European) per 100,000

Estimated incidence and mortality from All sites but non-melanoma skin cancer in women, 2008; Age Standardized Rate (European) per 100,000

Methods of estimation (summary): EUNAM (Sweden, France, Italy)

1. **Sweden**
   - The Swedish Cancer Register was founded 1958.
   - It is compulsory for every health care provider to report newly detected cancer cases diagnosed during: Clinical, Pathological, Morphological, Other lab, and medical examinations as well as cases diagnosed at autopsy to the cancer registry.

2. **France**
   - National incidence data: local incidence data of cancer registries

3. **Italy**
   - Incidence was estimated from national mortality by modeling, using incidence mortality ratios derived from recorded data in country-specific cancer registries.
**FIG. 12: DISTRIBUTION OF THE DATA PROCESSING CENTRES**

CTDs are:
- CTD Essais Cancer de Bordeaux,
- CTD du Cancéropôle Nord-Ouest,
- CTD Fédération Francophone de Cancérologie Digestive (FFCD),
- CTD Groupe d'Étude des Lymphomes de l'Adulte Recherche Clinique (GELARC),
- CTD Groupe Coopérateur Multidisciplinaire en Oncologie (GERCOR)
- CTD Institut Curie & centre René Huguenin,
- CTD Institut Gustave Roussy (IGR),
- CTD Institut Paoli Calmettes-Provence Alpes Côte d'Azur (IPC-PACA),
- CTD-Montpellier,
- CTD de la Plate-forme d'Aide à la Recherche Clinique en Cancérologie Auvergne et Rhône-Alpes (PARCC-ARA),
- CTD hôpital Saint-Louis

Health care centres
Cooperating groups
FIG. 29: STANDARDISED INCIDENCE RATES (GLOBAL POPULATION) FOR ALL CANCERS, AT REGIONAL SCALE IN FRANCE (INLAND) IN 2005

FIG. 27: STANDARDISED DEATH RATES (GLOBAL POPULATION) BY CANCER ON A DEPARTMENTAL SCALE IN FRANCE (INLAND) (2002-2004)
### Summary statistics (2008): EUNAM (Sweden, France and Italy)

<table>
<thead>
<tr>
<th></th>
<th>Sweden</th>
<th>France</th>
<th>Italy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Population (millions)</td>
<td>4.6</td>
<td>4.6</td>
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<tr>
<td>Number of new cancer cases</td>
<td>23</td>
<td>21</td>
<td>189</td>
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<tr>
<td>(thousands)</td>
<td></td>
<td></td>
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<tr>
<td>Age-standardized rate (ASR)</td>
<td>270</td>
<td>241</td>
<td>361</td>
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<tr>
<td>Risk of getting cancer before age 75 (%)</td>
<td>28</td>
<td>24</td>
<td>36</td>
</tr>
<tr>
<td>Number of cancer deaths</td>
<td>11</td>
<td>11</td>
<td>85</td>
</tr>
<tr>
<td>(thousands)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age-standardized rate (SMR)</td>
<td>112</td>
<td>92</td>
<td>144</td>
</tr>
<tr>
<td>Risk of dying from cancer before age 75 (%)</td>
<td>11</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>5-year prevalent cases, adult population (thousands)</td>
<td>72</td>
<td>66</td>
<td>552</td>
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</tbody>
</table>
Estimated age-standardized incidence and mortality rates, Male

**Sweden**

**France**

**Italy**
Estimated age-standardized incidence and mortality rates, Female

**Sweden**

**France**

**Italy**

- Breast
- Colorectum
- Lung
- Melanoma of skin
- Corpus uteri
- Brain, nervous system
- Ovary
- Cervix uteri
- Non-Hodgkin lymphoma
- Leukaemia
- Bladder
- Thyroid
- Kidney
- Pancreas
- Lip, oral cavity
- Multiple myeloma

- Incidence
- Mortality

- ASR (M) rate per 100,000
Summary EUNAM (Sweden, France and Italy)- Male

5 most frequent cancers

<table>
<thead>
<tr>
<th></th>
<th>Sweden</th>
<th>France</th>
<th>Italy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prostate</td>
<td>Prostate</td>
<td>Prostate</td>
<td></td>
</tr>
<tr>
<td>Colorectum</td>
<td>Lung</td>
<td>Colorectum</td>
<td></td>
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<tr>
<td>Lung</td>
<td>Colorectum</td>
<td>Lung</td>
<td></td>
</tr>
<tr>
<td>Urinary Bladder</td>
<td>Urinary Bladder</td>
<td>Urinary Bladder</td>
<td></td>
</tr>
<tr>
<td>Melanoma</td>
<td>Kidney</td>
<td>Stomach</td>
<td></td>
</tr>
</tbody>
</table>

Risk of getting cancer before age 75 (%)

Risk of dying from cancer before age 75 (%)
Summary EUNAM (Sweden, France and Italy) - Female

5 most frequent cancers

<table>
<thead>
<tr>
<th></th>
<th>Sweden</th>
<th>France</th>
<th>Italy</th>
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</thead>
<tbody>
<tr>
<td>Breast</td>
<td>Breast</td>
<td>Breast</td>
<td></td>
</tr>
<tr>
<td>Colorectum</td>
<td>Colorectum</td>
<td>Colorectum</td>
<td></td>
</tr>
<tr>
<td>Lung</td>
<td>Lung</td>
<td>Lung</td>
<td></td>
</tr>
<tr>
<td>Corpus uteri</td>
<td>Thyroid</td>
<td>Corpus uteri</td>
<td></td>
</tr>
<tr>
<td>Melanoma</td>
<td>Corpus uteri</td>
<td>Stomach</td>
<td></td>
</tr>
</tbody>
</table>

Risk of getting cancer before age 75 (%)

France

Italy

Sweden

Risk of dying from cancer before age 75 (%)

France

Italy

Sweden
Sweden
All sites but non-melanoma skin cancer
ASR (World) age 0-85+
**FIGURE 1: TREND IN ESTIMATED CANCER INCIDENCE AND MORTALITY IN MEN IN FRANCE (1980-2005)**

Source: Institut de Veille Sanitaire (InVS), Hospices civils de Lyon, Francim, Inserm, INCa 2008.

**FIGURE 2: TREND IN ESTIMATED CANCER INCIDENCE AND MORTALITY IN WOMEN IN FRANCE (1980-2005)**

Source: Institut de Veille Sanitaire (InVS), Hospices civils de Lyon, Francim, Inserm, INCa 2008.
**FIGURE 3B: PROSTATE CANCER: ESTIMATED INCIDENCE AND MORTALITY IN FRANCE (1980-2005)**

Source: Institut de Veille Sanitaire (InVS), Hospices civils de Lyon, Francim, Inserm, INCa 2008.

For 10,000 person-years World standardised rates

- **Incidence**
- **Mortality**

Source: Institut de Veille Sanitaire (InVS), Hospices civils de Lyon, Francim, Inserm, INCa 2008.
All cancer incidence trend

Male

Female

Lung cancer
Methods of estimation (summary): EUNAM (NA countries)

1. Morocco
   - No national incidence data exist.
   - **Incidence**: Local incidence data: one cancer registry covering part of a country is used as representative of the country profile.
   - **Mortality**: No data: the number of cancer deaths was estimated from incidence estimates and site specific survival estimated by the GDP method.

2. Tunisia, Algeria and Egypt
   - No national incidence data exist.
   - **Incidence**: Local incidence data: incidence rates were estimated as the weighted average of the local rates.
   - **Mortality**: No data: the number of cancer deaths was estimated from incidence estimates and site specific survival estimated by the GDP method.
### Summary statistics (2008): EUNAM (NA countries)

<table>
<thead>
<tr>
<th></th>
<th>Morocco</th>
<th>Tunisia</th>
<th>Algeria</th>
<th>Egypt</th>
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<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Population (thousands)</td>
<td>15.5</td>
<td>16.1</td>
<td>5.1</td>
<td>5.1</td>
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<tr>
<td></td>
<td>17.3</td>
<td>17.0</td>
<td>41.0</td>
<td>40.5</td>
</tr>
<tr>
<td>Number of new cancer cases (thousands)</td>
<td>13</td>
<td>15</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Age-standardized rate (ASR)</td>
<td>100</td>
<td>105</td>
<td>143</td>
<td>103</td>
</tr>
<tr>
<td>Risk of getting cancer before age 75 (%)</td>
<td>11</td>
<td>11</td>
<td>16</td>
<td>11</td>
</tr>
<tr>
<td>Number of cancer deaths (thousands)</td>
<td>10</td>
<td>10</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Age-standardized rate (SMR)</td>
<td>82</td>
<td>69</td>
<td>107</td>
<td>65</td>
</tr>
<tr>
<td>Risk of dying from cancer before age 75 (%)</td>
<td>9</td>
<td>8</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>5-year prevalent cases, adult population (thousands)</td>
<td>22</td>
<td>41</td>
<td>12</td>
<td>13</td>
</tr>
</tbody>
</table>
Estimated age-standardized incidence and mortality rates, Male

- **Morocco**
- **Tunisia**
- **Algeria**
- **Egypt**
Estimated age-standardized incidence and mortality rates, Female

Morocco

Tunisia

Algeria

Egypt
Summary EUNAM - Male

5 most frequent cancers

<table>
<thead>
<tr>
<th>Country</th>
<th>Sweden</th>
<th>France</th>
<th>Italy</th>
<th>Morocco</th>
<th>Tunisia</th>
<th>Algeria</th>
<th>Egypt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prostate</td>
<td>Prostate</td>
<td>Prostate</td>
<td>Lung</td>
<td>Lung</td>
<td>Lung</td>
<td>Bladder</td>
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</tr>
<tr>
<td>Colorectum</td>
<td>Lung</td>
<td>Colorectum</td>
<td>Prostate</td>
<td>Bladder</td>
<td>Bladder</td>
<td>Liver</td>
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<tr>
<td>Lung</td>
<td>Colorectum</td>
<td>Lung</td>
<td>Colorectum</td>
<td>Prostate</td>
<td>Colorectum</td>
<td>NHL</td>
<td></td>
</tr>
<tr>
<td>Bladder</td>
<td>Bladder</td>
<td>Bladder</td>
<td>NHL</td>
<td>Colorectum</td>
<td>NHL</td>
<td>Lung</td>
<td></td>
</tr>
<tr>
<td>Melanoma</td>
<td>Kidney</td>
<td>Stomach</td>
<td>Larynx</td>
<td>NHL</td>
<td>Stomach</td>
<td>Leukaemia</td>
<td></td>
</tr>
</tbody>
</table>
Trend of HCC Mortality in Egypt, 1981-1996
(Mostafa & El-Said, May 2002)

http://nci.cu.edu.eg/lectures/cancer_problem/Magnitude%20of%20problem%20liver%20Cancer.pdf
Risk Factors of Liver Cancer Among Egyptians

1. Egypt has the World’s highest prevalence of hepatitis C virus (HCV)

2. HCV antibody positivity estimated by the Egyptian Ministry of Health (1999) to be 19%

3. Smoking is increasing among men

4. Pesticides are common in the environment
Summary EUNAM- Female

5 most frequent cancers

<table>
<thead>
<tr>
<th></th>
<th>Sweden</th>
<th>France</th>
<th>Italy</th>
<th>Morocco</th>
<th>Tunisia</th>
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<tr>
<td><strong>Breast</strong></td>
<td>Breast</td>
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<tr>
<td><strong>Colorectum</strong></td>
<td>Colorectum</td>
<td>Colorectum</td>
<td>Cervix uteri</td>
<td>Colorectum</td>
<td>Cervix uteri</td>
<td>NHL</td>
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</tr>
<tr>
<td><strong>Lung</strong></td>
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<td>Lung</td>
<td>Lung</td>
<td>Colorectum</td>
<td>Cervix uteri</td>
<td>Colorectum</td>
<td>Ovary</td>
</tr>
<tr>
<td><strong>Corpus uteri</strong></td>
<td>Thyroid</td>
<td>Corpus uteri</td>
<td>Thyroid</td>
<td>NHL</td>
<td>Thyroid</td>
<td>Colorectum</td>
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<tr>
<td><strong>Melanoma</strong></td>
<td>Corpus uteri</td>
<td>Stomach</td>
<td>Ovary</td>
<td>Thyroid</td>
<td>Gallbladder</td>
<td>Leukaemia</td>
<td></td>
</tr>
</tbody>
</table>

Risk of getting cancer before age 75 (%)
Risk of dying from cancer before age 75 (%)
Adjusted prevalence estimates for current smoking any tobacco products

WHO REPORT on the global TOBA CCO epidemic, 2008

Male
Female

Sweden
France
Italy
Morocco
Tunisia
Algeria
Egypt
Female Smoking

“Smoking behaviour of women differs from that of men. They are more highly motivated to smoke, they find it harder to stop smoking, they are more neurotic than men... there may be a case for launching a female oriented cigarette with relatively high deliveries of nicotine.”

1976 research report, British American Tobacco
Breast cancer age at diagnosis

Age-specific breast cancer incidence rate

![Graph showing age-specific breast cancer incidence rate for different countries.](GLOBOCAN 2008 (IARC) - 14.2.2012)
Age-specific incidence rates of breast cancer among Turkish, Asian Arab and other Africans immigrant in Sweden compared to Swedes from 1990 to 2006


Hemminki et al, The Oncologist, 2011
Breast cancer age at diagnosis

• The results show that in many immigrant groups the breast cancer age at diagnostic is earlier than in Swedes, suggesting that biological factors underlie the differences,

• These factors are mainly related to postmenopausal breast cancer,

• They should explain much of the international variation in breast cancer incidence.

Hemminki et al, The Oncologist, 2011
Some completed projects (EU FP7/2007-2013 grant 260715):

1) Published manuscripts:

2) Submitted (edition process) manuscripts:
   a) Does the colorectal cancer age at diagnosis differ among immigrants to Sweden?
   b) Do global differences in cancer risk influence the survival?
   c) Cancer incidence among Turkish, Chilean and North African first-generation immigrants in Sweden compared to the residents in countries of origin and the native Swedes
Thank you,