GENDER GAP IN CARDIOVASCULAR RISK FACTORS. MORBIDITY AND MORTALITY

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DECLARATION OF CONFLICT OF INTEREST

NO FOR THIS PRESENTATION
Indeed, one of the striking findings of the report is the paucity of statistics on key health issues that affect girls and women.

Key findings
1. Widespread and persistent inequities

Disparities between women and men

Women generally live longer than men because of both biological and behavioural advantages. But in some settings, notably in parts of Asia, these advantages are overridden by gender-based discrimination so that female life expectancy at birth is lower than or equal to that of males. Moreover, women’s longer lives are not necessarily healthy lives. There are conditions that only women experience and whose potentially negative impact only they suffer.

Is this true in Europe, in recent years?
GENDER GAP IN CARDIOVASCULAR RISK FACTORS. MORBIDITY AND MORTALITY

♥ TOTAL MORTALITY
♥ LIFE EXPECTANCY
♥ CARDIOVASCULAR MORTALITY
♥ HEALTHY LIFE YEARS
♥ CARDIOVASCULAR MORBIDITY
♥ CV RISK FACTORS (traditional and gender specific)
♥ CONCLUSIONS
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In Europe the total number of deaths is roughly similar in men and women, and also the trends are similar.
Considering 100 the number of male deaths, there is a substantial difference in women, among the various countries. Also the trends are different at country level.
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In Europe women die older than men and have a longer life expectancy, with marked differences among countries.
In Europe the gender gap in life expectancy, favouring women, shows a threefold variation among countries.
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Ten leading causes of death in women aged 20–59 years by country income group. 2004

In High-income countries, including Europe, cardiovascular diseases are the leading cause of premature death in women, proportionally similar to breast cancer.
In Europe cardiovascular diseases are the leading cause of death in women, proportionally more than men.

CV deaths 43%

CV deaths 54%

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In Europe healthy life years are proportionally higher in men, but in absolute terms women pay a heavier tribute to disability, which is accounted for $\frac{1}{4}$ by cardiovascular diseases.
EXPLAINING THE DIFFERENCE, THE CASE OF ITALY

THE DIFFERENCE IN LIFE EXPECTANCY BETWEEN MEN AND WOMEN IS DECLINING

CONTRIBUTION OF THE DIFFERENCE IN LIFE EXPECTANCY BETWEEN MEN AND WOMEN

2002: $\Delta e_0 = 5.9$ years

- Cancer: 0.7 years
- Diabetes: 0.9 years
- CVDs: 0.5 years
- Resp. dis.: 1.8 years
- Inj.: 0.1 years
- Others: 2.0 years
In Italy the major gap in life expectancy between women and men is due to cardiovascular diseases and cancer. Considering the age range 0-74 years, 62% of the difference is amenable to primary prevention.
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2. Morbidity

Incidence rates

Comparable data on morbidity from CVD are more difficult to collect than mortality data, since there are many different measures of morbidity (e.g. prevalence, incidence, DALYs, years of healthy life lost etc.). At present, there is no routinely updated source of Europe-wide CVD morbidity data\textsuperscript{1}.

The WHO MONICA (monitoring trends and determinants in cardiovascular disease) project\textsuperscript{2} examined the incidence of major coronary events in 37 different populations in 21 countries (including 29 populations in 16 European countries). Although the data from the study are now more than 10 years old, it still represents the most recent Europe-wide comparable dataset on CVD morbidity.
In the WHO MONICA Project, coronary morbidity showed a substantial difference between men and women aged 35-64 years (rates about 3 times higher in men), with huge variations among the various populations. Also, the trend variance explained by CV risk score was different, higher in men.
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SOME IMPORTANT QUESTIONS TO EXPLAIN THIS GENDER GAP IN LIFE EXPECTANCY AND CV MORBIDITY:

1) DO CV RISK FACTORS HAVE A DIFFERENT DISTRIBUTION IN THE TWO GENDERS?

2) ARE THEY TREATED DIFFERENTLY?

3) ARE THERE GENDER-SPECIFIC CV RISK FACTORS?

4) ARE CV RISK FACTORS DIFFERENTLY PREDICTIVE IN THE TWO GENDERS?

5) DO PRIMARY AND SECONDARY PREVENTION HAVE A DIFFERENT IMPACT ON THE TWO GENDERS?

6)…….
SOME IMPORTANT QUESTIONS TO EXPLAIN THIS GENDER GAP IN LIFE EXPECTANCY AND CV MORBIDITY:

1) DO CV RISK FACTORS HAVE A DIFFERENT DISTRIBUTION IN THE TWO GENDERS? Yes, MONICA, WHO estimations, etc. They are worse in men.

2) ARE THEY TREATED DIFFERENTLY? Yes, MONICA, EURIKA study etc. In Europe women have better TRx for hypertension, worse TRx for dyslipidemia, similar TRx for diabetes and obesity

3) ARE THERE GENDER-SPECIFIC CV RISK FACTORS?

4) ARE CV RISK FACTORS DIFFERENTLY PREDICTIVE IN THE TWO GENDERS?

5) DO PRIMARY AND SECONDARY PREVENTION HAVE A DIFFERENT IMPACT ON THE TWO GENDERS? Yes, IMPACT studies (Simon Capewell). In these studies secondary prevention had a larger effect in women and in older age groups.

6)…….
Risk Factors Unique to Women

Gestational Diabetes


Pregnancy-Induced Hypertension & Preeclampsia

A Canadian study (Lancet 2005; 366:1797-1803) of 75,380 women with preeclampsia, gestational hypertension, placental abruption, or placental infarction showed that these women had an increased risk of CVD with an adjusted hazard ratio of 2.0 (95% CI: 1.7–2.2), with an even higher risk in the presence of fetal compromise. In a cohort of 198,252 women affected by preeclampsia, the relative risk of subsequent hypertension was 3.70 (95% CI: 2.70–5.05) after 14.1 years, ischemic heart disease 2.16 (95% CI: 1.86–2.52) after 11.7 years, stroke 1.81 (95% CI: 1.45–2.27) after 10.4 years, and venous thromboembolism 1.79 (95% CI: 1.37–2.33) after 4.7 years (BMJ 2007; 335: 974).
Risk Factors Unique to Women

Polycystic Ovarian Syndrome

Polycystic ovarian syndrome (PCOS) is estimated to affect nearly 10% of women at reproductive age. A substudy of the Women’s Ischemia Evaluation Study (WISE) (J Clin Endocrinol Metab. 2008; 93:1276-1284) confirmed that women with PCOS have a larger number of cardiovascular events. In this study, multivessel CVD was observed in 32% of PCOS women compared with 25% of non-PCOS women (odds ratio, 1.7) and correlated with several factors, including increased free testosterone. In addition, the event free survival (including fatal and nonfatal events) was significantly lower in PCOS compared with non-PCOS women. The difference between the two groups was higher when cerebrovascular accidents were considered too, confirming the association of PCOS with stroke.

There are CV risk factors unique to women, but their predictive power is largely mediated by traditional risk factors. However they should be taken into account.
## Cohort distributions, men and women 35-69 years

<table>
<thead>
<tr>
<th>Location</th>
<th>N</th>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brianza</td>
<td></td>
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</tr>
<tr>
<td>Men</td>
<td>2,519</td>
<td>172</td>
</tr>
<tr>
<td>Women</td>
<td>2,623</td>
<td>54</td>
</tr>
<tr>
<td>Friuli</td>
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<td></td>
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<tr>
<td>Men</td>
<td>2,192</td>
<td>160</td>
</tr>
<tr>
<td>Women</td>
<td>2,274</td>
<td>75</td>
</tr>
<tr>
<td>Latina</td>
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</tr>
<tr>
<td>Men</td>
<td>2,809</td>
<td>311</td>
</tr>
<tr>
<td>Women</td>
<td>3,287</td>
<td>161</td>
</tr>
<tr>
<td>Naples</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>4,943</td>
<td>38</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>7,520</td>
<td>643</td>
</tr>
<tr>
<td>Women</td>
<td>13,127</td>
<td>328</td>
</tr>
</tbody>
</table>

**Incidence:**
80 (men) and 31 (women) x10,000 person-years
In Italy, as in many countries, the predictive power of the traditional CV risk factors is similar in the two genders, with the exception of smoking, worse in women.

Smoking W/M HRratio 1.31
The proportion of the gender gap in mortality related to alcohol and smoking ordered by the all cause mortality gender gap (2003-2005) in this study smoking-related deaths accounted for around 40–60% of the gender gap in all-cause mortality, while alcohol-related mortality typically accounted for 20–30% of the gender gap in Eastern Europe and 10–20% elsewhere in Europe.

*All mortality rates are deaths per 100,000 population per year.
**All gender gaps are calculated by subtracting the female from the male rate.

Tobacco Control 2011;20:166-168. doi:10.1136/tc.2010.037929
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- CONCLUSIONS
In Europe cardiovascular diseases are the first cause of death in women, even considering deaths under 50 years;

In 2008, life expectancy at birth in the European Union (27), was 82.4 years in women, 6 years more than men (76.4), with huge variations among countries;

In absolute terms Life Expectancy with Disability is longer in European women compared to men. It cumulates in later life and is due to cardiovascular diseases for about 1/4;
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CONCLUSIONS (II)

♥ Even if there are CV risk factors unique to women (gestational diabetes, pregnancy-induced hypertension & preeclampsia, PCOS) they seem to act through the traditional RF;

♥ Traditional CV RF have a similar predictive power in both genders, with the possible exception of smoking, but their distribution is worse in men at younger ages;

♥ The CV gender gap is substantially related to lifestyle habits like smoking and alcohol intake, fostering indications for prevention.
THANK YOU
FOR YOUR ATTENTION
RESERVE SLIDES
TRENDS IN LIFE EXPECTANCY AT BIRTH (YEARS) FOR SELECTED COUNTRIES BY GENDER

Red Alert for Women’s Hearts

Women and Cardiovascular Research in Europe

November 2009

<table>
<thead>
<tr>
<th>TOPICS</th>
<th>NUMBER OF PARTICIPANTS</th>
<th>NUMBER OF WOMEN</th>
<th>PERCENTAGE OF WOMEN</th>
<th>MEAN AGE</th>
<th>MEAN FOLLOW-UP (YEARS)</th>
<th>TRIALS WITH ANALYSIS BY GENDER M, (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLOOD PRESSURE-LOWERING TREATMENT</td>
<td>69,473</td>
<td>28,008</td>
<td>40.3%</td>
<td>70.2</td>
<td>3.2</td>
<td>3/5 (60.0%)</td>
</tr>
<tr>
<td>DIABETES AND METABOLIC SYNDROME</td>
<td>48,508</td>
<td>20,891</td>
<td>41.4%</td>
<td>61.1</td>
<td>4.3</td>
<td>4/7 (57.1%)</td>
</tr>
<tr>
<td>CHOLESTEROL-LOWERING THERAPY</td>
<td>50,194</td>
<td>15,856</td>
<td>30.0%</td>
<td>60.8</td>
<td>3.2</td>
<td>1/6 (16.7%)</td>
</tr>
<tr>
<td>ANTITHROMBOTIC THERAPY AND OTHER INTERVENTIONS</td>
<td>24,874</td>
<td>7,101</td>
<td>28.9%</td>
<td>65.3</td>
<td>3.4</td>
<td>2/3 (66.7%)</td>
</tr>
<tr>
<td>ISCHAEMIC HEART DISEASE</td>
<td>90,400</td>
<td>24,756</td>
<td>27.3%</td>
<td>62.6</td>
<td>0.96</td>
<td>5/13 (38.4%)</td>
</tr>
<tr>
<td>HEART FAILURE</td>
<td>46,141</td>
<td>12,834</td>
<td>27.3%</td>
<td>69.2</td>
<td>2.4</td>
<td>8/11 (72.7%)</td>
</tr>
<tr>
<td>ATRIAL FIBRILLATION</td>
<td>22,511</td>
<td>9,192</td>
<td>40.8%</td>
<td>72.1</td>
<td>2.5</td>
<td>3/7 (42.8%)</td>
</tr>
<tr>
<td>STROKE</td>
<td>28,790</td>
<td>10,618</td>
<td>36.9%</td>
<td>69.0</td>
<td>1.26</td>
<td>5/10 (50%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>380,891</td>
<td>127,716</td>
<td>33.5%</td>
<td>66.3</td>
<td>2.7</td>
<td>31/62 (50.0%)</td>
</tr>
</tbody>
</table>