Epidemiology of ischemic heart disease in the Sub-Saharan Africa region in 1990 and 2005:
a systematic review for the Global Burden of Disease Study

Janina Morrison, MD
I have no conflict of interest to report.
The Global Burden of Disease (GBD) Study

- Aims to provide a “consistent and comparative description” of the burden of diseases and injuries as an “important input to health decision making and planning processes”

- GBD 2010 currently underway summarizing data from 1990 and 2005
Ischemic Heart Disease in the GBD

• Ischemic Heart Disease (IHD) Sequelae
  – Acute Myocardial Infarction (AMI)
  – Angina pectoris
  – Congestive Heart Failure
IHD Systematic Review for Sub-Saharan Africa

Inclusion Criteria:
- Published 1980-2008
- Inclusive of at least ages 40-60 years
- Population based
- Epidemiologic parameters of interest
- Ideally, generalizable to a national population

Initial Search of Embase, Pubmed, Lilac with validation by regional experts
41,508 unique items

73% from developing nations

Screening step of abstracts and titles: 94% excluded

Papers sorted by region

Total papers from Sub-Saharan Africa selected for full text review: 125

Regional expert: Nasheeta Peer
The Sub-Saharan African Region
Sub-Saharan African Papers: inclusion and exclusion 125 full text articles reviewed

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<td>3</td>
<td>0</td>
<td>2</td>
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Included Studies by Region in Sub-Saharan Africa

<table>
<thead>
<tr>
<th>Region</th>
<th>Southern</th>
<th>Western</th>
<th>East</th>
<th>Central</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number included</td>
<td>14 (all from South Africa)</td>
<td>4</td>
<td>0</td>
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IHD Parameters

• Mortality
  – Reported in 6 studies from Sub-Saharan region
  – To be quantified by the GBD Mortality group
• Prevalence
• Incidence
• Case fatality
IHD Prevalence

- Reported in 5 studies from Sub-Saharan region
- Only 2 studies used objective data to quantify prevalence (others used self report or did not describe methods)

<table>
<thead>
<tr>
<th>Study authors</th>
<th>Year</th>
<th>Country</th>
<th>Parameter</th>
<th>Method of Quantification</th>
<th>Sample Size</th>
<th>Age range, % males</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steyn et al*</td>
<td>1990</td>
<td>South Africa</td>
<td>Prevalence of Angina</td>
<td>Rose Questionnaire</td>
<td>976</td>
<td>15-64 years, 49% male</td>
<td>13.0%</td>
</tr>
<tr>
<td>Pobee, J†</td>
<td>1986</td>
<td>Ghana</td>
<td>Prevalence of Angina</td>
<td>Rose Questionnaire</td>
<td>808</td>
<td>40-59 years, 45% male</td>
<td>6.8%</td>
</tr>
<tr>
<td>Pobee, J†</td>
<td>1986</td>
<td>Ghana</td>
<td>Prevalence of old MI</td>
<td>Minnesota Codes on EKG: Q-waves 1-1 and 1-2</td>
<td>808</td>
<td>40-59 years, 45% male</td>
<td>3.3%</td>
</tr>
</tbody>
</table>

†Pobee JO, Cas Lek Cesk. 1986.
IHD incidence: example of Soweto, South Africa

- Two papers reporting IHD incidence in Soweto, South Africa (Walker 1997*, Sliwa 2008†)
- Setting in both papers was Chris Hani Baragwanath hospital: a large public hospital which serves the population of Soweto, but also a significant population that comes from outside Soweto
- Multiple areas of uncertainty in incidence calculation:
  - Diagnostic: 1997 cases used physicians’ diagnoses, 2008 were strict and defined
  - Incidence numerator: is the proportion of IHD cases reported coming from Soweto accurate?
  - Incidence denominator: Soweto population estimates vary

<table>
<thead>
<tr>
<th>Estimate</th>
<th>Author/year</th>
<th>Case Definition (men and women, all ages)</th>
<th>Soweto population denominator</th>
<th>Rate per 100,000 (range based on denominator)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IHD incidence 1992</td>
<td>Walker 1997</td>
<td>Physician diagnosis (abstracted from the medical record), assume 50% from Soweto</td>
<td>Soweto population (Statistics South Africa) 1996</td>
<td>4.7</td>
</tr>
<tr>
<td>IHD incidence 2006</td>
<td>Sliwa 2008</td>
<td>“Coronary artery disease” cases using European Heart Society definition, assume 50% from Soweto</td>
<td>Stats SA 2001 (858,653) SAfrica Bureau Market Research 2009 (1,171,258)</td>
<td>7.0—9.6</td>
</tr>
</tbody>
</table>
IHD Case-fatality

- Reported from 4 studies from the Sub-Saharan region
- Only one study reports out of hospital mortality at 1 and 5 years

<table>
<thead>
<tr>
<th>Study Author</th>
<th>Year</th>
<th>Country</th>
<th>Sample size</th>
<th>Parameter</th>
<th>Case fatality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bertrand, E*</td>
<td>1995</td>
<td>Cote d’Ivoire</td>
<td>38</td>
<td>AMI in-hospital fatality</td>
<td>15.8%</td>
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<td>AMI case fatality at 1 year</td>
<td>20%</td>
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<td></td>
<td></td>
<td>AMI case fatality at 5 years</td>
<td>48.3%</td>
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</table>

Conclusions (1)

• This systematic review revealed limited population based epidemiology data from Sub-Saharan Africa in the past 30 years
• Few data represented nations other than South Africa
• Under-estimates possible given lack of access to formal care and diagnostic tools in this region
Conclusions (2)

• Overall, IHD does not appear to be common
  – As compared to estimated incidence of IHD in Soweto (7-9.6 per 100,000), the incidence in the US is 255 per 100,000 * (not age standardized)

• Other GBD groups will likely show that stroke and heart failure are more common than IHD in Sub-Saharan Africa

• GBD review aims not only to quantify IHD in Sub-Saharan Africa, but to spur cardiovascular research and guide resource allocation for these resource-limited regions

Thank you!

Questions?
Acknowledgements

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