BURDEN OF LIVER DISEASE IN BRAZIL
Burden of Liver Disease

- Burden of Liver Disease in Europe
  Blachier et al. J Hepatol 58:593, 2013
  - Review of 260 epidemiologic studies of the 5 previous years
  - Cirrhosis is responsible for 170,000 deaths/year
  - HCC is responsible for 47,000 deaths/year
  - Alcoholic liver disease
  - NAFLD
  - 0.5-0.7% of population has HBV
  - 0.13-3.26% of population has HCV
  - The main causes of liver disease are preventable/treatable
Burden of Liver Disease

• The mortality of liver disease is underestimated in the USA
  Chronic liver disease is the 12th cause of † (30,000 † /year)
  National Center for Health Statistics (at the CDC)
  Update of causes of death in 2 databases
  Rochester database and National Death Registry
  HRS, viral hepatitis, HCC.
  ↑ of mortality by liver disease in ≥ 2 times
  Mortality by liver disease underestimated in the last 2 decades
Burden of Liver Disease

- *Global Burden of Diseases* - 2010
  Hypertension, smoking and alcohol abuse.
  **alcohol** is the main factor in 27/34 countries in Americas

- Alcohol-related mortality in Americas
  Mortality evaluated in 16 countries of North, Central and South America
  - Yearly mean mortality: 79,456 (1.4% of all causes of †)
    - Alcoholic liver disease represented 0.6%
  - 63% of causes of death were related to liver disease
    - Exception: El Salvador and Guatemala (neuro-psychiatric diseases)
Burden of Liver Disease

• NAFLD in Americas
  NAFLD is the most frequent liver disease in Western countries
  20-30% of NAFLD and 2.7-12.2% of NASH
  Review of 356 articles between 2000-2013
• **Mexico:** 17.1% (actually more ↔ obesity)
• Brasil: 18-35.2%
• Chile: 23%
• Colombia: 26.6%
Burden of Liver Disease

NAFLD; inquiry of Brazilian Society of Hepatology

1280 cases evaluated in 9 States

- mean age: 49.68±13.59 yrs; gender: 53% male.
- risk factors: dyslipidemia (66.8%)
  - obesity (44.7%)
  - overweight (44.4%)
  - diabetes (22.7%)
  - metabolic syndrome (41.3%)

Liver biopsy in 437 patients: steatosis (42%)
- NASH (58%)
- NASH and fibrosis (27%)
- Cirrhosis (15.4%)
- HCC (0.7%)
Burden of Liver Disease

- Contribution of viral hepatitis in the burden of liver diseases


Estimates of data of 2006-2010

6 billion outpatient visits in the period

25.8 million (0.43%) related to chronic liver disease

49.6% related to viral hepatitis (B/C)

Viral hepatitis (B/C) correspond to 50% of chronic liver diseases
Burden of Liver Disease

• Burden of HCV in Europe

Mathurin P. Dig Liver Dis 45S:314, 2013

– HCV is the main cause of cirrhosis
– It increases † by 1.5-5 times compared to the population
– In cohorts of inpatients, it increases morbimortality

Screening is neglected

90% of infected people do not know their status

HCV is considered the greatest public health problem
Burden of Liver Disease

- Impact of the burden of HCV in the USA
  Younossi ZM et al. Aliment Pharmacol Therap 2014 (*in press*)
- Systematic review by an Expert Panel
- Screening is neglected
  - 70% of infected people do not know their status
  - CDC: screening in people born between 1945-65 (irrespective of other risk factors)
  - Prevalence of cirrhosis ↑ and will continue to ↑ in the next decade
  - HCV infection is the leading cause of †
  - HCV infection is the leading cause of morbidity (HCC...)
  - HCV infection causes loss of quality of life
  - HCV infection is the leading cause of costs
    - Hundreds of millions to 30 billions of dollars/year
Burden of Liver Disease

- Burden of HCV in Latin America
  Systematic review of 25 articles
  - 9 populational studies
  - Estimates of 7.8 million infected individuals
  - Prevalence of infection of 0.9-5.8

The greatest challenge in Brazil and Mexico
- 4 million infected people
Burden of Liver Disease

- Populational base, prevalence study, in the capital cities of Brazil
  Ministry of Health, Secretary of Vigilance in Health
  BMC Infect Dis 13:60, 2013
  Prevalences of anti-HCV:
    - 19,503 evaluated individuals
    - General prevalence: 1.38%

- Evaluation of cirrhotic patients in an outpatient clinic
  Mattos AA et al. Ann Hepatol 2014 (to be submitted)
  581 cirrhotic patients
  - Median follow-up of 5 yrs
  - 35% HCV and 23% HCV + alcohol: **58% HCV**
  Survival in 5 and 10 years: 73% e 57%
  MA: decreased survival in HCV+ patients
Burden of Liver Disease

- Future burden of HCV
  Model with dynamic system involving 36 cohorts
  ↓ of 2/3 in the prevalence of the infection by 2030
  ↑ in the incidence of cirrhosis (626.500 in 2015);
    ↑ in the incidence of decompensated cirrhosis (107.400 in 2019)
  ↑ in the incidence of HCC (23.800 in 2018)
  ↑ in mortality by liver disease (29.695 in 2019)
  ↑ in costs (9.1 billions of dollars by 2024)
Burden of Liver Disease

Impact of liver diseases in the Public Health System of Brazil (SUS).

Nader LA, Mattos AA, Bastos GA. Liver Int 2014 (Jan 15)
Burden of Liver Disease

Study design:
Observational study - ecologic-analytic.

Outcomes

Mortality by liver disease

Hospitalization by liver disease
Burden of Liver Disease

Secondary data of hospitalization and mortality
DATASUS (www.datasus.gov.br)
Data collection and analysis using TABWIN software

<table>
<thead>
<tr>
<th></th>
<th>Number of States x number of months during the year x period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitalizations: 2001-2010</td>
<td>3.240 records</td>
</tr>
<tr>
<td>Mortality: 2001-2009</td>
<td>2.916 records</td>
</tr>
</tbody>
</table>

According to International Classification of Diseases - 10th version (ICD-10)

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Chapter</th>
<th>Absolut number of deaths</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Diseases of the circulatory system</td>
<td>2,623,605</td>
<td>28.40</td>
</tr>
<tr>
<td>2</td>
<td>Neoplasms</td>
<td>1,335,400</td>
<td>14.46</td>
</tr>
<tr>
<td>3</td>
<td>External causes of morbidity and mortality</td>
<td>1,163,317</td>
<td>12.59</td>
</tr>
<tr>
<td>4</td>
<td>Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified</td>
<td>958,695</td>
<td>10.38</td>
</tr>
<tr>
<td>5</td>
<td>Diseases of the respiratory system</td>
<td>909,155</td>
<td>9.84</td>
</tr>
<tr>
<td>6</td>
<td>Endocrine, nutritional and metabolic diseases</td>
<td>507,708</td>
<td>5.50</td>
</tr>
<tr>
<td>7</td>
<td><strong>Diseases of the digestive system</strong></td>
<td><strong>452,964</strong></td>
<td><strong>4.90</strong></td>
</tr>
<tr>
<td>8</td>
<td>Certain infectious and parasitic diseases</td>
<td>416,193</td>
<td>4.51</td>
</tr>
<tr>
<td>9</td>
<td>Certain conditions originating in the perinatal period</td>
<td>266,941</td>
<td>2.89</td>
</tr>
<tr>
<td>10</td>
<td>Diseases of the genitourinary system</td>
<td>158,835</td>
<td>1.72</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>8,792,813</strong></td>
<td><strong>95.19</strong></td>
</tr>
</tbody>
</table>

Liver diseases – 308,290 (68% of diseases of digestive system)
Total of deaths in the period – 9,237,149
Absolute number of hospitalizations because of liver disease in Brazil, 2001–2010.

Total of hospitalizations in Brazil in the period – 117,979,343
Total of hospitalizations due to liver diseases – 853,571
Hospitalizations by gender in Brazil

Liver diseases

- Masculino: 33%
- Femenino: 67%

Mean age at hospitalization: 48.05 yrs

p < 0.001
## Leading causes of hospitalization for liver disease in Brazil, 2001–2010

<table>
<thead>
<tr>
<th>Cause</th>
<th>ICD</th>
<th>Absolut number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Other and unspecified cirrhosis of liver</td>
<td>K74.6</td>
<td>196,148</td>
<td>22.98%</td>
</tr>
<tr>
<td>2. Alcoholic cirrhosis of liver</td>
<td>K70.3</td>
<td>101,859</td>
<td>11.93%</td>
</tr>
<tr>
<td>3. Acute and subacute hepatic failure</td>
<td>K72.0</td>
<td>73,384</td>
<td>8.59%</td>
</tr>
<tr>
<td>4. Unspecified viral hepatitis without hepatic coma</td>
<td>B19.9</td>
<td>46,904</td>
<td>5.49%</td>
</tr>
<tr>
<td>5. Biliary cirrhosis, unspecified</td>
<td>K74.5</td>
<td>42,906</td>
<td>5.02%</td>
</tr>
<tr>
<td>6. Abscess of liver</td>
<td>K75.0</td>
<td>27,988</td>
<td>3.27%</td>
</tr>
<tr>
<td>7. Hepatitis A without hepatic coma</td>
<td>B15.9</td>
<td>22,518</td>
<td>2.63%</td>
</tr>
<tr>
<td>8. Malignant neoplasm of liver, not specified</td>
<td>C22.9</td>
<td>16,994</td>
<td>1.99%</td>
</tr>
<tr>
<td>9. Alcoholic hepatic failure</td>
<td>K70.4</td>
<td>16,148</td>
<td>1.89%</td>
</tr>
<tr>
<td>10. Hepatic failure, unspecified</td>
<td>K72.9</td>
<td>15,166</td>
<td>1.77%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>560,015</strong></td>
<td><strong>65.60%</strong></td>
</tr>
</tbody>
</table>
### Absolute number of hospital admissions for liver disease in the five macro-regions of Brazil, 2001–2010.

<table>
<thead>
<tr>
<th>Macro-region</th>
<th>Total population</th>
<th>Number of admissions for liver diseases</th>
<th>Percentual</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>15.864.454</td>
<td>69.289</td>
<td>0.43%</td>
</tr>
<tr>
<td>Northeast</td>
<td>53.081.959</td>
<td>203.396</td>
<td>0.38%</td>
</tr>
<tr>
<td>Southeast</td>
<td>80.364.410</td>
<td>376.843</td>
<td>0.47%</td>
</tr>
<tr>
<td>Center-West</td>
<td>14.048.094</td>
<td>51.504</td>
<td>0.36%</td>
</tr>
<tr>
<td>South</td>
<td>27.386.891</td>
<td>152.539</td>
<td>0.55%</td>
</tr>
</tbody>
</table>

p<0.001
Absolute number of deaths because of liver disease in Brazil, 2001–2009.

Total deaths in Brazil in the period – 9.237.149
Total deaths for liver diseases – 308.290
Mortality by Gender

Liver Diseases

Masculino: 28.54%
Femenino: 71.44%

Mean age at death time: 58.10 yrs

p<0.001
Leading causes of death because of liver disease in Brazil, 2001–2009

<table>
<thead>
<tr>
<th>Cause</th>
<th>ICD</th>
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<tbody>
<tr>
<td>1 Other and unspecified cirrhosis of liver</td>
<td>K74.6</td>
<td>80,655</td>
<td>26.16%</td>
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<tr>
<td>2 Alcoholic cirrhosis of liver</td>
<td>K70.3</td>
<td>40,333</td>
<td>15.68%</td>
</tr>
<tr>
<td>3 Malignant neoplasm of liver, not specified</td>
<td>C22.9</td>
<td>41,769</td>
<td>13.55%</td>
</tr>
<tr>
<td>4 Hepatic failure, unspecified</td>
<td>K72.9</td>
<td>20,688</td>
<td>6.71%</td>
</tr>
<tr>
<td>5 Liver disease, unspecified</td>
<td>K76.9</td>
<td>12,472</td>
<td>4.04%</td>
</tr>
<tr>
<td>6 Liver cell carcinoma</td>
<td>C22.0</td>
<td>10,791</td>
<td>3.50%</td>
</tr>
<tr>
<td>7 Alcoholic hepatic failure</td>
<td>K70.4</td>
<td>9,644</td>
<td>3.13%</td>
</tr>
<tr>
<td>8 Chronic viral hepatitis C</td>
<td>B18.2</td>
<td>9,111</td>
<td>2.95%</td>
</tr>
<tr>
<td>9 Alcoholic liver disease, unspecified</td>
<td>K70.9</td>
<td>8,756</td>
<td>2.84%</td>
</tr>
<tr>
<td>10 Acute hepatitis C</td>
<td>B17.1</td>
<td>3,853</td>
<td>1.25%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>246,072</strong></td>
<td><strong>79.81%</strong></td>
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<td>Northeast</td>
<td>53.081.959</td>
<td>77.308</td>
<td>0.14%</td>
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<td>Southeast</td>
<td>80.364.410</td>
<td>149.155</td>
<td>0.18%</td>
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<tr>
<td>Center-West</td>
<td>14.048.094</td>
<td>17.649</td>
<td>0.12%</td>
</tr>
<tr>
<td>South</td>
<td>27.386.891</td>
<td>48.452</td>
<td>0.17%</td>
</tr>
</tbody>
</table>

p<0.001
Burden of Liver Disease

- Impact of liver diseases in Brazil is **significant, increasing and evolving**
  - 853,571 hospitalizations;
  - 308,290 deaths
- **8th place** in the ranking of mortality in Brazil.
- **Hospitalization** rate for liver diseases is **0.72%**.
- **Mortality** rate for liver diseases in Brazil is **3.34%**.
- The leading causes of hospitalization for liver diseases are: **cirrhosis** and acute or subacute liver failure.
- The leading causes of death by liver diseases in Brazil are: **cirrhosis** and malignant neoplasm of liver.
- Hospitalizations: **South region**
- Mortality: **Southeast region**
Burden of Liver Disease

• Take home message

*The correct understanding of the real burden of a disease is essential in order to formulate health politics to prioritize interventions and to improve strategies for an adequate resource allocation.

*Only through efforts of the Government and health professionals, in all levels, the growth of liver diseases could be reverted, in order to avoid their consequences.