Clinical Spectrum
Liver Disease in Africa

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CONFERENCE ON
LIVER DISEASE
IN AFRICA
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Disclaimer

- Nothing to disclose
Africa

54 countries

- **North Africa**: Algeria, Egypt, Libya, Morocco, Tunisia, Sudan
- **SSA**: Western, Central, Eastern and Southern
- **Total Population**: 1.29 Billion: **16.4% world’s population**
- **40.6% population is urban**: 523 004 491 in 2018

Socio-demographic Index (SDI) quintiles GBD subnational L1 geography, 2015

GBD 2016 Study; Lancet 2017; 390:1151
Access to Healthcare in Africa

WHO Africa region

- 27 are low-income and 14 lower-middle-income countries

Low-income countries

- Per capita gross national income <1 657 USD
- Total health expenditure of 5.5% of GDP (2016)
- WHO per capita health spend is 83 USD: <2% of average spend in high-income countries
- *Estimated 2.7 physicians and 12.4 nurses/10,000 population*
  - Worldwide average of 13.9 physicians and 28.6 nurses/10,000 population
- *0.7 (low-income) and 5.5 (lower-middle income) surgical care providers per 100,000 population*
  - 22.6 and 56.9 per 100,000 for upper-middle-income and high-income countries respectively
Climate Zones in Africa

- Hot and cold desert
- Warm and cold semi-arid
- Equatorial/Tropical/Monsoon
- Sub-tropical
- Temperate/Mediterranean

Socioeconomic factors affecting health expenditure and access to healthcare as well as climate factors all affect the spectrum and severity of liver diseases seen in Africa
Clinical Spectrum of Liver Disease in Africa

- Viral Hepatitis - Cirrhosis, HCC
- HIV and liver disease
- Alcoholic liver disease
- Non-alcoholic fatty liver disease
- Drug-induced liver injuries

- Other infections
  - Schistosomiasis
  - Ascariasis
  - Hydatid disease

- Vascular
  - Membranous obstruction of IVC

- Autoimmune liver diseases
- Metabolic Liver Diseases
Classification of national time series of vital registration and verbal autopsy data, 1980–2016, on the basis of the fraction of deaths well certified and assigned to a detailed GBD cause.

Mortality estimates in Africa largely based on verbal autopsy data

- Majority of vital registration data from Southern Africa and Egypt

Mortality due to Cirrhosis and HCC in SSA

Viral Hepatitis in Africa

The Global Health Sector Strategy (2016 – 2021) addresses all 5 hepatitis viruses (A, B, C, D and E), with particular focus on HBV & HCV

In the WHO Africa Region

- **Hepatitis B**: highly endemic affecting an estimated 5-8% population, mainly in West and Central Africa.

- **Hepatitis C**: Estimated 19 million adults are chronically infected

- **Viral hepatitis is growing cause of mortality among people living with HIV**
  - About 1.96 million are HIV-HBV are co-infected in SSA
  - 0.5 million are HIV-HCV are co-infected

- **Hepatitis D**: Endemic but poor natural history data

- **Hepatitis E**: Recent outbreaks reported in Chad, Senegal, South Sudan and Uganda
  - High levels of endemicity reported in other countries in the African Region
WHO Africa Service Coverage Targets by 2020

- All 47 countries have developed national action plans for the prevention, care and treatment of viral hepatitis
- HBV vaccine coverage among infants at 90% region-wide
- HBV vaccine coverage among health workers at 90% region-wide
- At least 25 countries have introduced a birth dose of HBV vaccine
- All countries routinely test all blood donations for TTIs
WHO Africa Service Coverage Targets by 2020

• 50% injections administered with safe devices in & out of health facilities

• At least 200 sterile needles and syringes provided per PWID per year

• 20% people with chronic viral hepatitis infections diagnosed

• 1 million people receiving hepatitis B virus treatment

• 300 000 people receiving hepatitis C virus treatment
Africa Mortality rates ranging from:

- <10 per 100,000 per year (Southern Africa)
- 15 - 22.49 per 100,000 per year (Eastern Africa)
- 22.5 - 33.49 per 100,000 per year (Central and North Africa)
- ≥33.5 per 100,000 per year (West Africa)
HBV and HCV: Sub-Saharan Africa: DALYS
Africa: 60 Million HBV infected : 6.1% HBsAg positive (95% UI 4.6-8.5)
Hepatitis B Epidemiology: Africa

HBsAg Prevalence in children 5-9 years: 2005
- Prevalence similar in adults

Ott et al; Vaccine 30 (2012) 2212–2219
Hepatitis B Epidemiology: SSA

HBV infection rates largely reflect a failure of maternal and child healthcare programmes to prevent HBV MTCT and early childhood acquisition.

**Horizontal transmission - early childhood <5 years old**
- Close household contacts, medical or traditional scarification procedures
- Gambian Phylogenetic Analysis Study: HBV transmission within 2/3 of families
- 30-50% risk of chronic infection

**Perinatal Transmission: Impact of HIV/HBV co-infection in pregnancy**
- Increased risk of HBV MTCT: 90% risk of chronicity

**Sexual Transmission**
- Adults born pre-introduction HBV vaccine into EPI: <5% risk of chronicity
  - Potential HIV co-acquisition and increased risk of ALF

**Percutaneous Transmission**
- Needle-stick injuries, unsafe injection/medical practices, blood transfusions


Hepatitis B Epidemiology: Africa

- **Much higher HBsAg prevalence in rural than in urban areas**
  - Further economic burden on under-resourced rural health-care services
- **Greater risk for males of developing chronic HBV infection**
  - M:F ranging from 1.1:1 to 3:1 and increasing with age
- 30-50% Africans HBV-infected in early childhood remain HBsAg positive
  - *Only 10% remain HBeAg positive during adolescence*
- Majority HBeAg positive individuals lose HBeAg at annual rate of 14%-16%
- >85% individuals with biochemically & histologically active disease are HBeAg-negative
  - Need for Quantitative HBV PCR
- **The Gambia:** Male sex, maternal HBsAg status, genotype, aflatoxin exposure, HBeAg status, HBV viral load & ALT level were independent predictors of fibrosis

HBV Diagnosis and Linkage to Care

Full beneficial effects of HB BD vaccine & Universal HBV vaccination will take 2-3 decades

- Large reservoir of chronic hepatitis B in Africa
- Need to diagnose HBV-infected individuals and link to care

The Polaris Observatory HBV Modelling Study: Africa
(Lancet Gastroenterol Hepatol 26 March 2018)

- 78 M (68–89 M) estimated to be HBV-infected
- 1 486 000 diagnosed (2%)
- 21 356 000 (27%) eligible for Rx
- 33 700 treated (<1% accessed therapy)
- <1% pregnant women treated
- 1 046 000 HBsAg positive children aged 5yrs old (3.4% prevalence)
- 19% HB Birth dose vaccination and 10% timely vaccination

Upscaling Diagnosis and linkage to care requires
- Affordable diagnostics: Point-of-care tests and HBV DNA quantification
- Long term follow-up and sustainable access to NUCs for HBV-mono-infected
Impact of HIV/HBV Co-infection

71% of global 36.7 million people with HIV live in sSA

❖ 1.96 M HIV/HBV co-infected

Increased mortality & morbidity

**HIV co-infection promotes:**

- Increased HBV replication & rates of HBV reactivation
- **HBV MTCT 2.5 fold increased**
- Increased rates of occult HBV
- Chronicity of newly acquired HBV infections
- **Progression to fibrosis and cirrhosis – 5x faster**
- **HCC - occurs at a younger age and is more aggressive**

HIV/HBV Co-infections in SSA

Liver-related mortality 2x higher in HBV/HIV than HCV/HIV

- CD4 count <200 cells/mm$^3$ have 16.2 x higher risk of liver-related deaths vs CD4 count >350 cells/mm$^3$

MTCT of HBV and HIV in SSA

Estimated no of infants perinatally infected each year in SSA

11 African countries: 15 articles were included

- HBeAg-positive women: Pooled risk 38.3% (95% CI: 7.0–74.4%) without prophylaxis - significantly lower than of 70–90% risk in literature (P = 0.007)
- HBeAg-negative women: Pooled risk 4.8% (95% CI: 0.1–13.3%) without prophylaxis - within the lower range of 5–30% risk in Asia

Keane et al; Aliment Pharmacol Ther 2016; 44: 1005
HCV Epidemiology: Africa

Global HCV viraemic prevalence: 1%: 71 (62-79) million people infected

North Africa/Middle East
- Overall HCV viraemic prevalence: 1.7% (95% UI 1.4-1.9)
- 8.5 M (6.8–9.2) HCV-infected individuals
- **Egypt**: 6.3% (4.5–6.7) viraemic prevalence or 5 625 M (4007- 6044) infected

SSA
- Overall HCV viraemic prevalence: 1% (95% UI 0.7-1.6)
- 11 M (95% UI 7-16) HCV-infected individuals

HCV Epidemiology: Africa

Regional prevalence & no of HCV-infected individuals in SSA (95% UI)

- **East Africa**: 0.5% (0.4-0.7) : 2.1 M (1.6-2.9)
- **Southern Africa**: 0.7% (0.4-0.9) : 0.5 M (0.3-0.7)
- **West Africa**: 1.3% (1.1-1.4) : 5.1 M (4.3-5.7)
- **Central Africa**: 2.1% (0.1-6.9) : 2.4 M (0.1-8.0)

Data scarce on high-risk populations: MSM, PWID

- Cultural biases or criminalization

**MSM: Few accurate assessments of HCV seroprevalence**

- **Sudan**: 0.1 to 1%
- **South Africa**: 3% in HIV negative MSM; 6% in HIV pos MSM in Cape Town

HCV Transmission Risks: Africa

- Globally, most new HCV infections are in high-risk groups: PWID or MSM.
- HCV transmission in Africa differs in many aspects to other parts of the world.

**Traditional practices**
- Circumcision or scarification rituals - reused instruments.

**Iatrogenic**
- **Unsafe Blood transfusions**: Late 1990s, only 19% blood screened.
  - *Risk of acquiring HCV from blood*: 2.5 per 1000 units transfused vs 1 per 2-3 million units in high-income countries.
  - *2016*: 40 WHO Africa region countries: testing 100% blood donations for TTIs.
  - Inconsistent confirmatory testing of blood donations remains an issue.

- **Unsafe injection practices**: 3.7% in WHO Africa region.
  - Reused needles/syringes and injection overuse.
    - *Vaccination campaigns*
    - *Parenteral treatment campaigns*: Schistosomiasis, Trypanosomiasis.
  - Lack of reuse prevention devices.

HCV Genotypes : Africa

Genotypes 1 and 4 predominate overall, but is pangenotypic (G1-5)

- **Central Africa**: G4 >80% - heterogenous: 4k, 4c, 4r & 4f
- **East Africa**: G1-5 with G4 (50-68%) and G2 (33.3%) predominance
- **Southern Africa**: G1-5 with G5a predominance (35%), G1 (31%)
- **West Africa**: G1 (Nigeria 85%) and G2 (Ghana 87%)
- **North Africa**: GT4 predominates

Access to HCV Therapy

Net cure by region in 2016

- Negative net cure = epidemic size is increasing
- Net cure worldwide in 2016: 0.43%

North Africa/Middle East: 5x more people achieving SVR than new infection
- 8.1% HCV-infected individuals were treated

SSA (8 countries): 0.1% HCV-infected individuals were treated
SSA had 34.4 times more new HCV infections than cures
- 130,800 new HCV infections, 3,805 cured & 21,540 HCV-related deaths

HIV/HCV Co-infection: Africa

2014: Globally, estimated 2.3 M people of 36.7 M living with HIV are anti-HCV positive (6.2%): Odds of HCV infection 6x higher if HIV positive

- **anti-HCV positive in HIV-infected individuals:** PWID (82.4%), MSM (6.4%), pregnant or heterosexual exposure (4.0%) and **general population** (2.4%)

**SSA:** 19% of HIV/HCV co-infected people: 429,600 cases

- Median prevalence: HIV-infected excl PWID: 1% (IQR 1-8): 361 300 cases

**North Africa/Middle East:** 2% of HIV/HCV co-infected people: 53 500 cases

- Median prevalence: HIV-infected excl PWID: 4% (IQR 2-6): 7 000 cases

Best estimates of anti-HCV prevalence of HIV-infected in 4 population samples

Lancet Infect Dis 2016; 16: 797
Viral Hepatitis & People who inject Drugs (PWID)

Globally: 15.6 M (95% UI 10.2-23.7) PWID aged 15-64yrs
0.33% (95% UI 0.21-0.49) population prevalence
17.8% (10.8-24.8) PWID are living with HIV;
52.3% (42.4-62.1%) are anti-HCV pos and 9.1% (5.1-13.2) are HBsAg pos

SSA: 1 378 000 PWID: 0.28% (95% UI 0.13-0.62) population prevalence of PWID
North Africa/Middle East: 349 500 PWID: 0.12% (95% UI 0.06-0.18) population prevalence of PWID

Lancet Glob Health 2017;5: e1192
## Estimated HIV, HBsAg and anti-HCV Ab prevalence: PWID

<table>
<thead>
<tr>
<th></th>
<th>HIV</th>
<th>HCV</th>
<th>HBV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prevalence among PWID (95% UI)</td>
<td>Estimated number of PWID living with HIV (95% UI)</td>
<td>Prevalence among PWID (95% UI)</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>18.3% (11.3-25.4)</td>
<td>251500 (75000-508500)</td>
<td>21.8% (17.6-26.5)</td>
</tr>
<tr>
<td>Middle East and north Africa</td>
<td>3.6% (1.5-6.2)</td>
<td>12500 (4500-24500)</td>
<td>48.1% (39.2-57.1)</td>
</tr>
<tr>
<td>Global</td>
<td>17.8% (10.8-24.8)</td>
<td>2787000 (1482500-4464000)</td>
<td>52.3% (42.4-62.1)</td>
</tr>
</tbody>
</table>

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*Estimated HIV prevalence*

*Estimated anti-HCV prevalence*

*Estimated HBsAg prevalence*

*Lancet Glob Health 2017;5: e1192*

Hepatitis D

Meta-analysis & Systematic Review: 30 studies: 15 countries

HDV Seroprevalence: SSA

- Pooled overall seroprevalence 8.39% (95% CI 4.73–12.85)
- 0.7% SSA population: 7 million people

East and Southern Africa

- 0·05% (0·00–1·78) in gen pop

West Africa

- 7·33% (95% CI 3·55–12·20) in gen pop
- 9·57% (2·31–20·43) in liver-disease pop

Central Africa

- 25·64% (12·09–42·00) in gen pop
- 37·77% (12·13–67·54) in liver-disease populations

Egypt: 5-58%
Hepatitis D

- Accelerated progression to cirrhosis & increased HCC incidence in HBV infected individuals

- Natural history data have not been reported in African populations
  Genotypes 5–8 specific to continent

- Methods of HDV RNA detection need to be standardised

- Eligibility of HDV Ab & RNA testing in African settings need to be investigated

OR 5.24 (95% CI 2.74–10.01; p<0.0001) for anti-hepatitis D detection among HBsAg-pos patients with liver fibrosis or HCC relative to asymptomatic controls

Lancet Glob Health 2017; 5: e992–1003
Hepatitis E

Hepatitis E (genotype 1 and 2)

Sudan, Chad, Uganda, Kenya and Somalia - large outbreaks

- 10,000 cases
- Individuals living in refugee camps with inadequate access to clean water and sanitation, overcrowding
- Associated high mortality
- Severe morbidity in individuals with co-existing liver disease (HBV, HCV)
- Lack of available and affordable diagnostic serology/molecular tests
- Vaccine not widely available

HIV and Liver Disease

Pre-ART era

Opportunistic infections
- Mycobacterium avium intracellulare
- Mycobacterium tuberculosis
- Cytomegalovirus
- Leishmaniasis
- Histoplasmosis
- Cryptococcosis

Viral hepatitis: HBV and HCV

HIV cholangiopathy: CMV and Cryptosporidiosis

Malignancy
- Lymphoma, Kaposi’s sarcoma

Post-ART era

Immune reconstitution syndrome

Complications of HBV and HCV

Metabolic Syndrome

DILI

Despite access to effective ART, many HIV-infected individuals in SSA are still presenting with CD4 counts <100 cells/mm³
HIV and Liver Disease

Division of Hepatology, UCT: High HIV burden area

Clinicopathological assessment of 301 HIV/AIDS patients

- Median age: 34 years (IQR 29-40)
  - Women (143): median age 33 years (IQR 28-37)
  - Men (158): median age 35 years (IQR 31-41) s, P <0.001

- **76.1% Black African**

- **Median CD4 127 (52-260) cells/mm³ at time of biopsy**

Biopsy Findings

- Drug-induced liver injury (42.2%)
- Granulomatous inflammation (29%): 52% TB IRIS
- Steatosis/steatohepatitis (19.3%)
- Hepatitis B co-infection (19%)
- Hepatitis C co-infection (3.3%)
- More than one pathology in 16.2%
Clinicopathological assessment of 301 HIV/AIDS patients

Univariate analysis
- Cotrimoxazole and ART conferred risk for drug injury (OR 2.78 [1.72-4.48], p <0.001; OR 1.69 [1.06-2.68], p=0.027)

Multivariate analysis
- **Cotrimoxazole** associated with *cholestatic* (OR 7.05 [2.50-19.89], p <0.001; or *ductopenic injury* OR 17.6 [3.26-95.3], p <0.0001)
- **Efavirenz** associated with nonspecific hepatitis (OR 4.3 [1.92-9.83], p<0.001) or *submassive necrosis* OR 10.46 [2.7-40.5], p <0.001)
- Cholestatic injury associated with female gender & CD4 >200 cells/mm³
- *Submassive necrosis associated with younger age*
- HBV demonstrated no association
- *Mycobacterium tuberculosis was leading opportunistic infection*

Liver biopsy remains important diagnostic procedure in this setting
HIV : Efavirenz DILI

Division of Hepatology at UCT/GSH (AIDS 2016, 30:1483)

81 pts (50 retrospective) & 31 (prospective cohort): Criteria for EFV DILI

- Median age 34 years
- 86% Black African, remainder mixed ancestry
- 73% female
- Prospective group: 58% pregnant at time of initiating ART
- Median CD4 nadir was 348 cells/ml (IQR 173–522)
- 27% had used or were currently using cotrimoxazole prophylaxis
- Median duration on ART was 20 weeks (IQR 12–24)
- 3 pts HBsAg positive and HBeAg negative: Liver histology : DILI
- 1 patient anti-HCV positive, HCV RNA negative
- No patients fulfilled clinical criteria for TB IRIS
81 pts: 50 retrospective and 31 prospective: Criteria for EFV DILI

Three histological injury patterns observed: 73 patients

**Non-specific hepatitis (17):** Grade 1–2 elevation of ALT and AST

**Mixed cholestatic-hepatitis (20):**
- Grades 2–3 elevation of ALT, AST, ALP, GGT & mild/moderate jaundice

**Submassive necrosis (36):**
- Grade 4 elevation of ALT/AST with severe jaundice & coagulopathy
- ‘**Immuno-allergic** pattern’ with inflammatory cell infiltrates composed of lymphocytes, plasma cells, and conspicuous eosinophils
HIV: Efavirenz DILI

81 pts: 50 retrospective and 31 prospective: Criteria for EFV DILI

Multivariate logistic regression model: Submassive necrosis

- **CD4 cell count >350 cells/ml**: OR 9.4; 95% CI, 2.5–35.8, p<0.001
- **Female gender**: OR, 9.0; 95% CI, 1.4–59.8, p=.023
- **Age >30 years protective**: OR 0.87; 95% CI, 0.78–0.98, p=0.02

Mixed pattern

- **CD4 <350 cells/ml**: OR 11.6; 95% CI, 2.2–61.4, p<0.004
- **Age >30**: OR 1.1; 95% CI, 1.1–1.2, p=0.036

Median length of hospital stay: 28 days (IQR 11–60)

Overall liver-related mortality: 11% (9)

- 6% (3) in retrospective and **19% (6) in prospective cohort**
- Majority of deaths occurred within 1 week of presentation

Corticosteroids: Submassive necrosis patients

Sonderup et al; AIDS 2016; 30:1483
Average standard drinks (10 g of pure ethanol per serving) consumed per day, age-standardised, for females and males in 2016.

Alcohol per capita per year varies considerably in Africa and is influenced by cultural and religious beliefs in different countries.
WHO: Age-standardized death rates per $10^5$ population: Cirrhosis

Males

Females

Global Information System on Alcohol and Health
## Obesity in Africa

<table>
<thead>
<tr>
<th>Region</th>
<th>Overweight and Obesity %</th>
<th>Obesity %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>North Africa &amp; Middle East</td>
<td>58.5</td>
<td>65.5</td>
</tr>
<tr>
<td>- Egypt</td>
<td>71.2</td>
<td>79.4</td>
</tr>
<tr>
<td>sub-Saharan Africa, Central</td>
<td>24.8</td>
<td>25.7</td>
</tr>
<tr>
<td>sub-Saharan Africa, East</td>
<td>14.9</td>
<td>23.7</td>
</tr>
<tr>
<td>sub-Saharan Africa, Southern</td>
<td>34.2</td>
<td>63.7</td>
</tr>
<tr>
<td>- South Africa</td>
<td>38.8</td>
<td>69.3</td>
</tr>
<tr>
<td>sub-Saharan Africa, West</td>
<td>32.6</td>
<td>34.5</td>
</tr>
</tbody>
</table>

Increasing prevalence of obesity, diabetes mellitus and the Metabolic Syndrome – associated risk of NAFLD

GBD Study 2013: Lancet 2014;384:786
Geographic variation in daily energy availability per capita (kilocalories) & NAFLD prevalence

- Global prevalence of NAFLD is estimated at 24%
- Early malnutrition & growth stunting associated with increased risk of MS
- Further exacerbated by increasing urbanisation in adult life and associated change from traditional diet high in fibre to more western diet high in calories, animal protein, saturated fat and sugar
Non-Alcoholic Fatty Liver Disease in Africa

Scant available data on NAFLD prevalence in Africa

- Lower prevalence similar to African Americans
- Under-recognised

Nigeria
- 9.5 -16.7% in diabetics (central obesity and dyslipidaemia)
- 1.2- 4.5% in individuals without diabetes

South Africa
- 47.6% in diabetics/insulin resistant (69% mixed ancestry)
- 36% patients with NAFLD on biopsy had NASH & 17% advanced fibrosis

Sudan
- 20% in small population-based study (increased with age and BMI)
- 50.3% in diabetics - associated with MS

Egypt
- 15.8% in school children (6-14 yrs), increasing with age, assoc MS

# NAFLD in South Africa: Ethnicity

<table>
<thead>
<tr>
<th>Variables</th>
<th>Indian</th>
<th>African</th>
<th>Caucasian</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
<td>38.3 ± 10.4</td>
<td>37.3 ± 12.8</td>
<td>35.9 ± 14.4</td>
</tr>
<tr>
<td><strong>BMI</strong></td>
<td>24.7 [21.5, 27.2]***</td>
<td>30.1 [25.7, 34.3]</td>
<td>26.2 [22.1, 28.3]*</td>
</tr>
<tr>
<td><strong>Waist (cm)</strong></td>
<td>80.7 ± 11.9**</td>
<td>87.1 ± 14.3</td>
<td>78.0 ± 8.91***</td>
</tr>
<tr>
<td><strong>Visceral fat (cm³)</strong></td>
<td>82.4 [45.9, 123]</td>
<td>76.9 [35.9, 158]</td>
<td>44.2 [27.9, 108]</td>
</tr>
<tr>
<td><strong>Subcutaneous fat (cm³)</strong></td>
<td>361 [237, 435]</td>
<td>443 [325, 643]</td>
<td>313 [213, 414]*</td>
</tr>
<tr>
<td><strong>Liver: spleen ratio</strong></td>
<td>1.22 [1.10, 1.35]</td>
<td>1.35 [1.28, 1.41]</td>
<td>1.27 [1.16, 1.33]</td>
</tr>
<tr>
<td><strong>Insulin (pmol/L)</strong></td>
<td>51.1 [34.2, 87.5]*</td>
<td>28.2 [19.0, 64.5]</td>
<td>52.9 [28.8, 70.7]*</td>
</tr>
<tr>
<td><strong>Glucose (mmol/L)</strong></td>
<td>4.80 [4.60, 5.00]</td>
<td>4.90 [4.70, 5.27]</td>
<td>4.70 [4.50, 5.10]</td>
</tr>
<tr>
<td><strong>HOMA</strong></td>
<td>1.63 [0.98, 2.50]*</td>
<td>0.86 [0.60, 2.06]</td>
<td>1.64 [0.95, 2.38]*</td>
</tr>
<tr>
<td><strong>Metabolic Syndrome (%)</strong></td>
<td>27.1++</td>
<td>17.2</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Walking (steps per day)</strong></td>
<td>8927 [6048, 11063]*</td>
<td>10871. [7424, 12820]</td>
<td>8056 [6881, 9846]</td>
</tr>
<tr>
<td><strong>Total energy expenditure (cals/day)</strong></td>
<td>2198 [1957, 2623]**</td>
<td>2646 [2211, 3134]</td>
<td>2283 [2123, 2524]*</td>
</tr>
</tbody>
</table>

Data given a mean ± SD, median [interquartile range] or percentage.
Schistosomiasis

Schistosomiasis affects 240 M people worldwide, mostly in SSA

Clinically leading to hepatosplenomegaly & complications of Portal HT

- Access to gastroscopy and oesophageal varices eradication services
- Often HBV and/or HCV co-infections
- SSA: Estimated that 100 million school-aged children (aged 6–14 years) require treatment for schistosomiasis
- Mass drug administration (MDA) programmes (praziquantel): Merck Soreno, World Vision, World Bank, UK International Development
- 2014: 56 M people in 27 countries (20 in Africa) received praziquantel
- Most people in endemic areas receive ≥ 1 treatment during their lifetime

WHO Weekly epidemiological record No 49, 2017, 92, 749–760; Lancet Infect Dis 2017; 17: e42
Estimated number of children aged 6–14 years requiring annual treatment for schistosomiasis (preventative chemotherapy) in endemic countries

Black dots indicate countries where there has been a MDA programme using praziquantel within the past 5 years (2010-15)

**Eradication programmes: WASH** (Improvements in water supplies, sanitation, and hygiene), mollusciciding and praziquantel (**Egypt**)

- Requires infrastructure especially in rural areas for implementation
Soil Transmitted Helminths

SSA: 273 514 333 M infected with STH, only 54.3% Rx coverage

- *Ascaris lumbricoides* infection common in tropical and subtropical areas - poor sanitation and hygiene - faecal contamination of soil
- Endemic areas: infection prevalence rises at 2-3 years of age, maximum by the age of 8-14 years

**Hepatic Ascariasis: Adults**

- F:M ratio of 3:1
- Mid-thirties: range of 4-70 years

**Presentations**

- Biliary colic: Worm in CBD
- Acute cholangitis
- Acalculous cholecystitis
- Hepatic abscess
- Recurrent pyogenic cholangitis
  - Intra-hepatic stones and secondary sclerosing cholangitis
  - Dead worm fragments & ova form nidus for stone formation

Membranous Obstruction of IVC

- Occlusive lesion of IVC usually complete, but occasionally with small central opening
- Located close to entrance of IVC into RA or just below level of the diaphragm
- Usually a membrane of variable thickness
- Maybe a fibrotic occlusion of variable length
- Chronic hepatic venous congestion & centrilobular fibrosis of liver
- **Aetiology:** ? Congenital vascular anomaly or result of organization of a thrombus in hepatic portion of IVC
- **Southern Africa:** 4% SSA Black Africans
- Risk of HCC: 4.7-23%
  - Highest in South African Blacks, with risk of 40 - 48%

Clinical Spectrum of Liver Disease in Africa

• Clinical spectrum and burden of liver disease is affected by:
  o Socioeconomic and climatic factors

• Lack of vital registration data to accurately assess burden of liver disease in Africa

• Need to improve education, clinical awareness and public health resources for management of liver diseases and associated complications

• National governments, International Aid groups, NGOs and pharmaceutical companies all need to play a role in combating liver diseases in Africa
  o Potentially preventable, eminently treatable and even curable with present day therapies