Knowledge, attitudes and practices (KAP) towards Asthma in Africa

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Background

• Asthma is defined by Global Initiative for asthma (GINA) as a heterogeneous disease usually characterized by chronic airway inflammation and accompanied by a history of recurrent or persistent respiratory symptoms such as wheeze, shortness of breath, chest tightness and cough that vary over time and in intensity, together with variable airflow obstruction.

• The variation in symptoms and airflow obstruction can in most cases be associated with an identifiable trigger such as allergen exposure, exercise, change in weather or a chest infection.

• Symptoms can be absent for several weeks or months following appropriate asthma treatment or even spontaneously.
Asthma knowledge

Adequate knowledge and a positive attitude are important prerequisites for optimal asthma management.

Knowledge is key in achieving a positive attitude to a disease by the patient

Knowledge is also key in dispelling misconceptions which have a negative impact on any disease outcomes

Misconceptions are very common in asthma

The World Asthma Day 2021 (WAD 2021) was dedicated to asthma misconception with the theme “Uncovering Asthma Misconceptions”.
What asthma knowledge should patients have?

• Correct knowledge of the **causes, symptoms & management** of asthma and no misconceptions and harmful practices

• There is no gold standard assessment of asthma knowledge

• Kate Lucie et al performed a systematic review of asthma knowledge questionnaires in 2018

• Forty-four papers with **37** different instruments for asthma knowledge measurement were found

• The most common cited asthma knowledge questionnaire is the Newcastle Asthma Knowledge Questionnaire 1990


<table>
<thead>
<tr>
<th>Question number</th>
<th>Question</th>
<th>Correct answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>What are the three main symptoms of asthma?</td>
<td>Coughing, wheezing, shortness of breath</td>
</tr>
<tr>
<td>2</td>
<td>One in ten children will have asthma at some point during their childhood</td>
<td>True</td>
</tr>
<tr>
<td>3</td>
<td>Children with asthma have abnormally sensitive pulmonary airways</td>
<td>True</td>
</tr>
<tr>
<td>4</td>
<td>If one child in the family has asthma, then all of his brothers and sisters are likely to have asthma as well</td>
<td>False</td>
</tr>
<tr>
<td>5</td>
<td>Most children with asthma have an increase in mucus when they drink cow’s milk</td>
<td>False</td>
</tr>
<tr>
<td>6</td>
<td>Write down everything that you know may trigger an asthma attack</td>
<td>Allergens, colds, and exercise</td>
</tr>
<tr>
<td>7</td>
<td>During an asthma attack, the wheezing may be due to the contraction of the muscles that form the walls of the pulmonary airways</td>
<td>True</td>
</tr>
<tr>
<td>8</td>
<td>During an asthma attack, the wheezing may be due to the swelling of the lining of the pulmonary airways</td>
<td>True</td>
</tr>
<tr>
<td>9</td>
<td>Asthma damages the heart</td>
<td>False</td>
</tr>
<tr>
<td>10</td>
<td>Write down two treatments (drugs) for asthma that are commonly used on a daily basis</td>
<td>Two of: inhaled corticosteroids, chromones, montelukast, long-acting beta-2-adrenergic agonist combinations</td>
</tr>
<tr>
<td>11</td>
<td>Which asthma treatments (drugs) are useful during an asthma attack?</td>
<td>Two out of: short-acting beta-2-adrenergic preparation, ipratropium bromide, oral corticosteroids, and oxygen</td>
</tr>
<tr>
<td>12</td>
<td>Antibiotics are an important part of treatment for most children with asthma</td>
<td>False</td>
</tr>
<tr>
<td>13</td>
<td>Most children with asthma should not consume dairy products</td>
<td>False</td>
</tr>
<tr>
<td>14</td>
<td>Allergy shots cure asthma</td>
<td>False</td>
</tr>
<tr>
<td>15</td>
<td>If a person dies of an asthma attack, that usually means that the last attack must have developed so fast that there was no time to start a treatment</td>
<td>False</td>
</tr>
<tr>
<td>16</td>
<td>People with asthma usually have “nervous problems”</td>
<td>False</td>
</tr>
<tr>
<td></td>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>17</td>
<td>Asthma is an infectious disease (i.e. you can catch it from another person)</td>
<td>False</td>
</tr>
<tr>
<td>18</td>
<td>Inhaled medications for asthma (such as the Ventolín® or Terbasmín® inhalers) have fewer side effects than tablets and syrups</td>
<td>True</td>
</tr>
<tr>
<td>19</td>
<td>Short courses of oral steroids (such as Estilsona®, Dacortín®, prednisone) usually have significant side effects</td>
<td>False</td>
</tr>
<tr>
<td>20</td>
<td>Some treatments for asthma (such as Ventolín®) damage the heart</td>
<td>False</td>
</tr>
<tr>
<td>21</td>
<td>A five year old child has an asthma attack and takes two puffs from a Ventolín® inhaler (a metered-dose inhaler). After five minutes there is no improvement. Give some reasons why this may have happened.</td>
<td>Two from: the medication has expired, inhaler is empty, poor technique, insufficient dosage</td>
</tr>
<tr>
<td>22</td>
<td>During an asthma attack that is being treated at home, your child needs to use an inhaler with a space chamber (or mask) every two hours. He is getting better but after two hours he is having difficulty breathing. Since the child is not getting worse, it is OK to continue giving the treatment every two hours</td>
<td>False</td>
</tr>
<tr>
<td>23</td>
<td>Write ways in which one can help prevent an asthma attack during exercise</td>
<td>Two out of: warm-up exercises, short-action beta-2 agonists or chromones prior to exercising, managing asthma more carefully, breathing through the nose, warm and humid environment</td>
</tr>
<tr>
<td>24</td>
<td>Children with asthma become addicted to their asthma medications</td>
<td>False</td>
</tr>
<tr>
<td>25</td>
<td>Swimming is the only suitable sport for asthmatics</td>
<td>False</td>
</tr>
</tbody>
</table>
### NAKQ (26-31)

<table>
<thead>
<tr>
<th></th>
<th>Statement</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>Parental smoking may make the child’s asthma worse</td>
<td>True</td>
</tr>
<tr>
<td>27</td>
<td>With appropriate treatment, most children with asthma should be able to lead a normal life with no restrictions on activity</td>
<td>True</td>
</tr>
<tr>
<td>28</td>
<td>The best way to measure the severity of a child’s asthma is for the doctor to listen to the child’s chest</td>
<td>False</td>
</tr>
<tr>
<td>29</td>
<td>Asthma is usually more of a problem at night than during the day</td>
<td>True</td>
</tr>
<tr>
<td>30</td>
<td>Most children with asthma will have stunted growth</td>
<td>False</td>
</tr>
<tr>
<td>31</td>
<td>Children with frequent asthma symptoms should take preventive drugs</td>
<td>True</td>
</tr>
</tbody>
</table>
Common asthma misconceptions

• Asthma is a childhood disease; individuals will grow out of it as they age.

• Asthma is infectious.

• Asthma sufferers should not exercise.

• Asthma is only controllable with high dose steroids.

• Asthma is a psychological condition.

• Asthma medicine is addictive.

• If I or my child takes asthma medicine every day for a long time, it will lose effectiveness and won't work when she's really sick.

• When I feel fine and have no symptoms it's because the asthma has gone away.

• Nebulizers are the best way to give asthma medicines.

• I can stop taking my medicine when I feel good and don't have any symptoms or problems breathing.

• If I or my child has asthma, I or he or she should not be allowed to play like other kids.

• Asthma inhalers weaken the heart and should not be used unless asthma is very serious.
Impact of asthma knowledge on asthma perceptions and practices

Impact of asthma KAP on asthma outcomes

• Higher asthma knowledge is associated with better asthma outcomes including of control and mortality

• In Vietnam Vinh Nhu Nguyen et al 2018 found that patients with better knowledge of asthma self-management (ASMQ score \( \geq 50 \)) had better asthma control based on the Asthma Control Test score

<table>
<thead>
<tr>
<th>Asthma self-management knowledge</th>
<th>ACT score (Mean ± SD)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor (ASMQ score &lt;50)</td>
<td>16.2±5.0</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Adequate and good (ASMQ score ( \geq 50 ))</td>
<td>21.9±2.6</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: ACT, Asthma Control Test; ASMQ, Asthma Self-Management Questionnaire.
Asthma education improves knowledge, asthma control and quality of life

101 adults patients with asthma in Korea

Effect of an individualised education programme on asthma control, inhaler use skill, asthma knowledge and health-related quality of life among poorly compliant Korean adult patients with asthma

## Findings

Table 2: Comparison of the means of the dependent variables in each repeated measurements ($n = 101$)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean ± SD</th>
<th>Post-test 1</th>
<th>Post-test 2</th>
<th>$F$</th>
<th>$p$</th>
<th>Pairwise comparisons</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEFR %</td>
<td>82.32 ± 23.40</td>
<td>85.19 ± 23.77</td>
<td>85.27 ± 24.27</td>
<td>3.59</td>
<td>0.003</td>
<td>a &lt; b = c</td>
</tr>
<tr>
<td>DRC score</td>
<td>1.76 ± 0.81</td>
<td>1.67 ± 0.78</td>
<td>1.60 ± 0.77</td>
<td>5.46</td>
<td>0.002</td>
<td>a &gt; b = c</td>
</tr>
<tr>
<td>Skill score</td>
<td>8.47 ± 1.13</td>
<td>8.69 ± 1.05</td>
<td>8.97 ± 0.99</td>
<td>10.57</td>
<td>&lt;0.001</td>
<td>a &lt; b &lt; c</td>
</tr>
<tr>
<td>Knowledge</td>
<td>20.27 ± 2.53</td>
<td>20.75 ± 2.13</td>
<td>20.44 ± 2.30</td>
<td>2.21</td>
<td>0.115</td>
<td></td>
</tr>
<tr>
<td>HRQoL</td>
<td>25.38 ± 6.82</td>
<td>29.66 ± 5.74</td>
<td>28.73 ± 5.93</td>
<td>11.57</td>
<td>0.003</td>
<td>a &lt; c &lt; b</td>
</tr>
</tbody>
</table>
Asthma KAP in Africa

- Asthma KAP studies are very few in Africa
- Few available studies show asthma knowledge is low leading to high prevalence of misconceptions and practices
- This is probably contributory to the high rates of adverse asthma outcomes on the continent
- Justus Simba et al in 106 care givers 70% mothers in Kenya found:
  - 72.4% had basic asthma knowledge
  - 64.7% believed inhalers are for the very sick
  - 31% felt preventer medications in asthma were necessary

Meshack Shimwela et al studied 610 rural pupils and 619 urban pupils.

### Table 3 Knowledge of the triggers of asthma among pupils in the two districts

<table>
<thead>
<tr>
<th>Reported trigger factors</th>
<th>Bagamoyo n (%)</th>
<th>Ilala n (%)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust/kapok tree dust</td>
<td>67 (10)</td>
<td>117 (17.5)</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Cat hairs/fur</td>
<td>68 (10.2)</td>
<td>80 (12.0)</td>
<td>0.297</td>
</tr>
<tr>
<td>Cold whether</td>
<td>29 (4.3)</td>
<td>37 (5.6)</td>
<td>0.316</td>
</tr>
<tr>
<td>Prawns</td>
<td>18 (2.7)</td>
<td>13 (2.0)</td>
<td>0.468</td>
</tr>
<tr>
<td>Exercise</td>
<td>9 (1.3)</td>
<td>17 (2.6)</td>
<td>0.118</td>
</tr>
<tr>
<td>Fumes/perfumes</td>
<td>3 (0.5)</td>
<td>11 (1.6)</td>
<td>0.034</td>
</tr>
<tr>
<td>Aspirin</td>
<td>4 (0.6)</td>
<td>5 (0.8)</td>
<td>0.753</td>
</tr>
<tr>
<td>Cigarette smoke</td>
<td>5 (0.75)</td>
<td>4 (0.6)</td>
<td>1.0</td>
</tr>
<tr>
<td>Cough</td>
<td>0</td>
<td>4 (0.6)</td>
<td>0.062</td>
</tr>
<tr>
<td>Don’t know</td>
<td>467 (69.7)</td>
<td>400 (60.0)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Total</td>
<td>670 (100)</td>
<td>668 (100)</td>
<td></td>
</tr>
</tbody>
</table>
Perceptions

Table 4 Perceptions about asthma among pupils in selected secondary schools in Ilala and Bagamoyo districts

<table>
<thead>
<tr>
<th>Perceptions about asthma</th>
<th>Bagamoyo (%)</th>
<th>Ilala (%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear playing together</td>
<td>128 (20.7)</td>
<td>78 (12.8)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Fear studying together</td>
<td>95 (15.3)</td>
<td>59 (9.7)</td>
<td>0.003</td>
</tr>
<tr>
<td>Fear eating together</td>
<td>117 (18.9)</td>
<td>82 (13.4)</td>
<td>0.009</td>
</tr>
<tr>
<td>Fear sleeping in the same room</td>
<td>169 (27.3)</td>
<td>114 (18.1)</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Ghana, Malawi, Nigeria, South Africa, Uganda, and Zimbabwe- ACACIA study

- 442 Children 12-14 years answered questions on: symptom severity, medication, access to healthcare, knowledge, and the Brief-Illness Perception Questionnaire (B-IPQ)
- 72.4% of participants had no previous diagnosis of asthma by a doctor.
- Participants with asthma diagnosis answered on average 5.3 out of 14 knowledge questions correctly
- 39.7% of participants incorrectly thought that you can get addicted to asthma inhalers.

Asthma misconception and relationship with asthma outcomes in Uganda- URAC project

- 449 patients with asthma from chest clinics of six tertiary hospitals in Uganda
- 28.3% male, median age 33 years
- 32.2% of the patients had controlled at enrollment
- 17 patients died (3.7%, 27.3 deaths per 1000 person year) during 2 years of follow up
- Prevalence of misconceptions and their impact on asthma control and mortality shown in the next slide
## Prevalence of asthma misconceptions and their impact on asthma outcomes among Uganda patients enrolled in the Uganda Registry for asthma and COPD

<table>
<thead>
<tr>
<th>Misconception</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male (N=128)</td>
</tr>
<tr>
<td><strong>Asthma is a psychological condition</strong></td>
<td>19 (14.8)</td>
</tr>
<tr>
<td><strong>Asthma medicine is addictive</strong></td>
<td>28 (21.9)</td>
</tr>
<tr>
<td><strong>If I or my child takes asthma medicine every day for a long time, it will lose effectiveness and won’t work when she’s really sick</strong></td>
<td>28 (21.9)</td>
</tr>
<tr>
<td><strong>When I feel fine and have no symptoms it’s because the asthma has gone away</strong></td>
<td>50 (39.1)</td>
</tr>
<tr>
<td><strong>Nebulizers are the best way to give asthma medicines</strong></td>
<td>53 (41.4)</td>
</tr>
<tr>
<td><strong>I can stop taking my medicine when I feel good and don’t have any symptoms or problems breathing</strong></td>
<td>75 (58.6)</td>
</tr>
</tbody>
</table>
## Misconception Uganda cont’d

### Prevalence

<table>
<thead>
<tr>
<th>Misconception</th>
<th>Male (N=128)</th>
<th>Female (N=321)</th>
<th>PR (p-value)</th>
<th>Controlled (N=126)</th>
<th>Uncontrolled (N=323)</th>
<th>PR (p-value)</th>
<th>Died (N=17)</th>
<th>Alive (N=432)</th>
<th>PR (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can stop taking my medicine when I feel good and don’t have any symptoms or problems breathing</td>
<td>75 (58.6)</td>
<td>191 (59.3)</td>
<td>0.99 (0.888)</td>
<td>70 (55.6)</td>
<td>196 (60.5)</td>
<td>0.92 (0.352)</td>
<td>7 (41.2)</td>
<td>259 (59.8)</td>
<td>0.69 (0.202)</td>
</tr>
<tr>
<td>If I or my child has asthma, I or he or she should not be allowed to play like other kids</td>
<td>10 (7.8)</td>
<td>16 (5.0)</td>
<td>1.57 (0.245)</td>
<td>8 (6.4)</td>
<td>18 (5.6)</td>
<td>1.14 (0.746)</td>
<td>2 (11.8)</td>
<td>24 (5.5)</td>
<td>2.12 (0.278)</td>
</tr>
<tr>
<td>Asthma inhalers weaken the heart and should not be used unless asthma is very serious</td>
<td>20 (15.6)</td>
<td>53 (16.5)</td>
<td>0.95 (0.819)</td>
<td>28 (22.2)</td>
<td>45 (13.9)</td>
<td>1.60 (0.031)</td>
<td>3 (17.7)</td>
<td>70 (16.2)</td>
<td>1.08 (0.873)</td>
</tr>
</tbody>
</table>
Conclusions

• Asthma knowledge is critical in shaping perceptions, attitudes and practices of asthma patients

• Asthma education raises knowledge

• Knowledge improves attitudes perceptions and practices

• Low asthma knowledge is associated with adverse asthma outcomes

• Asthma knowledge among asthma patients is low in Africa

• Asthma misconceptions stemming from low knowledge is probably a major contributor to the high rates of adverse asthma outcomes in Africa
Recommendations

• Health workers should strive to always save time to educate their patients about asthma

• Governments, development partners should prioritize patient education programs

• More research is needed on asthma KAP in Africa
Thank you!

If your lungs are not working nothing else works
Diagnostic tests in asthma: a continuing challenge in Africa

By
Dr Obianuju Ozoh
College of Medicine,
University of Lagos,
Lagos Nigeria
Introduction

• Asthma diagnosis
  • Asthma diagnostic pathway
  • Under diagnosis in Africa?
• Challenges
• Opportunities
• Way forward
Asthma diagnostic pathway

- **Asthma diagnosis**
  - **Reversible airflow obstruction**
    - Peak flow
    - Spirometry
  - **Airway inflammation**
    - • FENO
    - • SPT, IgE
    - • Eosinophilia
  - **Bronchial hyper-responsiveness**
    - Bronchoprovocation challenges
GINA recommendation
Asthma under diagnosis and overdiagnosis


Cynthia B. Baard, Zoe Franckling-Smith, Jacinta Munro, Lesley Workman, Heather J. Zar
ERJ Open Research Apr 2021, 7 (2) 00576-2020; DOI: 10.1183/23120541.00576-2020

**TABLE 2** Comparison of prevalence of asthma symptoms by written questionnaire among South African adolescents, 2002 (ISAAC III) and 2017 (GAN I)

<table>
<thead>
<tr>
<th></th>
<th>2002 (ISAAC III)</th>
<th>2017 (GAN I)</th>
<th>2002 to 2017 OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>n (%)</td>
<td>5037</td>
<td>3979</td>
<td></td>
</tr>
<tr>
<td>Wheezing ever</td>
<td>1570 (31.1)</td>
<td>1373 (34.5)</td>
<td>1.06 (0.97-1.16)</td>
</tr>
<tr>
<td>Wheezing last 12 months</td>
<td>1025 (20.3)</td>
<td>847 (21.3)</td>
<td>1.06 (0.98-1.17)</td>
</tr>
<tr>
<td>Four or more attacks of wheezing in last 12 months</td>
<td>254 (5.0)</td>
<td>230 (5.8)</td>
<td>1.15 (0.96-1.39)</td>
</tr>
<tr>
<td>Woken by wheezing one or more nights per week in last 12 months</td>
<td>252 (5.0)</td>
<td>275 (6.9)</td>
<td>1.41 (1.16-1.68)</td>
</tr>
<tr>
<td>Severe wheeze limiting speech to one or two words at a time in last 12 months</td>
<td>395 (7.8)</td>
<td>468 (11.8)</td>
<td>1.57 (1.36-1.80)</td>
</tr>
<tr>
<td>Exercise-induced wheeze in last 12 months</td>
<td>1641 (32.6)</td>
<td>1431 (36.0)</td>
<td>1.16 (1.04-1.27)</td>
</tr>
<tr>
<td>Night cough in last 12 months</td>
<td>1846 (36.6)</td>
<td>1684 (41.4)</td>
<td>1.22 (1.12-1.33)</td>
</tr>
<tr>
<td>Diagnosis of asthma ever</td>
<td>725 (14.4)</td>
<td>660 (16.6)</td>
<td>1.18 (1.05-1.33)</td>
</tr>
</tbody>
</table>
Universal challenges to asthma diagnosis

• Variability in symptoms
• Variability in lung function
  • Timing
  • Diurnal variations
  • Medications
• No ‘gold standard’
• Over diagnosis was considered a challenge

Access to diagnostic tests in Africa

Peak flow
• Uganda: 6.7%
• Ghana: 13%,
• Nigeria: 38%
• South Africa: 53.6%

Spirometry
• Uganda: 24.4%
• Nigeria 29.4%
• Cost: 27.8 days’ wages in Uganda

Availability of spirometry in Africa

<table>
<thead>
<tr>
<th></th>
<th>Spirometer available at all times (%)</th>
<th>Available spirometers that are calibrated (%)</th>
<th>Staff received training on the use of the available spirometer (%)</th>
<th>Staff received training on spirometry data interpretation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>73.0</td>
<td>59.3</td>
<td>77.8</td>
<td>70.4</td>
</tr>
<tr>
<td>No</td>
<td>27.0</td>
<td>29.6</td>
<td>11.1</td>
<td>18.5</td>
</tr>
<tr>
<td>Don’t know</td>
<td>0</td>
<td>11.1</td>
<td>11.1</td>
<td>11.1</td>
</tr>
</tbody>
</table>

## Use of diagnostic tests in Africa

<table>
<thead>
<tr>
<th>Question</th>
<th>Proportion</th>
<th>Study</th>
</tr>
</thead>
</table>
A problem for LMICs?

Table 3. Asthma diagnostic techniques and clinical monitoring used by participating GPs for asthmatic patients.\(^a\)

<table>
<thead>
<tr>
<th>Diagnostic techniques</th>
<th>No. (%) of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chest radiography</strong></td>
<td>296 (98.0)</td>
</tr>
<tr>
<td>Spirometry</td>
<td>142 (47.0)</td>
</tr>
<tr>
<td>Skin testing or RAST</td>
<td>68 (22.5)</td>
</tr>
<tr>
<td>Daily peak flow monitoring</td>
<td>63 (20.9)</td>
</tr>
<tr>
<td>Sinus radiography</td>
<td>33 (10.9)</td>
</tr>
<tr>
<td>Sputum exam for eosinophils</td>
<td>24 (7.9)</td>
</tr>
<tr>
<td>Clinical monitoring</td>
<td></td>
</tr>
<tr>
<td>Frequency of cough and wheezing</td>
<td>297 (98.7)</td>
</tr>
<tr>
<td>Frequency of (\beta_2)-agonist use</td>
<td>288 (95.4)</td>
</tr>
<tr>
<td>Frequency of sleep disturbances</td>
<td>215 (71.2)</td>
</tr>
<tr>
<td>Review of inhaler technique</td>
<td>166 (55.0)</td>
</tr>
<tr>
<td>Activity level</td>
<td>73 (24.2)</td>
</tr>
<tr>
<td>Loss of work/school days</td>
<td>31 (10.3)</td>
</tr>
<tr>
<td>Peak expiratory flow</td>
<td>18 (6.0)</td>
</tr>
<tr>
<td>Peak expiratory flow diary review</td>
<td>9 (3.0)</td>
</tr>
</tbody>
</table>

RAST: radioallergosorbent testing.
\(^a\)Data are presented as number (%).

Access to other tests

<table>
<thead>
<tr>
<th>Essential Studies</th>
<th>%</th>
<th>Preferred studies</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full spirometry (including expiratory and inspiratory maneuvers and respiratory</td>
<td>34</td>
<td>Methacholine challenge testing</td>
<td>0</td>
</tr>
<tr>
<td>muscle function testing)</td>
<td></td>
<td>Radio-allergosorbent test (RAST)</td>
<td>0</td>
</tr>
<tr>
<td>Ziehl Neelsen (acid-fast) staining</td>
<td>91</td>
<td>Pleurodesis</td>
<td>60</td>
</tr>
<tr>
<td>Peak flow meters</td>
<td>86</td>
<td>PleurX catheter insertion</td>
<td>0</td>
</tr>
<tr>
<td>Pulse oximetry (in medical ward apart from ICU)</td>
<td>86</td>
<td>Medical thoracoscopy</td>
<td>11</td>
</tr>
<tr>
<td>Lowenstein-Jensen culture media</td>
<td>40</td>
<td>Body plethysmography</td>
<td>3</td>
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<tr>
<td>BACTEC culture media</td>
<td>20</td>
<td>CT pulmonary angiography</td>
<td>37</td>
</tr>
<tr>
<td>GeneXpert cartridges</td>
<td>37</td>
<td>Ventilation-perfusion scanning</td>
<td>20</td>
</tr>
<tr>
<td>Full functional respiratory laboratory</td>
<td>17</td>
<td>Oxygen titration testing</td>
<td>7</td>
</tr>
<tr>
<td>Arterial blood gas analysis</td>
<td>17</td>
<td>Carbon monoxide transfer factor (DLco)</td>
<td>0</td>
</tr>
<tr>
<td>Sputum induction</td>
<td>31</td>
<td>Flexible fiberoptic bronchoscopy</td>
<td>11</td>
</tr>
<tr>
<td>Pleural biopsy</td>
<td>69</td>
<td>biopsies with fluoroscopic guidance</td>
<td></td>
</tr>
<tr>
<td>Therapeutic thoracentesis</td>
<td>80</td>
<td></td>
<td></td>
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<tr>
<td>Chest radiography (day case investigation in clinic)</td>
<td>77</td>
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<td></td>
</tr>
<tr>
<td>Chest CT</td>
<td>71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexible fiberoptic bronchoscopy</td>
<td>46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washings</td>
<td>31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bronchoscopy</td>
<td>31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bronchoalveolar lavage</td>
<td>37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transbronchial biopsies (blind)</td>
<td>43</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What then is the problem in LMIC

- UK practices still use peak flow > spirometry
- Low resource
- Personal devices (Compare with DM)
- Stakeholder support and uniform messaging
- Local reference values
- Spirometry hubs

Challenges in Africa

• Who makes the diagnosis in Africa?
• Level of Knowledge and attitude

• Social factors:

“...when you tell them that this is likely asthma, they say, “No, God forbid, it is not me, I can’t have asthma”,... “my enemy has asthma it is not me”....Nigerians are very spiritual people...There’s a big clash between spirituality and medical care.

• Value of diagnostic tests:

“I don’t always use spirometry.. there is really no reason why I don’t consider it. ..I am just not keen about telling them to do the test. I don’t see any need... it is just based on my own knowledge and the way I have been trained”.

(FP, private) (spirometry available).
Gaps/mitigation to low utilization of spirometry

Gaps

- Training and guidelines
  - Value of lung function testing
- Access to equipment and technical support
- Human resources
- Financial resources

Mitigation

- PATS training
- PATS MECOR training
- Local training


Way forward

• Education
  • Attitude towards diagnosis
  • Confidence
  • Value of testing

• Domesticate recommendation
  • Peak flow
  • Spirometry hubs
  • Reference values

• Prioritize CRD

Conclusion

- Asthma diagnosis remains a challenge
- Limited access to diagnostic test in Africa
- Attitude and social factors contribute
- Low utilization of the cost effective peak flow meter
- Uniform messaging
- Creating access to spirometry
- Highlight the value of lung function testing
THANK YOU
Guidelines for Asthma Management in Africa

Amsalu Bekele, MD
Associate Professor of Medicine, Consultant Pulmonologist
Addis Ababa University
PATS Mini Symposium

August 21, 2021
Presentation Outline

- Introduction
- Overview of asthma guidelines
- History of asthma guidelines
- Evidence supporting asthma guidelines
- Lack of asthma guidelines in LMIC
- Summary
Introduction

- Asthma is one of the most common chronic conditions worldwide.
  - Approximately 339 million people of all ages and ethnicities affected
    - Total number estimated to increase by 100 million in 2025, mostly in LMIC
  - Asthma prevalence estimated to be 10-20% in adult population
    - Prevalence has stabilized in high-resource countries but continues to increase in LMIC

Goals of Asthma Guidelines

- Provide evidence-based management recommendations for health care workers & patients
- Improve the quality of patient care and clinical effectiveness for providers
- Foster shared decision-making among primary care providers, specialist, and patients
- Reduce asthma mortality and morbidity
Considerations in Developing Asthma Guidelines

- Theoretically consist of 4 basic components:
  - Constructed on a strong foundation from scientific or evidenced-based therapies or discoveries
  - Widely disseminated and implemented throughout the health care community
  - Ultimately benefit patient outcomes
  - Ensure that they remain current and based on knowledge and evidence with regularly scheduled update
Evidence-Based Clinical Practice Guidelines

Evidence Pyramid

Levels of Evidence

I

SR
RCT
Cohort
Case control
Case series
Case report
Expert opinion

Grades of Recommendations

A
B
C

BREATHTING LIFE INTO AFRICA
Considerations in Developing Asthma Guidelines

- **Level 1 (L1):**
  - Meta-analyses.
  - Randomized controlled trials with meta-analysis.
  - Randomized controlled trials.
  - Systematic reviews.

- **Level 2 (L2):**
  - Observational studies, examples include:
    - Cohort studies with statistical adjustment for potential confounders.
    - Cohort studies without adjustment.
    - Case series with historical or literature controls.
    - Uncontrolled case series.
  - Statements in published articles or textbooks.

- **Level 3 (L3):**
  - Expert opinion.
  - Unpublished data, examples include:
    - Large database analyses.
    - Written protocols or outcomes reports from large practices.
Considerations in Developing Asthma Guidelines

- Recommendation Grade A1 (RGA1): Evidence demonstrates at least moderate certainty of at least moderate net benefit

- R-GA2: Evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care

- R-GB: Evidence is insufficient, conflicting, or poor and demonstrates an incomplete assessment of net benefit vs harm; additional research is recommended

- R-GC1: Evidence demonstrates a lack of net benefit; additional research is recommended

- R-GC2: Evidence demonstrates potential harm that outweighs benefit; additional research is recommended

- R-GDG: Recommended best practice on the basis of the clinical experience of the Guideline Development
Considerations in Developing Asthma Guidelines

- Quality of guidelines as well as their effect on outcomes
- Prospective validation of the content and use
- Effective implementation into daily practice

Potential Value of Asthma Guidelines

- Cost-effective
- Reduce management errors
- May improve outcomes
- Improve care in areas with limited qualified health professionals
- Solve ethical issues
- Avoid double standards
- Easily implemented in various environments
- Improve political commitment
- Increase affordability and accessibility of asthma medications
Concerns about Asthma Guidelines

- Tend to be rigid and based on group consensus
- Too complex to be implemented by primary health care providers
- Not widely distributed; often don’t reach the facility level for use
- No specific medication listed
- Not realistic to the existing conditions in many LMICs
- Implementation can be challenging
- Lack of proper orientation for use of the guidelines
- Physician adherence to guidelines is often poor
- Time delays may be significant
Guideline Development at WHO

1. Scope the guideline
2. Set up GDG and External Review Group
3. DOI and manage conflicts of interest
4. Formulate questions (PICO) and Choose relevant outcomes
5. Evidence retrieval, assessment, synthesis (systematic review(s))
   GRADE - evidence profile(s)
6. Formulate recommendations: GRADE
   - Include explicit consideration of:
     ☐ Benefits and harms
     ☐ Values and preferences
     ☐ Resource use
7. Disseminate, implement
8. Evaluate impact
9. Plan for updating

GRC approval of guideline development proposal

GRC approval of final guideline
Figure 1a: Timeline for 2020 Asthma Guideline Update

Abbreviations:
AHRQ—Agency for Healthcare Research and Quality
DHHS—U.S. Department of Health and Human Services
NAEPPCC—National Asthma Education and Prevention Program Coordinating Committee
NIH—National Institutes of Health
History of Asthma Guidelines

- Asthma guidelines are approaching their 35th anniversary in the literature and have positively influenced the quality and outcomes of asthma care worldwide.

- Starting in 1983, an increase in asthma morbidity and mortality was noted worldwide, initiating a call for action.

- The first clinical practice guidelines for the assessment and management of asthma were published in New Zealand and Australia.
  - Opinion-based asthma guidelines published in mid-1980s.
  - Overall, goal of these guidelines was to reduce asthma mortality and morbidity.

History of Asthma Guidelines

- In the 1990's:
  - Britain, Scotland, Canada, and the US (National Heart, Lung, Blood Institute) all developed asthma guidelines.
  - National Asthma Education and Prevention Program
    - Develop asthma guidelines for the United States
    - Participated with an international task force to develop guidelines for the treatment of asthma in all countries, which resulted in the formation of the Global Initiative for Asthma (GINA).
History of Asthma Guidelines

- Asthma guidelines issued prior to the late 1990s were primarily based on consensus or expert opinion.

- These early guidelines played a vital role in bridging the gap between various treatment options and recent discoveries in basic science and served as the vehicle to implementation into daily clinical practice.

- Dissemination and implementation of the early guidelines was inconsistent, and they were criticized for not being evidence-based.
History of Asthma Guidelines

- As the knowledge of asthma pathophysiology expanded, newer guidelines were based on evidence-based medicine.

- Evidence-based medicine attempts to present a rational and suitable structure of problem-solving from which the quality and importance of clinical studies can be analyzed in an unbiased manner.

- If there is uncertainty in the research, systematic reviews may offer a resolution.

- Current asthma evidence-based clinical practice guidelines offer both evidence and instructional components, bringing current scientific knowledge to the clinic and bedside.
Current International Asthma Guidelines

- International Union Against Tuberculosis and Lung Disease (IUATLD)
- United States
  - Global Initiative for Asthma (GINA),
  - National Asthma Education and Prevention Program (NAEPP),
  - National Institute for Health and Care Excellence (NICE)
- Others: Canada, Australia, United Kingdom, South Africa, Kenya, Uganda, Ethiopia, and Nigeria
Current International Asthma Guidelines

- Current guidelines spend significant space discussing the diagnosis of asthma.

- Unlike the original severity-based asthma guidelines, asthma assessment now depends on 2 concepts: control and severity.

- Signs and symptoms are systematically identified and quantified to assist the clinician in determining
  - disease severity (during diagnosis) and
  - assessing asthma control (during follow-up care and management).

- The control and severity assessments are both based on symptoms, exacerbations, impact on daily life, use of rescue medications, lung function, and variations in lung function.
Current International Asthma Guidelines

- Five most frequently cited current asthma guidelines and patient self-management plans:
  - Utilize peak flow to help direct management
  - Classify asthma severity differently
  - Although there is agreement on the type of drug to be used, guidelines vary with respect to when to use the drug, the "best" strategy to increase the dose, and the maximum dose
  - Studies available on self-management do not make it possible to determine which part of the program is most important or cost-effective.

Current International Asthma Guidelines

- GINA and NAEPP guidelines are the most frequently cited and solicited and are now evidence-based and have similar frameworks.

- Convenience of access to these guidelines via the Internet, and their inclusion of potentially helpful information for patients, should promote wider awareness and implementation across the continuum of asthma care.
GINA Guideline Overview

- GINA was established by the WHO and NHLBI in 1993
  - To increase awareness about asthma
  - To improve asthma prevention and management through a coordinated worldwide effort
  - GINA is independent, funded only by the sale and licensing of its reports and figures
- The GINA report is a global evidence-based strategy that can be adapted for local health systems and medicine availability
  - ~500,000 copies of GINA reports downloaded each year from 100 countries
  - Practical focus: multiple flow-charts and tables
- The GINA strategy report is updated every year
- Twice-yearly cumulative review of new evidence across the whole asthma strategy

*For GINA methodology, see www.ginasthma.com/aboutus/methodology*
## 2021 GINA Recommendations

### Adults & adolescents

**12+ years**

**Personalized asthma management**

Assess, Adjust, Review for individual patient needs

**CONTROLLER and PREFERRED RELIEVER**

(Track 1). Using ICS-formoterol as reliever reduces the risk of exacerbations compared with using a SABA reliever.

**CONTROLLER and ALTERNATIVE RELIEVER**

(Track 2). Before considering a regimen with SABA reliever, check if the patient is likely to be adherent with daily controller.

### STEPS 1 – 2

**As-needed low dose ICS-formoterol**

**RELIEVER**: As-needed low-dose ICS-formoterol

**Other controller options for either track**

- Low dose ICS whenever SABA taken, or add LTRA, or add and switch to high dose ICS
- Medium dose ICS, or add LTRA, or add LTRA and switch to high dose ICS
- Add LAMA or LTRA or add low dose ICS but consider side-effects

**Confirmation of diagnosis if necessary**

- Symptom control & modifiable risk factors (including lung function)
- Comorbidities
- Inhaler technique & adherence
- Patient preferences and goals

**Treatment of modifiable risk factors and comorbidities**

- Non-pharmacological strategies
- Asthma medications (adjust down/up/between tracks)
- Education & skills training
Background - the risks of ‘mild’ asthma

- Patients with apparently mild asthma are still at risk of serious adverse events
  - 30–37% of adults with acute asthma
  - 16% of patients with near-fatal asthma
  - 15–20% of adults dying of asthma
  - had symptoms less than weekly in previous 3 months (*Dusser, Allergy 2007*)

- Exacerbation triggers are unpredictable (viruses, pollens, pollution, poor adherence)

- Inhaled SABA has been first-line treatment for asthma for 50 years
  - Dating from an era when asthma was thought to be a disease of bronchoconstriction
  - Its role has been reinforced by rapid relief of symptoms and low cost
  - Starting treatment with SABA trains the patient to regard it as their primary asthma treatment

For GINA methodology, see www.ginasthma.com/aboutus/methodology
GINA 2021 treatment figures for adult & Adolescent

The GINA 2021 treatment figure for adults and adolescents

- For clarity, the GINA treatment figure now shows two 'tracks', based on evidence about outcomes with the two reliever choices across asthma severity
  - Track 1, with low dose ICS-formoterol as the reliever, is the preferred approach
    - Using ICS-formoterol as reliever reduces the risk of exacerbations compared with using a SABA reliever, with similar symptom control and similar lung function
  - Track 2, with SABA as the reliever, is an alternative approach
    - Use this if Track 1 is not possible, or is not preferred by a patient with no exacerbations on their current controller therapy
    - Before considering a regimen with SABA reliever, consider whether the patient is likely to be adherent with daily controller – if not, they will be exposed to the risks of SABA-only treatment
- Treatment may be stepped up or down within a track using the same reliever at each step, or switched between tracks, according to the patient’s needs and preferences

ICS: inhaled corticosteroids; SABA: short-acting beta₂-agonist
2020 Focused Update of the NAEPP Asthma Guidelines

- FeNO2 is recommended to aid in asthma diagnosis and monitoring and to assist in ICS medication titration
- Antigen mitigation interventions are only recommended for those who have symptoms related to specific indoor aeroallergens
- ICS recommended for on-demand usage
- Subcutaneous immunotherapy recommended for mild to moderate asthmatics with mild to moderate asthma (documented with IgE or skin tests)
- Bronchial thermoplasty not recommended

NAEPP = National Asthma Education and Prevention Program
# 2020 Focused Update of the NAEPP Asthma Guidelines

**Figure 1.d: Stepwise Approach for Management of Asthma in Individuals Ages 12 Years and Older**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>STEP 1</th>
<th>STEP 2</th>
<th>STEP 3</th>
<th>STEP 4</th>
<th>STEP 5</th>
<th>STEP 6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intermittent Asthma</strong></td>
<td>PRN SABA</td>
<td>Daily low-dose ICS and PRN SABA or PRN concomitant ICS and SABA</td>
<td>Daily and PRN combination low-dose ICS-formoterol</td>
<td>Daily and PRN combination medium-dose ICS-formoterol</td>
<td>Daily medium-high dose ICS-LABA + LAMA and PRN SABA</td>
<td>Daily high-dose ICS-LABA + oral systemic corticosteroids + PRN SABA</td>
</tr>
<tr>
<td><strong>Management of Persistent Asthma in Individuals Ages 12+ Years</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Preferred</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Alternative</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Steps 2-4: Conditionally recommend the use of subcutaneous immunotherapy as an adjunct treatment to standard pharmacotherapy in individuals > 5 years of age whose asthma is controlled at the initiation, build up, and maintenance phases of immunotherapy.

Assess Control:

- Consider adding Asthma Biologics (e.g., anti-IgE, anti-IL5, anti-IL5R, anti-IL4/IL13)**

---

*Note: ICS = Inhaled Corticosteroid, LABA = Long-Acting Beta-2 Agonist, LAMA = Long-Acting Muscarinic Agonist, SABA = Short-Acting Beta-2 Agonist, PRN = As Needed.*
Specific Guidelines for Asthma Management in Africa

- Optimal management of asthma in resource limited settings is hindered by lack of resources, making it difficult for health providers to adhere to international guidelines.

- Good quality asthma care can be achieved in resource limited settings by use of clinical data and simple tests.

Clinical diagnosis of asthma can be made if:
- Presence of recurrent respiratory symptoms especially current wheeze or wheeze in the last 12 months,
- Presence of a trigger, other allergic diseases,
- Personal or family history of asthma,
- Clinical improvement and increase in the peak flow and forced expiratory volume in one second of ≥12% after salbutamol administration.

At diagnosis, severity grading, patient education, removal or reduction of trigger should be done.

Follow up 2-6 weeks with assessment of control during therapy.

Therapy should be adjusted up or down depending on control levels.

Patients should be instructed to increase the frequency of their bronchodilators and/or steroids therapy when they start to experience worsening symptoms.
South African Guideline for Adult Asthma Management

<table>
<thead>
<tr>
<th>Step 5</th>
<th>Step 4</th>
<th>Step 3</th>
<th>Step 2</th>
<th>Step 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>(The continuous or frequent use of oral steroids)</td>
<td>(Persistent poor control)</td>
<td>(Initial add-on therapy)</td>
<td>(Regular preventer therapy)</td>
<td>(Mild intermittent asthma)</td>
</tr>
<tr>
<td>Refer for add on treatment e.g. Ipratropium, anti-IgE, anti-IL5</td>
<td>Med/High ICS (500–1000 mcg/day beclometasone) / LABA</td>
<td>Low dose ICS (500–1000 mcg/day beclometasone) or LABA</td>
<td>Low dose ICS (250–500 mcg/day beclometasone)</td>
<td>Inhaled SABA, when needed</td>
</tr>
<tr>
<td>Add low-dose OCS</td>
<td>Add ipratropium Med/High-dose ICS + LRTA (or theophylline)</td>
<td>Med/High-dose ICS Low-dose ICS + LRTA (or theophylline)</td>
<td>Leukotriene receptor antagonist (LRTA) Low-dose theophylline</td>
<td>Consider low-dose ICS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>As-needed SABA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>As-needed SABA or low-dose ICS/ formoterol</td>
</tr>
</tbody>
</table>

**PREFERRED CONTROLLER CHOICE**

- Inhaled SABA, when needed

**OTHER CONTROLLER OPTIONS**

- Consider low-dose ICS
- Leukotriene receptor antagonist (LRTA)
- Low-dose theophylline

**RELIEVER**

- As-needed SABA

**Abbreviations**

- SABA: short-acting β2 agonist
- ICS: inhaled corticosteroids
- LABA: long-acting β2 agonist
- OCS: oral corticosteroid
- LRTA: leukotriene receptor antagonist
Asthma Management for Adults and Adolescents 12 Years and Above at PHC in Ethiopia

First Option
Controller medication

Step 1
Take Low Beclomethasone inhaler
Whenever SABA taken

Step 2
Low dose Beclomethasone inhaler (ICS)

Step 3
Low dose Budesonide-Formoterol combination (160/4.5 μg) one puff BID (ICS-LABA)

Step 4
Medium dose Budesonide-Formoterol combination (ICS–LABA)

Step 5
High dose Budesonide-Formoterol combination BID + Low dose Prednisolone

2nd Option
Controller medication

Reliever Medication

Reliever medication: SABA PRN
Summary

- Asthma guidelines are beneficial in asthma management.
- Asthma Guideline helps to reduce asthma related morbidity and mortality
- Ideally, asthma guidelines should be:
  - evidence-based and simple to access
  - timely
  - adjusted for local resource availability
  - updated continuous, based on the most recent research
- Asthma guidelines should be customized to country context
- More specific asthma guidelines for Africa are needed
- Asthma guideline is one option to improve quality of asthma care
Thank You!
Quality assured, affordable, accessible & acceptable asthma medicines

Dr Jumaa Bwika

MBCHBNbi  MRCPResp  MBA_{Birm}  FRCP_{Edin}

Consultant Physician and Pulmonologist, Clinical Assistant Professor

Aga Khan University
Scope

1. Medicines for Asthma
2. Quality Medicines
3. Access to Medicines
4. Cost of Asthma
5. Key take home messages
6. References
MEDICINES FOR ASTHMA
## Medicines for Asthma

<table>
<thead>
<tr>
<th>Medication</th>
<th>Formulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICS/Formoterol</td>
<td>pMDI DPI</td>
</tr>
<tr>
<td>ICS/LABA</td>
<td>pMDI DPI</td>
</tr>
<tr>
<td>SABA, SABA/ICS</td>
<td>pMDI DPI</td>
</tr>
<tr>
<td>SABA, SABA/SAMA</td>
<td>Neb solution</td>
</tr>
<tr>
<td>OCS</td>
<td>Oral formulations</td>
</tr>
<tr>
<td>LTRA</td>
<td>Oral formulations</td>
</tr>
<tr>
<td>Others</td>
<td>Xanthines, macrolides, biologics</td>
</tr>
</tbody>
</table>
Choosing An Inhaler

1. Individualised
2. Molecule / indication
3. Safety
4. Efficacy
5. Effectiveness
   1. Patient ability
   2. Cost
   3. Ease of adherence
   4. Accessibility
QUALITY ASSURANCE
Quality Assurance

• Substandard (not meeting specification) and Falsified (deliberate, fraudulent identity) Medications; unregistered or unlicensed
• Originator and Generic affected, full gambit
• Illegal street markets, unregulated websites / internets, Hospitals, pharmacies and clinics
• 1 in 10 medical products in LMIC are falsified / substandard- WHO
• Ineffective care, harmful to patients, antimicrobial resistance
• Good Manufacturing Practice, users + environment (CFC,HFA)
• WHO Global Surveillance and Monitoring System
Good Manufacturing Practice

KENYA PPB

• Compliance with GMP
• Foreign Manufacturers shall have one local agent with blanket power of attorney
• Free Sale Certificate from manufacturing country or Certificate of a Pharmaceutical Product
• Each Product has own separate application
• Fees
• Validity: 5 year licence
Access to Asthma Medication
Nearly 2 billion people have no access to basic medicines, causing a cascade of preventable misery and suffering. Since the landmark agreement on the Global Strategy and Plan of Action on Public Health, Innovation and Intellectual Property, WHO and its partners have launched a number of initiatives that are making market forces serve the poor. The WHO prequalification programme is now firmly established as a mechanism for improving access to safe, effective and quality-assured products.

When prices are so low they preclude profits, companies leave the market.

1. Availability (Patent, local manufacturing, minimum bulk order quantities, shelf life)
2. Geographical availability (Time, cost of travel/courier)
3. Financial barriers
4. Ease of doing business (licensing and taxation)
5. Cultural barriers
6. Prescriber knowledge and awareness
### Table 2: Availability of the asthma-COPD drugs in the 4 study regions

<table>
<thead>
<tr>
<th>Selected medicines (N = 10 classes and 2 types of spacers)</th>
<th>Availability (%)</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Central region</td>
<td>Eastern region</td>
<td>Western region</td>
<td>Northern region</td>
<td>P value</td>
<td></td>
</tr>
<tr>
<td>Inhaled LABA and LAAC combinations</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Inhaled LAAC monotherapies</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Inhaled LABA monotherapies</td>
<td>9.7</td>
<td>4.2</td>
<td>4.6</td>
<td>33.3</td>
<td>0.031</td>
<td></td>
</tr>
<tr>
<td>Inhaled SABA and SAAC combinations</td>
<td>19.4</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.005</td>
<td></td>
</tr>
<tr>
<td>Inhaled SAAC monotherapy</td>
<td>22.2</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td>Oral methylxanthines</td>
<td>22.2</td>
<td>16.7</td>
<td>4.6</td>
<td>8.3</td>
<td>0.215</td>
<td></td>
</tr>
<tr>
<td>Adult spacer devices</td>
<td>25.0</td>
<td>8.3</td>
<td>13.6</td>
<td>8.3</td>
<td>0.184</td>
<td></td>
</tr>
<tr>
<td>Paediatric spacer devices</td>
<td>30.6</td>
<td>4.2</td>
<td>4.6</td>
<td>8.3</td>
<td>0.004</td>
<td></td>
</tr>
<tr>
<td><strong>Inhaled LABA-ICS combinations</strong></td>
<td>61.1</td>
<td>25.0</td>
<td>31.8</td>
<td>33.3</td>
<td>0.004</td>
<td></td>
</tr>
<tr>
<td><strong>ICS monotherapies</strong></td>
<td>61.1</td>
<td>37.5</td>
<td>9.1</td>
<td>33.3</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Oral LTRA</td>
<td>75.0</td>
<td>37.5</td>
<td>50.0</td>
<td>41.7</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td><strong>Inhaled SABA monotherapy</strong></td>
<td>80.6</td>
<td>70.8</td>
<td>68.2</td>
<td>66.7</td>
<td>0.490</td>
<td></td>
</tr>
</tbody>
</table>

LAMA-Long acting anti muscarinic agents, LABA-Long acting beta agonists, SABA-Short acting beta agonists, SAMA-Short acting anti muscarinic agents, ICS-Inhaled corticosteroids, LTRA-Leukotriene receptor antagonists
Essential Drugs Listing
<table>
<thead>
<tr>
<th>Category</th>
<th>Formulation</th>
<th>Medicine</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICS</td>
<td>pMDI</td>
<td>Budesonide pMDI</td>
<td>10mcg/dose. 200 dose 200mcg/dose. 200 dose</td>
</tr>
<tr>
<td>ICS/Formoterol</td>
<td>pMDI DPI</td>
<td>Budesonide + Formoterol DPI</td>
<td>100 mcg + 6mg/dose. 120 dose 200mcg + 6mg/dose. 120 dose</td>
</tr>
<tr>
<td>ICS/LABA</td>
<td>pMDI DPI</td>
<td>Salbutamol pMDI And neb, salbutamol + beclomethasone pMDI</td>
<td>100 mcg , 5mg/Ml 100mcg+50mcg/dose</td>
</tr>
<tr>
<td>SABA, SABA/ICS</td>
<td>pMDI DPI</td>
<td>Ipratropium bromide pMDI Nebuliser solution</td>
<td>20mcg/dose (200 dose) 50mcg/2mL</td>
</tr>
<tr>
<td>SABA, SABA/SAMA</td>
<td>Neb solution</td>
<td>Ipratropium bromide pMDI Nebuliser solution</td>
<td>20mcg/dose (200 dose) 50mcg/2mL</td>
</tr>
<tr>
<td>OCS</td>
<td>Oral formulations</td>
<td>Prednisolone</td>
<td>5mg tablets</td>
</tr>
<tr>
<td>LTRA</td>
<td>Oral formulations</td>
<td>montelukast</td>
<td>5mg and 10mg tablets</td>
</tr>
</tbody>
</table>
AFFORDABLE MEDICINES FOR ASTHMA
Cost of Asthma

For medicines
- ICS/Form
- ICS/LABA and SABA

• The poorer the asthmatic, the worse the control
• The poorer the control, the more expensive the care
Aggregate GDP ppp\(^1\) | $4097.85
---|---
6.1 \% of GDP PPP Africa spends on healthcare\(^2\) | $25/year
NHIF premium | $6/year

\(^1\)Statista  \(^2\)National Research Council (US)

## Example of Cost of Inhalers in East Africa

<table>
<thead>
<tr>
<th></th>
<th>Controller</th>
<th>120 dose/canister</th>
<th>Avrg cannister/month</th>
<th>Cost of Inhaler/month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>ICS/Form prn</td>
<td>1 canister &gt; 1/2yr</td>
<td>1/6</td>
<td>@$22.2=  $3.7</td>
</tr>
<tr>
<td>Mild*</td>
<td>ICS</td>
<td>1 in 2 months</td>
<td>1/2</td>
<td>@$10.4=  $5.2*</td>
</tr>
<tr>
<td>Moderate</td>
<td>ICS/Form</td>
<td>1-2/month</td>
<td>1-2</td>
<td>@$22.2=  $22-44</td>
</tr>
<tr>
<td>Moderate*</td>
<td>ICS/LAB</td>
<td>1-2/month</td>
<td>1-2</td>
<td>@$13.3=  $13-26*</td>
</tr>
<tr>
<td>Reliever*</td>
<td>SABA</td>
<td>3 canisters /yr</td>
<td>1/4</td>
<td>@$2.8=   $0.7*</td>
</tr>
<tr>
<td>Drug</td>
<td>Median (IQR) price in Ug Shs</td>
<td>Median local price in USD</td>
<td>IRP in USD</td>
<td>MPR</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>------------------------------</td>
<td>---------------------------</td>
<td>------------</td>
<td>-----</td>
</tr>
<tr>
<td>Salbutamol 100 µg</td>
<td>10,000 (9000–13,000)</td>
<td>2.8</td>
<td>0.0114</td>
<td>243</td>
</tr>
<tr>
<td>Formoterol 12 µg.</td>
<td>38,500 (30,000–44,000)</td>
<td>10.7</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Salmeterol 25 µg</td>
<td>30,000 (25,500–33,750)</td>
<td>8.3</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Ipratropium bromide 20 µg</td>
<td>60,000 (48,500–65,000)</td>
<td>10.7</td>
<td>0.0220</td>
<td>486</td>
</tr>
<tr>
<td>Ipratropium 40 µg</td>
<td>64,000 (56,750–65,000)</td>
<td>17.8</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Salbutamol/primatropium 100/20 µg</td>
<td>50,000 (35,000–65,000)</td>
<td>13.9</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Formoterol-becloamethasone 6/100 µg</strong></td>
<td>30,000 (15,000–40,000)</td>
<td>8.3</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Formoterol-budesonide 4.5/160 µg</strong></td>
<td>80,000 (45,000–85,000)</td>
<td>22.2</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Salmeterol-fluticasone propionate 25/125 µg</strong></td>
<td>48,000 (35,000–50,000)</td>
<td>13.3</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Beclomethasone dipropionate 100 µg</strong></td>
<td>25,000 (20,000–30,000)</td>
<td>6.9</td>
<td>0.0443</td>
<td>155</td>
</tr>
<tr>
<td><strong>Budesonide 200 µg</strong></td>
<td>37,500 (33,000–42,000)</td>
<td>10.4</td>
<td>0.0305</td>
<td>340</td>
</tr>
<tr>
<td>Fluticasone propionate 250 µg</td>
<td>25,000 (25,000–26,000)</td>
<td>6.9</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Fluticasone propionate 125 µg</td>
<td>27,000 (25,000–40,000)</td>
<td>7.5</td>
<td>0.0630</td>
<td>119</td>
</tr>
<tr>
<td>Fluticasone propionate 50 µg</td>
<td>27,500 (25,000–30,000)</td>
<td>7.6</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Slow release theophylline tablets 100 mg</td>
<td>1000 (1000–1900)</td>
<td>0.3</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Tablets montelukast 10 mg</td>
<td>1000 (800–1200)</td>
<td>0.3</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Tablets montelukast 20 mg</td>
<td>1200 (1000–1500)</td>
<td>0.3</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Adult spacers</td>
<td>60,000 (51,000–65,000)</td>
<td>16.7</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Paediatric spacers</td>
<td>35,000 (28,500–45,000)</td>
<td>9.7</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

IQR-Inter-quartile range, UgX-Uganda shillings, USD-US dollars, IRP-International reference price, MPR-Median price ratio
1. Asthma is a significant and increasingly prevalent cause of Morbidity and Mortality that can be prevented with effective care.

2. Asthma medicines have a unique feature due to device delivery (cost, impact on environment, cultural acceptability).

3. Many African countries have very low GDP PPP, and allocate a less proportion of this to healthcare.

4. Up to 10% of Medication in LMICS are falsified, substandard or unregulated.

5. African Countries and WHO should enhance access and availability of affordable and quality asthma medication.

Further Reading


