Pharmaceutical Trends in Sub Saharan Africa

Randall Crisp

Life Sciences Regional Manager, Sub Saharan Africa

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SSA As A Major Pharmaceutical Market

- The pharmaceuticals market in Africa is expected to reach a business opportunity of **$45 billion in 2020**, propelled by a convergence of changing economic profiles, rapid urbanization, increased healthcare spending and investment, and increasing incidence of chronic lifestyle diseases.

- The tropical climate of Africa makes the continent the **largest reservoir of infectious diseases**, particularly malaria, (TB), and acquired immune deficiency syndrome (AIDS).

- With the increasing adoption of Western lifestyle in Africa, there has been a paradigm shift in the burden of illness towards non-communicable diseases (NCDs), driving the **demand for chronic prescription drugs**.

- Despite all of this, high growth within this market is achievable.

### Market ($MM)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Market ($MM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>USA</td>
<td>339,694</td>
</tr>
<tr>
<td>2</td>
<td>Japan</td>
<td>94,025</td>
</tr>
<tr>
<td>3</td>
<td>China</td>
<td>86,774</td>
</tr>
<tr>
<td>4</td>
<td>Germany</td>
<td>45,828</td>
</tr>
<tr>
<td>5</td>
<td>France</td>
<td>37,156</td>
</tr>
<tr>
<td>6</td>
<td>Brazil</td>
<td>30,670</td>
</tr>
<tr>
<td>7</td>
<td>Italy</td>
<td>27,930</td>
</tr>
<tr>
<td>8</td>
<td>UK</td>
<td>24,513</td>
</tr>
<tr>
<td>9</td>
<td>Canada</td>
<td>21,353</td>
</tr>
<tr>
<td>10</td>
<td>Spain</td>
<td>20,741</td>
</tr>
</tbody>
</table>
Sub-Saharan Africa

- Geographically comprising of 48 countries, Sub-Saharan Africa (SSA) represents the most genetically diverse region.

- SSA accounts for 64% of the global disease burden from human immunodeficiency virus (HIV/AIDS), tuberculosis (TB) and malaria, but only 4% of the world’s health workforce. Its pharmaceuticals sector faces challenges with high drug prices and regulations, which open up opportunities for illicit imports and production.

- Between 2005 and 2015, six of the world's 10 fastest-growing countries were in SSA – Angola, Nigeria, Ethiopia, Chad, Mozambique and Rwanda. In eight of the past 10 years, SSA has grown faster than Asia. In 2020, the International Monetary Fund expects Africa to grow at a rate of 6% - about the same as Asia. Continuing such trends, it is estimated that by 2035, Africa’s workforce, which is larger than any other continent, will be making significant strides in the fields of agriculture, healthcare, manufacturing, hospitality and technology.
Concerns with Running Clinical Trials in SSA

- In SSA costs, complexity, legal requirements and number of amendments associated with clinical trials are rising constantly, which negatively affects the efficient conduct of trials.

- This situation is exacerbated by capacity and funding limitations, which further increase the workload of clinical workers.

- One study found various internal factors associated with slowing down clinical trials; these were summarised into two broad themes, “planning” and “site organisation”.

- “Planning” factors related to budget feasibility, clear project ideas, realistic deadlines, understanding of trial processes, adaptation to the local context and involvement of site staff in planning.

- “Site organisation” factors covered staff turnover, employment conditions, career paths, workload, delegation and management.

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# Top 12 Drugs to Watch in 2018

Analysis of 12 new drugs forecast to enter the market in 2018 and achieve blockbuster sales of over $1 billion by 2022

<table>
<thead>
<tr>
<th>RANK</th>
<th>DRUG</th>
<th>DISEASE</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>COMPANY (HQ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hemlibra (recombinant)</td>
<td>Hemophilia A with factor VIII inhibitors</td>
<td>496</td>
<td>1,457</td>
<td>2,356</td>
<td>3,362</td>
<td>4,802</td>
<td>Roche (Switzerland)/Chugai (Japan)</td>
</tr>
<tr>
<td>2</td>
<td>Biktarvy (tenofovir alafenamide + emtricitabine + rilpivirine)**</td>
<td>HIV Infection</td>
<td>896</td>
<td>2,282</td>
<td>3,387</td>
<td>4,296</td>
<td>3,715</td>
<td>Gilead (U.S.)</td>
</tr>
<tr>
<td>3</td>
<td>Ozempic (semaglutide)</td>
<td>Type 2 diabetes</td>
<td>260</td>
<td>862</td>
<td>1,576</td>
<td>2,583</td>
<td>3,469</td>
<td>Novo Nordisk (Denmark)</td>
</tr>
<tr>
<td>4</td>
<td>Erleada (apalutamide)**</td>
<td>Non-metastatic CRPC</td>
<td>25</td>
<td>500</td>
<td>1,200</td>
<td>1,600</td>
<td>2,000</td>
<td>Johnson &amp; Johnson (U.S.)</td>
</tr>
<tr>
<td>5</td>
<td>Shingrix (zoster vaccine recombinant, adjuvanted)**</td>
<td>Shingles</td>
<td>242</td>
<td>337</td>
<td>879</td>
<td>1,202</td>
<td>1,368</td>
<td>GlaxoSmithKline (UK)</td>
</tr>
<tr>
<td>6</td>
<td>Patisiran (siRNA)</td>
<td>Hereditary TTR amyloidosis</td>
<td>83</td>
<td>373</td>
<td>726</td>
<td>1,104</td>
<td>1,212</td>
<td>Alnylam (U.S.)/Gencrype (U.S.)</td>
</tr>
<tr>
<td>7</td>
<td>Epiiolex (plant-derived cannabidiol)**</td>
<td>Dravet syndrome and Lennox-Gastaut syndrome</td>
<td>19</td>
<td>266</td>
<td>645</td>
<td>936</td>
<td>1,131</td>
<td>GW Pharmaceuticals (UK)</td>
</tr>
<tr>
<td>8</td>
<td>Aimovig (migraine)**</td>
<td>Migraine</td>
<td>115</td>
<td>361</td>
<td>685</td>
<td>941</td>
<td>1,170</td>
<td>Amgen (U.S.)/Novartis (Switzerland)</td>
</tr>
<tr>
<td>9</td>
<td>Lanadelumab* (anti-ANG)</td>
<td>Hereditary angioedema</td>
<td>74</td>
<td>350</td>
<td>629</td>
<td>902</td>
<td>1,153</td>
<td>Shire (Ireland)</td>
</tr>
<tr>
<td>10</td>
<td>Elagolix (mRNA)</td>
<td>Endometriosis</td>
<td>57</td>
<td>268</td>
<td>549</td>
<td>896</td>
<td>1,152</td>
<td>AbbVie (U.S.)</td>
</tr>
<tr>
<td>11</td>
<td>Stegl crazo (opioid receptor)**</td>
<td>Type 2 diabetes</td>
<td>220</td>
<td>482</td>
<td>769</td>
<td>1,024</td>
<td>1,087</td>
<td>Pfizer (U.S.)/Merck (U.S.)</td>
</tr>
<tr>
<td>12</td>
<td>Sublocade (once-monthly buprenorphine)**</td>
<td>Opioid dependence</td>
<td>121</td>
<td>308</td>
<td>439</td>
<td>634</td>
<td>1,072</td>
<td>Indivior (UK)</td>
</tr>
</tbody>
</table>

Data were obtained from the Cortellis Competitive Intelligence database, accessed March 05, 2018 (Source: Thomson Reuters/MER). Forecasts are in U.S. million. CRPC—castration-resistant prostate cancer. 

*siRNA-molecule. **Analogue of drug. TTR—titanium transport receptor. ANG—angiogenin. ANG—angioedema. Opioid receptor. **Analogue molecule. **Analogue molecule. 1St-first-in-class. 2St-second-in-class.
Chemistry & Metallurgy accounts for 27% of patents filed in South Africa. This is closely followed by Medical Science, Machinery & Manufacturing.

While public health remains to be a key focus in South Africa, Industry 4.0 is gaining additional importance.

“Industrie 4.0 will create a shift from mass production to customized and creative solutions. Innovation and creativity will be key. Emphasis on education all the more necessary,” says Massimo De Luca, Head of Trade and Economics at the delegation of the EU to SA.

Does South Africa have the right input and output for knowledge – Who are protecting innovation here? Where are the gaps? How can we accelerate those areas to improve overall knowledge output (e.g. IP)?
According to this study, six out of every ten South Africans interviewed (base of 1000) claim that they are innovators. 20% feel that they are not reliant on others to come up with creative solutions to challenges. Almost half (46%) feel that their idea will be the next big thing in their industry.

Roadblocks to innovation & detours around issues
- Capital, or rather lack thereof, since 57% of respondents see lack of money as a barrier to innovation.
- Approximately 29% of respondents see lack of infrastructure to implement a solution as a barrier.
- 16% stated that there is a perceived lack of financial reward or benefit to generating innovative ideas.

Innovation indicators
Botswana 2011 – 2016: Web of Science publications – where is the innovation potential?
Clinical Trial Starts by Country : 2007-2016

- USA: 47,133
- Japan: 18,563
- Germany: 12,384
- China: 11,498
- UK: 10,722
- France: 9,789
- Canada: 9,039
- Italy: 7,852
- Spain: 7,438

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Powering Life Sciences Innovation
Clinical Trial Starts SSA and MENA: 2007-2016

Start Year

Number of Trials


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Clinical Trial Starts by Organization SSA and MENA: 2007-2016

Start Year

Number of Trials

Academic
Company
Government

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Clarivate Analytics
SSA: Trials Over Last 10 Years

<table>
<thead>
<tr>
<th>Start Year</th>
<th>Number Of Trials</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>215</td>
</tr>
<tr>
<td>2009</td>
<td>234</td>
</tr>
<tr>
<td>2010</td>
<td>211</td>
</tr>
<tr>
<td>2011</td>
<td>266</td>
</tr>
<tr>
<td>2012</td>
<td>230</td>
</tr>
<tr>
<td>2013</td>
<td>239</td>
</tr>
<tr>
<td>2014</td>
<td>236</td>
</tr>
<tr>
<td>2015</td>
<td>233</td>
</tr>
<tr>
<td>2016</td>
<td>192</td>
</tr>
<tr>
<td>2017</td>
<td>178</td>
</tr>
</tbody>
</table>

Source: Clarivate Analytics, Cortellis Clinical Trials Intelligence
SSA: Trials Over Last 10 Years By Phase

Source: Clarivate Analytics, Cortellis Clinical Trials Intelligence
SSA: Trials Over Last 10 Years By Sponsor Type

Percentage Of Trials

Start Year

Source: Clarivate Analytics, Cortellis Clinical Trials Intelligence
South Africa: Trials Over Last 10 Years By Sponsor Type

Source: Clarivate Analytics, Cortellis Clinical Trials Intelligence
SSA: Trials Last 10 Years: Commercially Relevant

Commercially Relevant Trials are those trials where the sponsor is recognized as the drug owner.

Source: Clarivate Analytics, Cortellis Clinical Trials Intelligence
South Africa: Trials Last 10 Years: Commercially Relevant

Commercially Relevant Trials are those trials where the sponsor is recognized as the drug owner.

Source: Clarivate Analytics, Cortellis Clinical Trials Intelligence
A trial tagged as ‘infectious disease’ involves the testing of a compound designed to treat at least one infectious disease indication. It may also be under study in the same trial against a non-infectious disease indication.

Source: Clarivate Analytics, Cortellis Clinical Trials Intelligence
Top Sponsors for Clinical Trial Starts SSA: 2007-2016

Number of Trials

Sponsor

- Pfizer Inc
- GlaxoSmithKline plc
- Novartis AG
- National Institute of All...
- Sanofi
- Novo Nordisk A/S
- Merck Sharp & Dohme...
- London School of Hygi...
- Bristol-Myers Squibb Co
- AstraZeneca plc
- Eli Lilly & Co
- Roche Holding AG
- Makerere University
- Amgen Inc
- University of Cape Town

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Top Collaborators for Clinical Trial Starts SSA: 2007-2016

Number of Trials

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Top 5 Indications for Clinical Trial Starts for SSA : 2007-2016

Number of Trials
Index of Productivity and Innovation