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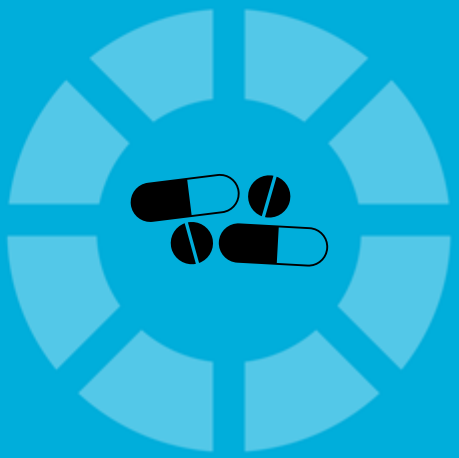
TANZANIA
PHARMACEUTICALS & HEALTHCARE REPORT

INCLUDES 10-YEAR FORECASTS TO 2025



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Tanzania Pharmaceuticals & Healthcare Report Q3 2016

INCLUDES 10-YEAR FORECASTS TO 2025

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BMI Industry View

BMI View: *Tanzania is one of a number of Sub-Saharan African countries attempting to achieve universal health coverage through insurance-based models. While low unemployment levels have facilitated a relatively fast uptake of the national health insurance scheme, underlying structural issues will continue to hinder patients' access to essential medicines, particularly in the rural areas. The pharmaceutical market continues to suffer from inefficiencies within its supply chain - a risk that should be heeded by drugmakers operating in the country.*

Headline Expenditure Projections

Pharmaceuticals: TZS900bn (USD442mn) in 2015 to an expected TZS1.02trn (USD463mn) in 2016; +13.1% growth in local currency terms and +4.8% in US dollar terms. *Forecast maintained from Q216.*

Healthcare: TZS4.96trn (USD2.44bn) in 2015 to TZ5.57trn (USD2.53bn) in 2016; +12.3% growth in local currency terms, and +4.1% in US dollar terms. *Forecast maintained from Q216.*

Table: Headline Pharmaceuticals & Healthcare Forecasts (Tanzania 2014-2020)

	2014	2015	2016f	2017f	2018f	2019f	2020f
Pharmaceutical sales, USDbn	0.480	0.440	0.460	0.500	0.530	0.570	0.610
Pharmaceutical sales, % of GDP	1.00	1.02	1.02	1.01	1.00	0.99	0.98
Pharmaceutical sales, % of health expenditure	18.0	18.1	18.3	18.4	18.5	18.7	18.8
Health spending, USDbn	2.660	2.440	2.530	2.700	2.860	3.030	3.210

f = BMI forecast. Source: World Health Organization, UN Comtrade, National Sources, BMI

Risk/Reward Index

In our Q316 Pharmaceutical Risk/Reward Index (RRI) Tanzania's score of 34.5 out of 100 marks a slight improvement from its score last quarter of 32.1, and improves its position by two ranks to 22nd place out of 31 countries analysed in the whole Middle East and Africa (MEA) region. However, a sizeable counterfeiting industry, poor healthcare funding, corruption, regulatory environment deficiencies and a number of other issues will conspire to keep Tanzania in a similarly lowly position in the MEA matrix. In particular, issues relating to patent approvals and the regulatory system remain a major issue for foreign

research-based pharmaceutical players. Nevertheless, in comparison with many other African markets, Tanzania offers more commercial promise and a more stable overall business environment.

Latest Updates

- In May 2016, the government of Tanzania announced that medicines will be procured directly from pharmaceutical manufacturers in the next financial year 2016/17, not from private suppliers as is the current case.
- In May 2016, Tanzania's government announced that the budget allocated for the purchase of medicines and medical supplies has risen to TZS251bn (USD115mn), a notable increase from TZS66bn (USD30mn) in 2015/16.
- In May 2016, the government of Tanzania announced that greater emphasis will be placed on ensuring a constant availability of diabetes medicines in hospitals and clinics across the country.

BMI Economic View

Tanzania's real GDP growth will far outstrip its Sub-Saharan African counterparts in 2016 and 2017. While a pull-back in international aid will temper growth modestly, the country will benefit from strong investment and low inflation. Moreover, Tanzanian President John Magufuli's reforming policies and anti-graft measures will support economic growth over the coming years.

BMI Political View

Tanzania will continue to enjoy broad political stability over the coming decade, with little to suggest that the ruling Chama Cha Mapinduzi party's authority will be threatened. This is not to say the 2016-2023 period will be without challenges. Chief among these will be dealing with high levels of corruption and addressing the country's dependence on foreign aid.

SWOT

Pharmaceutical SWOT Analysis

Strengths

- Progress has been made towards establishing the East African Medicines and Food Safety Commission, which if successful, would improve drug registration processes.
- Tanzania's pharmaceutical expenditure fares well against comparable countries in Sub-Saharan Africa (SSA).
- The pharmaceuticals market in Tanzania is forecast to grow strongly over the next few years, largely due to an increasing disease burden.
- Government's interest in developing the pharmaceutical sector.
- High rate of population growth and urbanisation will continue to support pharmaceutical market growth, creating revenue earning opportunities for drugmakers.

Weaknesses

- Reliance on imported raw materials.
- Significant counterfeit drug market.
- Underdeveloped but improving pharmaceutical procurement and distribution system, plagued by financial problems.
- Limited public healthcare provision and staff shortages.
- Many Tanzanians lack access to health facilities due to financial reasons or because of sparse healthcare infrastructure in rural areas.

Opportunities

- Large and increasing burden of disease suggests a significant unmet demand for pharmaceuticals.
- Programme to introduce a national health insurance scheme will improve access to medicines in the longer term.

Pharmaceutical SWOT Analysis - Continued

	▪ Tanzania has the largest proportion of the working age population in employment in SSA at over 86%, meaning that uptake of the national health insurance scheme will occur faster than many of its regional peers. ▪ Self-medication is prevalent in Tanzania, making the OTC medicine market an attractive prospect.
Threats	▪ Competition from Uganda and Kenya as they strengthen their own pharmaceutical manufacturing industries. ▪ Trade imbalance of pharmaceutical products set to widen annually, putting pressure on public finances. ▪ The overwhelming and slowing presence of bureaucracy is a major concern, and is a key problem in the country's pharmaceuticals distribution system, where a web of government, charity and private sector organisations overlap.

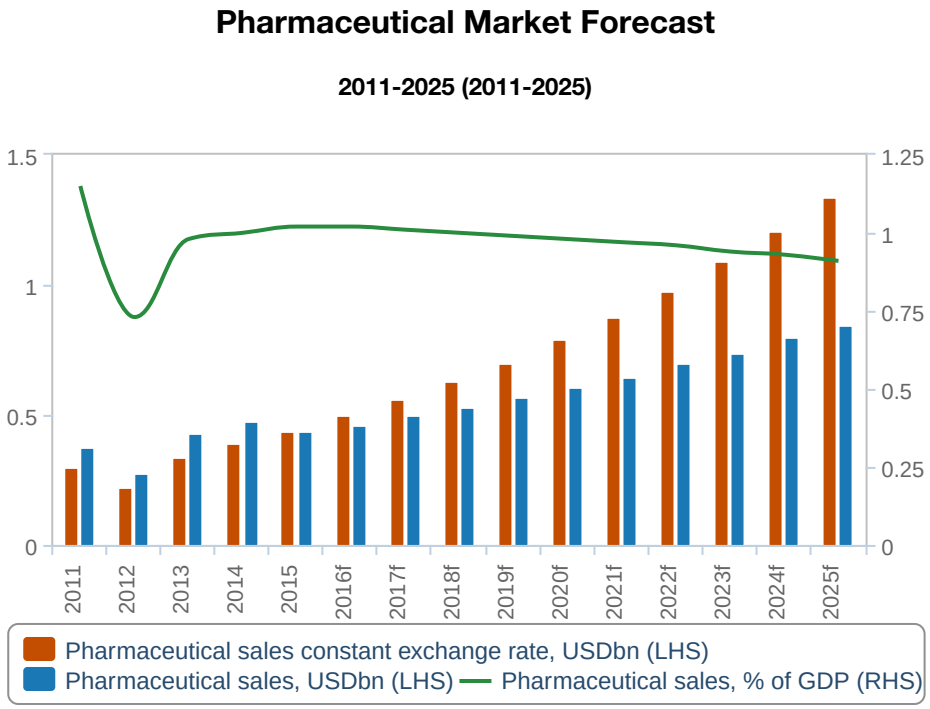
Industry Forecast

Pharmaceutical Market Forecast

BMI View: *Tanzania's pharmaceutical market will continue to be dominated by generic medicines, with local drugmakers limited to basic production capabilities. As such, Indian drugmakers will be especially well placed to gain a foothold in the Tanzanian market given their drugmakers' cost-competitiveness. Although government encouragement of domestic pharmaceutical production will increase domestic output, the majority of the country's pharmaceutical needs will remain sourced from abroad.*

Latest Updates

- In May 2016, the government of Tanzania announced that medicines will be procured directly from pharmaceutical manufacturers in the next financial year 2016/17, not from private suppliers as is the current case.
- In May 2016, Tanzania's government announced that the budget allocated for the purchase of medicines and medical supplies has risen to TZS251bn (USD115mn), a notable increase from TZS66bn (USD30mn) in 2015/16.



f = BMI forecast. Source: UN Comtrade, National Sources, BMI

Structural Trends

In 2015, pharmaceutical expenditure in Tanzania reached TZS900bn (USD442mn), and we forecast the market to grow by 13.1% in local currency terms (4.8% in US dollar terms) to reach a market size of TZS1.02trn (USD463mn) by 2016. By 2020, we expect the market to reach a value of TZS1.60trn (USD605mn), corresponding to a five-year compound annual growth rate (CAGR) of 12.3% (6.5% in US dollar terms). Over the longer term, we forecast pharmaceutical sales to climb at a 10-year local currency CAGR of 11.8% (6.7% in US dollar terms). Due to low purchasing power, generic drugs comprise the majority of Tanzania's pharmaceuticals market. Generic drugs will become increasingly prevalent in Tanzania's pharmaceutical market as a result of low purchasing power and cost-containment measures enacted by the government. Patented drugs only hold a small market share as low per-capita drug expenditure continues to limit the capacity of most of the population to purchase the higher-priced medication. Nevertheless, we expect the increasing use of tiered pricing systems by multinational pharmaceuticals companies to boost the consumption of patented drugs in areas where access has been similarly restricted.

Self-medication is prevalent in Tanzania, making the OTC medicine market an attractive prospect. Many Tanzanians lack access to health facilities due to financial reasons or because of sparse healthcare infrastructure in rural areas. The division between prescription and OTC drugs is blurred by the prevalence of roadside kiosks selling malaria drugs and antibiotics, highlighted by a rapid growth in the number of pharmacies in rural and urban areas.

We expect that Tanzania will continue to suffer from a shortage of essential medicines as a result of budgetary constraints that have lead to inadequate allocations to the healthcare sector. That said, the announcement that budget allocation for the purchase of medicines and medical supplies has increased to TZS251bn (USD115mn) will go some way in reducing the frequency of medicine shortages. We note, however, the Ministry of Health still owes the Medical Stores Department (MSD) around TZS131bn (USD59.8mn), which could affect distribution of the newly revised medicines budget for 2016/17. It is worth mentioning that improvements to Tanzania's public procurement system and the involvement of international funding should increase the government's ability to negotiate bulk purchases with multinationals.

Sourcing accurate and reliable quantitative data on Tanzania's pharmaceutical market remains challenging. Both primary and secondary research firms are faced with substandard audits, language barriers, porous

sales channels, a high prevalence of counterfeits, questionable national statistics, dispensing without prescriptions, sizeable 'grey markets' and the widespread use of traditional remedies.

Table: Pharmaceutical Sales, Historical Data And Forecasts (Tanzania 2012-2020)

	2012	2013	2014	2015	2016f	2017f	2018f	2019f	2020f
Pharmaceutical sales, USDbn	0.280	0.430	0.480	0.440	0.460	0.500	0.530	0.570	0.610
Pharmaceutical sales, USDbn, % y-o-y	-25.70	51.04	11.68	-7.81	4.83	7.22	6.80	6.64	6.99
Pharmaceutical sales, TZSbn	450.830	693.880	797.170	899.930	1,017.790	1,143.210	1,282.030	1,435.470	1,604.760
Pharmaceutical sales, TZSbn, % y-o-y	-25.64	53.91	14.89	12.89	13.10	12.32	12.14	11.97	11.79
Pharmaceutical sales constant exchange rate, USDbn	0.220	0.340	0.390	0.440	0.500	0.560	0.630	0.700	0.790
Pharmaceutical sales, USD per capita	5.8	8.5	9.3	8.3	8.4	8.7	9.0	9.4	9.7
Pharmaceutical sales, % of GDP	0.73	0.98	1.00	1.02	1.02	1.01	1.00	0.99	0.98
Pharmaceutical sales, % of health expenditure	12.8	17.6	18.0	18.1	18.3	18.4	18.5	18.7	18.8

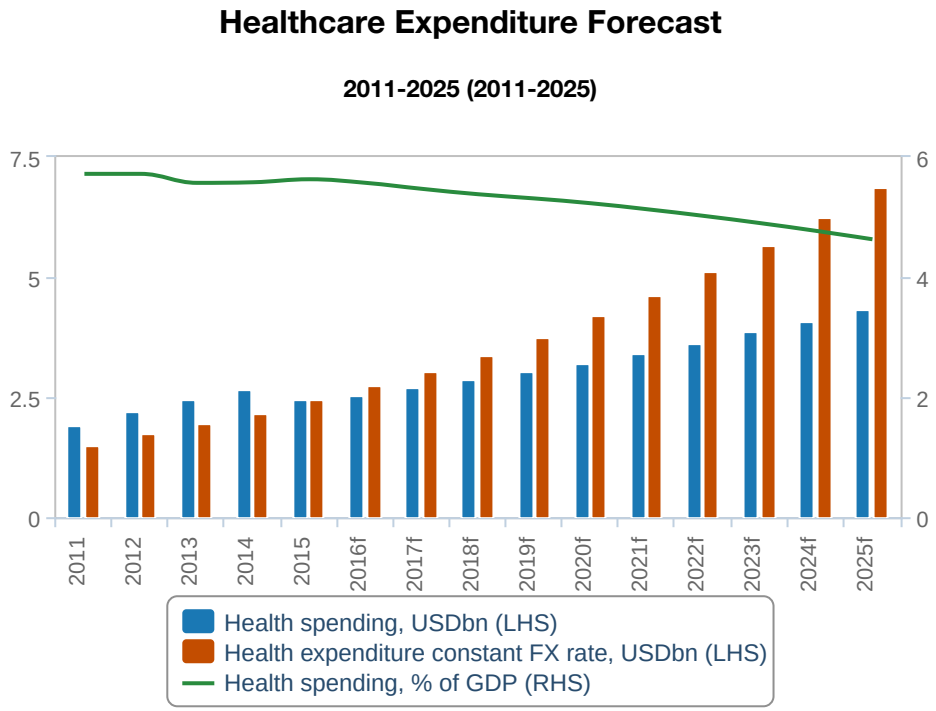
f = BMI forecast. Source: UN Comtrade, National Sources, BMI

Healthcare Market Forecast

BMI View: *Access to healthcare services in Tanzania will continue to improve with the expansion of the country's National Health Insurance Scheme. Uptake of the scheme is likely to be relatively successful compared to insurance models in its regional peers, owing to the compulsory nature of the scheme and the fact Tanzania boasts the largest proportion of the working age population in employment in sub-Saharan Africa. The government's contribution to healthcare spending will increase over the long-term, however the private sector will continue to play an important role towards healthcare provision in Tanzania.*

Latest Updates

- In May 2016, a private mining company donated TZS700mn (USD0.320mn) to the government of Tanzania and multiple private organisations for use towards combating the HIV/AIDs epidemic throughout the country.
- In May 2016, the government of Tanzania announced that greater emphasis will be placed on ensuring a constant availability of diabetes medicines in hospitals and clinics across the country.



f = BMI forecast. Source: World Health Organization (WHO), BMI

Structural Trends

We calculate that healthcare spending in Tanzania reached a value of TZS4.96trn (USD2.44bn) in 2015, and we expect the healthcare market to reach a value of TZS5.57trn (USD2.53bn) in 2016. By 2020, we forecast that the sector will be valued at TZS8.53trn (USD3.21bn), corresponding to a local currency compound annual growth rate (CAGR) of 11.4% (5.7% in US dollar terms). Over the long term, we forecast the market will grow at a 10-year CAGR of 10.9% (5.9% in US dollar terms) to yield a market size of TZS14.0trn (USD4.34bn) by 2025.

In 2015, per capita spending on healthcare reached a value of USD46, which we forecast to increase slightly to USD52 by 2020, and USD60 by 2025. Health expenditure as a percentage of GDP is forecast to decrease, however, from 5.6% in 2015 to 5.2% in 2020 and 4.6% by 2025. Government expenditure on health accounted for 47% of total healthcare expenditure in 2015, and we see this percentage increasing over the long term to 51% by 2025. Nevertheless, private health expenditure will continue to provide a significant share of healthcare expenditure, responsible for 53% of total health spending in 2015, yet forecast to decrease to 49% by 2025 as the government increases its commitment to the sector.

The low proportion of the population covered by public health insurance means that the majority of Tanzania's population seeks treatment at private healthcare facilities, paying out-of-pocket (OOP) for medicines, with OOP payments representing a third of total healthcare expenditure. **BMI's** Country Risk team notes that private consumption will be the main driver of economic expansion in 2016. Consumer purchasing power will be strengthened through lower inflation - driven by lower fuel costs as a result of the collapse in oil prices. As such, we believe that spending in private facilities is likely to remain dominant over the short-term at least, in terms of market value.

The introduction of compulsory health insurance in Tanzania will increase uptake of the scheme, driving growth in the healthcare sector. The government will increase its share of the healthcare market over our forecast period as insurance uptake increases. Tanzania is one of a number of sub-Saharan African (SSA) countries attempting to achieve universal healthcare coverage through the roll out of health insurance. Currently, around 20% of the population is covered by health insurance, according to the World Bank, with around a third of total healthcare expenditure coming from out-of-pocket payments. Tanzania has the largest proportion of the working age population in employment in SSA at over 86%, meaning that uptake of the scheme will occur faster than many of its regional peers. We believe that the compulsory nature of Tanzania's health insurance model is one that should be adopted by other SSA countries, as is being done in

the Gulf Cooperation Council (GCC) states. Other health insurance schemes rolled out in the region have been unsuccessful in terms of coverage, with much of the population unwilling to sacrifice their salary given a lack of trust in public healthcare provision, such as those in Ghana and Nigeria. This problem will not be encountered in Tanzania given that the scheme is compulsory in terms of contributions, and accredited health facilities are a combination of public and private facilities.

Table: Healthcare Expenditure Trends, Historical Data And Forecasts (Tanzania 2012-2020)

	2012	2013	2014	2015	2016f	2017f	2018f	2019f	2020f
Health spending, USDbn	2.210	2.440	2.660	2.440	2.530	2.700	2.860	3.030	3.210
Health spending, USDbn, % y-o-y	16.39	10.34	9.05	-8.58	4.06	6.45	6.01	5.84	6.18
Health spending, TZSbn	3,514.700	3,951.850	4,432.960	4,962.370	5,570.830	6,211.930	6,914.810	7,684.530	8,525.780
Health spending, TZSbn, % y-o-y	16.49	12.44	12.17	11.94	12.26	11.51	11.32	11.13	10.95
Health expenditure constant FX rate, USDbn	1.730	1.940	2.180	2.440	2.730	3.050	3.390	3.770	4.190
Health spending, USD per capita	45.5	48.7	51.4	45.6	46.0	47.4	48.8	50.1	51.6
Health spending, % of GDP	5.72	5.57	5.58	5.63	5.57	5.47	5.38	5.31	5.23

f = BMI forecast. Source: World Health Organization (WHO), BMI

Table: Government Healthcare Expenditure Trends, Historical Data And Forecasts (Tanzania 2012-2020)

	2012	2013	2014	2015	2016f	2017f	2018f	2019f	2020f
Govt. health spend, USDbn	1.080	1.130	1.240	1.140	1.190	1.280	1.370	1.460	1.560
Govt. health spend, USDbn, % y-o-y	30.55	4.20	9.88	-7.88	4.40	7.35	6.94	6.77	7.13
Govt. health spend, TZSbn	1,714.290	1,820.230	2,057.510	2,320.880	2,613.970	2,939.570	3,300.680	3,700.470	4,142.300
Govt. health spend, TZSbn, % y-o-y	30.66	6.18	13.04	12.80	12.63	12.46	12.28	12.11	11.94
Govt. health spend, % total health spend	48.77	46.06	46.41	46.77	46.92	47.32	47.73	48.15	48.59

f = BMI forecast. Source: World Health Organization (WHO), BMI

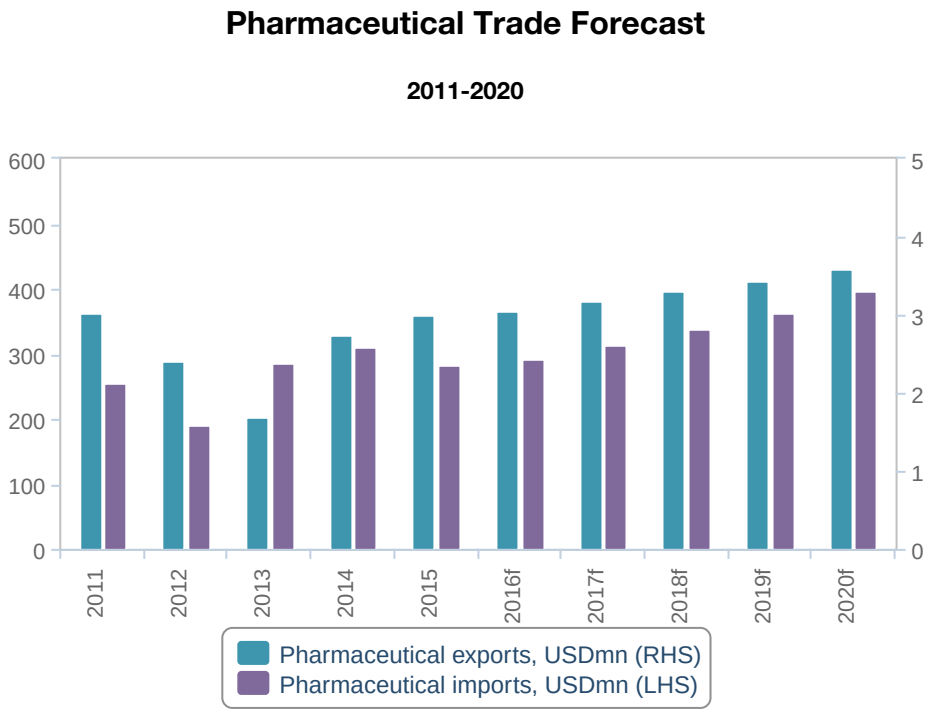
Table: Private Healthcare Expenditure Trends, Historical Data And Forecasts (Tanzania 2012-2020)

	2012	2013	2014	2015	2016f	2017f	2018f	2019f	2020f
Private health spend, USDbn	1.130	1.320	1.430	1.300	1.350	1.420	1.500	1.570	1.650
Private health spend, USDbn, % y-o-y	5.50	16.18	8.33	-9.19	3.76	5.65	5.19	4.99	5.30
Private health spend, TZSbn	1,800.410	2,131.620	2,375.440	2,641.490	2,956.870	3,272.350	3,614.130	3,984.060	4,383.480
Private health spend, TZSbn, % y-o-y	5.59	18.40	11.44	11.20	11.94	10.67	10.44	10.24	10.03
Private health spend, % total health expenditure	51.23	53.94	53.59	53.23	53.08	52.68	52.27	51.85	51.41

f = BMI forecast. Source: World Health Organization (WHO), BMI

Pharmaceutical Trade Forecast

BMI View:*Political pressures and global macroeconomic trends will see the Tanzanian shilling resume its depreciation against the US dollar before the close of 2016. However, this will be at a far more stable and sedate pace than experienced in 2015. As a result, imports of raw materials will become increasingly expensive for the few remaining domestic drugmakers. Despite improvements to local drugmaker production capabilities, over the long-term, the majority of Tanzania's pharmaceuticals will remain sourced from abroad.*



f = BMI forecast. Source: United Nations Comtrade Database DESA/UNSD, BMI

Structural Trends

BMI forecasts that Tanzanian pharmaceutical exports will increase from TZS6.10bn (USD2.99mn) in 2015 to TZS9.50bn (USD3.58mn) in 2020 - corresponding to a compound annual growth rate (CAGR) of 9.3% (3.1% in US dollar terms). With regards to imports, we predict an increase from TZS574bn (USD282mn) in

2015 to TZS1.1trn (USD397mn) in 2020 - a 12.9% CAGR over the forecast period (7.1% in US dollar terms)

Tanzania's pharmaceutical trade performance is relatively erratic. Tanzania is heavily reliant on the importation of medicines, and pharmaceutical production has been on the decline since 2009. A tax regime that favours imports of finished pharmaceuticals and a lack of skilled labour will be detrimental to local manufacturers, and will see the country remain reliant on imported pharmaceuticals for the foreseeable future. Despite this, we forecast an uptick in production and exports over the coming years as domestic manufacturing capabilities improve. According to UN Comtrade data, Tanzania imports the majority of its medicines from India, Kenya and Switzerland. Uganda, Kenya and Rwanda are the top three destinations for pharmaceutical products manufactured in Tanzania.

Decline In Production

In 2009, domestic pharmaceutical production accounted for around a third of medicines in the country following the sharp improvement in regulations by the Tanzanian Food and Drug Authority (TFDA) in 2003. However since 2014, it is estimated that local manufacturers' public and private market share stands at less than 20%. Local producers' share of public sector medicine procurement by the Medical Stores Department (MSD) has been declining and there are currently just five local pharmaceutical manufacturers with just one actively tendering for MSD contracts. Local manufacturers are mainly concerned with the production of over-the-counter medicines and generic antimalarials, antiretrovirals and antibiotics. The domestic medicine market is now supplied almost entirely by imports paid in dollars.

Reasons For Decline

- **Higher Import Costs:** Local manufacturers are exiting the production of basic affordable medicines as they are no longer profitable. Increasing import prices, particularly of raw materials, due to the depreciating Tanzanian shilling has resulted in a slowdown in domestic production.
- **Rising Operational Costs:** Manufacturers have faced additional problems including higher operational costs due to poor infrastructure and rising power prices - which increased by 40% in January 2014. This has led to unpredictable power outages damaging machinery and creating output losses.
- **Unfavourable Tax Law:** Imported finished medicines are exempt from tax, although VAT is charged on pharmaceutical raw materials - which undermines local manufacturers and incentivises imports.
- **Continued Registration Delays:** Product registration delays negatively affect profitability, and local firms have reported up to two year delays by the TFDA testing and registering products.
- **Labour Shortage:** A lack of skilled labour is another problem facing local manufacturers, as the pharmaceutical sector is one that requires a high-skilled workforce. There are very few pharmaceutical

technicians in Tanzania, and local firms often recruit expatriates - though these companies face challenges with the ensuing high cost and complicated process of obtaining work permits.

Table: Pharmaceutical Trade Data And Forecasts (Tanzania 2014-2020)

	2014	2015	2016f	2017f	2018f	2019f	2020f
Pharmaceutical exports, USDmn	2.75	2.99	3.05	3.19	3.31	3.44	3.58
Pharmaceutical exports, USDmn, % y-o-y	63.31	9.01	1.92	4.44	4.03	3.96	3.98
Pharmaceutical imports, USDmn	310.87	281.95	293.59	314.80	338.10	364.60	396.65
Pharmaceutical imports, USDmn, % y-o-y	8.68	-9.31	4.13	7.22	7.40	7.84	8.79
Pharmaceutical trade balance, USDmn	-308.13	-278.96	-290.54	-311.61	-334.79	-361.15	-393.07

f = BMI forecast. Source: UN Comtrade, National Sources, BMI

Table: Pharmaceutical Trade Data And Forecasts Local Currency (Tanzania 2014-2020)

	2014	2015	2016f	2017f	2018f	2019f	2020f
Pharmaceutical exports, TZSmn	4,567.06	6,095.94	6,702.95	7,333.31	8,010.02	8,743.82	9,499.52
Pharmaceutical exports, TZSmn, % y-o-y	68.00	33.48	9.96	9.40	9.23	9.16	8.64
Pharmaceutical imports, TZSmn	517,171.87	574,338.58	645,219.54	724,725.30	817,296.95	925,412.16	1,051,958.42
Pharmaceutical imports, TZSmn, % y-o-y	11.80	11.05	12.34	12.32	12.77	13.23	13.67
Pharmaceutical trade balance, TZSmn	-512,604.81	-568,242.63	-638,516.59	-717,391.98	-809,286.93	-916,668.34	-1,042,458.90

f = BMI forecast. Source: UN Comtrade, National Sources, BMI

Industry Risk/Reward Index

Middle East and Africa Risk/Reward Index - Q3 2016

***BMI View**: Geographic diversification may be a favourable strategy for multinational pharmaceutical companies, but it is vital that firms recognise both the rewards and the risks present in a market, whether developed or emerging. **BMI**'s Risk/Reward Index (RRI) tool, which provides a globally comparative and numerically based assessment of a market's attractiveness, was established to address this.*

In **BMI**'s Q316 Pharmaceutical RRI, the Middle East and Africa region scores 41.3 out of 100, comparing poorly against Western Europe (70.3), Asia Pacific (52.3), Central and Eastern Europe (52.2) and the Americas (50.1). The indicators used to assess the attractiveness of a pharmaceutical market are now visible, improving the transparency of the index system and enabling the identification of regional or group outperformers across single indicators. A market's RRI score is made up of a sum of the Rewards score (Industry Rewards + Country Rewards) and the Risks score (Industry Risks + Country Risks).

The weight assigned to each subsector (such as Industry Rewards or Industry Risks) shows its influence within the final Rewards or Risks score and the final RRI score. The Rewards component accounts for 65% of the final RRI, while the Risks component accounts for 35%.

Q316 Middle East and Africa Pharmaceutical Risk/Reward Index

Rewards & Risks Scores

	Industry Rewards	Country Rewards	Rewards	Industry Risks	Country Risks	Risks	RRI	Ranking
Weighting	44	21	65	21	14	35	100	
UAE	27.6	11.0	38.6	13.3	9.2	22.5	61.1	1
Saudi Arabia	29.6	12.8	42.4	8.4	9.6	18.0	60.4	2
Kuwait	22.8	14.6	37.4	14.0	7.9	21.9	59.3	3
Israel	22.0	16.3	38.3	8.8	8.0	16.7	55.0	4
Lebanon	21.2	15.7	36.9	9.5	7.6	17.1	54.0	5
Qatar	17.2	13.3	30.5	11.9	10.0	21.9	52.4	6
Bahrain	16.4	12.3	28.7	13.3	10.0	23.3	52.0	7
Algeria	25.2	13.1	38.3	5.6	6.9	12.5	50.8	8
Jordan	18.0	12.8	30.8	9.8	7.7	17.5	48.3	9
Oman	16.0	13.0	29.0	10.5	8.1	18.6	47.6	10
South Africa	15.6	10.5	26.1	11.2	9.0	20.2	46.3	11
Morocco	16.8	10.2	27.0	10.5	8.0	18.5	45.5	12
Egypt	20.4	10.4	30.8	6.3	7.2	13.5	44.3	13
Mauritius	12.8	9.0	21.8	11.2	10.0	21.2	43.0	14
Iran	17.6	11.8	29.4	5.6	5.4	11.0	40.4	15
Botswana	14.0	10.4	24.4	7.7	8.1	15.8	40.2	16
Ghana	12.8	10.9	23.7	7.0	8.7	15.7	39.4	17
Gabon	12.8	13.6	26.4	6.3	6.7	13.0	39.4	18
Iraq	16.4	12.2	28.6	5.6	3.4	9.0	37.6	19
Kenya	13.6	9.0	22.6	7.7	6.6	14.3	36.9	20
Namibia	9.2	10.1	19.3	7.7	8.0	15.7	35.0	21
Tanzania	11.6	9.8	21.4	6.3	6.8	13.1	34.5	22
Cameroon	12.8	10.9	23.7	4.9	5.0	9.9	33.6	23
Sudan	13.6	9.3	22.9	4.2	4.3	8.5	31.4	24
Cote d'Ivoire	11.6	10.9	22.5	2.8	5.1	7.9	30.4	25
Uganda	8.0	8.2	16.2	6.3	6.6	12.9	29.1	26
Nigeria	7.6	10.6	18.2	4.2	6.0	10.2	28.4	27
Mozambique	6.8	9.8	16.6	4.9	5.9	10.8	27.4	28
Zambia	3.2	10.6	13.8	6.3	6.2	12.5	26.3	29
Zimbabwe	9.2	9.3	18.5	2.8	3.7	6.5	25.0	30
Angola	6.8	10.6	17.4	4.2	3.3	7.5	24.9	31
Regional Average	15.1	11.4	26.5	7.7	7.1	14.8	41.3	

**RRI scores out of 100, with 100 highest. Source: BMI.*

The Industry Rewards, Country Rewards, Industry Risks and Country Risks subsectors are each made up of a number of indicators. The weighting of each indicator (such as market expenditure which is used to assess Industry Reward or economic diligence which is used to assess Country Risk) reflects its relative

importance to the pharmaceutical industry and subsequently the relative reward or risk that each factor poses to drug companies. In Q316, the UAE is ranked as the most attractive market in the Middle East and Africa region (scoring 61.1 out of 100), followed by Saudi Arabia (60.4) and Kuwait (59.3). In the same quarter, Angola is ranked as the least attractive market in the region (scoring 24.9 out of 100), followed by Zimbabwe (25.0) and Zambia (26.3).

With regards to assessing rewards, we identify industry-specific factors, such as the size of the pharmaceutical market, and country-specific factors, such as the size of the pensionable population, which represent opportunities to would-be investors. Focusing on the Rewards component of the index system, Saudi Arabia scores a total of 42.4 out of 65, the highest score in the subsector. Saudi Arabia's score is boosted by the country's large drug market (market expenditure score of 14.0 out of 20) and a rapidly growing population (population growth score of 4.0 out of 5), but dragged down by a relatively small pensionable population (pensionable population score of 1.6 out of 8). Meanwhile, Zambia scores a total of 13.8 out of 65, the lowest score in the subsector.

Q316 Middle East And Africa Pharmaceutical Rewards

Industry Rewards & Country Rewards Scores

	Market Expenditure	Spending Per Capita	Sector Value Growth	Industry Rewards	Urban/Rural Split	Pensionable Population	Population Growth	Country Rewards	Rewards
Weighting	20	12	12	44	8	8	5	21	65
UAE	12.0	7.2	8.4	27.6	7.2	0.8	3.0	11.0	38.6
Saudi Arabia	14.0	6.0	9.6	29.6	7.2	1.6	4.0	12.8	42.4
Kuwait	6.0	7.2	9.6	22.8	8.0	1.6	5.0	14.6	37.4
Israel	10.0	6.0	6.0	22.0	8.0	4.8	3.5	16.3	38.3
Lebanon	8.0	6.0	7.2	21.2	7.2	4.0	4.5	15.7	36.9
Qatar	4.0	6.0	7.2	17.2	8.0	0.8	4.5	13.3	30.5
Bahrain	2.0	6.0	8.4	16.4	7.2	1.6	3.5	12.3	28.7
Algeria	12.0	4.8	8.4	25.2	6.4	3.2	3.5	13.1	38.3
Jordan	6.0	4.8	7.2	18.0	7.2	1.6	4.0	12.8	30.8
Oman	4.0	4.8	7.2	16.0	6.4	1.6	5.0	13.0	29.0
South Africa	12.0	3.6	0.0	15.6	5.6	2.4	2.5	10.5	26.1
Morocco	6.0	2.4	8.4	16.8	4.8	2.4	3.0	10.2	27.0
Egypt	12.0	2.4	6.0	20.4	4.0	2.4	4.0	10.4	30.8
Mauritius	2.0	4.8	6.0	12.8	3.2	4.8	1.0	9.0	21.8
Iran	8.0	1.2	8.4	17.6	6.4	2.4	3.0	11.8	29.4
Botswana	2.0	3.6	8.4	14.0	4.8	1.6	4.0	10.4	24.4
Ghana	2.0	1.2	9.6	12.8	4.8	1.6	4.5	10.9	23.7
Gabon	2.0	2.4	8.4	12.8	7.2	2.4	4.0	13.6	26.4
Iraq	8.0	2.4	6.0	16.4	5.6	1.6	5.0	12.2	28.6
Kenya	4.0	1.2	8.4	13.6	2.4	1.6	5.0	9.0	22.6
Namibia	2.0	3.6	3.6	9.2	4.0	1.6	4.5	10.1	19.3
Tanzania	2.0	1.2	8.4	11.6	3.2	1.6	5.0	9.8	21.4
Cameroon	2.0	1.2	9.6	12.8	4.8	1.6	4.5	10.9	23.7
Sudan	4.0	1.2	8.4	13.6	3.2	1.6	4.5	9.3	22.9
Cote d'Ivoire	2.0	1.2	8.4	11.6	4.8	1.6	4.5	10.9	22.5
Uganda	2.0	1.2	4.8	8.0	1.6	1.6	5.0	8.2	16.2
Nigeria	4.0	1.2	2.4	7.6	4.0	1.6	5.0	10.6	18.2
Mozambique	2.0	1.2	3.6	6.8	3.2	1.6	5.0	9.8	16.6
Zambia	2.0	1.2	0.0	3.2	4.0	1.6	5.0	10.6	13.8
Zimbabwe	2.0	1.2	6.0	9.2	3.2	1.6	4.5	9.3	18.5
Angola	2.0	1.2	3.6	6.8	4.0	1.6	5.0	10.6	17.4
Regional Average	5.2	3.2	6.7	15.1	5.2	2.0	4.2	11.4	26.5

**RRI scores out of 100, with 100 highest. Source: BMI.*

With regards to assessing risks, we identify industry-specific dangers - such as approvals expediency - and those emanating from the state's political and economic profile - such as bureaucracy - which call into question the likelihood of anticipated returns being realised over the assessed time period. With regards to the economic and political assessment, only the aspects most relevant to the pharmaceutical industry are incorporated into the assessment. Focusing on the Risks component of the index system, Zimbabwe scores a total of 6.5 out of 35, the lowest score in the subsector. Compared to its peers, Zimbabwe's score is dragged down by industry characteristics such as weak patent respect (patent respect score of 0.7 out of 7) and approvals expediency (approvals expediency score of 0.7 out of 7). Meanwhile, the UAE scores a total of 22.5 out of 35, the highest score in the subsector, making it the least risky proposition for pharmaceutical product launch.

Q316 Middle East And Africa Pharmaceutical Risks

Industry Risks & Country Risks Scores

	Patent Respect	Policy Enforcement	Approvals Expediency	Industry Risks	Economic Diligence	Policy continuity	Lack of Bureaucracy	Legal Diligence	Business transparency	Country Risks	Risks
Weighting	7	7	7	21	3	3	3	3	2	14	35
UAE	4.9	3.5	4.9	13.3	1.7	2.7	1.8	1.7	1.3	9.2	22.5
Saudi Arabia	2.8	2.8	2.8	8.4	2.0	2.4	2.7	1.8	0.7	9.6	18.0
Kuwait	4.2	4.2	5.6	14.0	1.4	2.1	1.5	1.7	1.3	7.9	21.9
Israel	2.1	3.9	2.8	8.8	2.2	1.8	1.3	1.8	0.9	8.0	16.7
Lebanon	3.2	2.8	3.5	9.5	1.9	2.1	1.5	1.3	0.9	7.6	17.1
Qatar	4.9	3.5	3.5	11.9	1.4	2.7	2.6	2.0	1.3	10.0	21.9
Bahrain	4.9	3.5	4.9	13.3	2.0	2.7	2.3	2.0	1.1	10.0	23.3
Algeria	2.1	1.4	2.1	5.6	1.9	1.8	1.7	1.0	0.5	6.9	12.5
Jordan	3.5	2.8	3.5	9.8	1.8	2.4	1.0	1.4	1.1	7.7	17.5
Oman	4.2	3.5	2.8	10.5	1.7	2.1	1.5	1.7	1.2	8.1	18.6
South Africa	3.5	4.2	3.5	11.2	2.1	1.8	1.8	1.8	1.5	9.0	20.2
Morocco	4.9	2.1	3.5	10.5	1.7	2.4	1.8	1.3	0.7	8.0	18.5
Egypt	2.8	2.1	1.4	6.3	1.9	1.8	1.7	1.3	0.5	7.2	13.5
Mauritius	3.5	4.2	3.5	11.2	1.9	2.7	2.0	1.9	1.5	10.0	21.2
Iran	0.7	2.8	2.1	5.6	1.1	2.1	1.1	1.0	0.0	5.4	11.0
Botswana	2.8	2.8	2.1	7.7	1.1	2.7	1.4	1.5	1.4	8.1	15.8
Ghana	2.8	2.1	2.1	7.0	1.7	2.4	1.5	1.6	1.5	8.7	15.7
Gabon	2.1	2.8	1.4	6.3	1.6	2.7	1.0	0.8	0.6	6.7	13.0
Iraq	2.1	1.4	2.1	5.6	1.1	0.9	0.5	0.7	0.2	3.4	9.0
Kenya	2.1	2.8	2.8	7.7	1.7	2.1	1.2	1.1	0.6	6.6	14.3
Namibia	2.1	2.8	2.8	7.7	1.5	2.1	1.3	1.7	1.5	8.0	15.7
Tanzania	2.1	2.1	2.1	6.3	1.5	2.1	1.1	1.2	0.9	6.8	13.1
Cameroon	2.1	1.4	1.4	4.9	1.4	1.8	0.6	0.7	0.5	5.0	9.9
Sudan	0.7	1.4	2.1	4.2	1.2	0.9	1.3	0.8	0.1	4.3	8.5
Cote d'Ivoire	0.7	1.4	0.7	2.8	1.3	1.5	1.0	0.6	0.6	5.1	7.9
Uganda	2.1	2.1	2.1	6.3	1.6	1.8	1.5	1.0	0.7	6.6	12.9
Nigeria	0.7	2.1	1.4	4.2	1.7	1.8	1.0	1.1	0.4	6.0	10.2
Mozambique	2.1	1.4	1.4	4.9	1.3	2.4	0.7	0.8	0.8	5.9	10.8
Zambia	1.4	2.8	2.1	6.3	1.4	1.5	1.2	1.2	0.9	6.2	12.5
Zimbabwe	0.7	1.4	0.7	2.8	0.7	0.9	0.9	0.8	0.4	3.7	6.5
Angola	1.4	1.4	1.4	4.2	0.8	1.2	0.3	0.6	0.4	3.3	7.5
Regional Average	2.6	2.6	2.6	7.7	1.5	2.0	1.4	1.3	0.8	7.1	14.8

**RRI scores out of 100, with 100 highest. Source: BMI.*

In the table below, the subsector scores (i.e, Industry Rewards) and full component scores (i.e, Rewards) have been expressed as a percentage of the total weight or as a percentage of the maximum score that can be achieved. This allows for the identification of the sub-sector or component that will most positively or negatively affect a single market.

Q316 Middle East And Africa Pharmaceutical Risk/Reward Index

Rewards & Risks Scores As A Percentage Of The Maximum Score

	Industry Rewards	Country Rewards	Rewards	Industry Risks	Country Risks	Risks	RRI	Ranking
UAE	63	52	59	63	66	64	**61**	1
Saudi Arabia	67	61	65	40	69	51	**60**	2
Kuwait	52	70	58	67	57	63	**59**	3
Israel	50	78	59	42	57	48	**55**	4
Lebanon	48	75	57	45	54	49	**54**	5
Qatar	39	63	47	57	71	63	**52**	6
Bahrain	37	59	44	63	72	67	**52**	7
Algeria	57	62	59	27	49	36	**51**	8
Jordan	41	61	47	47	55	50	**48**	9
Oman	36	62	45	50	58	53	**48**	10
South Africa	35	50	40	53	64	58	**46**	11
Morocco	38	49	42	50	57	53	**46**	12
Egypt	46	50	47	30	51	38	**44**	13
Mauritius	29	43	34	53	71	61	**43**	14
Iran	40	56	45	27	38	31	**40**	15
Botswana	32	50	38	37	58	45	**40**	16
Ghana	29	52	36	33	62	45	**39**	17
Gabon	29	65	41	30	48	37	**39**	18
Iraq	37	58	44	27	24	26	**38**	19
Kenya	31	43	35	37	47	41	**37**	20
Namibia	21	48	30	37	57	45	**35**	21
Tanzania	26	47	33	30	49	38	**35**	22
Cameroon	29	52	36	23	36	28	**34**	23
Sudan	31	44	35	20	31	24	**31**	24
Cote d'Ivoire	26	52	35	13	36	22	**30**	25
Uganda	18	39	25	30	47	37	**29**	26
Nigeria	7	50	21	30	44	36	**26**	27
Mozambique	21	44	28	13	26	18	**25**	28
Zambia	15	50	27	20	23	21	**25**	29
Zimbabwe	17	50	28	20	43	29	**28**	30
Angola	15	47	26	23	42	31	**27**	31
Average	34	54	41	37	50	42	**41**	

**RRI scores out of 100, with 100 highest. Source: BMI.*

Tanzania Risk/Reward Index

In our Q316 Pharmaceutical Risk/Reward Index (RRI) Tanzania's score of 34.5 out of 100 marks a slight improvement from its score last quarter of 32.1, and improves its position by two ranks to 22nd place out of 31 countries analysed in the whole Middle East and Africa (MEA) region. However, a sizeable counterfeiting industry, poor healthcare funding, corruption, regulatory environment deficiencies and a number of other issues will conspire to keep Tanzania in a similarly lowly position in the MEA matrix. In particular, issues relating to patent approvals and the regulatory system remain a major issue for foreign research-based pharmaceutical players. Nevertheless, in comparison with many other African markets, Tanzania offers more commercial promise and a more stable overall business environment.

Rewards

Industry Rewards

This category is a measure of the size of the market and its potential for growth. It is therefore given the highest weighting in **BMI**'s Risk/Reward Index. Tanzania has received a relatively low score of 11.6 out of 44 in this component of our index system, well below the regional average of 15.1. We note, however, this has been revised upwards from last quarter's score of 9.2, owing to improvements in pharmaceutical sector growth rates. Nonetheless, the country's pharmaceuticals market is small, largely because per-capita expenditure is low, dragging down its score. In per-capita terms, however, Tanzania's drug expenditure fares well against comparable countries in Sub-Saharan Africa (SSA). Furthermore, the drug market is forecast to grow strongly over the next few years due to a high disease burden, which should result in improved returns over the forecast period, supporting its industry rewards score.

Country Rewards

Tanzania's country structure is still not conducive to growth in the pharmaceuticals market; as a result it maintains a score of 9.8 out of 21, below the regional average of 11.4. The underdeveloped state of the country's rural healthcare infrastructure places significant limits on access to pharmaceuticals for Tanzania's rural population. Furthermore, the population has a low life expectancy, resulting in a young population and a low demand for high-value medicines. However, its high rate of population growth and urbanisation should support future market growth, creating revenue-earning opportunities for drugmakers.

Risks

Industry Risks

Tanzania maintains a poor score of 6.3 out of 21 in this component of our rating system, below the regional average of 7.7. In common with other African nations, significant concerns exist regarding Tanzania's intellectual property environment. The Industrial Property Act is compliant with its World Trade Organization Trade Related Aspects of Intellectual Property Rights obligations. However, enforcement is a major problem and substandard, counterfeit drugs are prevalent.

Country Risks

Tanzania's country risk score for Q316 of 6.8 matches its score from the previous quarter. Despite sitting just below the regional average of 7.1, our Country Risk team are of the view that Tanzania has emerged as one of SSA's top foreign investment destinations - pulling in almost USD600mn on average annually, which places it firmly in the continent's top echelon of foreign direct investment performers. The country's strengths include a relatively efficient commercial dispute arbitration system, favourable investment laws and declining corruption. Weaknesses remain, however, particularly in the country's physical infrastructure, labour market and property rights framework. Investment in physical infrastructure is ongoing, but it will be years before the situation improves substantially. The overwhelming and slowing presence of bureaucracy is a major concern, and is a key problem in the country's pharmaceuticals distribution system, where a web of government, charity and private sector organisations overlap.

Regulatory Review

Tanzania's pharmaceutical and healthcare regulations continue to improve in line with the government's efforts to create a more transparent market with widespread access to healthcare. The Tanzania Food and Drugs Authority (TFDA) is a regulatory body under the Ministry of Health and Social Welfare, which is responsible for regulating the quality and safety of medicines, medical devices, food and cosmetics. It was established under Tanzania Food, Drugs and Cosmetics Act No. 1 of 2003, after repealing the Pharmaceutical and Poisons Act No. 9 of 1978 (which established the Pharmacy Board) and Food (Control of Quality) Act No. 10 of 1978 (which established the National Food Control Commission). Although regulatory standards continue to fall below the levels in developed states, we highlight the ongoing public sector commitment towards the sector.

The TFDA's core activities include:

- Ensuring all companies (dealing with drugs, herbal drugs, medical devices, cosmetics and food) have the relevant licences and permits.
- The inspection of manufacturers, wholesalers and retailers as well as sites for clinical trials to ensure compliance to standard requirements for food, drugs, herbal drugs, cosmetics and medical devices.
- Monitoring the import and export of food, drugs, herbal drugs, cosmetics and medical devices in order to ensure their safety, quality and effectiveness.
- The analysis of the safety of food, drugs, herbal drugs, cosmetics and medical devices available on the Tanzanian market.
- The promotion of food, drugs, herbal drugs, cosmetics and medical devices in the country are regulated by TFDA.
- The public education of all issues related to the TFDA's functions, such as control of the quality, safety and rational use of drugs, food, herbal drugs, cosmetics and medical devices.

Drug registration time in Tanzania is slow, as is the case in the majority of other Sub-Saharan African countries. Delays by the TFDA of up to two years have been noted by local companies. However, as of 2015, the TFDA was granted a time period of 60 days to register drugs in the domestic market, according to Ministry of Health and Social Welfare Deputy Minister, Stephen Kebwe. We believe that this is a very ambitious turnover time; however, it is positive to note the government is attempting to improve registration times which can often act as a barrier to foreign investment.

Perhaps highlighting an improving regulatory environment, a study published in the American Journal of Tropical Medicine and Hygiene in 2015 showed no traces of fake antimalarial medicines in Tanzania. Researchers at the Artemisinin-based Combination Therapy (ACT) Consortium at the London School of

Hygiene and Tropical Medicine analysed 2,028 antimalarials from Tanzania and Cambodia. The drugs were tested negative for any falsification. However, substandard drugs were found in 12% of samples in Tanzania. A previous report had suggested that up to one-third of antimalarials could be counterfeit.

Tanzania's government, in cooperation with health practitioners is currently working to control the purchase of drugs without prescriptions, according to Donan Mmbando, permanent secretary at the Ministry of Health and Social Welfare. The move is aimed at addressing the growing concerns that 'off-the-counter' drug purchases without prescriptions may lead to antimicrobial resistance.

Intellectual Property Issues

According to a 2002 Decision of the Trade-Related Aspects of Intellectual Property Rights (TRIPS) Council, based on the 2001 Doha Declaration on the TRIPS Agreement and Public Health, LDCs such as Tanzania were exempt until January 1 2016 from implementing, applying or enforcing the TRIPs provisions on patents and the protection of undisclosed information with respect to pharmaceuticals products.

Notwithstanding this flexibility, Tanzania's Patents Act of 1987 makes patents available for processes and products, without expressly excluding pharmaceuticals products. Prior to starting the manufacture of a given drug, generic producers therefore have to make sure that neither the final product nor any of its ingredients are patented in Tanzania. Where a patent exists, the producer will in principle have to seek a voluntary licence from the patent holder.

The Tanzanian government was free under World Trade Organization (WTO) law to amend the Patents Act with a view to excluding, until January 1 2016, pharmaceutical products from the protection through patents and undisclosed information. Alternatively, the government may elect to authorise its authorities (such as administrative bodies or courts) to not enforce pharmaceuticals patent rights until January 1 2016.

Pricing Regime

The prices of key medicines in Tanzania vary greatly between location and sector, with many Tanzanians unable to afford medications from private retail pharmacies that are on average retailed at prices significantly higher than international reference prices. Reducing the out-of-pocket retail cost of medicines and improving affordability remains a challenge for the Tanzanian government and national health leadership.

Legislative controls on the price of medicines in Tanzania are significantly under-developed, which has resulted in the wide price variation observed between the health sectors across the country. Price control of

essential medicines only takes places as part of the Medical Stores Department (MSD) tender process, and as such does not guarantee the lower price will be passed on to consumers in retail settings. Nevertheless, the MSD procures medicines at prices that are below the International Reference Prices.

Market Overview

Tanzania's pharmaceutical market is amongst the largest in Sub-Saharan Africa. Tanzania's pharmaceutical market is valued at TZS900bn (USD442mn), with per-capita drug expenditure at just over USD8 in 2015. This is fairly modest in global terms and even by regional standards. Due to low purchasing power, generic drugs comprise the majority of Tanzania's pharmaceuticals market, providing opportunities for companies focused on off-patent drugs. Patented drugs only hold a small market share as low per-capita drug expenditure continues to limit the capacity of most of the population to purchase the higher-priced medication. Self-medication is prevalent in Tanzania, making the OTC medicine market an attractive prospect. Healthcare expenditure was valued at TZS4.96trn (USD2.44bn) in 2015, accounting for 5.6% of GDP, with per-capita health expenditure at USD46.

In Tanzania, communicable diseases place a much heavier burden on the population that non-communicable diseases, accounting for 59% and 32% of all disability-adjusted life years (DALYs) in the country in 2015 respectively. However, over the long term, the burden non-communicable diseases will surpass that of the communicable diseases in Tanzania. According to **BMI's** Disease Database, between 2015 and 2030, the number of DALYs lost to non-communicable diseases will rise by 45% (6.9mn to 10.1), while the number of DALYs lost to communicable diseases will actually decrease by 43% (12.9mn to 7.4mn). As it stands, infectious diseases - such as HIV/AIDS, malaria and tuberculosis - dominate the communicable disease burden. Cardiovascular diseases, diabetes and cancer account for a growing burden of non-communicable diseases.

According to the Tanzania Food and Drugs Authority there are seven registered pharmaceuticals manufacturers in Tanzania: Tanzania Pharmaceuticals Industries, AA Pharmaceuticals, Keko Pharmaceuticals, Mansoor Daya Chemical, Shelys Pharmaceuticals (which entered into a long-term strategic partnership with South African drugmaker Aspen in 2008), Tanzansino United Pharmaceuticals and Interchem Pharmaceuticals. Multinational drugmakers such as GlaxoSmithKline, AstraZeneca, Sanofi, Johnson & Johnson, Boehringer Ingelheim, Bayer, Novartis and Novo Nordisk supply the market via exports. Indian drugmakers including Ranbaxy, Dr Reddy's, Cipla, Strides Arcolab, Panacea Biotech and Piramal Healthcare also supply the sector, primarily through the import of generic medicines.

Healthcare Sector

The Tanzanian government is placing an increasing emphasis on healthcare, particularly in expanding access to underserved regions of the population.

Tanzania's National e-Health Strategy was implemented across the country in FY14/15. The healthcare programme aims to improve the quality and efficiency of healthcare and reduce the existing expenses of implementing healthcare programmes in the country. The programme will be implemented nationwide in three main stages and will take a minimum of seven to 15 years to be accomplished completely, according to Deputy Minister Seif Suleiman Rashid. The programme will help to track the flow of funding, expenditure and cost effective health services in the country. The MOHSW is currently working on a programme with the aim of ensuring that all healthcare facilities in the country have a fully functional accreditation system by the 2017/18 financial year.

With regards to healthcare, in 2015, a total of TZS1,588.2bn (USD957mn) was set aside for procurement of medicines, prevention of epidemic diseases, immunisation for children, construction of hospitals and dispensaries and HIV and malaria control. While the government's focus on developing the country's healthcare infrastructure, reducing infant mortality, improving access to medicines and managing infectious diseases is commendable, we note that government expenditure on healthcare still remains below the Abuja Declaration target of 15% of total government expenditure.

These expenditure figures are unrealistically optimistic, especially given spending levels in the previous fiscal year, and the fact that government expenditure tends to come in under budget. This scenario, combined with the government's heavy reliance on aid, has the potential to seriously derail the government's healthcare sector development plans.

Health Insurance

Currently, around one fifth of the population is covered by health insurance, with around a third of total healthcare expenditure coming from out-of-pocket payments. With Tanzania being among the poorest countries in SSA (GDP per capita of USD827 in 2015), subsidised healthcare services are paramount to the country achieving universal coverage. Tanzania is in the final stages of implementing a bill that will make registration to the scheme compulsory, with contributions coming from an employee's salary. A household of six people will contribute TZS25,000 (USD14) a year, which will be matched through the NHIF. The programme is known as the improved Community Health Fund (iCHF) and will cover drugs for chronic diseases including asthma, hypertension, diabetes and rheumatism.

Tanzania has the largest proportion of the working age population in employment in SSA at over 86%, meaning that uptake of the scheme will occur faster than many of its regional peers. However, the majority of the population is employed in the subsistence agriculture sector, with over 10% of the workforce

employed in the informal sector. Salary contributions are less likely to occur from these individuals, posing a downside risk to our outlook.

BMI believes that the compulsory nature of Tanzania's health insurance model is one that should be adopted by other SSA countries, as is being done in the Gulf Cooperation Council (GCC) states. Other health insurance schemes rolled out in the region have been unsuccessful in terms of coverage, with much of the population unwilling to sacrifice their salary given a lack of trust in public healthcare provision, such as those in Ghana and Nigeria. Additionally, much of the middle income population choose not to contribute until such a time when these services are required. This problem is less likely to be encountered in Tanzania given that the scheme is compulsory in terms of contributions, and accredited health facilities are a combination of public and private facilities. However, with much of the population self-employed in the subsistence agriculture sector, compulsory contributions will be much harder to achieve.

Tanzania's health insurance market is comprised of five key players - the National Health Insurance Fund (NHIF), National Social Security Fund - Social Health Insurance Benefit (NSSF-SHIB), Community Health Funds (CHF), private health insurance and community based health insurance (CBHI)/microinsurance.

Health Infrastructure

The results of a health facility survey conducted across a total of 134 health facilities in five districts in Tanzania further emphasises the human resource shortage in the country's healthcare sector. The MOHSW staff guideline recommends 441 clinical staff and 854 nurses for the facilities visited. However, only 20% (90/441) of the recommended number of clinical staff and 14% (122/854) of the recommended number of nurses had been employed. This equates to an overall staffing level of 0.10 clinical staff per 1,000 population and 0.14 nurses per 1,000 population. There was marked variation in staffing levels between districts, ranging from 0.05 - 0.16 per 1,000 population for clinical staff and 0.07-0.23 per 1,000 population for nurses. There was a high level of absenteeism amongst employed staff, with 44% of clinical staff and 49% of nurses absent from their work station on the day of the survey. This reduced the effective coverage of staff to 0.06 and 0.07/1,000 population for clinical staff and nurses respectively.

Healthcare Budget

Despite the government increasing its budget allocations towards the healthcare sector in 2015-2016, it currently stands at 11.3% which is short of the target pledged during the Abuja Declaration. Furthermore,

a large proportion of patients continue to purchase products from private pharmacies and drug stores out-of-pocket, which highlights an underlying weakness in Tanzania's public pharmaceutical supply chain.

The Medical Stores Department (MSD) has the mandate to procure, store and distribute pharmaceutical products which are then sent to zonal stores to supply districts, before eventually being distributed to health facilities in respective districts. According to MSD Director Laurian Rugambwa, the department was allocated just TZS80bn (USD3.66mn) in the FY2015/16. She added that TZS500bn (USD229mn) would be needed to end the chronic shortage of medical supplies in Tanzania. A combination of budgetary constraints and delays in the disbursement of funds by the government has limited the MSD's capacity to cope with the increasing demand of medicines in the country. According to Sikika - a local health advocacy NGO in Tanzania - the demand for essential medicines has been increasing from about TZS188bn (USD86mn) in 2011/12 to about TZS577bn (USD264mn) in 2014/15.

Funding for medicines in Tanzania is released by the Ministry of Finance and Economic Affairs (MoFEA) then approved by the Ministry of Health and Social Welfare before finally being transferred to the MSD account where it is available to purchase orders. Delays of up to three months between funding being released from the MoFEA and appearing in health facility accounts have been noticed. A report from USAID highlighted the existence of a large funding gap, with less than half of the funds required for essential medicines available in 2013. Of the allocated funds for medicines purchasing, the funds actually disbursed are traditionally below that of the allocated amount, further complicating matters.

Supply Chain Inefficiencies

It is our view that Tanzania's inefficient pharmaceutical supply chain is a risk that should be heeded by drugmakers operating in the country. While the government has recognised the need to improve the situation and is implementing certain strategies to this end, the lack of funding and pre-existing structural issues will continue to hinder patients' access to essential medicines.

Stakeholders within Tanzania's healthcare sector expressed concerns regarding the government's failure to provide its public health centres with essential medicines in October 2015, causing many patients to purchase products from private pharmacies and drug stores out-of-pocket. This development has highlighted weakness in Tanzania's pharmaceutical supply chain.

According to Tanzania's Minister of Health and Social Welfare, Dr Ummy Mwalimu, only 30% of all medicines supplied by the government actually reach patients in Tanzania. This represents a fundamental issue in drug procurement and distribution.

A tracking study by the Euro Health Group identified three main weaknesses in Tanzania's drug supply system:

1) Essential medicines are consistently insufficient or out of stock at the MSD, encouraging a system of rationing.

2) Insufficient attention is being paid to the procurement and distribution of essential medicines compared to specific vertical programme supplies (those for family planning, AIDS, immunization, malaria and TB).

3) A lack of technical and administrative skills including stock management, inventory control, quality control and financial management.

As such, shortages, delays in distribution, and exhausted inventories are commonplace. However, it is our view that simply focusing on preventing leakages in the medicine distribution chain will not resolve the chronic drug shortages problem. Instead, **BMI** believes that addressing the root cause of drug shortages should be carried out alongside strategies to improve supply chain efficiencies. For example, tackling the funding gaps at the country's MSD and ensuring the health sector budget is adequately funded over the long term.

Research & Development

A lack of finance and technical knowledge means that little novel research is carried out by local drugmakers in Tanzania. R&D in Ghana is limited or discouraged due to the high costs involved. However, we note that R&D into vaccines specific to regions in Africa is an emerging trend among drugmakers, and the presence of an established clinical trial firm like Quintiles will significantly boost market entry for new drugs. Although Quintiles is yet to establish a base in Tanzania, its growing presence across sub-Saharan Africa will increase countries openness to engaging in clinical trials.

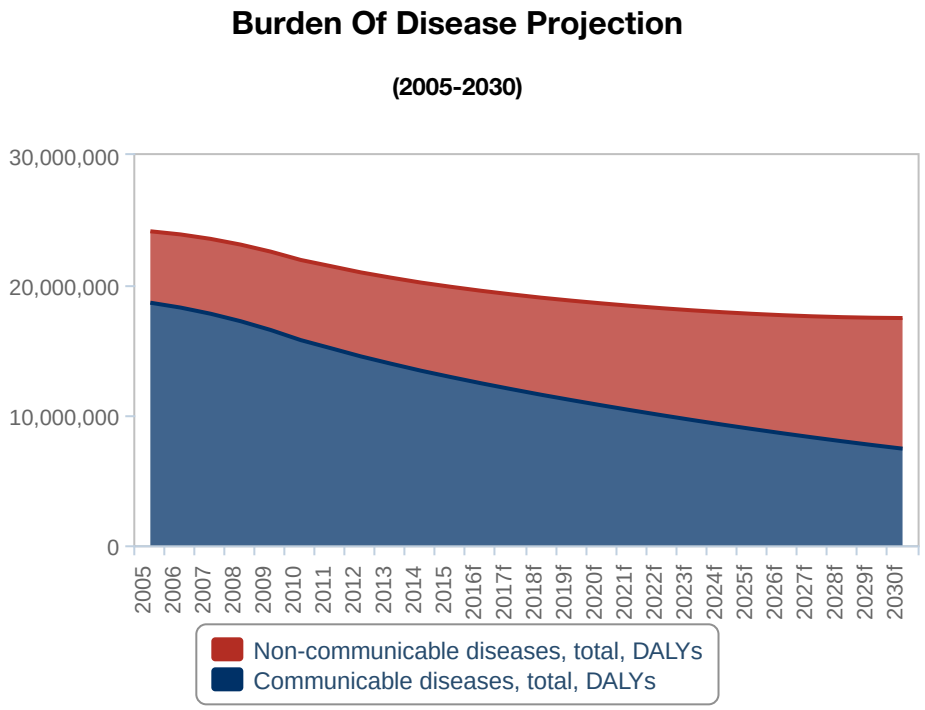
Clinical Trials

The Tanzania Food and Drugs Authority (TFDA) oversee the conduct of clinical trials in Tanzania. The guidelines for the conduct of clinical trials in Tanzania have been made under the provisions of Section 63 of the Tanzania Food, Drugs and Cosmetics Act, 2003.

A clinical trial is required for all unregistered and registered drugs in case of change in dosage, indication, target population, or route of administration. Approval is not required for the post-marketing study of an

already registered drug. A foreign sponsor wishing to conduct a clinical trial in Tanzania should submit an application with the prescribed fee, an ethical clearance certificate issued by any approved institute for medical research, and other relevant information to the TFDA. The Medical Research Coordinating Committee coordinates and ensures that the research in Tanzania follows the country's ethics requirements. The National Health Research Ethics Review Sub-Committee (NatHREC) of the Medical Research Coordinating Committee registers the trial, reviews the ethics, and approves and monitors the research in Tanzania.

Epidemiology



f = forecast. DALYs = disability-adjusted life years. Source: BMI's Disease Database

The burden of both communicable and non-communicable diseases remains high in Tanzania, and we expect both to persist over the long-term. According to **BMI**'s Disease Database, cardiovascular conditions, mental disorders, and cancer account for a large and growing burden of disease. Communicable diseases inflict a greater burden, with malaria, HIV/AIDs and tuberculosis acting as significant health concerns. By 2030, however, communicable diseases will represent a smaller, yet still significant, burden on the population. This reflects the shift in the epidemiological profile throughout the region. The health issues associated with young people are increasingly mirroring those in more developed countries, such as the prevalence of mental and behavioural disorders.

Increased longevity in developed markets translates into an increased demand for aged care healthcare services and medicines. However, in emerging markets such as Tanzania, despite increased life expectancy, communicable diseases will remain a significant health burden over the next two decades, continuing to limit revenue earning opportunities for companies whose product portfolios contain medicines for the treatment of long-term diseases

HIV/AIDS

UNAIDS estimates that 1.5mn Tanzanians are living with HIV, equating to a prevalence rate of 5.3% among adults aged between 15 and 49. The Global Fund To Fight AIDS, Tuberculosis and Malaria estimates that only 69% of these sufferers aged over 15 are receiving antiretroviral (ARV) therapy, despite the government providing ARV drugs free of charge to all HIV sufferers since 2003. This highlights a lack of widespread access to healthcare services. While the HIV prevalence rate is falling, barriers still persist which will hinder Tanzania's attempts to eliminate the disease including the lack of human resources, healthcare service provision and stigma against sufferers. Additionally, Tanzania is heavily reliant on donor funding for its HIV/AIDS programmes, with around 95% coming from foreign donors. **BMI**'s Disease Database estimates that the number of DALYs lost to HIV/AIDS in Tanzania was 3.1mn in 2015. We forecast this will decrease to around 810,000 DALYs by 2030. Nevertheless, HIV/AIDS will continue to place a significant burden on Tanzania's healthcare system, with complications surrounding the disease an ongoing issues.

The East African Community (EAC) HIV strategic plan (2015-2020) will go some way in combating the HIV/AIDs epidemic throughout the region. The meeting in Kenya last year is one in a series of five coordinated meetings to occur across the member states of the EAC: Burundi, Kenya, Rwanda, Tanzania and Uganda. There is a need for stronger coordination in the response to the high burden of disease along the transport corridors linking the five nations. The key topic for discussion in the meeting was how to effectively reach mobile populations, including those displaced by conflict both within and beyond national borders. The structural drivers of HIV in the region were identified in the meeting, and included mobility conflict, human trafficking, a lack of harmonisation of care and treatment protocols.

Malaria

While malaria cases have declined, the disease still poses a severe burden in Tanzania with just under 2mn reported cases in 2013. Malaria is the fourth leading cause of death in the country, representing 5.2% of deaths according to the World Health Organization (WHO). The country's fight against malaria will be aided by the opening of a biolarvicide plant in July 2015 and the approval of GlaxoSmithKline's malaria vaccine *Mosquirix* (RTS,S) by the European Medicines Agency in the same month. In line with these developments, the burden of malaria on Tanzania is forecast to decline further, with an estimated reduction in DALYs lost to the disease to 731,147 by 2030 (down from 2.34mn in 2015).

Cancer

As the population ages in line with improving health outcomes, the prevalence of lifestyle-related diseases such as cancer will increase. Cancers currently represent 5% of deaths in Tanzania according to the WHO. According to Globocan, there is a 12.8% chance of a person developing cancer before the age of 75 in Tanzania, with the likelihood of dying of cancer before this age standing at 9.6%. The leading cancers by incidence in men are prostate, Kaposi sarcoma and oesophagus, whilst cervical, breast and Kaposi sarcoma cancers have the highest incidence in women. Most cases are often undiagnosed or misdiagnosed, which is partly due to inadequate healthcare infrastructure and partly due to the widespread lack of awareness regarding the disease. There are two cancer treatment centres in the country which have the capacity to serve only 5,000 of the estimated 30,000 new cancer cases each year. Lack of cancer education, screening services, detection methods and a lack of access to healthcare services are all detrimental to Tanzania's fight against cancer.

In 2014, the Tanzanian government launched a cervical cancer community awareness and screening initiative, urging women to monitor their health more closely. The initiative will be carried out by five non-governmental organisations under the auspices of the ministry, according to Director of Preventive Services in the Ministry of Health and Social Welfare Neema Rusibamayila. The two-year joint programme, supported by financial commitments and technical on-the-ground aid from the Bristol-Myers Squibb Foundation (BMSF), aims to cut rising deaths in women from the cancer in developing countries.

Diabetes

According to the International Diabetes Federation (IDF), there were over 820,000 cases of diabetes in Tanzania in 2015, representing a prevalence rate of 3.5% among adults aged between 20 and 79. The economic burden of diabetes in Tanzania is estimated at USD96 per person. All diabetes sufferers are exempt from cost-sharing in public healthcare facilities and, in April 2015, the government re-affirmed its commitment to providing free treatment to diabetics under the national diabetic programme as part of the 2007 Health Policy. Deputy Minister for Health and Social Affairs Stephen Kebwe noted that the government has launched 169 diabetic clinics and provided special diabetic training to 1,925 medics across the country, highlighting the commitment to treatment of the disease. According to our Disease Database, the numbers of DALYs lost to diabetes in Tanzania is forecast to increase from 200,000 in 2015 to 308,000 in 2030.

Danish drugmaker Novo Nordisk entered into a three-year extension of its Changing Diabetes in Children programme in 2015. The programme is run as a private-public partnership between Novo Nordisk, Roche, the International Society for Pediatric and Adolescent Diabetes and the World Diabetes Foundation. The programme runs in Tanzania and other SSA countries Cameroon, Democratic Republic of Congo, Ethiopia, Guinea, Kenya and Uganda, and is implemented by a group of local partners with the national Ministry of Health playing a key role to ensure that the programme is anchored within the existing healthcare system.

Competitive Landscape

Research-Based Industry

Tanzania is attempting to reduce its reliance on imports, something which is viewed as unsustainable in the long-term given rapidly rising healthcare costs. Antiretroviral (ARV) drugs have been produced locally since 2012 following an investment in a manufacturing plant by Tanzania Pharmaceuticals Industries, the EU and German medical aid organisation Action Medeor. The government clearly realises the importance of achieving self-sufficiency in terms of pharmaceutical production, and has encouraged investments from Indian generic drugmakers to establish production facilities locally; the semi-autonomous region of Zanzibar is offering 5-10 year tax holidays for Indian pharmaceutical companies in this respect. Tanzanian authorities have reportedly been seeking collaborations with international pharmaceutical companies to promote the local development of medicines. In July 2015, Cuban firm Entrepreneurial Group Biological and Pharmaceutical Laboratories (Labiofam) opened Tanzania's first biolarvicides factory.

Domestic Industry

According to the Tanzania Food and Drugs Authority (TFDA), there are seven registered pharmaceutical manufacturers in Tanzania: Tanzania Pharmaceuticals Industries, AA Pharmaceuticals, Keko Pharmaceuticals, Mansoor Daya Chemical, Tanzansino United Pharmaceuticals, Interchem Pharmaceuticals and Shelys Pharmaceuticals. We calculate that domestic manufacturing output covers only 10% of the pharmaceutical market by value, with Tanzania heavily reliant on imports, like the majority of its Sub-Saharan African (SSA) neighbours. In 2008, Shelys Pharmaceuticals entered into a long-term strategic partnership with South African drugmaker Aspen.

Foreign Industry

Indian drugmakers are the leading suppliers to Tanzania's pharmaceutical market, with imports from India accounting for almost two-thirds of imported medicines. Indian companies Cadila, Hetero Labs, Cipla, Ajanta Pharma, Ranbaxy and Dr Reddy's Laboratories among others all supply products to the country. East African neighbour Kenya is the second leading supplier to Tanzania, providing just over 15% of imports, with Switzerland third at below 5% by value. These Swiss imports are likely to represent patented medicines, and, as is the case throughout SSA, these medicines have a very small market share, with generic medicines dominating the market. Multinationals GlaxoSmithKline, AstraZeneca, Sanofi, Johnson & Johnson, Boehringer Ingelheim, Bayer, Novartis and Novo Nordisk are all present via imports. Leading

pharmaceutical distributors include Jilichem, Action Medeor International Healthcare Tanzania, Abacus Pharma, Sunpharm Pharmacy, JD Pharmacy and Kings Medics.

Opportunities In Government Financed & Donor Funded Healthcare Sector

All pharmaceuticals producers can participate in pharmaceuticals tenders issued by the government. Local producers enjoy 15% preferential treatment and have to comply with Tanzanian good manufacturing practice standards. Highlighting further opportunities for companies, donor funding accounts for a large proportion of healthcare finances in Tanzania and if local producers of drugs comply with international quality standards they can participate in tenders issued by the donor community in the country (and the region) - thereby gaining increased access to the ARV pharmaceuticals market in Tanzania.

Sources of donor funds for ARV procurement in Tanzania include multilateral partners (such as NORAD, the Norwegian Agency for Development Co-operation), bilateral partners (such as UNITAID, the international facility for the purchase of drugs against HIV/AIDS, Malaria and Tuberculosis), NGO partners (such as AXIOS, an international philanthropic organisation) and private partners (such as Crown Agents, a global procurement agent).

However, as highlighted in a WHO study assessing the viability of local pharmaceuticals production in Tanzania, it should be noted that in some cases it might still be more cost-effective to import drugs from India (which is home to more than 70 US-approved production plants where APIs and ARVs can be produced) and China than to produce them locally.

Table: Multinational Market Activity

Company	Operations
Novartis	Novartis does not have a direct presence in Tanzania; products are imported.
Pfizer	Pfizer does not have a direct presence in Tanzania; products are imported. In December 2012, Tanzania included Pfizer's pneumococcal conjugate vaccine *Prevenar 13* in its paediatric immunisation programme. Pneumococcal disease accounts for more than one out of every five deaths of children less than five years of age in Tanzania.
Roche	Roche does not have a direct presence in the country; products are imported.
Sanofi	The company does not have a direct presence; products are imported.
Merck & Co	The company does not have a direct presence; products are imported.
Johnson & Johnson	The company does not have a direct presence; products are imported.
GlaxoSmithKline	The company does not have a direct presence; products are imported.
AstraZeneca	The company does not have a direct presence. Products are imported. The company's East Africa hub is in Kenya, which offers marketing and sales support to the rest of the EAC.

Multinational Market Activity - Continued

Company	Operations
Takeda	The company does not have a direct presence; products are imported. The company runs a support program 'Measure against Malaria' in Tanzania.

Source: Pharmaceutical companies, BMI

Generic Drugmakers

Over the long term, we expect that Tanzania's pharmaceutical sector will remain dominated by generic drugmakers, with a majority of them coming from India. Indian companies Cipla, Ajanta Pharma, Ranbaxy and Dr Reddy's Laboratories represent major generic players in the Tanzanian pharmaceuticals market. We expect purchasing power to remain low, as such generic drugs will comprise the majority of Tanzania's pharmaceuticals market. Government encouragement of domestic pharmaceutical production will increase domestic output; however, the majority of the country's pharmaceutical needs, including generic medicines, will remain sourced from abroad.

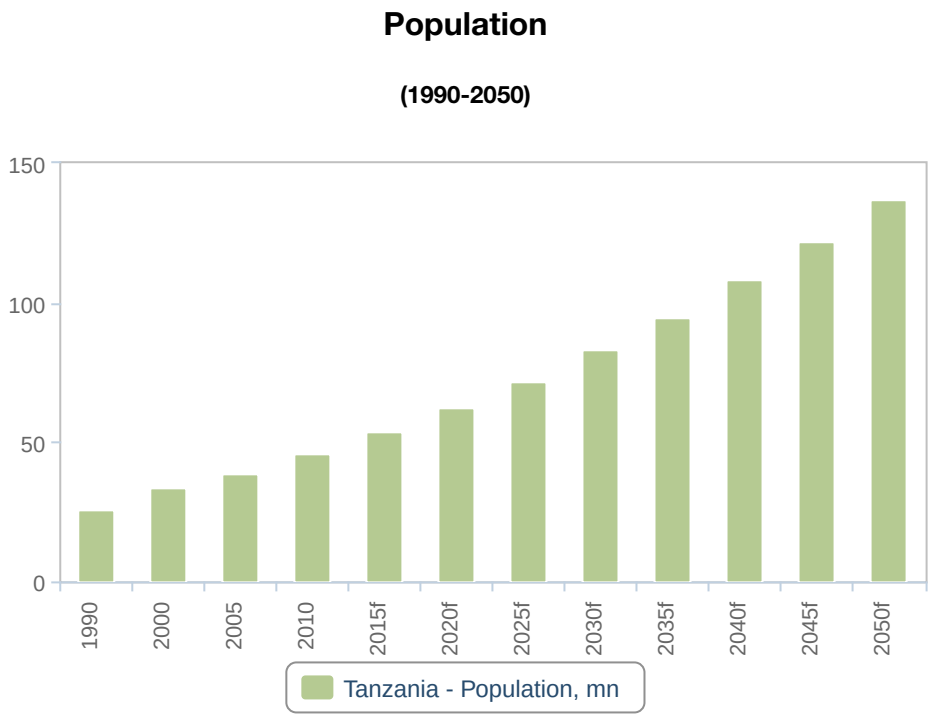
Pharmaceutical Retail Sector

According to the latest WHO data, there are over 5,200 pharmacies in Tanzania, with public and private sector pharmacies comprising 61% and 10% of the total respectively. The number of pharmacies per 10,000 population (1.68) is relatively low, ranging between 1.08-2.61 between each region in Tanzania. The majority of pharmacists and pharmacies are found in urban areas with some underserved regions having only two pharmacists per region.

Demographic Forecast

Demographic analysis is a key pillar of **BMI**'s macroeconomic and industry forecasting model. Not only is the total population of a country a key variable in consumer demand, but an understanding of the demographic profile is essential to understanding issues ranging from future population trends to productivity growth and government spending requirements.

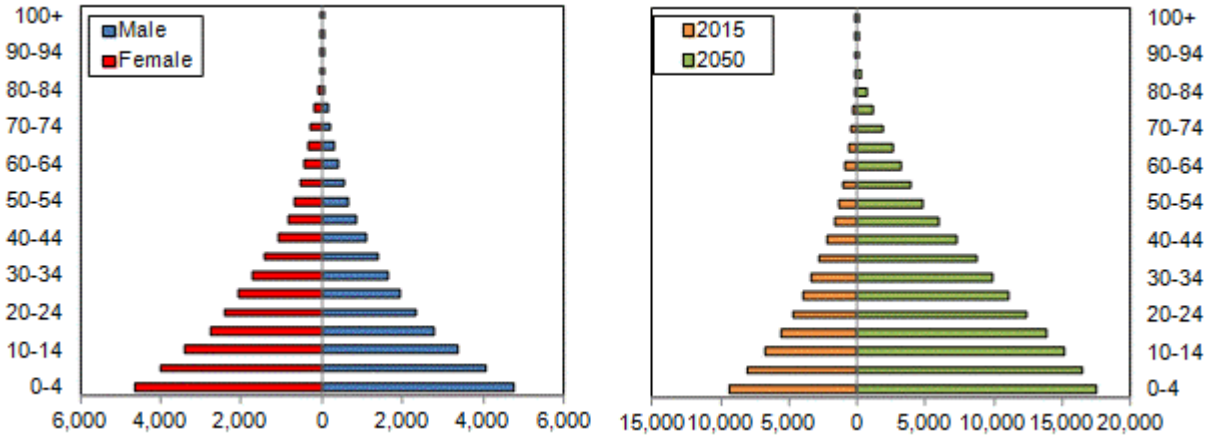
The accompanying charts detail the population pyramid for 2015, the change in the structure of the population between 2015 and 2050 and the total population between 1990 and 2050. The tables show indicators from all of these charts, in addition to key metrics such as population ratios, the urban/rural split and life expectancy.



f = BMI forecast. Source: World Bank, UN, BMI

Tanzania Population Pyramid

2015 (LHS) & 2015 Versus 2050 (RHS)



Source: World Bank, UN, BMI

Table: Population Headline Indicators (Tanzania 1990-2025)

	1990	2000	2005	2010	2015f	2020f	2025f
Population, total, '000	25,458	33,991	39,065	45,648	53,470	62,267	72,032
Population, % y-o-y	na	2.6	3.0	3.2	3.2	3.0	2.9
Population, total, male, '000	12,608	16,910	19,394	22,665	26,574	30,992	35,900
Population, total, female, '000	12,849	17,080	19,671	22,982	26,896	31,275	36,132
Population ratio, male/female	0.98	0.99	0.99	0.99	0.99	0.99	0.99

na = not available; f = BMI forecast. Source: World Bank, UN, BMI

Table: Key Population Ratios (Tanzania 1990-2025)

	1990	2000	2005	2010	2015f	2020f	2025f
Active population, total, '000	13,054	17,744	20,295	23,641	27,590	32,573	38,575
Active population, % of total population	51.3	52.2	52.0	51.8	51.6	52.3	53.6
Dependent population, total, '000	12,403	16,247	18,769	22,006	25,880	29,693	33,457
Dependent ratio, % of total working age	95.0	91.6	92.5	93.1	93.8	91.2	86.7

Key Population Ratios (Tanzania 1990-2025) - Continued

	1990	2000	2005	2010	2015f	2020f	2025f
Youth population, total, '000	11,713	15,283	17,606	20,578	24,167	27,686	31,072
Youth population, % of total working age	89.7	86.1	86.7	87.0	87.6	85.0	80.6
Pensionable population, '000	690	963	1,163	1,428	1,712	2,007	2,384
Pensionable population, % of total working age	5.3	5.4	5.7	6.0	6.2	6.2	6.2

f = BMI forecast. Source: World Bank, UN, BMI

Table: Urban/Rural Population & Life Expectancy (Tanzania 1990-2025)

	1990	2000	2005	2010	2015f	2020f	2025f
Urban population, '000	4,807.5	7,583.2	9,705.8	12,833.6	16,900.9	21,879.5	27,804.7
Urban population, % of total	18.9	22.3	24.8	28.1	31.6	35.1	38.6
Rural population, '000	20,650.7	26,408.4	29,359.8	32,814.9	36,569.5	40,387.8	44,228.2
Rural population, % of total	81.1	77.7	75.2	71.9	68.4	64.9	61.4
Life expectancy at birth, male, years	48.5	49.9	55.1	60.6	64.1	66.2	67.6
Life expectancy at birth, female, years	51.5	51.1	56.1	62.8	66.9	68.6	70.4
Life expectancy at birth, average, years	50.0	50.5	55.6	61.6	65.5	67.4	69.0

f = BMI forecast. Source: World Bank, UN, BMI

Table: Population By Age Group (Tanzania 1990-2025)

	1990	2000	2005	2010	2015f	2020f	2025f
Population, 0-4 yrs, total, '000	4,641	5,907	7,008	8,135	9,398	10,427	11,486
Population, 5-9 yrs, total, '000	3,822	5,031	5,695	6,816	8,019	9,297	10,337
Population, 10-14 yrs, total, '000	3,249	4,344	4,901	5,625	6,750	7,961	9,248
Population, 15-19 yrs, total, '000	2,722	3,733	4,191	4,811	5,540	6,663	7,880
Population, 20-24 yrs, total, '000	2,247	3,166	3,599	4,107	4,717	5,441	6,559
Population, 25-29 yrs, total, '000	1,844	2,590	3,031	3,502	4,005	4,614	5,333
Population, 30-34 yrs, total, '000	1,510	2,066	2,429	2,917	3,393	3,900	4,507
Population, 35-39 yrs, total, '000	1,222	1,646	1,897	2,309	2,797	3,282	3,792
Population, 40-44 yrs, total, '000	1,036	1,322	1,488	1,786	2,194	2,687	3,175
Population, 45-49 yrs, total, '000	836	1,062	1,215	1,404	1,695	2,101	2,591

Population By Age Group (Tanzania 1990-2025) - Continued

	1990	2000	2005	2010	2015f	2020f	2025f
Population, 50-54 yrs, total, '000	676	891	976	1,142	1,329	1,615	2,014
Population, 55-59 yrs, total, '000	539	709	821	903	1,077	1,259	1,538
Population, 60-64 yrs, total, '000	416	555	643	755	839	1,006	1,181
Population, 65-69 yrs, total, '000	303	412	485	564	677	758	913
Population, 70-74 yrs, total, '000	200	279	339	408	476	577	650
Population, 75-79 yrs, total, '000	114	163	199	257	309	366	448
Population, 80-84 yrs, total, '000	51	76	96	141	163	200	240
Population, 85-89 yrs, total, '000	16	26	33	44	67	80	100
Population, 90-94 yrs, total, '000	3	5	7	10	14	22	27
Population, 95-99 yrs, total, '000	0	0	0	1	1	2	4
Population, 100+ yrs, total, '000	0	0	0	0	0	0	0

f = BMI forecast. Source: World Bank, UN, BMI

Table: Population By Age Group % (Tanzania 1990-2025)

	1990	2000	2005	2010	2015f	2020f	2025f
Population, 0-4 yrs, % total	18.23	17.38	17.94	17.82	17.58	16.75	15.95
Population, 5-9 yrs, % total	15.01	14.80	14.58	14.93	15.00	14.93	14.35
Population, 10-14 yrs, % total	12.76	12.78	12.55	12.32	12.62	12.79	12.84
Population, 15-19 yrs, % total	10.70	10.98	10.73	10.54	10.36	10.70	10.94
Population, 20-24 yrs, % total	8.83	9.32	9.22	9.00	8.82	8.74	9.11
Population, 25-29 yrs, % total	7.25	7.62	7.76	7.67	7.49	7.41	7.40
Population, 30-34 yrs, % total	5.93	6.08	6.22	6.39	6.35	6.26	6.26
Population, 35-39 yrs, % total	4.80	4.84	4.86	5.06	5.23	5.27	5.26
Population, 40-44 yrs, % total	4.07	3.89	3.81	3.91	4.10	4.32	4.41
Population, 45-49 yrs, % total	3.29	3.12	3.11	3.08	3.17	3.37	3.60
Population, 50-54 yrs, % total	2.66	2.62	2.50	2.50	2.49	2.59	2.80
Population, 55-59 yrs, % total	2.12	2.09	2.10	1.98	2.01	2.02	2.14
Population, 60-64 yrs, % total	1.64	1.63	1.65	1.66	1.57	1.62	1.64
Population, 65-69 yrs, % total	1.19	1.21	1.24	1.24	1.27	1.22	1.27
Population, 70-74 yrs, % total	0.79	0.82	0.87	0.89	0.89	0.93	0.90
Population, 75-79 yrs, % total	0.45	0.48	0.51	0.56	0.58	0.59	0.62
Population, 80-84 yrs, % total	0.20	0.23	0.25	0.31	0.31	0.32	0.33

Population By Age Group % (Tanzania 1990-2025) - Continued							
	1990	2000	2005	2010	2015f	2020f	2025f
Population, 85-89 yrs, % total	0.07	0.08	0.09	0.10	0.13	0.13	0.14
Population, 90-94 yrs, % total	0.01	0.02	0.02	0.02	0.03	0.04	0.04
Population, 95-99 yrs, % total	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Population, 100+ yrs, % total	0.00	0.00	0.00	0.00	0.00	0.00	0.00

f = BMI forecast. Source: World Bank, UN, BMI

Glossary

- **Pharmaceuticals, medicines, drugs:** synonym terms used interchangeably.
- **Pharmaceutical market/sales:** the sum of revenues generated by generic, patented, and over-the-counter (OTC) drugs through hospitals, retail pharmacies and other channels. Unless otherwise stated, market value is reported at final consumer price including mark-ups, taxes, etc.
- **Prescription drugs:** patented and generic drugs regulated by legislation that requires a physician's prescription before they can be sold to a patient.
- **Patented drug:** an innovative medicine granted intellectual property protection by the patent and trademark office. The patent may encompass a wide range of claims, such as active ingredient, formulation, mode of action, etc, giving the patent holder the sole right to sell the drug while the patent is in effect.
- **Generic drug:** a bioequivalent medicine that contains the same active ingredient as an originator drug. The originator drug is an innovative medicine that no longer has intellectual property protection due to patent expiry.
- **OTC drug:** a medicine that does not require a prescription to be sold to patients. Also known as non-prescription medicines.
- **Counterfeit drugs:** unregistered and illegal medicines which have not been subject to regulatory assessments to ensure quality, safety, efficacy and manufacturing standards.
- ***Similares*:** non-bioequivalent alternatives to either an originator patented drug or a generic drug. While s*imilares* and the originator/generic drug have a common indication, *similares* do not always contain the same active ingredient as an originator and invariably have a different pharmacokinetic and pharmacodynamic profile. Prevalent in select South American countries, *similares* are legal. **BMI** does not include their sales in total pharmaceutical market values.
- **Health expenditure:** the sum of the funds mobilised by government and private systems for the operation of a healthcare system, according to the WHO. It includes the purchase of healthcare services and goods by public entities such as ministries and social security institutions; or by private entities such as non-profit institutions, commercial insurances and households acting as complementary funders to the previously cited institutions or unilaterally disbursing health commodities. The revenue base of these entities varies by country and comprises multiple sources. The inclusion of this in **BMI's** forecasts necessitates taking into account the essential attributes of country-specific health accounting such as comprehensiveness, consistency, standardisation and timeliness.
- **Government health expenditure:** the sum of outlays for health maintenance, restoration or enhancement paid by government entities such as a ministry of health, other ministries, parastatal organisations and social security agencies, including transfer payments to households to offset medical care costs and extra-budgetary funds to finance healthcare provision.
- **Private health expenditure:** the sum of outlays for health by private entities such as commercial or mutual health insurance, households, non-profit institutions serving households, resident corporations and quasi-corporations not controlled by governments, according to the WHO.
- **Medical devices:** products used for diagnosis or therapy in patients. Whereas pharmaceuticals achieve their principal action by pharmacological, metabolic or immunological means, medical devices act by physical or mechanical means. Medical devices include a wide range of products, including syringes, thermometers, blood-sugar tests, prosthetic limbs, ultrasound scans and X-ray machines.

- ***Burden of Disease Database*** **(BoDD): BMI**'s disease database incorporates WHO, World Bank, IMF and BMI**'s own** data to create a proprietary dataset. BoDD data are quantified as the sum of disability-adjusted life years lost to a disease in a particular country.
- **Disability-adjusted life years (DALYs):** the sum of the years of life lost (YLL) due to premature mortality in a population and the years lost due to disability (YLD) for incident cases of the health condition. The DALY is a health gap measure that extends the concept of potential years of life lost due to premature death (PYLL) to include equivalent years of 'healthy' life lost in states of less than full health (broadly termed 'disability'). One DALY represents the loss of one year of equivalent full health.

Methodology

Pharmaceutical Expenditure Forecast Model

Historic pharmaceutical market data is collected from a range of sources, including:

- regulatory agencies;
- pharmaceutical trade associations;
- company press releases and annual reports;
- subscription information providers;
- local news sources;
- information from market research firms that is in the public domain.

Currently available data varies in confidence levels, so it is calibrated by **BMI**'s Pharmaceuticals & Healthcare analysts. In the absence of a complete time series of numbers, intermediate years are calculated from secondary sources. This 'composite' approach is used to ensure the accuracy and consistency of historic data, which is crucial for reliable forecasts.

To remove the effect of inflation, real pharmaceutical expenditure figures are then calculated by removing the annual average consumer price index (CPI).

Real per-capita pharmaceutical expenditure numbers are calculated by dividing by population figures.

A linear regression (*see Note 1 for explanation*) is then performed on five years of real per-capita pharmaceutical expenditure against real per-capita final consumption (*see Note 2*). From analysis of the top 130 economies, **BMI** has established a strong statistical relationship between pharmaceutical expenditure and final consumption expenditure (r = 0.985).

Healthcare Expenditure Forecast Model

Historic public and private healthcare expenditure data is sourced from the World Health Organization (WHO)'s Global Health Expenditure Database, which contains the National Health Accounts (*see Note 1 for methodology*).

Data is provided in nominal local currency terms.

To remove the effect of inflation, real healthcare expenditure figures are then calculated by removing the annual average CPI.

Real per-capita healthcare expenditure numbers are calculated by dividing by population figures.

A linear regression is then performed (*see Note 2 for explanation*). This is first on five years of real per-capita public healthcare expenditure against real per-capita government final consumption expenditure (*see Note 3 for definition*). This generates a 10-year forecast of future of real per-capita public healthcare expenditure figures from 'known' projected real per-capita government final consumption expenditure figures. Another linear regression is simultaneously performed on real per-capita private healthcare expenditure against real per-capita private final consumption expenditure (*see Note 4 for definition*).

To generate the nominal public healthcare spending forecast, population and CPI numbers are returned to both real per-capita public healthcare expenditure figures and real per-capita private healthcare expenditure figures.

The overall healthcare expenditure forecast is then calculated by combining public and private healthcare expenditure.

Notes On Methodology

Note 1: National Health Accounts methodology. The global health expenditure database that the WHO has maintained for the past 10 years provides internationally comparable numbers on national health expenditures. The WHO updates the data annually, taking, adjusting and estimating the numbers based on publicly available reports (national health account reports, reports from ministries of finance, central banks, national statistics offices, public expenditure information and reports from the World Bank, the IMF, etc). The estimates are sent out to the ministries of health for validation prior to publication, but users are advised that country data may still differ in terms of definitions, data collection methods, population coverage and estimation methods used. This database is the source of the health expenditure tables in the World Health Statistics Report and the WHO Global Health Observatory.

Note 2: Linear regression equation.

y = mx + b

Where y = unknown variable, m = slope of gradient, x = known variable, and b = where the line crosses the y-axis.

Note 3: Final consumption is the sum of government final consumption expenditure and private final consumption expenditure. Government final consumption expenditure is the sum of expenditure on final goods and services by the government. Included in this are public sector salaries, but it does not include transfer payments such as unemployment benefits or pensions. Private final consumption expenditure is the sum of all private consumption of goods and services within the economy, including both durable and non-durable goods. Housing purchases, however, are excluded. Government final consumption expenditure and private final consumption expenditure are the 'G' and 'C' in this equation:

GDP = C + I + G + (X - M)

Where GDP = gross domestic product, C = private final consumption expenditure, I = gross investment, G = government final consumption, X = exports, and I = imports.

Risk/Reward Index Methodology

Geographic diversification may be a favourable strategy for any multinational pharmaceutical company but it is vital that a company recognises both the rewards and the risks present in a market, in both developed and emerging pharmaceutical markets. **BMI**'s index, which provides a globally comparative and numerically based assessment of a market's attractiveness, was established to address this.

BMI's Pharmaceutical Risk/Reward Index (RRI) analyses and assesses a market's attractiveness to multinational drugmakers looking to launch innovative medicines in the country. Our approach in assessing the risk/reward balance incorporates our industry-leading Country Risk Index (CRI), drawing on our 25-year expertise in assessing political, economic and business operational risk, as well as our in-depth knowledge of the global pharmaceutical industry.

It should be emphasised that the Pharmaceutical RRIs broadly assess the rewards and the risks that a company will face when looking to launch an innovative drug in a market. For example, we do not differentiate between drugs that are a part of different therapeutic groups or whether the drug being

launched is the first to be launched in the market or will be one of the many different drugs of the same therapeutic class that has been launched in the market.

Index Overview

With regards to assessing rewards, we identify industry specific factors (such as the size of the pharmaceutical market) and country specific factors (such as the size of the pensionable population) that represent opportunities to would-be investors.

With regards to assessing risks, we identify industry specific dangers (such as approvals expediency) and those emanating from the state's political/economic profile (such as bureaucracy) that call into question the likelihood of anticipated returns being realised over the assessed time period. With regard to the economic and political assessment, only aspects most relevant to the pharmaceutical industry are incorporated in the assessment.

Table: Pharmaceutical Risk/Reward Index Indicators

	Rationale
Rewards	
Industry Rewards	
Market expenditure, USDbn	Denotes breadth of pharmaceutical market. Large markets score higher than smaller ones
Market expenditure per capita, USD	Denotes depth of pharmaceutical market. High value markets score better than low value ones
Sector value growth, % y-o-y	Denotes sector dynamism. Scores based on annual average growth over five-year forecast period
Country Rewards	
Urban-rural split	Urbanisation is used as a proxy for development of medical facilities. Predominantly rural states score lower
Pensionable population, % of total	Proportion of the population over 65 years of age. States with ageing populations tend to have higher per-capita expenditure
Population growth, 2003-2015	Fast-growing states suggest better long-term trend growth for all industries
Risks	
Industry Risks	
Patent respect	Markets with fair and enforced IP regulations score higher than those with endemic counterfeiting
Policy reinforcement	Markets with full and equitable access to modern medicines score higher than those with minimal state support
Approvals expediency	High scores awarded to markets with a swift appraisal system. Those that are weighted in favour of local industry or are corrupt score lower

Pharmaceutical Risk/Reward Index Indicators - Continued	
	Rationale
Country Risks	
Economic diligence	Evaluates the structural balance of the economy, noting issues such as reliance on single sectors for exports/growth, and past economic volatility
Policy continuity	Evaluates the risk of a sharp change in the broad direction of government policy
Lack of bureaucracy	Denotes ease of conducting business in the state
Legal diligence	Denotes the strength of legal institutions in each state. Security of investment can be a key risk in some emerging markets
Business Transparency	Denotes the risk of additional illegal costs/possibility of opacity in tendering/ business operations affecting companies' ability to compete

Source: BMI

Indicator Weightings

	Market Expenditure	Spending Per Capita	Sector Value Growth	Industry Rewards	Urban/Rural Split	Pensionable Population	Population Growth	Country Rewards	Rewards	Patent Respect	Policy Enforcement	Approvals Expediency	Industry Risks	Economic Diligence	Policy continuity	Lack of Bureaucracy	Legal Diligence	Business transparency	Country Risks	Risks	RRR
Weighting	20	12	12	44	8	8	5	21	65	7	7	7	21	3	3	3	3	2	14	35	100

Source: BMI

The weighting of each indicator reflects its relative importance to the pharmaceutical industry and the relative reward or risk that each factor poses to drug companies. The score assigned to each sub-sector (ie Industry Rewards) indicates the weighting of the sub-sector segment in the final RRI, and the score assigned to each indicator shows each indicator's influence within the sub-sector and the final RRI. All the indicators and their weightings are visible, improving the transparency of the index, allowing for the identification of regional (or group) outperformers across one indicator.

Uses For BMI's Pharmaceutical RRIs

- Strategic decision making and country/market comparisons, providing quantifiable reasons as to why one market is more attractive than another.
- Assessing the viability of new markets.
- A benchmark for internal rating systems.
- Assessing frontier markets or markets in which data collection is difficult.
- Internal presentations.

Principals Likely To Derive Benefit

- Disease manager
- Country manager
- Regional manager
- CEO and other senior executives involved in high level strategic decisions
- Business development team
- Credit risk team