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Dynamics of Pharmaceutical Quality Systems for the Export of Pharmaceuticals from India to Africa

Empower School of Health

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Dynamics of Pharmaceutical Quality Systems for the Export of Pharmaceuticals from India to Africa

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By:

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Preface

The study has been conducted under the Knowledge Partnership Programme (KPP), which is funded by the UK Department for International Development (DfID) and managed by a consortium led by IPE Global. KPP aims to support evidence generation and uptake on issues central to India's national development and its impact on global poverty, and promote sharing of Indian evidence, best practice and expertise for lesson learning on an international level. The study is strategically aligned with the KPP objectives: the role of good quality pharmaceuticals is of utmost importance in two of the KPP work streams (health, trade & investment). Given the current anxiety and public health risk, DfID is interested in probing this topic.

The study is thus a landscape analysis of finished pharmaceutical export from India to Africa. It examines the dynamics of 'quality' with respect to market size, risks and gaps, and explores possible strategies to address these risks. Some of these risks and gaps require further research and have been mentioned in the recommendations. The scope of the study is limited to finished pharmaceutical products; vaccines, medical devices, diagnostics, biologicals and AYUSH (Ayurveda, Unani, Siddha and Homeopathy) are not included in the study.

During this study a total of 60 organisations were contacted in India and three African countries (Kenya, Ghana and Ethiopia).

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We thank all the organisations who have provided vital insights for the study. A list of organisations interviewed is presented below.

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Indian Organisations
CDSCO, Ministry of Health and Family Welfare, Pharmexcil, National Institute of Biologicals, FDA-Maharashtra, USFDA India, USAID, WHO-SEARO, MSF, IDA Foundation, Missionpharma, CHAI, SEAR Pharm, Indian Pharmaceutical Alliance, Public Health Foundation of India, Drug Information Association, Jawaharlal Nehru University, Ethiopian Embassy India, Ranbaxy laboratories, Medopharm, Prime pharma, IPCA laboratories, Micro Labs, Dabur, PSI India and Regulatory Wisdom.

African Organisations
FMHACA (Ethiopia), PFSA (Ethiopia), SCMS (Ethiopia), DKT international (Ethiopia), CHAI (Ethiopia and Kenya), Caroga Pharma (Ethiopia), Yoha International (Ethiopia), USAID (Ethiopia and Kenya), IFRC (Kenya), DfID (Ethiopia, Kenya and Ghana), FDA (Ghana), MoH (Ghana), PSI (Kenya), MEDS (Kenya), Kenya AIDS Control Project, CHMP (Kenya), KEMRI/CDC (Kenya), PPB (Kenya), KEMSA (Kenya), Veteran Pharmaceuticals (Kenya), Dominion Pharmaceuticals (Kenya), NQCL (Kenya) and World Bank (Kenya).

International Organisations
PFSCM (Global), PSI (Global), UNFPA (Global), MSI (Global), Ukrainian Center for Control of Socially Dangerous Diseases and IFRC (Global).

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Background of the Project

India's pharmaceutical industry of more than 10,000 manufacturing sites[1] is estimated to generate US$ 22 billion in revenue[2], half of which is exported to more than 150 countries across the globe. Exports to countries with Stringent Regulatory Authorities (SRAs) are estimated to be nearly 50% of the overall pharmaceutical exports, while exports to African countries are estimated to be a quarter of the total pharmaceutical exports from India[3].

With these pharmaceutical exports, India has been contributing to public health globally and is often referred to as the 'pharmaceutical factory' to the world. For example, India has a dominant global market share of anti-retrovirals (80%) and paediatric ARVs (90%) in the world[4]. Some studies estimate that Indian companies account for more than 50% of the pharmaceutical market in several African countries.

India also has one of the largest numbers of high quality United States Food and Drug Administration (USFDA)/United Kingdom's Medicines and Healthcare Products Regulatory Agency (MHRA) approved manufacturing plants[5].However, at the same time, India also has thousands of manufacturing units with weak manufacturing standards.

Magnitude of the problem

There is little consensus about the definition of poor quality pharmaceuticals, and every country has its own interpretation. One of the most widely accepted is SSFFC, which according to WHO means Sub-standard/Spurious/Falsified/Falsely-labelled/Counterfeit pharmaceuticals. However, each of these terms has different definition as per different sources. Another working group, International Medical Products Anti-Counterfeiting Taskforce (IMPACT), changed SSFFC to 'Sub-standard and SFFC,' thereby distinguishing between illegally manufactured drugs (SFFC) and poor quality drugs (sub-standard)[6].

For the purpose of this study, we are examining all SSFFC drugs.

[1] CDSCO. National List of Drug Manufacturers /Loan Licenses and CoPP's Holders in the Country [Internet]. 2011. Available from: http://www.cdsco.nic.in/data_bank.htm.
[2] Department of Pharmaceuticals (India).Annual Report (2011–12) [Internet].Available from: http://pharmaceuticals.gov.in/annualreport2012.pdf.
[3]Department of Commerce (India).Import-Export Data [Internet]. 2012. Available from: http://commerce.nic.in/eidb/default.asp.
[4]Waning B, Diedrichsen E, Moon S. A lifeline to treatment: the role of Indian generic manufacturers in supplying antiretroviral medicines to developing countries [Internet]. JIAS. 2010. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2944814/.
[5]Pharmexcil (India) data (2012).
[6] WHO. FAQs about SSFFC. [Internet]. Available from: http://www.who.int/medicines/services/counterfeit/faqs/QandAsUpdateJuly11.pdf.

India

In India, several studies have been conducted to identify the magnitude of the problem, both by the Government and private institutes / NGOs. Some of the more prominent ones are listed below:

1. In 2008, a countrywide survey was conducted by the National Drug Regulatory Authority in India (CDSCO)[7]for sub-standard and spurious drugs[8]. The extent of sub-standard drugs was compared with the extent quoted in the Mashelkar committee report[9]. The Mashelkar committee report had quoted nearly 10% sub-standard drugs in the country during the period 1995-2003. This figure, as per the CDSCO study, was found to be more than 6% in 2007-2008. The spurious drugs were less than 1%
2. As per a study conducted by American Enterprise Institute for Public Policy Research[10], the failure rate of samples collected from 3 cities in India was 4.4%. The failure rate for small companies (annual revenue less than US$ 300 million) was 8.9% and for large companies (annual revenue more than US$ 300 million) was 1.3%. Another study by AEI indicates that the prevalence of substandard drugs in two major Indian cities is roughly in accordance with the estimates of Indian government, i.e. about 5–10%
3. Various media articles also showcase the poor quality of Indian produced pharmaceuticals exported globally, and especially in Africa. Refer to table 1:

Table 1: Media articles showcasing poor quality of Indian pharmaceuticals

Media	Article	Weblink
The Times of India	Fake drug racket: one more held	http://timesofindia.indiatimes.com/city/delhi/Fake-drug-racket-One-more-held/articleshow/9330771.cms
PharmExec blog	FDA findings fuels Indian crackdown on sub-standard drugs	http://blog.pharmexec.com/2011/07/27/fda-finding-fuels-indian-crackdown-on-sub-standard-drugs/
Deccan Herald	India, Africa to check fake drug menace	http://www.deccanherald.com/content/58228/india-africa-check-fake-drug.html
NDTV	India says its drugs safe despite Ranbaxy generics fraud	http://www.ndtv.com/article/india/india-says-its-drugs-safe-despite-ranbaxy-generics-fraud-374698
NDTV	Flies in Ranbaxy's sample storage room in Punjab plant, says FDA	http://www.ndtv.com/article/india/flies-in-ranbaxy-s-sample-storage-room-in-punjab-plant-says-fda-report-475608
One India news	Ghanaian firm marketing fake drugs from India	http://news.oneindia.in/2013/03/13/brand-india-hit-ghanians-marketing-fake-drugs-from-india-1170456.html
PMC journal	India agrees to help Nigeria tackle the import of fake drugs	http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1151003/
The Wall Street Journal	Africa's Malaria battle: Fake drugs pipeline undercuts progress	http://online.wsj.com/news/articles/SB10001424127887324474004578444942841728204
The Hindu	Centre rushes to defend Pharma firms	http://www.thehindu.com/business/Industry/centre-rushes-to-defend-indian-pharma-firms/article4778505.ece
BMJ Blogs	Amir Attaran and Marvin Shephard:	http://blogs.bmj.com/bmj/2013/01/24/amir-attaran-

[7] Refer to Part 1 of the report for details on CDSCO.
[8] http://cdsco.nic.in/REPORT_BOOK_13-7-10.pdf.
[9] Refer to Part 1 and 2 of the report for details on the Mashelkar committee report.
[10] Are drugs made in emerging markets are of good quality?; Bate et al; AEI;2010.

	Denialism and India's risky medicine	and-marvin-shepherd-denialism-and-indias-risky-medicine/
Foreign Policy	Roger Bate: India is flooding the world with tainted drugs, and getting away with it	http://www.foreignpolicy.com/articles/2013/10/04/bad_medicine_india_tainted_drugs

Africa

Numerous studies have been conducted to identify the magnitude of the pharmaceutical quality problem in Africa. Some of the studies are listed below:

1. A USP conducted study[11] in 2009 collected samples of anti-malarial drugs from Madagascar, Senegal and Uganda. A total of 197 samples were tested as per USP standards and 32% did not pass the tests
2. Another study on anti-malarials[12]was conducted by Bate et al in 2008 in Ghana, Kenya, Nigeria, Rwanda, Tanzania and Uganda. Out of the 210 samples tested, 35% of samples failed the TLC or dissolution tests
3. Newton et al conducted a multi-country study[13] in Burkina Faso, Chad, Cameroon, D.R. Congo, Ghana, Kenya, Nigeria, Rwanda, and Senegal in 2011 for a large set of anti-malarial drugs. Out of 59 samples tested, 59% failed in various tests
4. Kenya:
   a. A random survey by the National Quality Control Laboratories (NQCL) and the Pharmacy and Poisons Board in Kenya found that almost 30% of the drugs in Kenya were counterfeit[14]
   b. A study done on antimalarials by the PPB and DOMC [Division of Malaria Control][15]in May 2006 found that, seven of the 43 batches of drugs tested failed analysis - a failure rate of 16%. However, the frequency of sub-standard pharmaceuticals has declined over the years as shown by a study done on malaria Artemisinin Combinational Therapies (ACTs). The failure rate was at 0.8 % representing the lowest rate since the inception of post-market surveillance program in the country
   c. Study conducted by Thoithi et al in Kenya (2008), tested anti-malarial drugs for tests for uniformity of weight, API content and dissolution. A total of 41 samples were tested and 27% of the samples failed these tests
5. Ghana:
   a. According to a news article in Ghana[16], only one-tenth of the oxytocin (an important maternal health product used to reduce harmful bleeding in women after child-birth) on the market was on sale legally; all the ergometrine tablets that were sampled failed to pass the basic tests for quality. Nearly all the oxytocin products sampled were also

[11]National Academy of Sciences. Countering the Problem of Falsified and Substandard Drugs. Gillian J. Buckley and Lawrence O. Gostin. 2013.
[12]National Academy of Sciences. Countering the Problem of Falsified and Substandard Drugs. Gillian J. Buckley and Lawrence O. Gostin. 2013.
[13]National Academy of Sciences. Countering the Problem of Falsified and Substandard Drugs. Gillian J. Buckley and Lawrence O. Gostin. 2013.
[14]http://www.who.int/medicines/services/counterfeit/impact/ImpactF_S/en/index1.html.
[15]Antimalarial Medicines in Kenya.Availability, Quality and Registration status, A Baseline Study Undertaken Prior to Nationwide Distribution of Artemether-Lumefantine (AL) in Kenya. December 2007. Pharmacy & Poisons Board and Division of Malaria Control, WHO and HAI.
[16] http://edition.myjoyonline.com/pages/news/201308/111608.php.

shown to have been wrongly formulated. FDA's own survey of the market shows that more than 80% of the medicines do not have the FDA registration

b. An Indian company Bliss GVS Pharma was blacklisted by Ghana FDA for exporting fake anti-malarial products into the country and not adhering to the laws of the company[17]

6. In 2011, WHO conducted a survey of the quality of selected antimalarial medicines circulating in six countries of sub-Saharan Africa including Ethiopia, Ghana and Kenya
   a. Ethiopia[18]: A total of 102 antimalarial samples were collected from various distribution levels in Ethiopia (manufacturers, central stores, wholesalers, pharmacies, hospitals and unregulated markets). A total of 43 samples were of WHO prequalified products and rest of it were non-WHO prequalified products. It was found that 41% of the samples were unregistered suggesting the vulnerability of the market towards fake and counterfeit products
   b. Ghana[19]: A total of 175 antimalarial samples were collected from various distribution levels in Ghana (manufacturers, central stores, wholesalers, pharmacies, hospitals and unregulated markets). A total of 26 samples were of WHO prequalified products and rest of it were non-WHO prequalified products. Minilab testing was used to test the samples at the preliminary level. In Ghana, there was an overall failure rate of 8% after minilab testing. But, during the quality control laboratory testing, 39% of the samples failed. It was also found that 30% of the samples which had failed were imported; and out of these samples, 7 were imported from India
   c. Kenya[20]: A total of 154 antimalarial samples were collected from various distribution levels in Kenya (manufacturers, central stores, wholesalers, pharmacies, hospitals and unregulated markets). A total of 93 samples were of WHO prequalified products and rest of it were non-WHO prequalified products. Minilab testing was used to test the samples at the preliminary level. In Kenya, there was no failure after minilab testing. But, during the quality control laboratory testing, 5% of the samples failed collected from Kenya

[17] Accessed from Ghana FDA website; www.fdaghana.gov.gh.
[18] http://www.who.int/medicines/publications/WHO_QAMSA_report.pdf.
[19] Survey of the quality of selected antimalarial medicines circulating in six countries of sub-Saharan Africa; WHO; January 2011; available at http://www.who.int/medicines/publications/WHO_QAMSA_report.pdf.
[20] Survey of the quality of selected antimalarial medicines circulating in six countries of sub-Saharan Africa; WHO; January 2011; available at http://www.who.int/medicines/publications/WHO_QAMSA_report.pdf.

Structure of the Report

The report is divided into four parts:

Section 1: Role of Key Stakeholders in the Indian Pharmaceutical Quality System for Export

The first part of the report maps out the key stakeholders who are involved in the pharmaceutical quality systems for export.

Section 2: Dynamics of Indian Quality System for Pharmaceutical Exports with a focus on India-Africa trade (the 'supply side')

The second part of the report looks at the overall pharmaceutical market in India and its contribution to global exports. This part also discusses regulations for pharmaceutical exports and maps out all the steps in an export process from.

Section 3: Dynamics of African Regulatory Environment for Pharmaceutical Imports from India (the 'demand side')

The third part of the report focuses on African regulatory systems for the import of pharmaceuticals (especially from India). This part also presents the profile and quality assurance policies adopted by international procurement organisations that supply pharmaceutical to Africa.

Section 4: Recommendations for Promoting Exports of Quality Pharmaceuticals between India and Africa

The recommendations report synthesises the various reports including background, stakeholders, supply side and demand side, and suggests actionable steps for policy makers, donors and the industry to improve quality systems across the pharmaceutical value chain.

Methodology

The objective of the study 'Dynamics of Pharmaceutical Quality Systems for the Export of Pharmaceuticals from India to Africa' is:

'To assess the dynamics of the pharmaceutical quality systems and formulate recommendations that will promote trade of good quality pharmaceutical products from India to Africa and maximize public health impact.'

The methodology adopted to accomplish the above was a mix of primary and secondary research. Details about the primary research are presented below:

- India research phase:
  - A workshop was conducted at the start of the project with participants from various organizations to fine-tune the methodology for the research
  - Discussions were held in India with regulatory organizations (Ministries, national and state drug regulatory authorities, various other Government organisations), suppliers (manufacturers, industry associations) and other organizations (academic, forums, consulting organizations)

- Africa research phase:
  - A workshop was conducted at the start of the project with participants from various organizations to select the model countries for research in Africa and to fine-tune the methodology for the research
  - Face-to-face and telephonic interviews were conducted with procurement organizations (both public and private sector), and regulatory organizations (NDRAs, donors, international regulatory organizations) in three African countries: Ethiopia, Ghana and Kenya. The three countries in Africa were chosen based on DfID focus, pharmaceutical consumption, share of pharmaceutical imports from India, and relative capacity of the NDRA to control pharmaceutical imports (with respect to other countries in Sub-Saharan Africa, excluding South Africa)

- An online survey (using Google survey) was also conducted with global procurement organizations to understand their quality assurance procedures while conducting procurement from India

- A results review workshop was conducted at the end of the research to include feedback on the findings from both the India research phase and the Africa research phase. Recommendations from the study were also discussed with the DfID India team during this workshop

The questionnaires used for primary research are included in the overall appendix at the end of the report.

A total of 60 organisations were interviewed for this research. The respondents have been classified into 13 categories: NGOs, Donors, Procurement agents, Manufacturers, Indian

Regulatory Organizations, Public Sector Importers, Private Sector Importers, Importing Country NDRAs, Manufacturer Industry Associations, International Regulatory Organizations, Quality Control Labs, Raw Material Supplier and others. A detailed list is appended at the end of the report (please refer to the overall appendix).

Apart from this, extensive secondary research was also conducted. A comprehensive list of reports, journals, databases and news articles referred for the study are also mentioned at the end of the report (please refer to the overall appendix).

Executive Summary

As mentioned, the report is divided into four parts. Main findings from each of the parts of the report are presented below:

Section 1: Role of Key Stakeholders in the Indian Pharmaceutical Quality System for Export

The export-related pharmaceutical sector in India and the importing countries includes a large number of stakeholders. These have been segmented into four categories for the purpose of our research. The categories are:

- **Regulatory and Policy Organisations.** These are Indian and International Organisations representing various Government Ministries, National Drug Regulatory Authorities, Donors and International Regulatory Organisations with mandates ranging from public health to commerce and trade
- **Pharmaceutical Suppliers.** These include 10,000 or more manufacturers of bulk drugs, finished pharmaceutical products, export / trade organisations and industry associations.
- **Procurement Organisations.** These are buying organisations, categorised as below:
    - Public sector importers (importing for the national programs; for example, Pharmaceutical Fund and Supply Agency(PFSA), Kenya Medical Supplies Agency (KEMSA))
    - Private sector importers (largely importing for the national private sector)
    - Procurement agents (international procurement agents such as International Dispensary Association [IDA]; their national chapters such as Supply Chain Management Systems [SCMS], Ethiopia; and other national procurement agents)
    - Non-governmental organizations (NGOs) (both international ones such as International Federation of Red Cross and Red Crescent Societies (IFRC) and national ones such as Kenya AIDS Control Project)
- **Quality Control (QC) laboratories.** The fourth group tests pharmaceutical products—which includes Indian, African and other international laboratories

Section 2: Dynamics of Indian Quality System for Pharmaceutical Exports with a focus on India-Africa trade (the 'supply side')

India's pharmaceutical exports have increased exponentially to around US$ 10 billion in 2012-13 from US$ 2 billion in 2005–6. The United States is the largest market for Indian pharmaceutical exports. Nearly 49% of the Indian pharmaceutical exports by value are to the countries with Stringent Drug Regulatory Authorities (SRA). The remaining 51% are to the countries with semi-regulated Drug Regulatory Authorities, which is equally divided between exports to Africa and other continents.

The Indian pharmaceutical market is extremely skewed in terms of small to big manufacturers. It is estimated that 50 companies accounted for more than 70% of the export market and 350 companies accounted for more than 85% of the export market in 2009–2010.

The Indian government and private sector organisations have conducted various studies over the past 10 years to determine the number of pharmaceutical manufacturers and plants in India, but there are significant variations in their findings. This can be attributed to the size and the complex market structure of the industry, which includes: contract, loan and own manufacturers; bulk and finished pharmaceuticals manufacturers; generic and brand product manufacturers; manufacturer exporters; and merchant exporters.

In terms of regulation of the pharmaceutical sector, the main law that directly impacts the market is the Drug and Cosmetics (D&C) Act of 1940. The D&C Act focuses on manufacturing, local consumption and import of medicinal products in India but does not explicitly contain laws related to the export of pharmaceuticals from India. The regulatory compliance for exporting pharmaceuticals from India is as per the registration of the medicinal product in the importing country. However, the Central Drugs Standard Control Organization (CDSCO) controls Indian pharmaceutical exports by imposing guidelines, in order to ensure the maintenance of quality of the exported medicinal products and Active Pharmaceutical Ingredients (APIs). These guidelines by CDSCO and the importing country's National Drug Regulatory Authority (NDRA) prescribes several approvals (and hence, related documentation) for exporting pharmaceuticals from India. They are issued by various Indian and importing country's authorities including the CDSCO, importing country NDRA, Pharmexcil, etc. These documents can be categorised in the following way:

- Company specific: this is required at the organisational level (manufacturer and / or the exporter). This includes the manufacturing license, the Registration-cum-Membership-Certificate (RcMC) and the Import-Export Code (IEC)
- Product specific: this is required for every product intended to be exported from India, and includes the Drug Registration Certificate, Export Permit, Import License, Certificate of Pharmaceutical Product (CoPP), Drug Master File (DMF) and API Certification
- Production batch specific: this is usually required for quality purposes or to be able to trace back the product to its source. The specific documents are Certificate of Analysis (CoA), and Certificate of Origin (CoO)
- Export shipment specific: this is the last step in the process and is required for every shipment. Key documents are commercial documents and the export No Objection Certificate (NOC). Additionally, pre-shipment testing may be done by the donor, procurement agent or the importing country NDRA

Additionally, there are several internationally accepted standards and agreements that are to be followed during the export of pharmaceuticals from India. These include World Health Organization's (WHO) standards (Good Manufacturing Practices [GMP], Good Laboratory Practices [GLP], Good Distribution Practices [GDP], Good Storage Practices [GSP]); pharmacopoeia standards (Indian, European, International, US, British); Trade Related Intellectual Property Rights (TRIPS) agreement, International Conference on Harmonization (ICH) agreement etc.

Apart from the various laws and regulations provided by national and international authorities, the industry is expected to conduct its own internal audits and inspections to ensure proper quality of all its products (self-regulation).

Section 3: Dynamics of African Regulatory Environment for Pharmaceutical Imports from India (the 'demand side')

The pharmaceutical market size of Africa was estimated at approximately US$ 20 billion in 2011, while that of Sub-Saharan Africa was estimated at US$ 7.5 billion (less than 40% of the overall Africa market size). Pharmaceutical imports account for nearly 60% to 70% of the overall market size which is US$ 11.5 billion for the entire African continent and US$ 5.1 billion for Sub-Saharan Africa. European Union (EU) countries and India are the biggest exporters of pharmaceuticals to African countries; interestingly, exports to Africa from India are also routed through the EU. It was mentioned during an interview with Food, Medicines and Health Care Administration and Control Authority (FMHACA), the NDRA for Ethiopia, that a significant value of Indian pharmaceutical exports is routed from EU countries like France and Belgium to Ethiopia. Pharmaceutical export to Sub-Saharan Africa from India is nearly US$ 1.4–1.6 billion, while export to the entire continent is nearly US$ 1.8–2.0 billion.

For ensuring the quality of imports, most importers and procurement organisations conduct minimal quality assurance during the procurement process, but instead rely on their respective National Drug Regulatory Authorities (NDRAs). Unfortunately, as suggested by the WHO study, most NDRAs in Africa have limited capacity to control the quality of their imports.

In order to gain a thorough understanding of the dynamics of import-related quality assurance in Africa, in-country research was conducted in Ethiopia, Kenya and Ghana. In these countries the researchers met with procurement organisations in the public and private sector, international and national non-governmental organisations [NGOs], national drug regulatory authorities, donor funds and Quality Control laboratories. Various aspects relating to import of pharmaceuticals in these countries were discussed, with particular reference to shipments from India.

The results show that the three countries have established drug regulatory authorities, but procedures to control the pharmaceutical imports in these countries (in terms of policies, legislation and guidelines) have only recently been established (less than 10 years ago) and are still being strengthened. Also, the capacity of enforcing authorities and the implementation of the regulations remains weak.

Research and analysis also included 23 procurement organisations from the three selected African countries–Ethiopia, Ghana and Kenya–and several global organisations. The interaction was based on a procurement questionnaire and interviews.

The organisations were a mix of private sector, public sector, procurement agencies and NGOs. Total procurement value of all 23 organisations exceeded US$ 3 billion annually (for 2012). The larger organisations purchase over 1,000 products worth more than US$ 500 million annually while the smaller organisations purchase less than 10 products worth less than US$ 10 million. In terms of health commodity procurement, the organisations buy more pharmaceutical products (almost half of the procurement organisations spend more than 70% of their budget on pharmaceuticals) than non-pharmaceutical health commodities (diagnostics, devices,

supplies etc). India is the largest supplier of pharmaceuticals to these organisations, and source on average, at least 50% of their total pharmaceutical need from Indian suppliers.

Regarding the quality of imported products, different procurement organisations conduct different levels of Quality Assurance activities. While the private sector procurement organisations conduct very few Quality Assurance activities, the international procurement agents and NGOs conduct a lot more of Quality Assurance activities. Other procurement organisations such as public sector buyers, national procurement agents and NGOs, have varying levels of Quality Assurance activity.

Section 4: Recommendations for Promoting Exports of Quality Pharmaceuticals between India and Africa

Based on the analysis of the research and discussions with various key opinion leaders and the DfID team, these recommendations have been segmented into five categories based on stakeholder groups and / or DfID funding mechanisms for India and Africa:

1. Support to Indian government drug regulatory authority at the central and state levels (government to government recommendations)
2. Support to African drug regulatory authorities and African buyers of Indian pharmaceuticals (Africa-focused recommendations)
3. Support to Indian pharmaceutical suppliers and industry associations (supplier-focused recommendations)
4. Promote African Pharmaceutical Quality Control Laboratories and Testing (quality-focused recommendations)
5. Support Indian suppliers and international buyers to find and use better quality supply chain (supply chain-focused recommendations)

Each recommendation is described in detail regarding potential challenges and risks, suggested approach for implementation, potential implementing partners and impact.

List of Figures and Tables

ACRONYMS

ACTs – Artemisinin Combination Treatments
ADC – Additional Drug Controller
AEO – Authorised Economic Operator
ASSOCHAM – The Associated Chambers of Commerce and Industry of India
AMRH – African Medicines Regulatory Harmonization
ANDA – Abbreviated New Drug Application
API – Active Pharmaceutical Ingredients
ARV – Anti-Retroviral
BDMA – Bulk Drugs Manufacturers Association
BP – British Pharmacopeia
CDA – Central Drug Authority
CDL – Central Drugs Laboratory
CDTL – Central Drug Testing Laboratory
CDSCO – Central Drugs Standard Control Organization
CGPDTM – Controller General of Patents, Designs and Trade Marks
CHAI – Clinton Health Access Initiative
CL – Compulsory Licensing
CLA – Central Licensing Authority
CII – Confederations of Indian Industry
CIPI – Confederations of Indian Pharmaceutical Industry
CMIE – Centre for Monitoring Indian Economy
COMESA – Common Market for Eastern and Southern Africa
CoA – Certificate of Analysis
CoO – Certificate of Origin
CoPP – Certificate of Pharmaceutical Product
CPSUs – Central Public Sector Undertakings
CTD – Common Technical Document
DARU – Drug Analysis Research Unit
D&C Act – Drugs and Cosmetics Act
DCGI – Drugs Controller General of India
DCO – Drugs Control Officer
DfID –Department for International Development
DGHS – Directorate General of Health Services
DGFT – Directorate General of Foreign Trade
DIPP – Department of Industrial Policy and Promotion
DMF– Drug Master File
DoP – Department of Pharmaceuticals
DRA – Drug Regulatory Authority
EIC – Export Inspection Council
EDQM – European Directorate for the Quality of Medicines and Healthcare
EPC – Export Promotion Council
EOI – Expression of Interest
ERCA – Ethiopian Revenue and Customs Authority
ERP – Expert Review Panel
EU – European Union
FICCI – Federation of Indian Chambers of Commerce and Industry
FMHACA – Food, Medicines and Health Care Administration and Control Authority of Ethiopia
FPP – Finished Pharmaceutical Product
GCG – Global Cooperation Group
GCP –Good Clinical Practice

GDP – Good Distribution Practices
GFATM – Global Fund to fight against AIDS, TB, Malaria
GLP – Good Laboratory Practices
GMP – Good Manufacturing Practices
GoI – Government of India
ICH – International Conference on Harmonization
IDA – International Dispensary Association
IEC – Importer Exporter Code
IECD – Import and Export Control Department
IDMA – Indian Drugs Manufacturers Association
IFPMA – International Federation of Pharmaceutical Manufacturers & Associations
IFPW – International Federation of Pharmaceutical Wholesalers
IND – Investigational New Drug Application
IP – International Pharmacopoeia
IPA – Indian Pharmaceutical Alliance
IPC – Indian Pharmacopoeia Commission
IPR – Intellectual Property Rights
ISO – International Organization for Standardization
JICA – Japan International Cooperation Agency
JSI – John Snow Inc
KEMSA - Kenya Medical Supplies Agency
KPP – Knowledge Partnership Programme
MEDS – Mission for Essential Drugs and Supplies
MoC&F – Ministry of Chemicals and Fertilisers
MoF – Ministry of Finance
MoC&I – Ministry of Commerce and Industry
MoHFW – Ministry of Health and Family Welfare
MoU – Memorandum of Understanding
MSF – Médecins Sans Frontières
MHRA – Medicines and Healthcare products Regulatory Agency
NABL – National Accreditation Board for Testing and Calibration Laboratories
NAFDAC – Nigeria's National Agency for Food and Drug Administration and Control
NCB – Narcotics Control Bureau
NDRA – National Drug Regulatory Authority
NEPAD – New Partnership for Africa's Development
NGO – Non-governmental organisation
NIB – National Institute of Biologicals
NIPER – National Institute of Pharmaceutical Education and Research
NOC – No Objection Certificate
NPPA – National Pharmaceutical Pricing Authority
NQCL – National Quality Control Laboratory
OHA – Office of HIV/AIDS
OIP – Office of International Programs
OPPI – Organisation of Pharmaceutical Producers in India
PANDRH – Pan American Network on Drug Regulatory Harmonization
PFSA – Pharmaceutical Fund and Supply Agency
PFSCM – Partnership for Supply Chain Management
PHFI – Public Health Foundation of India
Pharmexcil – Pharmaceutical Export Promotion Council of India
PIC/S – Pharmaceutical Inspection and Cooperation Scheme
PPB – Pharmacy and Poisons Board

PPP – Public Private Partnership
PQP – Pre-qualification Programme
PR – Principal Recipients
PSU – Public Sector Undertakings
R&D – Research and Development
RCMC – Registration-cum-Membership Certificate
RDTL – Regional Drug Testing Laboratory
SCMS – Supply Chain Management Systems
SCH – Supply Chain for Health Division
SEZ – Special Economic Zone
SME – Small and Medium Enterprises
SPIC – SME Pharma Industries Confederation
SRA – Stringent Regulatory Authority
TRIPs – Trade Related Intellectual Property Rights
TWN – Third World Network
UKAS – United Kingdom Accreditation Service
USAID – United States Agency for International Development
UNFPA – United Nations Population Fund
UNICEF – United Nations Children's Fund
USAID – United States Agency for International Development
USFDA – United States Food and Drug Administration
USP – United States Pharmacopeia
WHO – World Health Organization

Section 1: Role of Key Stakeholders in the Indian Pharmaceutical Quality Systems for Export

TABLE OF CONTENTS

Introduction

The export-related pharmaceutical sector in India and the importing countries includes a large number of stakeholders. These have been segmented into four categories for the purpose of our research. The categories are:

- **Regulatory and Policy Organisations.** These are Indian and International Organisations representing various Government Ministries, National Drug Regulatory Authorities, Donors and International Regulatory Organisations with mandates ranging from public health and pharmaceutical quality to commerce and trade (figure 1).

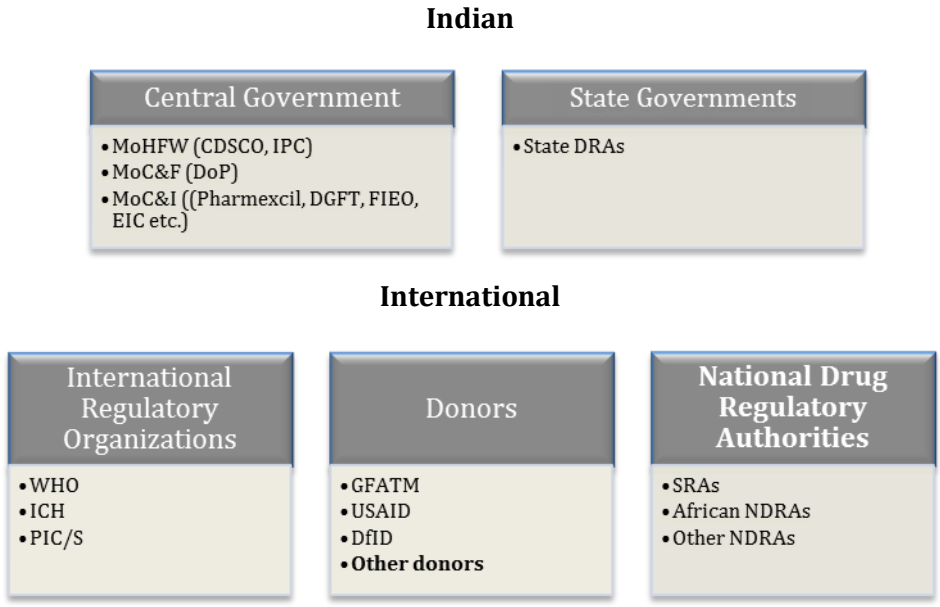


Figure 1: Regulatory and Policy Organisations

- **Pharmaceutical Suppliers.** These include 10,000 or more manufacturers of bulk drugs, finished pharmaceutical products, export / trade organisations and industry associations (figure 2).

Figure 2: Pharmaceutical Suppliers

- **Procurement Organisations.** These are buying organisations, categorised as below (figure 3):
    - Public sector importers (importing for the national programs; for example, Pharmaceutical Fund and Supply Agency(PFSA), Kenya Medical Supplies Agency (KEMSA))
    - Private sector importers (largely importing for the national private sector)

- Procurement agents (international procurement agents such as International Dispensary Association [IDA]; their national chapters such as Supply Chain Management Systems [SCMS], Ethiopia; and other national procurement agents)
- Non-governmental organizations (NGOs) (both international ones such as International Federation of Red Cross and Red Crescent Societies (IFRC) and national ones such as Kenya AIDS Control Project)

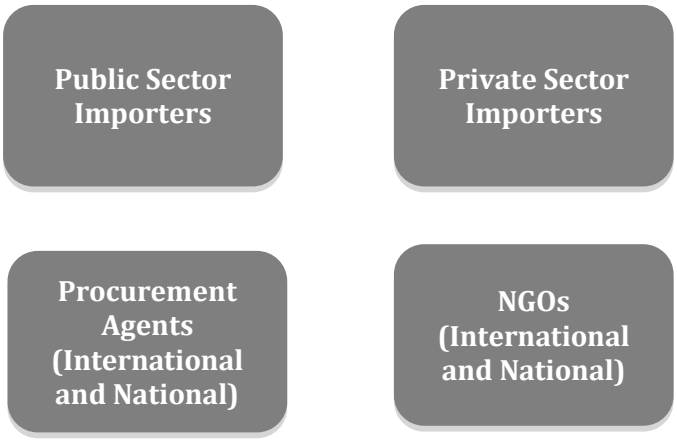


Figure 3: Procurement Organisations

- **Quality Control (QC) laboratories.** The fourth group tests pharmaceutical products—which includes Indian, African and other international laboratories (figure 4).

Figure 4: Quality Control Laboratories

The different stakeholders provide checks and balances in the pharmaceutical sector and there is sometimes tension between the various stakeholder groups and also within a stakeholder category. For example, within Regulatory and Policy Organisations, some ministries are focused on promoting exports while others are focused on quality and safety of drug exports. Also, within the Pharmaceutical Suppliers group, small manufacturers have a different viewpoint on some aspects of the regulatory policy in contrast to that of large pharmaceutical manufacturers.

This chapter on pharmaceutical sector stakeholders summarises key information about organisations that are directly linked with international trade and quality of pharmaceuticals. The overall pharmaceutical export sector ecosystem is illustrated in figure 5:

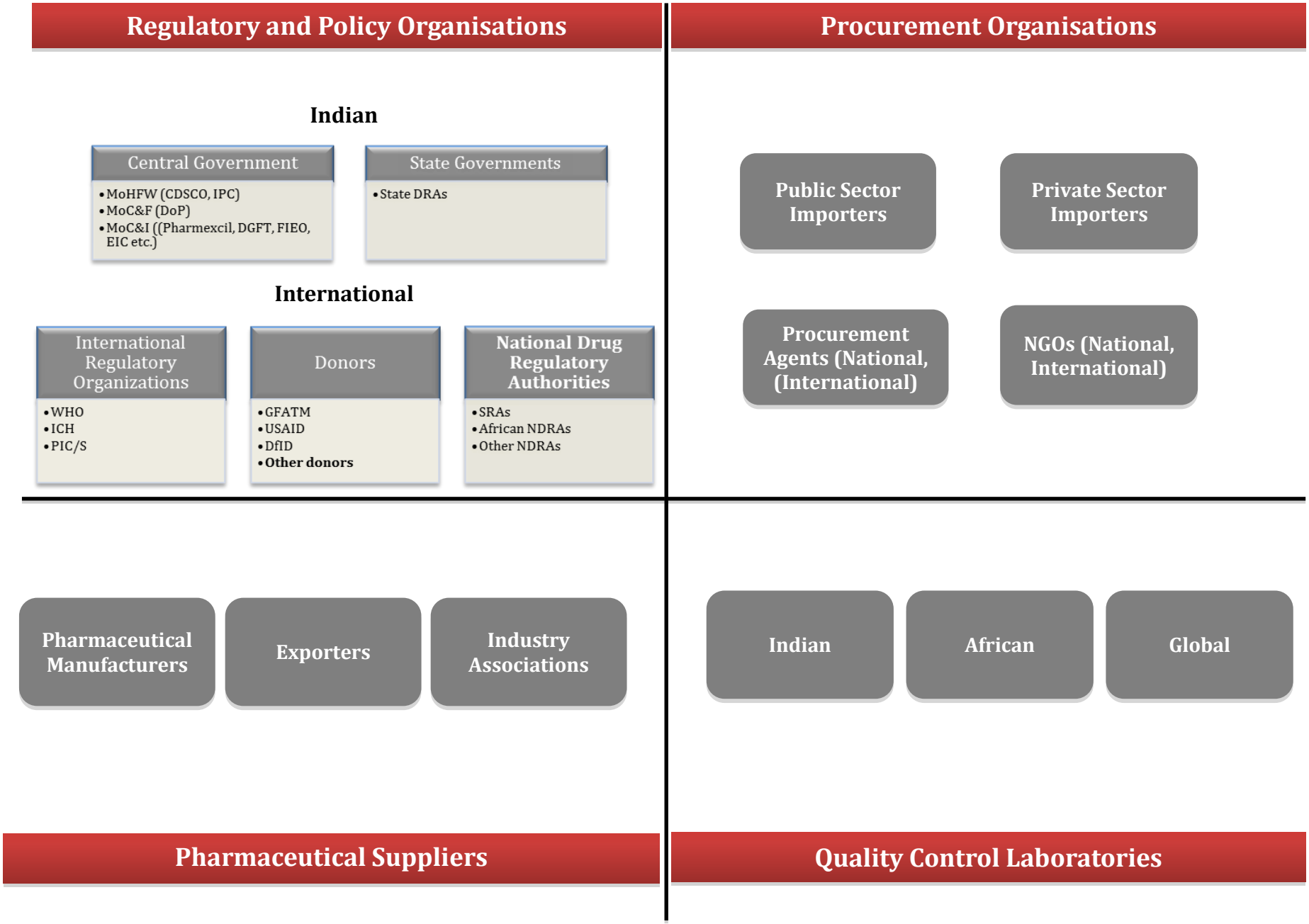


Figure 5: The Indian Pharmaceutical Sector Ecosystem with a Focus on Export and Quality

Sub-section 1. Regulatory and Policy Organisations

1. Indian Organisations

1.1. Central Government Organisations

The Government of India (GoI) has a comprehensive pharmaceutical regulatory system. At its apex are various ministries and they have different departments reporting to them.

The various central ministries relevant to the pharmaceutical sector are:

- Ministry of Health and Family Welfare (MoHFW)
- Ministry of Chemicals and Fertilisers (MoC&F)
- Ministry of Commerce and Industry (MoC&I)

The structure and role of each of the ministries is described in greater detail in the subsequent sub-sections. For the purpose of this report, the focus is on those bodies that have a bearing on the quality of pharmaceutical exports.

1.1.1. Ministry of Health and Family Welfare (MoHFW)

The **MoHFW** is responsible for governing regulations and policies in the Indian health sector. It comprises the following departments, each of which is headed by a secretary to the GoI. These are:

- Department of Health and Family Welfare
  - Directorate General of Health Services (DGHS): This office is attached to the Department of Health and Family Welfare, New Delhi, and has subordinate offices all over the country. The DGHS gives technical advice on all medical and public health matters and is involved in the implementation of various health services[21]
    - **Central Drugs Standard Control Organization (CDSCO):** This office is the pharmaceutical regulatory authority of India and operates under the DGHS. It directly coordinates pharmaceutical quality in the country (and to some extent also the quality of exports) and is therefore one of the most important organisations for the purposes of this report. Details are provided in the next sub-section
- Department of Ayush (not directly relevant to this study)
- Department of Health Research (not directly relevant to this study)
- Department of AIDS Control (not directly relevant to our study)
- Other autonomous bodies that report directly to the MoHFW are:
  - National Institute of Biologicals (NIB) (not directly relevant to this study)
  - **Indian Pharmacopoeia Commission (IPC)**

Two organisations–CDSCO and IPC are directly relevant to this study and are described in detail.

[21] DGHS. MoHFW. About Directorate General of Health Services [Internet]. Available from: http://mohfw.nic.in/index3.php?lang=1&level=0&deptid=22.

Central Drugs Standard Control Organization (CDSCO)

The **CDSCO**, headed by the Drugs Controller General of India (DCGI), is the national regulatory body of the Indian pharmaceutical sector and the central authority that regulates the quality of pharmaceuticals manufactured and marketed in the country.

CDSCO registers drugs and devices and maintains checks on the import and export of pharmaceuticals. It coordinates with state drug regulatory administrations (DRAs) and drug testing laboratories. The CDSCO also carries out pharmacovigilance activity and prohibits harmful pharmaceuticals.

In order to understand the role of the CDSCO, it is important to highlight that pharmaceutical regulatory responsibilities in India are shared by both the CDSCO (central government entity) and state governments. The details are mentioned below.

Functions of the central government[22]:

- Establshing standards for pharmaceuticals, cosmetics, diagnostics and devices
- Establshing regulatory measures and amendments to Acts and Rules
- Regulating market authorisation of new drugs
- Regulating Clinical Research in India
- Approving licenses to manufacture certain categories of pharmaceuticals such as large volume parenterals, vaccines and sera as the Central Licence Approving Authority
- Regulating the standards of imported pharmaceuticals
- Coordinating with the Drugs Technical Advisory Board and Drugs Consultative Committee
- Getting pharmaceuticals tested by Central Drug Laboratories
- Publishing the Indian Pharmacopoeia
- Other functions include:
    - Coordinating the activities of the State Drugs Control Organisations to achieve uniform administration of the Act and Policy guidance
    - Providing guidance on technical matters
    - Participating in the WHO-GMP certification scheme
    - Monitoring Adverse Drug Reactions
    - Conducting training programmes for regulatory officials and government analysts
    - Distributing quotas of narcotic drugs for use in medicinal formulations
    - Screening drug formulations available in the Indian market
    - Evaluating / Screening applications for granting No Objection Certificates for the export of unapproved/prohibited drugs

Functions of the state governments:

- Licensing of pharmaceutical manufacturing and sales establishments
- Licensing of drug testing laboratories
- Approving pharmaceutical formulations for manufacture
- Monitoring the quality of pharmaceutical and cosmetics, manufactured by units located in the state and those marketed in the state

[22] "Activities and prioritization of CDSCO".available at http://www.cdsco.nic.in/Prioritization.pdf. accessed on 23rd September 2013

- Investigating and prosecuting the contravention of legal provisions
- Performing administrative tasks
- Performing pre- and post-licensing inspections
- Recalling sub-standard drugs

The CDSCO is headquartered in New Delhi and has Zonal and Sub-Zonal offices all over the country[23]. The Deputy Drugs Controller (India) heads all the Zonal offices of the CDSCO and is given technical assistance by the Assistant Drugs Controller (India); Drugs Inspectors; Technical Officers; Senior Technical Assistants; and Technical Assistants. A group of ministerial staff including one Head Clerk and other subordinate staff support administrative functions.
Figure 6 shows the organisational chart:

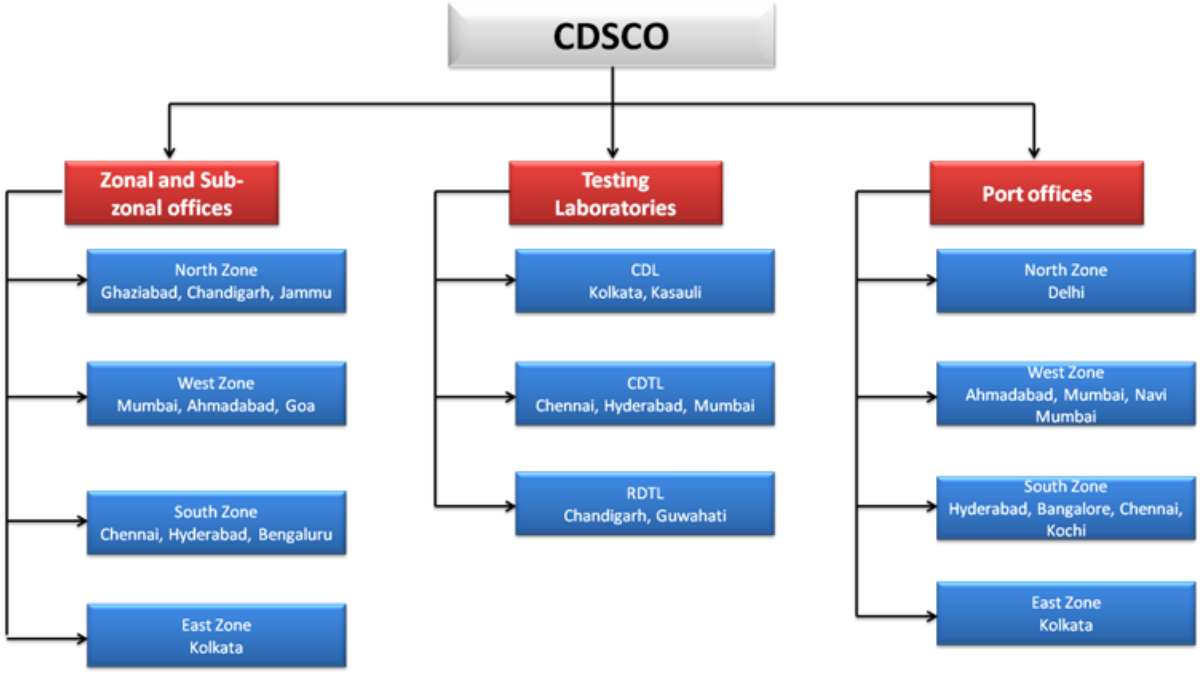


Figure 6: Organisational Chart Showing Hierarchy in CDSCO

Table 2 shows that CDSCO plans to scale up its capacity significantly and will triple its manpower once all the positions are filled.

[23]CDSCO. Initiatives, achievements and targets of CDSCO [Internet].Available from: http://www.cdsco.nic.in/CDSCO%20Initiatives%20&%20Targets%20for%20website%2013-7-2012_17-07-2012.pdf.

Table 2: Status of Human Resources[24] in CDSCO (2012)

Total sanctioned staff	Staff in position	Vacant positions	Contract staff	Number of proposed additional positions	Number of proposed drug inspectors
327	119	208	140	1,195	1,000

Activities undertaken by various offices of CDSCO are listed in table 3.

Table 3: Activities of CDSCO

CDSCO HQ Activities	Zonal and Sub-Zonal Activities
▪ Registration of pharmaceuticals ▪ Granting manufacturing licenses ▪ Approving clinical trials ▪ Granting import licenses ▪ Granting export licenses, CoPP and WHO-GMP certificates ▪ Controlling Zonal and Sub-Zonal offices ▪ Coordinating with State FDAs ▪ Conducting audits and inspections ▪ Training and conducting workshops ▪ Pharmacovigilance	▪ Issuing CoPP and GMP certificates for exports ▪ Inspecting manufacturers as guided by HQ ▪ Inspecting drug testing laboratories ▪ Conducting surprise raids ▪ Sampling and drug testing ▪ Coordinating with State FDAs of that zone ▪ Coordinating with pharmacovigilance centres in that zone ▪ Training and conducting workshops
CDL Activities	**Port office Activities**
▪ Quality Control of imported pharmaceuticals ▪ Quality Control of local manufactured pharmaceuticals ▪ Testing of bulk pharmaceuticals ▪ Assisting Zonal offices in Quality Control ▪ Sample collection ▪ Testing of vaccines, antigens, toxins and anti-toxins ▪ Education and training	**Import** ▪ Checking import licenses ▪ Checking test licenses when a pharmaceutical is imported for clinical trial ▪ Maintaining import statistics ▪ Liaising with customs offices ▪ Liaising with state FDAs ▪ Issuing permits **Export** ▪ Checking for export licenses (issued either by the DCGI or by the Narcotics Commissioner) ▪ Checking for CoA or CoPP ▪ Maintaining statistics of export ▪ Issuing permits

Analysis of the Capacity of CDSCO

The pharmaceutical regulatory regime has been assessed by Government-appointed parliamentary committees, independent expert committees, as well as by CDSCO itself. Listed below are the important assessments of CDSCO:

1. Hathi Committee, 1975—this committee reviewed the Indian pharmaceutical industry with the dual objectives of promoting its growth and regulating it more effectively. The

[24]CDSCO. Initiatives, achievements and targets of CDSCO [Internet]. Available from: http://www.cdsco.nic.in/CDSCO%20Initiatives%20&%20Targets%20for%20website%2013-7-2012_17-07-2012.pdf.

committees' recommendation that a National Drug Regulatory Authority be set up as a statutory body paved the way for the creation of the CDSCO

2. Mashelkar Committee, 2003—the GoI set up this committee to examine all aspects of India's drug regulatory infrastructure and the scale of spurious / sub-standard drugs manufactured and sold in the country. Key findings of this committee with respect to CDSCO were: inadequate infrastructure and HR; inadequate testing facilities; and the absence of a central database of registered drug products in the country

3. 59th report on the functioning of CDSCO by the Parliamentary Standing Committee (RajyaSabha), 2012—this committee observed that CDSCO's mandate was not synchronised with the role performed by drug regulators around the world and had to change. It also noted that CDSCO was doing the best it could, given its manpower and infrastructure constraints. As an example:

> *'Nine officers are in charge of processing approximately 20,000 applications; attending over 200 meetings; interfacing with 11,000 public / industry representatives; responding to 700 parliament questions; and handling around 150 court cases.'*
>
> ------- 59th report on the functioning of CDSCO by Parliamentary Standing Committee, 2012

4. Initiatives, Achievements and Targets: CDSCO (2001–2020) is an internal assessment of CDSCO's activities till 2012 and the targets to be achieved by 2020

5. The 12th five-year plan lists the proposed changes for CDSCO and its expanded budgets for strengthening CDSCO's capacity

The various reports list the strengths and weaknesses of the CDSCO in the regulation of pharmaceuticals for consumption in India and for export. The summary of strengths and weaknesses of CDSCO are presented below:

Strengths:

1. Well-established guidelines and policies for registration of pharmaceuticals in the country, import of pharmaceuticals, Good Manufacturing Practices (GMP), Good Laboratory Practices (GLP) and well-defined responsibilities of Zonal and port offices (Source: CDSCO)
2. Well-established Standard Operating Procedures for audits, inspections, random sampling during import and local manufacturing (Source: CDSCO)
3. Pan-India presence with 10 Zonal / Sub-Zonal offices and 11 port offices (Source: CDSCO)

Weaknesses:

1. Insufficient human resources at both centre and state levels. Offices are not adequately staffed to carry out routine tasks (Source: CDSCO, Mashelkar and RajyaSabha report)
2. Offices and laboratories need to be upgraded on both infrastructural and technological level (Source: CDSCO)
3. Not enough drug testing laboratories to keep pace with industry growth (Source: CDSCO)

4. Inadequate IT services with lack of e-governance and no central database (Source: Mashelkar Committee Report)
5. No uniformity in enforcement of laws and guidelines throughout the country (Source: Mashelkar Committee Report)
6. Lack of coordination between the centre and state DRAs (Source: Mashelkar Committee Report)

It is important to point out that most of these reports reference information from the Mashelkar Committee Report of 2003. This report was the last detailed assessment conducted for CDSCO and the state DRAs. Subsequently, no new study has been conducted to gauge the current capacity (or has not been made publicly available).

Efforts have also been made to amend the D&C Act, 1940 and enhance the powers of the CDSCO and DCGI, amongst other mandates. A detailed discussion about this aspect is presented in Part 2: Dynamics of Indian Quality System for Pharmaceutical Exports to Africa.

Indian Pharmacopeial Commission (IPC)

IPC is an autonomous institution of the MoHFW, GoI, and has been fully operational since 1st January 2009. IPC was established to set quality standards for pharmaceuticals in the country (based on various international standards like the United States Pharmacopeia [USP] and the British Pharmacopeia [BP]). Its basic function is to regularly update the standards of drugs commonly required for treatment of diseases prevailing in India. It publishes official documents for improving the quality of medicines by adding new medicines and updating existing monographs in the form of the Indian Pharmacopoeia. It further promotes rational use of generic medicines by publishing the National Formulary of India. More details on the pharmacopeia standards and IPC are provided in Part 2: Dynamics of Indian Quality System for Pharmaceutical Exports with a focus on India-Africa trade (the 'supply side'), Section 3.3.

1.1.2. Ministry of Chemicals and Fertilizers (MoC&F)

The **MoC&F** is the administrative unit of three departments:
- Department of Chemicals and Petrochemicals
- Department of Fertilisers
- Department of Pharmaceuticals (DoP)

The report's focus is on the DoP, which administers three bodies:
- National Pharmaceutical Pricing Authority (NPPA)
- National Institute of Pharmaceutical Education and Research (NIPER)
- Central Public Sector Undertakings (CPSUs)

Department of Pharmaceuticals (DoP)

The DoP was created on July 1, 2008, in order to provide greater focus on the growth of the pharmaceutical industry. Although not directly related to exports, DoP's focus on the domestic market has an impact on the quality of production of pharmaceuticals[25].

Vision: To make India the largest global provider of quality medicines at reasonable prices.

Mission**:**

- Develop human resources for pharmaceutical industry and drug research and development (R&D)
- Promote Public Private Partnerships (PPP) for the development of the pharmaceutical industry
- Promote pharmaceutical brand India through international cooperation
- Promote environmentally sustainable development of the pharmaceutical industry
- Enable availability, accessibility and affordability of pharmaceuticals

Key Activities:

- Developing manpower, infrastructure and skills for pharmaceutical sector
- Promoting of PPP in pharmaceutical sector
- International cooperation in pharmaceutical research
- Controlling and coordinating the NPPA
- Controlling and coordinating PSUs
- Controlling and coordinating the NIPER
- Education and technical support

1.1.3. Ministry of Commerce and Industry (MoC&I)

The **MoC&I** administer two departments:

- Department of Commerce – various departments described below
- Department of Industrial Policy and Promotion (DIPP) – not directly relevant to the research

Department of Commerce

The Department of Commerce develops, promotes and regulates India's international trade and commerce. The department's Foreign Trade Policy provides the policy and strategy framework for promoting exports and trade. The department also oversees multilateral and bilateral commercial relations, state trading, export promotion, and the development and regulation of certain export-oriented commodities and industries.

There are many autonomous bodies and subordinate offices under the Department of Commerce. The relevant ones for this report are described below in detail.

1. **Pharmaceutical Export Promotion Council of India (Pharmexcil)**

[25] DoP. Annual report, Department of Pharmaceuticals, Ministry of Chemicals and Fertilizers (2011-12)[Internet].Available from: http://pharmaceuticals.gov.in/.

There are 14 Export Promotion Council (EPCs) under the administrative control of the Department of Commerce. One of them is **Pharmexcil,** which promotes pharmaceutical exports from India.

In view of the rapid growth and potential of the Indian pharmaceutical market, the MoC&I, in 2004, set up the Pharmexcil in response to a recommendation by India's major pharmaceutical associations to create an export promotion agency, which would manage and promote pharmaceutical exports. This is the only Indian agency that has the power to issue Registration-cum-Membership Certificates (RCMCs) to pharmaceutical exporters, which allows the collection of data on pharmaceutical exports.[26] RCMC is mandatory for any Indian organisation that exports pharmaceuticals[27].

A Committee of Administration oversees the activities of the Pharmexcil with representatives from major pharmaceutical companies and laboratories, and officials from the ministry of commerce, health and chemical from the Centre and the Andhra Pradesh state government.

Pharmexcil is headquartered in Hyderabad, Andhra Pradesh, with regional offices in Delhi and Mumbai, and a branch office in Ahmedabad, Gujarat. The members of Pharmexcil include not only formulation manufacturers, but also a number of other companies involved in the export of AYUSH, bulk drugs, healthcare services such as R&D, clinical trials, etc. As of fiscal year 2011–12, Pharmexcil had 3,730 members, with merchant exporters making up the largest segment followed by manufacturers (see figure 7):

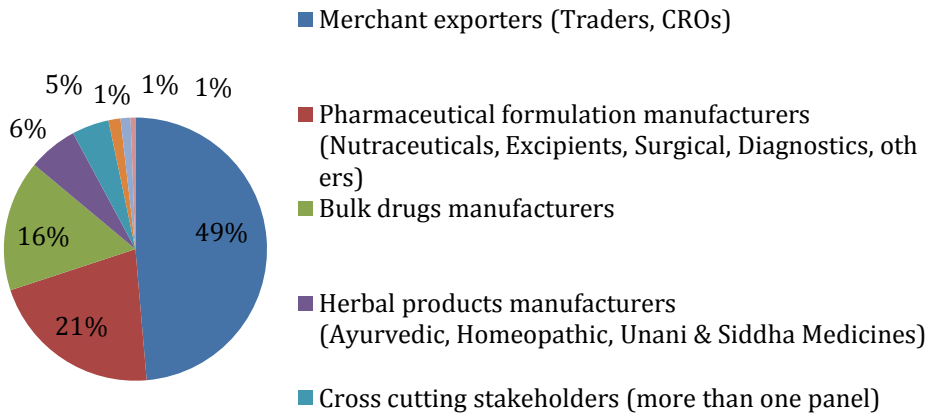


Figure 7: Pharmexcil Membership by Type of Stakeholder

The key activities of Pharmexcil are[28]:

- Issuing RCMCs
- Organising trade delegations and buyer-seller meetings within and outside India
- Issuing certificates of origin of goods manufactured in India
- Organising seminars and meetings on export-related issues
- Making suggestions to the GoI on policies related to pharmaceutical exports

[26]Pharmexcil. About Pharmexcil [Internet]. Available from: http://www.pharmexcil.org/index.php?option=com_content&view=article&id=12&Itemid=31.
[27] For more details about RCMC, please refer to Part 2: Dynamics of Indian Quality System for Pharmaceutical Exports to Africa.
[28]PHARMEXCIL. Our services [Internet]. Available from: http://www.pharmexcil.org/index.php?option=com_content&view=article&id=12&Itemid=31.

2. Export Inspection Council (EIC)

EIC was set up by the GoI in 1963 to promote responsible and quality-centric exports. It is an advisory committee to the government and takes measures to:

- Notify commodities, which will be subject to Quality Control and / or inspection prior to export
- Establish standards of quality for such notified commodities, and
- Specify the type of Quality Control and / or inspection to be applied to such commodities

EIC's activities specifically related to pharmaceutical export are:

- Certification of quality of export commodities through installation of quality assurance systems (in-process Quality Control and self-certification) in the exporting units, as well as consignment wise inspection
- Issue of certificates of origin to exporters

3. Federation of Indian Export Organisations (FIEO)

The **FIEO** is the apex body of Indian export promotion organisations, set up jointly by the MoCI and private trade industry in 1965. FIEO partners with the Indian government in export promotion. FIEO organises seminars, workshops, open house meetings, buyer-seller meetings and exchange of business delegations.

For pharmaceutical exports, FIEO (amongst several other organisations) is authorised to issue Certificate of Origin, which is required by most countries to establish proof of origin of imported goods.

4. Directorate General of Foreign Trade (DGFT)

The **DGFT**, under the MoCI, is responsible for administering the laws governing foreign trade and investment in India. It is also responsible for executing India's import and export policies.

The DGFT is the licensing authority for exporters, importers, and for the export and import business. It grants 10 digit Importer Exporter Codes (IECs), which are a primary requirement for import and export. For instance, finished pharmaceuticals fall under the ITC/HS (Indian Trade Clarification - Harmonized System) code 30.

5. Office of Development Commissioner of Special Economic Zones (SEZ)

The SEZs policy was announced in April 2000. This policy was intended to make SEZs an engine for economic growth supported by quality infrastructure and complemented by an attractive fiscal package at central and state levels, with the minimum possible regulation[29]. Among the various objectives of the SEZ scheme, is the promotion of export of goods and services. There are a few SEZs that are focused on promoting pharmaceutical production. The focus of these SEZs is to generate revenue and increase exports of pharmaceuticals.

[29] Department of Commerce, MoC&I.About SEZ [Internet]. Available from: http://www.sezindia.nic.in/about-introduction.asp.

There are 23 pharmaceutical SEZs, which have been issued formal approvals under the SEZ 2005 Act; there are also 32 biotech SEZs which have been issued formal approvals, and 21 notified biotech SEZs[30]. Further primary research is required on this topic, since there is little or no secondary information available about the number / size of operational manufacturing units in the export oriented pharmaceutical SEZs, the policies governing them and the quality of their output.

1.2. State Government Organisations

The D&C Act, 1940[31], grants Drug Regulatory Authorities (DRAs) the power to control the manufacture and sale of pharmaceuticals within their states. The principal responsibilities of state DRAs (also called State FDAs) or Licensing Authorities are:

- Granting manufacturing licenses (for a period of five years) as per standards set in schedule M of the D&C Act. Permission to manufacture specific products is part of the license.
  Additional licenses / certificates that require central or international approvals:
  - New drugs, blood products, sera and vaccines require approval from DCGI[32]
  - Manufacture of prohibited pharmaceuticals for the purpose of export—In this case, the state DRA grants manufacturing approval based on approval by CDSCO
  - Narcotic and Psychotropic substances—Approval for the manufacture of narcotics is granted by the Narcotics Control Bureau (NCB), Gwalior, India, which in turn is guided by the International Narcotics Control Board (INCB), Vienna, Austria. INCB publishes approved estimates of narcotics, which can be imported and exported. NCB issues the permits as per those estimates. Manufacture of psychotropic substances is approved by the state DRAs[33]
- Granting WHO-cGMP certification based on a joint assessment of state DRAs with CDSCO (which then allows a manufacturer to export its products)
- Ensuring quality of pharmaceuticals by:
  - Drawing random samples from manufacturing facilities to check the quality of pharmaceuticals
  - Legal / administrative actions for violations of the D&C Act and its rules
  - Testing pharmaceuticals at the National Accreditation Board for Testing and Calibration Laboratories (NABL)-accredited laboratories
- Even though the state DRAs do not have a direct role in the export process, they are involved in controlling the quality of production for domestic consumption and therefore for exports too

DRAs at the state level normally fall under the remit of their respective state health departments. In some cases, such as Delhi, the DRA is an independent or autonomous

[30] SEZs: Sectorwise distribution; [internet], available from: http://www.sezindia.nic.in/writereaddata/pdf/Sector-wise%20distribution-SEZ.pdf.
[31] Refer to Part 2: Dynamics of Indian Quality System for Pharmaceutical Exports to Africa for details of the D&C Act, 1940.
[32] SardaRohit R., LadkatNilesh B., KhodadeRavikiran B., ChandhariPallavi M., and KsatsurePramod V. The Indian Pharmaceutical Industry; Evolution of Regulatory System and Present Scenario. IRJP [Internet].2012. Available from: http://www.irjponline.com/admin/php/uploads/1164_pdf.pdf.
[33] Central Bureau of Narcotics.National Policy on Narcotic Drugs and Pyscotropic Substances [Internet]. Available from: http://cbn.nic.in/html/NationalPolicyEnglish.pdf.

organisation. Appendix 1 lists the various state / union territory DRAs. The information in the table is extracted from the CDSCO website, as well as websites of state DRAs. Unfortunately, not all the DRA websites are well populated and there is little or no information for 11 out of 35 states and union territories. Generally, state / union territories that have a large manufacturing base publish much more information. It is also important to mention that some state DRAs have a better functioning system than the others.

There are very few studies conducted to date to assess the capacity for the respective state / union territory DRAs. The only comprehensive account of the state DRAs was presented under the Mashelkar Committee Report dating back to 2003. Refer to excerpt below:

> *The Committee observed that in India, because of numerous licensing authorities (State / UT's); the implementation of drugs laws has been weak and non-uniform even after 56 years of enforcement. It is well established that the regulatory infrastructure in many States is below par, while it is functioning better in some.*
>
> ------- Mashelkar Committee Report, 2003

The main problems identified (as per the report) with the state DRAs are as follows:

- Inadequate infrastructure (also for the state labs)
- Inadequate manpower
- Variation in implementation of regulatory policies and quality of enforcement
- Lack of a database of drug products licensed by the state drug authorities

It is not clear whether (and which of) the state DRAs has been strengthened since the report was released and what their current level of performance is. A state-by-state analysis will have to be conducted in order to ascertain the strengths and weaknesses for each of the state DRA.

A major bottleneck identified by the states at the time of the study (2003) was the unavailability of sufficient funds. However, in 2012 the MoHFW allocated approximately INR 7,000 crores (which is more than GBP 700 million or USD 1,100 million) for the strengthening of CDSCO, NIB, IPC and state DRAs in the 12th five year plan (2012–17)[34], with 45% allocated to the states. The MoHFW has also proposed to share the estimated cost for upgrading the state DRAs in the ratio of 60:40 (centre: state). The status of utilisation of these funds is not known.

[34]MoHFW, India. Report of the Working Group on Drugs & Food Regulations for Formulation of 12th Five-Year Plan [Internet]. Available from: http://planningcommission.gov.in/aboutus/committee/wrkgrp12/health/WG_4drugs.pdf.

2. International Organisations

2.1. International Regulatory Organisations

2.1.1. World Health Organization (WHO)

The **WHO** is the coordinating authority for health within the United Nations. It is responsible for providing leadership and guidance on global health matters. WHO assesses and publishes global guidelines and policy documents on various health-related topics, including pharmaceuticals. Some of these guidelines and policies include WHO-GMP guidelines, WHO-GLP guidelines, WHO-GSP guidelines, WHO-GDP guidelines and WHO certification scheme for international commerce, which guides the member countries on managing pharmaceutical product quality during export and import. Details about these guidelines are mentioned in Part 2: Dynamics of Indian Quality System for Pharmaceutical Exports to Africa.

2.1.2. International Conference on Harmonisation (ICH)

The **International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use** (**ICH**), established in 1990 by the efforts of Europe, Japan and United States, is an organisation that works to harmonise the pharmaceutical regulatory environment of the world. The organisation started with regulatory bodies and pharmaceutical associations of Europe, Japan and USA but with time also included the regulatory bodies of other developed countries (Canada and Australia) and also emerging nations like Brazil, India and China. It has regional harmonisation initiatives such as Asian Pacific Economic Cooperation; Association of Southeast Asian Nation; and Gulf Cooperation Council etc.

ICH publishes various guidelines under quality, safety, efficacy and multidisciplinary topics, and encourages countries to adopt and harmonise their drug regulatory systems[35].

2.1.3. Pharmaceutical Inspection and Cooperation Scheme (PIC/S)

The Pharmaceutical Inspection Convention and Pharmaceutical Inspection Co-operation Scheme (jointly referred to as PIC/S) are two international instruments between countries and pharmaceutical inspection authorities, which provide together an active and constructive co-operation in the field of GMP. PIC/S became operational in 1995.

The purpose behind creation of PIC/S was to strengthen the inspection activities related to manufacturing of medicinal products among the participating authorities and promoting quality assurance of the inspections. It also envisaged a framework of sharing of information and experience, to conduct mutual training of inspectors and harmonise the standards and procedures for inspections and Quality Control testing[36]. Currently there are 44 PIC/S members. India is not a member of PIC/S.

[35] ICH. About ICH [Internet]. Available from: www.ich.org/.
[36] PIC/S. PIC/S Scheme [Internet]. Nov 2011. Available from: http://www.picscheme.org/publication.php?id=17.

For a regulatory authority to become a member of PIC/S, a detailed assessment is undertaken by PIC/S to verify whether the applicant has systems and the competency for an inspection system comparable to the existing members. The assessment involves examination of the NDRA's inspection, quality and licensing system, legislative requirements and inspectors training, etc. This is then followed by a field visit of the PIC/S team to observe NDRA inspectors conducting 'real-life' GMP inspections[37].

2.2. Donor Organisations

This section briefly describes three prominent donor organisations, which directly or indirectly impact the quality of exported pharmaceuticals from India; this is achieved by the donor establishing specific quality-assurance policies and guidelines for the procurement of quality-assured pharmaceuticals.

More details about the regulatory policies are discussed in Part 2: Dynamics of Indian Quality System for Pharmaceutical Exports to Africa.

2.2.1. The Global Fund to fight AIDS, TB, and Malaria (GFATM38)

GFATM is an international financing institution that fights HIV / AIDS, TB and Malaria with an approach of partnership, transparency, learning and results-oriented funding. It was established in 2002 with partnerships from Governments, civil societies and the private sector, to serve the communities living with these deadly diseases. GFATM now supports programs in more than 140 countries and has to date approved funding of US$ 102 billion.

GFATM does not manage or implement programs but relies on national experts. It works with many partners to ensure that the funding serves the men, women and children in the affected areas in a most efficient way.

Global Funds quality assurance policy can be summarized as follows:

Prequalification and selection:

a) for anti-retroviral, anti-tuberculosis and anti-malarial drugs

The pharmaceutical products procured by the Principal Recipients (PR) should be:

- Prequalified by WHO prequalification programme
- Approved by Stringent Regulatory Authority
- Recommended by use by an Expert Review Committee (ERP)

ERP process:

[37]PIC/S. Role of PIC/S [Internet]. Available from: http://www.picscheme.org/role.php.
[38]The Global Fund. About us [Internet].Available from: http://www.theglobalfund.org/en/about/.

- Upon Global Fund's request, an ERP can review the potential risk/benefits associated with an FPP and report to Global Fund
- ERP eligibility criteria:
    - the manufacturer has submitted an application of prequalification / marketing authorization to WHO or an SRA
    - the FPP is manufactured at a site which is prequalified by WHO, approved by an SRA or a regulatory authority under PIC/S

b) For all other FPPs

All other FPPs should comply with the relevant quality standards that are established by the National Drug Regulatory Authority of the country

Quality assurance activities during procurement

- PRs must ensure that the procurement should be conducted as per the WHO guidelines on model quality assurance for procurement agencies
- The PR should ensure that products are subjected to quality control activities such as quality control testing before shipment, upon receipt and during distribution. Physical examination should also be conducted at various point in time
- For any ERP approved product, Global Fund will make necessary arrangements for sampling and testing

2.2.2. United States Agency for International Development (USAID)

USAID is the US agency charged with foreign economic development; established in 1962 by US President John. F. Kennedy, USAID uses approximately 1% of US federal budget to provide assistance in various areas including health in more than 100 countries.

USAID's budget for 2014 is US$ 20 billion (for all sectors including health). In 2012, USAID's total funding to developing countries was more than US$ 15 billion. Out of this, more than US$ 5 billion was spent on health[39].

USAID's quality assurance policy can be summarized as follows:
The quality policies adopted by USAID are governed by Bureau for Global Health (GH), Office of HIV/AIDS (OHA) and Supply Chain for Health Division (SCH). The procurement process goes through the evaluation of GH/OHA/SCH which is based on:

- The manufacturer should have an approval from:
    - USFDA
    - Stringent Regulatory Authority
- The pharmaceutical can be sourced from an approved procurement agent
- The evaluation also takes into consideration the past performance of the vendor

[39] USAID. About us [Internet]. Available from: http://www.usaid.gov/.

- The products should be tested for quality assurance from an acceptable independent testing laboratory

2.2.3. Department for International Development (DfID)

DfID is a United Kingdom government office which is headed by a Cabinet Minister. It was established in 1997 with a goal 'to promote sustainable development and eliminate world poverty'. DFID's main programme areas of work are education, health, social services, water supply and sanitation, Government and civil society, economic sector (including infrastructure, production sectors and development planning), Environment protection, research and humanitarian assistance. DFID is the largest bilateral donor of development-focused research[40].

In the current fiscal year, DfID has spent approximately 20% of its funding, i.e. around GBP 1.8 billion on health, which is a top priority area for DfID. In 2012-2013, DfID had ensured 1.6 million safe births, immunised 46 million children (working with GAVI or the Global Alliance for Vaccines and Immunization) and detected and treated 1.1 million cases of TB (in association with GFATM).[41]

DfID's quality assurance policy can be summarized as follows:

DfID conducts all its procurement through third party organisations. The standards for quality are based on WHO prequalification, ERP approval, SRA approval and national drug regulatory authority approval. DfID relies on the third party organisations on quality assurance policies but monitors it regularly.

2.3. National Drug Regulatory Authorities (NDRAs)

This section describes some of the NDRAs in importing countries relevant to our research. USFDA and UK MHRA are considered Stringent Regulatory Authorities (SRAs) and have been described briefly. SRA means a regulatory authority, which is[42]:

- A member of the ICH (as specified on its website:); or
- An ICH Observer, being the European Free Trade Association as represented by Swiss Medic, Health Canada and WHO (as may be updated from time to time); or
- A regulatory authority associated with an ICH member through a legally binding mutual recognition agreement including Australia, Norway, Iceland and Liechtenstein (as may be updated from time to time)

As discussed later in the recommendation report, USFDA and UK MHRA have an important role in the implementation of the recommendations. A few African NDRAs have also been described

[40]DfID. About us [Internet]. Available from:; https://www.gov.uk/government/organisations/department-for-international-development.
[41]DfID. DfID annual report (2012–2013) [Internet]. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/208445/annual-report-accounts2013-13.pdf.
[22] The Global Fund's Quality Assurance Policy for Pharmaceutical Products (as amended and restated on 14 December 2010) [Internet]. Available from: www.theglobalfund.org/documents/psm/PSM_QAPharm_Policy_en/.

briefly. Kenya, Ghana and Ethiopia were the three sample African countries visited as part of the research and their NDRAs have been described.

2.3.1. US Food and Drugs Administration (USFDA)

> *There are around 150 manufacturers from India who are supplying most of the pharmaceuticals to USA. In fact majority of the supply is from 18 companies.*
>
> ------ Mr. AltafLal (Head, USFDA India)

The US is the largest market for Indian pharmaceutical exports—about 30% of the total Indian pharmaceutical exports by value are shipped to the US (refer to Part 2: Dynamics of Indian Quality System for Pharmaceutical Exports to Africa for more details).

The **USFDA**[43] oversees the safety and quality of pharmaceuticals consumed by the world's largest pharmaceutical market. The USFDA's Global Regulatory Operations and Policy office provides strategic leadership, executive oversight and policy direction to its efforts within and outside the US. This includes activities such as global collaboration and data sharing, the development and harmonisation of standards, field operations, compliance and enforcement. Under the umbrella of this office is the Office of International Programs (OIP), which is the single point of contact for the agency's international operations.

USFDA's office of International Programs (OIP)

The **OIP** works in collaboration with international health and regulatory authorities to advance the mission of the FDA in partnership with other FDA components, other US agencies, foreign governments and international organisations. This collaboration can take many forms such as cooperation on health and regulatory issues, exchange of public and non-public information and documents, personnel exchange and the certification of certain products exported to and from the US.

OIP's stated mission is to lead, manage and coordinate all of FDA's international activities, with the following goals:

- Effect an affirmative public health agenda in the international area
- Enhance and maximise FDA's communications and interactions globally, to ensure that they reflect the Agency's policies and the best scientific, legal and policy thinking
- Ensure that the FDA's international communications and interaction are consistent with the public health objectives of the U.S. Department of Health and Human Services
- Leverage resources with counterpart agencies to meet public health missions in the US

[43] FDA, India. Office of International Programs [Internet]. Available from: http://www.fda.gov/AboutFDA/CentersOffices/OfficeofGlobalRegulatoryOperationsandPolicy/OfficeofInternationalPrograms/ucm236581.htm.

Indian Presence and Activities

India has the second largest number of USFDA approved facilities for finished pharmaceutical products (more than 550[44]) outside USA and has emerged as a significant exporter to the US. As a result, the USFDA has opened offices in New Delhi and Mumbai, since 2008, to ensure that food and medical products exported from India to the US are safe, effective and of good quality. To achieve this, the Indian offices strive to obtain more robust information, which help officials at various FDA headquarter offices, centres and on the borders make better decisions about products from India that are either being reviewed for marketing authorisation in the US, or already being sold in the US market. The India office performs the following key activities:

- Engaging with the CDSCO for information exchange
- Surveillance of clinical trials for products marketed in the US
- Inspection of local manufacturing facilities
- Standardisation of product export from India to USA
- Managing safety-related issues
- Capacity building of Indian agencies
- Providing FDA certification to manufacturers

2.3.2. Medicines and Healthcare products Regulatory Agency (MHRA), UK

UK imports US$ 383 million[45] worth of pharmaceuticals and is the third largest importer of Indian pharmaceuticals. MHRA has provided 937 market authorisations to Indian companies and approved 141 manufacturing plants.[46] It is estimated that a significant percentage of pharmaceuticals used in UK's National Health Scheme (NHS) is of Indian origin. It is therefore not surprising that the MHRA's major activity in India is to inspect manufacturing units that are selling pharmaceuticals to the UK. Unlike the USFDA, the MHRA does not have an India office but sends experts and inspectors as required for inspections[47], meetings, seminars and workshops.

At the same time, the MHRA is working in other ways to enhance regulatory effectiveness. In order to strengthen the relationship with India, the office of the DCGI and the MHRA are in the process of signing a memorandum of understanding that will enable the two regulatory agencies to work more closely together.

2.3.3. Food, Medicine and Health Care Administration and Control Authority (FMHACA), Ethiopia

FMHACA is the national regulatory authority of Ethiopia with pharmaceutical regulation as one of its functions. It was established in 1999 after the government formulated 'Drug Administration and Control Proclamation number 176/99.' In 2009, another legislation

[44] Pharmexcil data from 2012.
[45] Department of commerce, India; 2012-13.
[46] Pharmexcil research 2012.
[47] Vijay N. MHRA not to open Indian office but prefers sending expert inspectors: Gerald Heddell. Pharmbiz [Internet]. Available from: http://pharmabiz.com/ArticleDetails.aspx?aid=74806&sid=1.

provided FMHACA with the mandate to control both import and export of food, medicines and health care products. In 2010, it was made an autonomous authority under Ministry of Health. A director with eight supportive directorates and two offices heads FMHACA.

More information is provided in Part 3: Dynamics of African Regulatory Environment for Pharmaceutical Imports from India.

2.3.4. Food and Drugs Authority (FDA), Ghana

Ghana Food and Drugs Authority was established in 1992 after formulation of the Food and Drugs Act. The authority regulates manufacture, import, export and distribution of food, pharmaceuticals, cosmetics, medical devices and household chemical substances. These departments are described in greater detail in Part 3: Dynamics of African Regulatory Environment for Pharmaceutical Imports from India.

2.3.5. Pharmacy and Poisons Board (PPB), Kenya

Pharmacy and Poisons Board is the NDRA of Kenya, which was established under the Pharmacy and Poisons Act, 1957. The board regulates the practice of pharmacy, manufacture and trade of drugs, and poisons. There are nine departments and one Quality Control laboratory under the jurisdiction of the PPB. More information is provided in the Part 3: Dynamics of African Regulatory Environment for Pharmaceutical Imports from India.

Sub-section 2. Pharmaceutical Manufacturers and Exporters

1. Pharmaceutical Manufacturers

In the past decade, India has transformed itself into a pharmaceutical production hub, with thousands of companies producing and exporting bulk and finished pharmaceuticals. Various reports highlight the vibrant pharmaceutical sector in India, but there is no agreed figure for the number of pharmaceutical facilities / manufacturers. Furthermore, the manufacturing value chain in India is rather long and complicated (see figure 8).

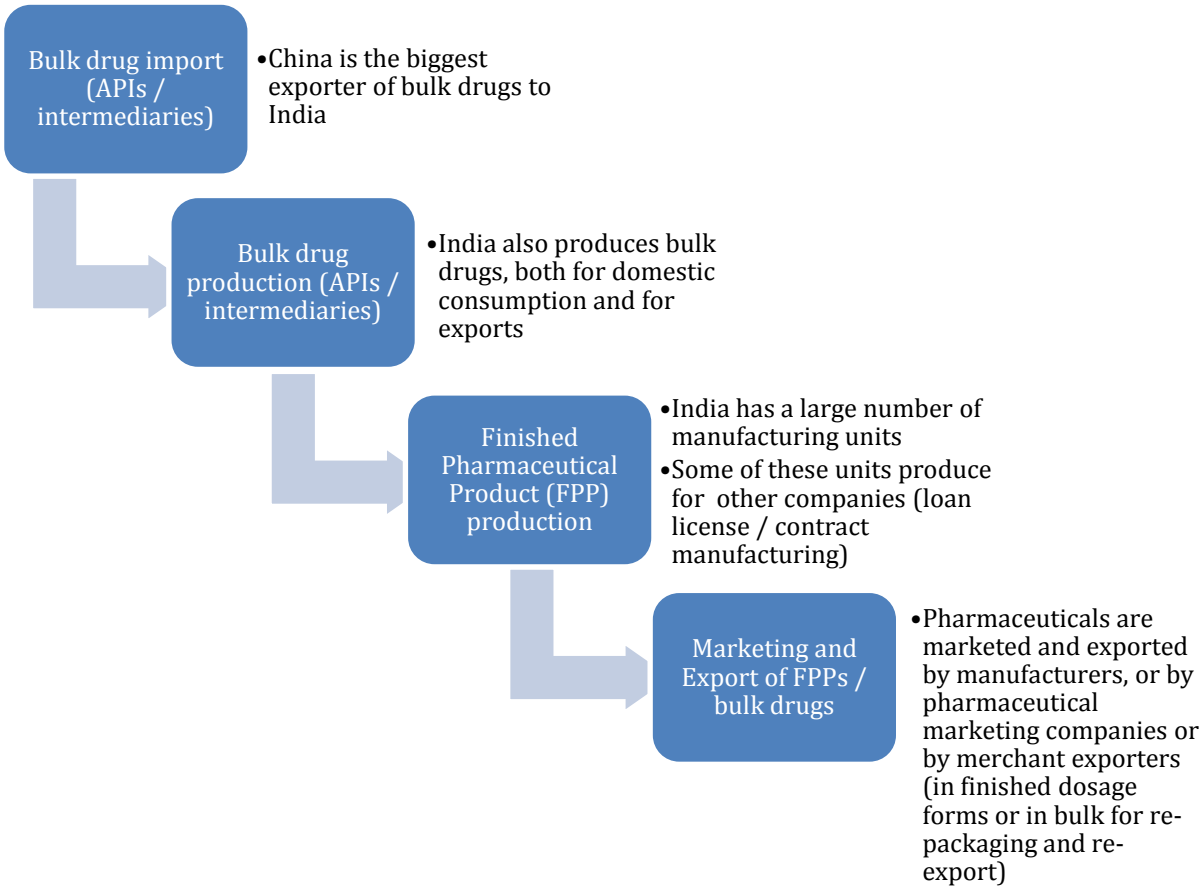


Figure 8: Pharmaceutical Manufacturing Value Chain in India

A more detailed discussion about the number and type of manufacturers is presented in Part 2: Dynamics of Indian Quality System for Pharmaceutical Exports to Africa.

2. Industry Associations

Pharmaceutical trade associations serve as an important connection between the industry and the regulators / buyers. India has various pharmaceutical trade associations; the following table summarises the size and mandate of three important organisations relevant to our research (see table 4).

Table 4: Size and Mandate of Important Industry Associations in India

	IDMA	OPPI	IPA
Total registered members (pharmaceutical companies)	607	36[48]	19
Number of Indian and MNC members	All Indian	6 Indian 30 MNCs	18 Indian 1 MNC
Share in exports	65% of India's total pharmaceutical exports[49]		Around 40% of exports[50]
Share in domestic market	75% in formulations and about 85% in bulk drugs[51]		One third of domestic market for finished pharmaceuticals
Mandate	Promoting pharmaceutical research and manufacturing, representing its members before the GoI and image-building for the Indian pharmaceutical Industry	Facilitating greater access to quality healthcare solutions; encouraging research and innovation; disseminating knowledge and sharing best practices; and contributing meaningfully in policy dialogues[52]	Research and Development (R&D); export of pharmaceuticals

These associations, as well as a few others are described in detail below.

2.1 Indian Pharmaceutical Alliance (IPA)

IPA is a Mumbai-based association of 19 Indian pharmaceutical companies. It is one of the most powerful pharmaceutical associations of India and its members control more than 50% of the Indian and export pharmaceutical market. The IPA was set up in 1999 with the cooperation of three leading pharmaceutical entrepreneurs—Dr Parvinder Singh of Ranbaxy Laboratories, Dr Anji Reddy of Dr Reddy's Laboratories and Dr Yusuf Hamied of Cipla. Their companies stood apart by virtue of size, investments in R&D and scale of exports. Their intention was to create a sub-group of like-minded national companies, which would work with the government to influence legislation and policy in the areas of intellectual property, pharmaceutical pricing, exports and R&D[53].

[48]OPPI. About OPPI [Internet]. Available from: http://www.indiaoppi.com/members.asp.
[49]IDMA. About IDMA [Internet]. Available from: http://www.idma-assn.org/about-idma.html.
[50]Satish Reddy takes over as IPA chief; [internet], available from: http://www.thehindubusinessline.com/industry-and-economy/satish-reddy-takes-over-as-ipa-chief/article5233612.ece
[51]IDMA. About IDMA [Internet]. Available from: http://www.idma-assn.org/about-idma.html.
[52]OPPI. About OPPI [Internet]. Available from: http://www.indiaoppi.com/about.asp#oppivision.
[53] Interview with Mr. DG Shah, Mumbai, July 29,2013

There were eight founding members in the IPA. Since then, it has added and lost members. Cipla, for instance, is no longer with the IPA. Ranbaxy continues to be a member in spite of being owned by Daiichi Sankyo, a Japanese company.

The criteria for IPA membership are as follows:

- Minimum 0.5% share of the Indian pharmaceutical market
- At least one approval in a regulated market
- An investment of at least 5% of revenues in R&D
- 25–30% revenue from exports
- Clear and pro-Indian pharma position on policy issues such as Intellectual Property Rights protection

Key activities of IPA include:

- Partnering with the GoI in the evolution of a patent regime that will meet the TRIPS obligations and serve national interest
- Engaging the GoI in constructive dialogue to move to price management of drugs from price control
- Working with the GoI to progressively upgrade regulatory provisions, procedures and standards for harmonisation with those of the developed markets
- Assisting government agencies in conducting a campaign against spurious pharmaceuticals

The last two are directly linked to improving quality of exports.

2.2 Indian Drug Manufacturers Association (IDMA)

The IDMA was formed in 1961 and has 607 wholly Indian large, medium and small companies as its members. IDMA has its headquarters in Mumbai and has a regional office in New Delhi. It has state boards in Gujarat, Himachal Pradesh, Uttaranchal, Haryana, Tamil Nadu and West Bengal[54]. Key activities include:

- Promoting pharmaceutical research and manufacturing
- Representing its members before the GoI
- Image building for the Indian pharmaceutical Industry

2.3 Organisation of Pharmaceutical Producers in India (OPPI)

The OPPI, based in Mumbai and established in 1965, is an association of research and innovation-driven pharmaceutical companies and is also a scientific and professional body[55]. It aims to facilitate industry and stakeholder partnership through various advisory and consultative processes in order to achieve the healthcare objectives of the nation. It is mostly comprised of foreign multinational pharmaceutical companies. OPPI is an active member of the International Federation of Pharmaceutical Manufacturers and Associations, Geneva. It has 36 ordinary members (pharmaceutical companies), 9 affiliate members and 6 associate members.

[54]IDMA. About IDMA [Internet]. Available from: http://www.idma-assn.org/aims-objectives.html.
[55] OPPI. About OPPI [Internet], Available from: http://www.indiaoppi.com/about.asp.

Key activities of OPPI include:

- Holding a continuous dialogue with stakeholders
- Knowledge creation and knowledge sharing
- Engaging in corporate-academia interaction

2.4 Other Industry Associations

There are several associations who work in the pharmaceutical industry, but are directly relevant to the study. These are mentioned below:

a. Confederations of Indian Pharmaceutical Industry (CIPI)
b. Small and Medium Enterprises Pharmaceutical Industries Confederation (SPIC)
c. Bulk Drugs Manufacturers Association (BDMA)
d. Confederation of Indian Industry (CII)
e. Federation of Indian Chambers of Commerce and Industry (FICCI)
f. The Associated Chambers of Commerce and Industry of India (ASSOCHAM)

3. Merchant Exporters

Another important category of stakeholders is the merchant exporter. These are trading companies, which market a manufacturer's product (for domestic consumption or for export). As per Pharmexcil data, there are approximately 1,800 registered merchant exporters of bulk pharmaceuticals and finished pharmaceutical products as well as Contract Research Organisations (CROs). The breakup between merchant exporters and CROs is unknown. As an exporting entity, a merchant exporter has to be registered with DGFT.

Merchant exporters are pure traders and have no direct responsibility of managing the product quality of the exported pharmaceutical product; in many cases, they are not able to furnish quality-related documents such as product registration certificates and manufacturer license (refer to Appendix 2 for a recent issue with CDSCO).

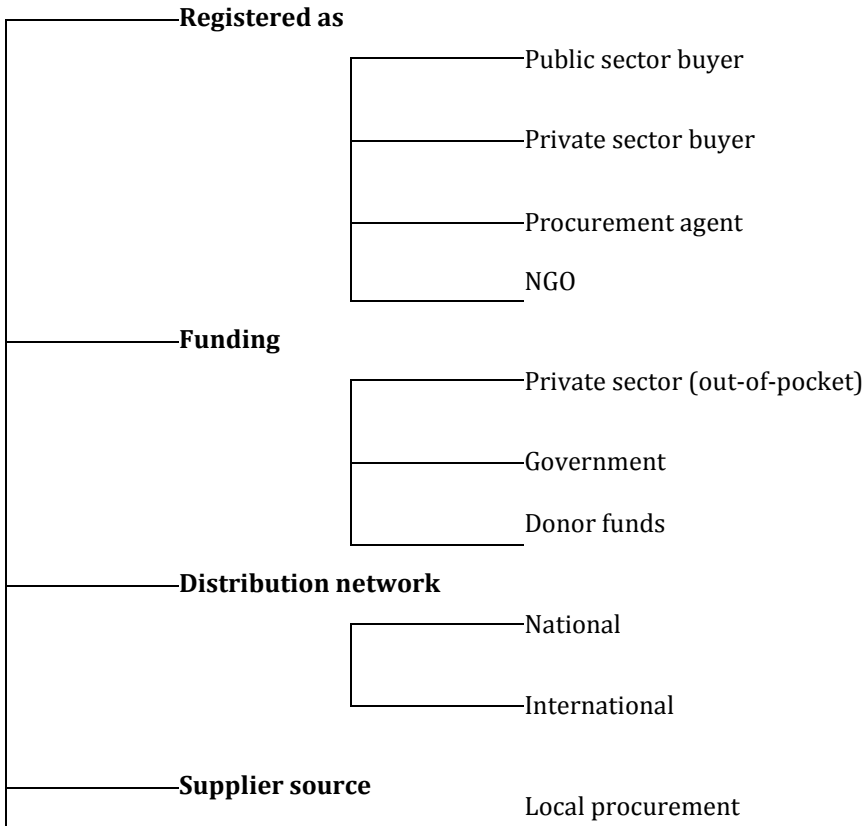
This topic requires further primary research since there is no secondary information available regarding the value / volume of pharmaceutical exports by merchant exporters, processes they follow and the quality assurance activities conducted by them.

Sub-section 3. Procurement Organisations

India exports drugs to over 150 countries[56]. The US is the largest market for Indian pharmaceutical exports—about 30% of the total Indian pharmaceutical exports by value are shipped to the US. This is more than six times the second largest importer, Russia. Pharmaceuticals are being imported by:

- Public sector buyers importing for the national needs (various Ministries under the government and public sector importers)
- Private sector buyers usually importing for national private sector needs (import agents and pharmaceutical marketing companies)
- Procurement agents (international procurement agents such as IDA, their national chapters such as Supply Chain Management Systems [SCMS], Ethiopia and other national procurement agents such as KEMSA)
- NGOs (both international ones such as UN agencies and national ones such as Kenya AIDS Control Project)

The above organisations widely differ in terms of their operations. Some of these organisations are advocacy organisations but also conduct procurement, and are hence classified as procurement organizations, such as Medicine Sans Frontier (MSF); while there are others that are pure advocacy organizations such as Oxfam, Third World Network (TWN) and are not classified as procurement organizations. A graphical representation of the scope of procurement operation for these organisations is presented in figure 9:



[56] Ministry of Commerce data, India, 2012.

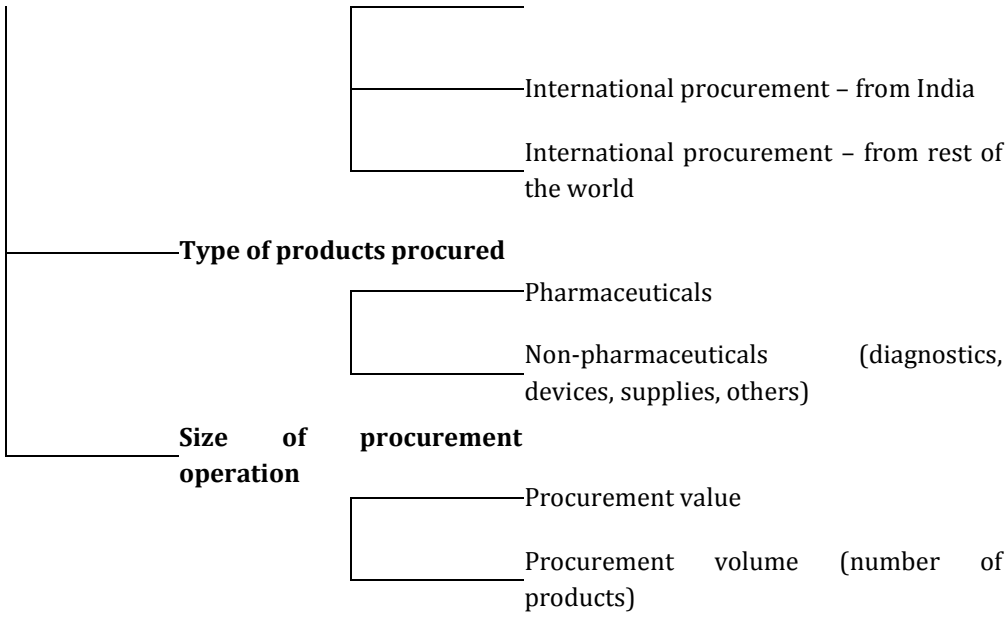


Figure 9: Scope of Operation for the Various Types of Procurement Organisations

A detailed account of the quality assurance procedures of various procurement organisations is presented in Part 3: Dynamics of African Regulatory Environment for Pharmaceutical Imports from India. A few international procurement agents and NGOs, which conduct significant procurement from India for supply to Africa (among other places), are described below:

1. International Dispensary Association Foundation (IDA)

The **IDA**, founded in 1972, is a large non-profit supplier of essential medicines and medical supplies to low- and middle-income countries. It reportedly distributes over 3,000 different medicines and medical supplies to over 100 countries.

Headquartered in Amsterdam, IDA has offices in India, China, Nigeria, Chile and the US. It also has representative agents in over 40 countries. IDA's Indian operation is based in Mumbai. India is one of the biggest suppliers to IDA's procurement programs[57].

Some key statistics made available by the IDA on the scale of its programmes are given below:

- Annual procurement of approximately US$ 200 million[58]
- Over 800 customers
- Distribution to over 100 countries worldwide
- 750 pharmaceutical products available from stock (stored and distributed from the Netherlands)

IDA's stated services are:

[57] IDA. About IDA [Internet]. Available from: http://www.idafoundation.org/about-us.html.
[58] Interview with IDA staff, September 2013.

- Warehousing and stock keeping
- Procurement services
- Quality Assurance and Quality Control
- Local assistance
- Registration support
- Assembly of special product kits
- IDA packaging and labelling
- Insurance and documentation
- Order tracking and tracing
- Distribution to any desired location

IDA procures over 60% of its supplies from India and more than 25% from China. More than 60% of its supplies are distributed to Africa and over 25% to South East Asia. IDA procures 98% of its Indian pharmaceutical supplies from approximately 50 suppliers and the balance of 2% from over 300 of them.

IDA claims that its Quality Assurance is based on risk assessment of production sites, product dossiers, past performance, and safety and efficacy of the product. To ensure that the quality standards meet agreed requirements, IDA's Quality Affairs department consisting of two specialised teams of internal and external auditors and regulatory affairs specialists, is responsible for the following tasks:

- Assessing dossiers of each product to assure safety and efficacy
- Designing comprehensive labels and leaflets meeting international standards
- Inspecting and testing batches in USFDA-approved laboratories before release

IDA's stated Quality Assurance process incorporates the following:

- Manufacturing site approval (Good Distribution Practices [GDP] certification is provided by Ministry of Health, Netherlands)
- Product approval (and registration for own label products)
- Batch control and quality monitoring
- Post release monitoring and evaluation

The formal accreditations received by IDA are as follows:

- ISO 9001:2008 certified
- GDP / GMP certified
- Accredited as European Commission Humanitarian Aid 'Humanitarian Procurement Centre'
- United States Agency for International Development (USAID) Source / Origin Waiver
- AEO[59] Certified (2012)
- QuaMed audited (2012)

2. United Nations Children's Fund (UNICEF)

[59] http://www.idafoundation.org/en/we-inform/news/single-news/news/ida-foundation-accredited-authorised-economic-operator.html.

Providing equitable access to quality medicines is one of **UNICEF's** many objectives. UNICEF procures and supplies over 5,000 products to address the needs of children. In 2011, the organisation bought US$ 2.14 billion worth of supplies such as vaccines, pharmaceuticals, nutrition products, bed nets, medical supplies and equipment from all over the world[60].

UNICEF suppliers are selected through a competitive pre-qualification process, on the basis of quality systems, organisation, and adherence to ethical standards, capacity and financial soundness. According to its stated protocol, product samples must be approved before contracts are awarded and quality checks should be made before goods are shipped or received. All supplies entering the UNICEF Copenhagen warehouse are inspected according to international standards.

In 2012, UNICEF procured US$ 558 million vaccines, pharmaceuticals and medical equipment from India.

3. Clinton Health Access Initiative (CHAI)

The **CHAI** began in 2002 as the Clinton HIV / AIDS Initiative to address the HIV / AIDS crisis in the developing world and strengthen health systems. CHAI began by working closely with governments and private stakeholders in a bid to improve markets for medicines and diagnostics; lower the cost of treatment; expand access to life-saving technologies; and create a sustainable model that could be owned and maintained by governments.

CHAI has since expanded this model to increase access to treatment for malaria, accelerate the rollout of new vaccines and lower infant mortality. On January 1, 2010, CHAI became a separate non-profit organisation. It works closely with governments and other partners in a bid to improve the management and organisation of in-country health systems and global commodity markets while addressing key health system barriers. CHAI procures a large amount of pharmaceuticals and diagnostics from India. CHAI's India office is based in New Delhi[61].

4. Missionpharma

Missionpharma was founded in 1975, to supply generic medicines, hospital equipment, medical devices and vaccines to developing and less-developed countries, mostly in Africa. The Denmark-based Missionpharma's major donors are the USAID, World Bank, International Federation of Red Cross and Red Crescent Societies and John Snow Inc (JSI). Missionpharma has offices in India, China and Africa with staff strength of 120.

Missionpharma sources about 60%, in value terms, of its procurement from India, making the country its largest supplier. China in second place, accounts for 20–30%. Approximately 80% of Missionpharma's procurement, in value terms, is shipped to African countries.

[60] UNICEF. Supplies and Logistics [Internet]. Available from: http://www.unicef.org/supply/index_procurement_services.html.
[61] CHAI. About CHAI [Internet]. Available from: http://www.clintonfoundation.org/main/our-work/by-initiative/clinton-health-access-initiative/about.html.

Missionpharma's stated preference is to source products from second–tier Indian companies. It claims to have a dedicated Quality Control team and spends about 5–6% of its procurement budget on ensuring quality of products manufactured. Some of the Quality Control steps include:

- The chosen manufacturer / supplier is required to provide basic documents like the Site Master File, GMP certificate, manufacturing license, Certificate of Pharmaceutical Product (CoPP), Certificate of Analysis (CoA) etc
- Quality Assurance / Quality Control staff audits the manufacturing unit with a focus on the manufacturing line and product-specific tests; for example, validation study, stability study and standard testing procedure for product analysis etc
- The site is either cleared for manufacturing or asked to make corrections within a certain time
    - Once approved, the manufacturers send their goods to the Mission's warehouse in Kandla, Gujarat, from where they are exported to their destination. The warehouse is ISO and GDP certified.

5. Médecins Sans Frontières (MSF)

MSF is an independent international medical aid organisation founded in 1971 in Paris by a small group of doctors and journalists. It delivers emergency aid to people affected by armed conflict, epidemics, natural or man-made disasters and exclusion from healthcare. MSF is active in more than 70 countries with branch offices in 19 countries.

MSF started its operations in India in 2001, in the state of Jammu and Kashmir. It is now present in Maharashtra, Andhra Pradesh, Chhattisgarh, Bihar, Manipur and Nagaland with its head office in New Delhi. In India, it helps provide basic healthcare during emergency situations with a focus on HIV/AIDS, malaria and kala azar. MSF focuses on India as a supplier of medicines for its worldwide operations and buys about 80% of its requirement of anti-retrovirals from India[62].

To avoid any purchase of poor quality medicines, MSF has adopted an effective Quality Control procedure, which is based on the WHO pre-qualification program. MSF is strictly against the tender process as it believes that the tender system emphasises cost over quality.

[62] MSF, India. About MSF [Internet]. Available from: http://www.msfindia.in/.

Sub-section 4. Quality Control Laboratories

1. Indian Quality Control Laboratories

Drug testing laboratories in India are either Government-owned and controlled (under CDSCO or state DRAs) or are privately owned. The overall accrediting body for Quality Control laboratories in India is the NABL. Certification is based on ISO/IEC 17025:2005 standards[63] (refer to the Appendix 3 for a sample accreditation certificate). However, not all Government owned and controlled laboratories are approved by NABL. Also, many of the privately owned laboratories are approved by the CDSCO, and some of them are approved by the WHO and recognised by the importing country NDRAs.

The number of private laboratories in India is nearly four times that of Government-owned laboratories. The growth of private laboratories has followed the growth of industry and is also concentrated in the states that are the centres of pharmaceutical manufacturing, namely Maharashtra, Andhra Pradesh, Karnataka, Tamil Nadu and Gujarat. However, the private quality testing industry is not present in similar strength in emerging centres of production such as Himachal Pradesh, Uttarakhand, and Jammu and Kashmir, suggesting a lag between investments in pharmaceutical manufacturing and quality testing infrastructure. In the 12th five year plan, the GoI (MoH) announced plans for new investment in testing infrastructure, which would include the installation of 20 mini drug testing laboratories at CDSCO's port offices and the purchase of 20 mobile drug testing vans to monitor the quality of drugs in the market[64].

Table 5 provides the state-wise distribution of public and private Quality Control laboratories.

Table 5: Public and Private Sector Pharmaceutical Quality Testing Laboratories

State	Government Laboratories		Independent Private Sector Laboratories approved by CDSCO
	Number of Central laboratories[65]	Number of state DRA laboratories[66]	Number of private laboratories[67]
Andhra Pradesh	1	2	14
Assam	1		
Bihar		1	2
Chhattisgarh		1	1
Daman and Diu			1
Delhi		1	2
Goa		1	1
Gujarat		1	13
Haryana		1	4
Himachal Pradesh	1	1	1
Jammu and Kashmir		2	
Jharkhand		1	1

[63] CDSCO. NABL Accreditation Certificate [Internet]. Available from: http://cdsco.nic.in/cert_accreditation_NABL1.pdf.
[64] Sasi A. Drug controller to fortify whistler blower scheme.The Indian Express [Internet]. Available from: http://m.indianexpress.com/news/drug-controller-to-fortify-whistle-blower-scheme/1129906/.
[65] CDSCO. Data on CDLs, CDTLs and RDTLs, and CDSCO labs [Internet]. Available from: www.cdsco.nic.in.
[66] FW. Number of state DRA labs [Internet]. Available from: http://mohfw.nic.in/searchdetails.php?lang=1&lid=1365&skey=laboratory.
[67] CDSCO. Number of CDSCO approved private labs [Internet]. Available from: www.cdsco.nic.in.

Karnataka		3	16
Kerala		1	6
Maharashtra	1	2	33
Madhya Pradesh		1	5
Meghalaya		1	
Orissa		1	1
Punjab	1	1	1
Puducherry		1	2
Rajasthan		1	3
Sikkim			1
Tamil Nadu	1	2	23
Uttarakhand			2
Uttar Pradesh		1	
Tripura		1	
West Bengal	1	1	1
	7	**29**	**135**

1.1 Central Government Laboratories (Under CDSCO)

There are seven national statutory laboratories of the GoI, established under the D&C Act 1940, overseen by CDSCO, which are responsible for the Quality Control of drugs, cosmetics and vaccines (see table 6 for function).

Key activities of these laboratories are:

- Quality Control of imported pharmaceuticals
- Quality Control of locally manufactured pharmaceuticals
- Testing of bulk pharmaceuticals
- Assisting Zonal offices in Quality Control
- Sample collection
- Education and training
- Testing of vaccines, antigens, toxins and anti-toxins

Table 6: List and Function of Central Drug Testing Laboratories

Category	Location	Function	NABL approved
Central Drug Laboratory (CDL)	Kolkata	National statutory laboratory of the GoI for Quality Control of Drug and Cosmetics	License expired
	Kasauli	Central laboratory engaged in the testing of vaccines	Approved
Central Drug Testing Laboratory (CDTL)	Chennai	Research and analysis of Drug and Cosmetics	Approved
	Hyderabad	Research and analysis of Drug and Cosmetics	Not listed in NABL
	Mumbai	Testing of imported bulk drugs and formulations, new pharmaceuticals and formulations	Not listed in NABL
Regional Drug Testing Laboratory (RDTL)	Guwahati	Research and analysis of Drug and Cosmetics for entire North Eastern State including Sikkim	Approved
	Chandigarh	Analysis of bulk pharmaceuticals and formulations for CDSCO North Zone, Ghaziabad, CDSCO Sub-Zone Chandigarh and CDSCO Sub-Zone Jammu	Not listed in NABL

1.2 State DRA-approved Laboratories

There are 29 state DRA-approved laboratories. Most states have up to three laboratories, which are used for testing of pharmaceuticals sampled from manufacturing facilities by the state DRAs. Some of these laboratories are approved by NABL / ISO, but there is no verified list mentioning which ones are approved. Refer to an excerpt from the Mashelkar Committee Report of 2003:

> *'The information collected from the States in response to a questionnaire sent by the Committee revealed serious inadequacies of the regulatory apparatus. Out of the information received from 31 States / UTs, only 17 drug-testing laboratories were found to be functioning. Out of 17 States having their testing laboratories, only 7 were reasonably equipped / staffed, while the others were poorly staffed and did not even have the bare minimum equipment.'*
>
> ------- Mashelkar Committee Report, 2003

1.3 Private Laboratories

In addition to the central drug laboratories, there are 135 private laboratories in the country conducting Quality Control tests. These laboratories are approved by CDSCO to conduct pharmaceutical analytical testing for the private sector. Out of the 135 laboratories, only 41 were found on the NABL accreditation list. Some of the laboratories listed have also been approved / recognised by organisations such as the WHO, USFDA, European Directorate for the Quality of Medicines and Healthcare (EDQM), Nigeria's National Agency for Food and Drug Administration and Control (NAFDAC), MHRA, MCC – South Africa and other DRAs (see table 7). Please refer to the Appendix 4 for a sample letter from USFDA and Appendix 5 for a sample letter from WHO.

Table 7: Number of Private Sector Quality Control Laboratories in India Approved / Recognised by Various Organisations

Approved / Recognised by	Total number of laboratories in the country (private sector)
CDSCO	135
NABL	41
WHO	3
USFDA / MHRA / EMA	4-5 (no comprehensive list available)

The key activities of these laboratories are:

- Quality Control testing of Finished Pharmaceutical Products as per pharmacopeia standards of various countries
- Quality Control testing of raw materials
- Method development
- Stability testing
- Method validation
- Research and training

2. African Quality Control Laboratories

Overall, there are few good quality drug-testing laboratories across Africa—it is estimated that the entire continent has only 6 WHO PQ laboratories[68]; additionally, the Global Fund lists 3 ISO 17025 labs[69] as being acceptable for testing funded products.

The following sections briefly describe a few QC laboratories in the three focus African countries.

2.1 Ethiopia

Quality control testing is performed at the FMHACA's Food and Medicine Quality Control laboratory. The laboratory is technically supported by organisations such as United States Pharmacopeia under Promoting the Quality of Medicines program (USP/PQM). Through the technical support of USP/PQM, the laboratory has been certified by ACLASS (by ANSI-ASQ National Accreditation Board)[70] by fulfilling the requirement of ISO 17025 in 2011 in seven tests: high performance liquid chromatography; pH; ultraviolet absorption; dissolution; Karl-Fischer titration; loss on drying; and uniformity of dosage unit. The equipment in the laboratory is sourced from Shimadzu, Perkin Elmer, Pharma test, Camag and other well-known analytical equipment manufacturers.

2.2 Kenya

Kenya is an anomaly when it comes to Quality Control laboratories—in an entire continent that has only 6-10 laboratories, Kenya has two WHO pre-qualified labs in the country:

i. Mission for Essential Medicines (MEDS)
ii. National Quality control lab (NQCL)

Kenya also has ISO-9001:2000 laboratory used for pharmaceutical product testing:

i. Drug Analysis Research Unit (DARU) at the School of Pharmacy

The Drug Registration Department was set up in 1982 and the department contracted DARU to carry out Quality Control tests of the pharmaceuticals. The NQCL was then established in 1992 through an Act of Parliament Cap 244 of the Pharmacy and Poisons Act. The NQCL is the major technical arm of the PPB, responsible for evaluating the quality of medicines and selected medical devices.

MEDS is also ISO 9001:2008 certified. DARU is ISO certified 9001:2000. NQCL is in the process of applying for ISO 17025 certification.

[68] WHO. List of Prequalified quality control laboratories. [internet] available from: http://apps.who.int/prequal/lists/PQ_QCLabsList.pdf.
[69] The Global Fund.List Of Iso 17025 Quality Control Laboratories Compliant With 'The Global Fund' QA Requirements. [internet] available from: http://theglobalfund.org/documents/psm/PSM_QCLab_List_en/.
[70] ACLASS (brand name) is an ISO/IEC 17025 certification for laboratories provided by ANSI – ASQ accreditation board company, see http://www.aclasscorp.com/.

2.3 Ghana

Ghana FDA has ISO-17025 approved laboratory which is utilized to test samples of FPP and APIs. The lab is working towards getting WHO Pre-qualification status as well.
For more details refer to Part 3: Dynamics of African Regulatory Environment for Pharmaceutical Imports from India

3. International Quality Control Laboratories (with India presence)

There are a few global Quality Control laboratories with an established presence in India, one of which is described below.

3.1. United States Pharmacopeia Laboratory[71](USP)

USP was established in India in 2005 and now has a significant presence in Hyderabad with 100,000 sq. ft. office and laboratory space and more than 140 Indian scientific and quality assurance experts.

The laboratory is ISO 9001:2008 certified and has also earned ISO 17025 accreditation. It is a one of a kind laboratory in India. USP-India supports the USP mission through:

- Collaborative laboratory testing and analysis for:
  - USP reference standards
  - MC reference material
  - USP verification programs

- Encouraging regional participation in USP's standards setting activities:
  - Standards-acquisition and testing
  - Volunteer service USP's Expert Committees and Panels

- Developing and delivering online and classroom Pharmacopoeial Education courses
- Hosting meetings and outreach opportunities:
  - Scientific meetings—held annually in India since 2011
  - Stakeholder forums in all Indian regions
  - User forums on the latest products and services

[71] USP, India. About USP, India [Internet]. Available from; http://www.usp.org/around-world/usp-sites/usp-india.

Appendix

1. List of State Drug Regulatory Authorities (DRAs) in India

Table 8: List of State DRAs

State	State Ministry / Department of Health	Website	State DRA	Website	Quality testing laboratory
Andhra Pradesh	Health Medical & family Welfare	http://health.ap.nic.in/	Drug Control Administration	http://dca.ap.nic.in/	Unknown
Arunachal Pradesh	Department of Health & Family Welfare	http://www.arunachalhealth.com	Arunanchal Pradesh Drugs Control	http://www.arunachalhealth.com/department/drugcontroladministration.php	Unknown
Assam	Department Of Health	http://www.nrhmassam.in/statehealthmission.php		No website found	Unknown
Bihar	Health Department	http://health.bih.nic.in/		No website found	Unknown
Chattisgarh	Department of Health	http://www.cghealth.nic.in/ehealth/welcome.htm		No website found	Unknown
Delhi	Delhi Government	http://delhi.gov.in	Drugs Control Department	http://delhi.gov.in/wps/wcm/connect/DOIT_Drug/doit_drug/home	15 private laboratories approved
Goa	Directorate of Health Services	http://www.dhsgoa.gov.in/	Directorate of Food & Drugs Administration	http://www.dfda.goa.gov.in/	Yes (1 laboratory under FDA)
Gujarat	Health Medical & family Welfare Department	http://www.gujhealth.gov.in	Food & Drugs Control Administration	http://dmla.guj.nic.in/mfg/myaccount/Home.aspx	Unknown
Haryana	Haryana Department of Haryana	http://haryanahealth.nic.in/	Food & Drugs Administration	http://fdaharyana.org/	Yes (1 laboratory under FDA)
Himachal Pradesh	Department of Health & Family Welfare	http://hphealth.nic.in/	Directorate Health Safety & Regulation	http://www.hp.gov.in/dhsrhp/ , http://www.hp.gov.in/dhsrhp/Drugs%20Administration.pdf	Unknown
Jammu & Kashmir	Department of Health	http://www.jkhealth.org	Controller, Drug & Food Organization	http://www.jkhealth.org/newsite/index.php?option=com_content&view=category&layout=blog&id=53&Itemid=82	Unknown

Jharkhand	Department of Health, Medical Education & Family Welfare	http://jharkhand.gov.in/New_Depts/healt/healt_fr.html	Under Department of Health, Medical Education & Family Welfare	http://jharkhand.gov.in/New_Depts/healt/Web%20Site/HEALTH%20WEBSITE/html/mainpage.html	Unknown
Karnataka	Health & Family Welfare Department	http://stg2.kar.nic.in/healthnew/	Drugs Control Department	http://202.138.105.5/drugscontrol/Pages/home.aspx	Yes (under DRA)
Kerala	Health & Family Welfare Department	http://www.kerala.gov.in/index.php?option=com_content&view=category&layout=blog&id=65&Itemid=324	Drugs Control Department	http://www.kerala.gov.in/index.php?option=com_content&view=category&layout=blog&id=63&Itemid=307	Yes (under DRA)
Madhya Pradesh	Department of Public Health & Family Welfare	http://www.health.mp.gov.in/	Food & Drugs Administration	http://cfdamp.nic.in/	Yes
Maharashtra	Directorate of Health Services	http://www.maha-arogya.gov.in/	Food & Drug Administration	http://www.fda-mah.com/	Yes
Manipur	Ministry of Health & Family Welfare	http://www.mohfw.nic.in/	Directorate of Health Services	http://www.manipurhealthdirectorate.in/	Unknown
Meghalaya	Department of Health & Family Welfare	http://meghealth.gov.in/		http://meghealth.nic.in/drugs.html	Yes
Mizoram	Health & Family Welfare Department	http://health.mizoram.gov.in/		No website found	Unknown
Nagaland	Department of Health & Family Welfare	http://nagahealth.nic.in/	Drug Control	http://nagahealth.nic.in/drug%20control.htm	Unknown
Odisha	Department of Health & Family Welfare	http://203.193.146.66/hfw/index.html	Directorate of Drugs Control Administration	http://203.193.146.66/hfw/Drug_Control_Administration.asp?GL=1 , http://www.orissa.gov.in/health_portal/directorate/DDCA/DDCA.html	Unknown
Punjab	Department of Health & Family Welfare	http://pbhealth.gov.in/	Food & Drug Administration	http://www.punjabhealth.co.in/downloads.aspx?ID=VQW1dQaf+bE=&&Header=9OTj2ZKQ/d6Pu0/yc+BORPYAS+kWJq9l63sng7EkMSENnSi/WmEIqw==	Unknown
Rajasthan	Department of Medical, Health & Family Welfare	http://www.rajswasthya.nic.in/	Drug Control Organization	http://www.rajswasthya.nic.in/DrugControlUnion.htm	Unknown

Sikkim	Department of Health & Family Welfare	www.sikkimhealth.org/		No website found	Unknown
Tamil Nadu	Health & Family Welfare Department	http://www.tnhealth.org/	Tamil Nadu Food Safety & Drugs Administration Department	http://www.tnhealth.org/drugcontrol/	Yes
Tripura	Department of Health & Family Welfare	http://tripurahealthservices.in/, http://tripura.nic.in/tspcb/health.htm		No website found	Unknown
Uttar Pradesh	Department of Medical, Health & Family Welfare	http://uphealth.up.nic.in/	Food Safety & Drug Administration	http://fda.up.nic.in/blood_bank.htm	Yes (5 labs)
Uttarakhand	Department of Medical, Health & Family Welfare	http://health.uk.gov.in/	Under Department of Medical Health & Family Welfare	http://health.uk.gov.in/pages/display/100-drug-control-administration	
West Bengal	Department of Health & Family Welfare	http://www.wbhealth.gov.in/	Directorate of Drugs Control	http://www.wbhealth.gov.in/site2/index.html	Unknown
Andaman & Nicobar	Directorate of Health Services	http://www.and.nic.in/C_charter/health/dhs/index.html		No website found	Unknown
Chandigarh	Department of Health & Family Welfare	http://pbhealth.gov.in/	Food & Drug Administration		Unknown
Dadar& Nagar Haveli	Department of Medical & Health services	http://dnh.nic.in/Departments.html		No website found	Unknown
Pondicherry	Department of Health & Family Welfare Services	http://health.puducherry.gov.in/	Food & Drug Administration	http://health.puducherry.gov.in/Programmes/Food%20&%20Drug%20Administration.htm	Yes
Lakshadweep	Department of Medical & Health services	http://lakdirhealth.nic.in/		No website found	Unknown
Daman & Diu	Directorate of Medical & Health Services	http://www.daman.nic.in/websites/directorate_of_health/daman/index.asp		No website found	Unknown

2. Merchant Exporters' Recent Issue with CDSCO

Merchant exporters upset over ADC's insistence on documents at JNPT to clear cargo

Ramesh Shankar, Mumbai
Thursday, March 22, 2012, 08:00 Hrs [IST]

A large number of merchant exporters using Jawaharlal Nehru Port (JNPT) in Mumbai are finding it difficult to export their products through JNPT as the new assistant drug controller (ADC) posted at the JNPT is insisting on several documents to clear the consignments which the exporters say are unrealistic and impossible.

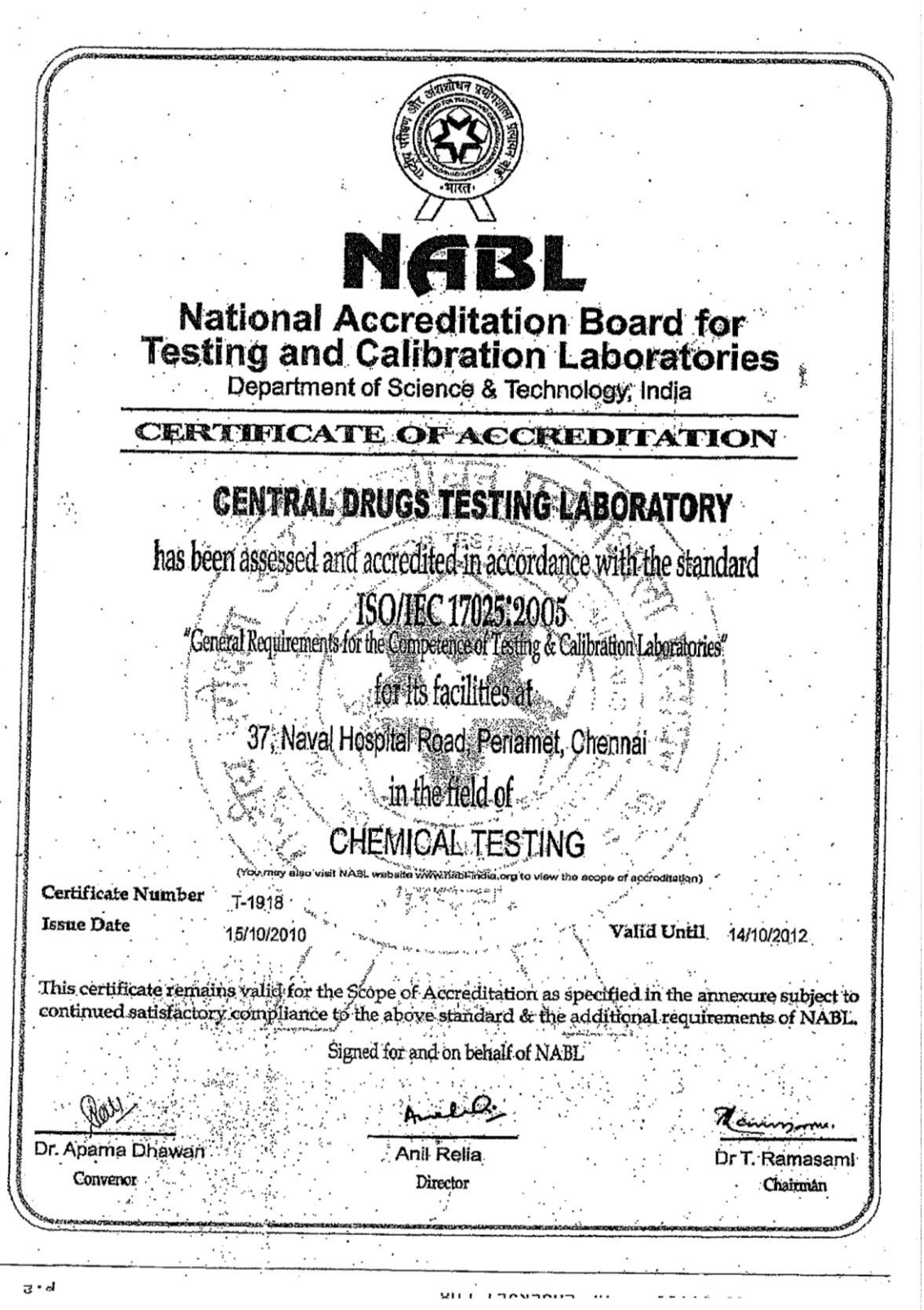
The affected merchant exporters in Mumbai said that the ADC Nageshwar Rao posted at the JNPT is insisting on documents like manufacturing license, product registration certificate, certificate of analysis, list of approved products, DCGI permission for locally procured goods, vitamins, etc. which are impossible to submit as these certificates can be submitted only by the manufacturers and the merchant exporters in most of the cases are not manufacturers.

The merchant exporters said that due to the unfriendly attitude of the ADC, several shipments are held up with the clearing and handling agents (CHA) resulting in demurrage, delay, containers held up after stuffing, etc. In the absence of these newly required documents, the shipment is rejected, incurring huge losses to the exporters.

They said that usually the merchant exporters support their shipments with the stipulated documents like purchase invoice, DL Nos and samples required for ADC clearance through CHA. But during the last some months, shipments have been delayed and rejected at the JNPT by the ADC for want of documents which, the merchant exporters say, is not practicable as the documents like manufacturing license, product registration certificate, certificate of analysis, list of approved products, etc are issued by the regulatory authorities to the manufacturers.

Exporters said that they will soon meet the DCGI to find an amicable solution to the issue.

3. NABL certificate for CDTL, Chennai



NABL

National Accreditation Board for Testing and Calibration Laboratories

Department of Science & Technology, India

CERTIFICATE OF ACCREDITATION

CENTRAL DRUGS TESTING LABORATORY

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2005

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

37, Naval Hospital Road, Periamet, Chennai

in the field of

CHEMICAL TESTING

(You may also visit NABL website www.nabl-india.org to view the scope of accreditation)

Certificate Number T-1918

Issue Date 15/10/2010 Valid Until 14/10/2012

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the additional requirements of NABL.

Signed for and on behalf of NABL

Dr. Aparna Dhawan
Convenor

Anil Relia
Director

Dr T. Ramasami
Chairman

4. Sample USFDA Letter to Quality Control Laboratories

DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service
Food and Drug Administration

CENTER FOR DRUG EVALUATION AND RESEARCH

Office of Manufacturing and Product Quality
Division International Drug Quality
International Compliance Branch
10903 New Hampshire Avenue
Building #51, Room 2258
Silver Spring, MD 20993

TELEPHONE: (301) 796-0483
FAX: (301) 847-8742

September 7, 2012

Reference: FEI 3004544153

We have completed our review of the Establishment Inspection Report (EIR) for the inspection conducted at your contract testing laboratory in Sanathnagar, Hyderabad, India by Investigator Heriberto Negron-Rivera during the period of September 26 to 28, 2011. An FDA-483, Notice of Inspectional Observations was issued at the conclusion of the inspection.

We have also reviewed your company's responses dated October 19, 2011, and September 1, 2012, with supportive documentation. Based on the profile class covered during the inspection, we are classifying your facility as acceptable. This letter is not intended as an endorsement or certification of the facility. It remains your responsibility to assure continued compliance with current good manufacturing practice (CGMP).

Please be advised that all manufacturers must register annually as required by 21 C.F.R. § 207.40. Information on how to register is available at http://www.fda.gov/cder/drls/registration_listing.htm

Additionally, we enclose a copy of the establishment inspection report (EIR). Releasing this EIR to you is part of FDA's effort to make its regulatory process and activities more transparent to the regulated industry. It is being provided to you for information purposes only and may reflect some redactions made by the Agency in accordance with the Freedom of Information Act and 21 C.F.R. Part 20. Copies provided to other requestors may have additional redactions of trade secret and confidential commercial information.

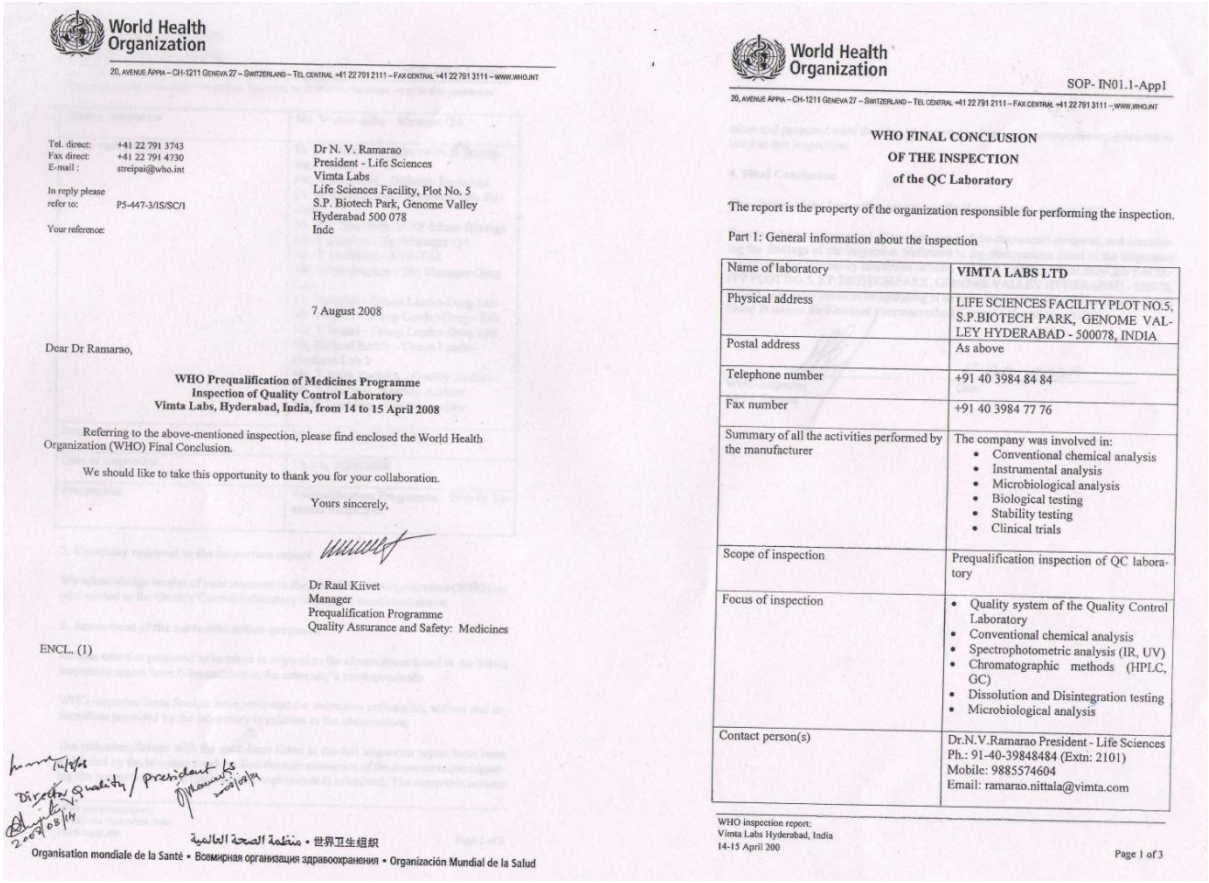
If you have any questions regarding this letter, you may contact me at the above address or number.

Sincerely,

Allison A. Aldridge, Ph.D.
Compliance Officer
Division of International Drug Quality

Enclosure: EIR

5. Sample WHO prequalification letter



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Tel. direct: +41 22 791 3743
Fax direct: +41 22 791 4730
E-mail: streipai@who.int

In reply please refer to: PS-447-3/IS/SC/I

Your reference:

Dr N. V. Ramarao
President - Life Sciences
Vimta Labs
Life Sciences Facility, Plot No. 5
S.P. Biotech Park, Genome Valley
Hyderabad 500 078
Indc

7 August 2008

Dear Dr Ramarao,

WHO Prequalification of Medicines Programme
Inspection of Quality Control Laboratory
Vimta Labs, Hyderabad, India, from 14 to 15 April 2008

Referring to the above-mentioned inspection, please find enclosed the World Health Organization (WHO) Final Conclusion.

We should like to take this opportunity to thank you for your collaboration.

Yours sincerely,

Dr Raul Kiivet
Manager
Prequalification Programme
Quality Assurance and Safety: Medicines

ENCL. (1)

منظمة الصحة العالمية • 世界卫生组织
Organisation mondiale de la Santé • Всемирная организация здравоохранения • Organización Mundial de la Salud

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WHO FINAL CONCLUSION
OF THE INSPECTION
of the QC Laboratory

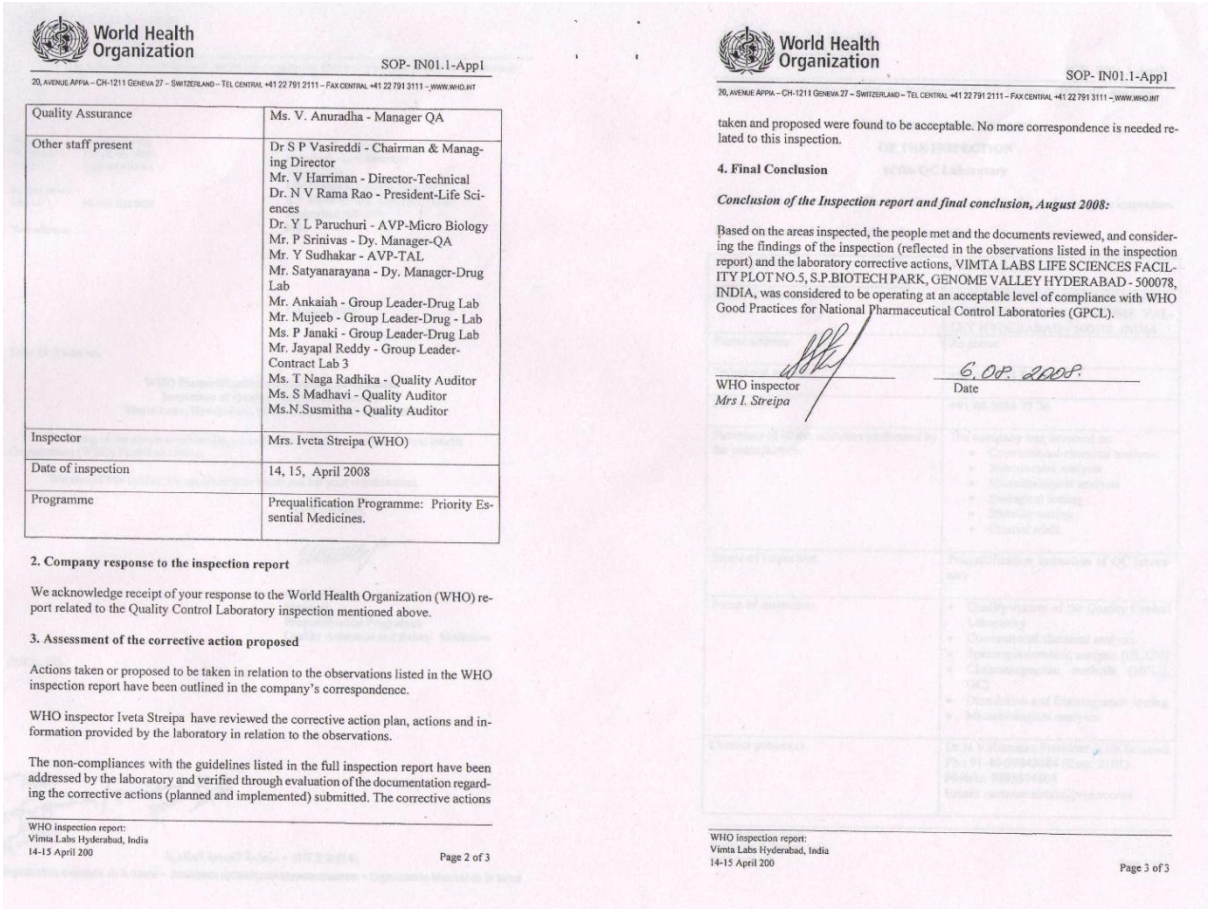
The report is the property of the organization responsible for performing the inspection.

Part 1: General information about the inspection

Name of laboratory	**VIMTA LABS LTD**
Physical address	LIFE SCIENCES FACILITY PLOT NO.5, S.P.BIOTECH PARK, GENOME VALLEY HYDERABAD - 500078, INDIA
Postal address	As above
Telephone number	+91 40 3984 84 84
Fax number	+91 40 3984 77 76
Summary of all the activities performed by the manufacturer	The company was involved in: • Conventional chemical analysis • Instrumental analysis • Microbiological analysis • Biological testing • Stability testing • Clinical trials
Scope of inspection	Prequalification inspection of QC laboratory
Focus of inspection	• Quality system of the Quality Control Laboratory • Conventional chemical analysis • Spectrophotometric analysis (IR, UV) • Chromatographic methods (HPLC, GC) • Dissolution and Disintegration testing • Microbiological analysis
Contact person(s)	Dr.N.V.Ramarao President - Life Sciences Ph.: 91-40-39848484 (Extn: 2101) Mobile: 9885574604 Email: ramarao.nittala@vimta.com

WHO inspection report:
Vimta Labs Hyderabad, India
14-15 April 200

Page 1 of 3



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Quality Assurance	Ms. V. Anuradha - Manager QA
Other staff present	Dr S P Vasireddi - Chairman & Managing Director Mr. V Harriman - Director-Technical Dr. N V Rama Rao - President-Life Sciences Dr. Y L Paruchuri - AVP-Micro Biology Mr. P Srinivas - Dy. Manager-QA Mr. Y Sudhakar - AVP-TAL Mr. Satyanarayana - Dy. Manager-Drug Lab Mr. Ankaiah - Group Leader-Drug Lab Mr. Mujeeb - Group Leader-Drug - Lab Ms. P Janaki - Group Leader-Drug Lab Mr. Jayapal Reddy - Group Leader-Contract Lab 3 Ms. T Naga Radhika - Quality Auditor Ms. S Madhavi - Quality Auditor Ms.N.Susmitha - Quality Auditor
Inspector	Mrs. Iveta Streipa (WHO)
Date of inspection	14, 15, April 2008
Programme	Prequalification Programme: Priority Essential Medicines.

2. Company response to the inspection report

We acknowledge receipt of your response to the World Health Organization (WHO) report related to the Quality Control Laboratory inspection mentioned above.

3. Assessment of the corrective action proposed

Actions taken or proposed to be taken in relation to the observations listed in the WHO inspection report have been outlined in the company's correspondence.

WHO inspector Iveta Streipa have reviewed the corrective action plan, actions and information provided by the laboratory in relation to the observations.

The non-compliances with the guidelines listed in the full inspection report have been addressed by the laboratory and verified through evaluation of the documentation regarding the corrective actions (planned and implemented) submitted. The corrective actions

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taken and proposed were found to be acceptable. No more correspondence is needed related to this inspection.

4. Final Conclusion

Conclusion of the Inspection report and final conclusion, August 2008:

Based on the areas inspected, the people met and the documents reviewed, and considering the findings of the inspection (reflected in the observations listed in the inspection report) and the laboratory corrective actions, VIMTA LABS LIFE SCIENCES FACILITY PLOT NO.5, S.P.BIOTECH PARK, GENOME VALLEY HYDERABAD - 500078, INDIA, was considered to be operating at an acceptable level of compliance with WHO Good Practices for National Pharmaceutical Control Laboratories (GPCL).

WHO inspector
Mrs I. Streipa

6. 08. 2008.
Date

Section 2: Dynamics of Indian Quality System for Pharmaceutical Exports with a focus on India-Africa trade (the 'supply side')

Photo courtesy: http://ehealth.eletsonline.com/2013/03/indian-pharma-growth-outpaces-rivals/

TABLE OF CONTENTS

Introduction

The Indian pharmaceutical market has evolved significantly over the past several decades, transforming from a domestic and poorly regulated industry to a dominant global industry.

The Indian pharmaceutical domestic consumption has grown from an estimated US$ 9 billion in 2005–2006 to US$ 16 billion[72] in 2012–2013. According to estimates[73], the Indian pharmaceutical market will grow to US$ 55 billion by 2020 driven by a steady increase in affordability, higher prices and an increase in market access. In terms of volume of production, India is estimated to be among the largest markets in the world, if not the largest.

India's pharmaceutical exports have increased exponentially to around US$ 10 billion in 2012–13,[74] up from US$ 2 billion in 2005–6. The United States is the largest market for Indian pharmaceutical exports. Nearly 49% of the Indian pharmaceutical exports by value are to the countries with Stringent Drug Regulatory Authorities (SRA[75]). The remaining 51% are to the countries with semi-regulated Drug Regulatory Authorities, which is equally divided between exports to Africa and other continents.[76].

The Indian pharmaceutical market is extremely skewed in terms of small to big manufacturers. It is estimated that 350 companies accounted for more than 95% of the domestic pharmaceutical market in 2009–2010, (as per Centre for Monitoring Indian Economy [CMIE] data). It is also estimated that 50 companies accounted for more than 70% of the export market and 350 companies accounted for more than 85% of the export market[77] in 2009–2010.

The Indian government and private sector organisations have conducted various studies over the past 10 years to determine the number of pharmaceutical manufacturers and plants in India, but there are significant variations in their findings. This can be attributed to the size and the complex market structure of the industry, which includes: contract, loan and own manufacturers; bulk and finished pharmaceuticals manufacturers; generic and brand product manufacturers; manufacturer exporters; and merchant exporters.

This study is focused on quality aspects of trade, vis-à-vis the commercial processes, and so the steps linked to quality are described in detail while the commercial processes are briefly mentioned. With the current regulatory structure, the onus of ensuring quality of pharmaceuticals falls mostly on the importing country, with a smaller, yet important role being played by the exporting country, in this case India.

Additionally, there are several internationally accepted standards and agreements that are to be followed during the export of pharmaceuticals from India. These include World Health Organization's (WHO) standards (Good Manufacturing Practices [GMP], Good Laboratory Practices [GLP], Good Distribution Practices [GDP], Good Storage Practices [GSP]);

[72]Department of Commerce. Export import data (2005-2013) and Annual report, Department of Pharmaceuticals. 2012.
[73]McKinsey & Company. India Pharma 2020: Propelling access and acceptance, realising true potential [Internet]. 2012. Available from: http://online.wsj.com/public/resources/documents/McKinseyPharma2020ExecutiveSummary.pdf.
[74] Department of Commerce, export import data (2005-2013)
[75] See Appendix 1 for definition and explanation
[76]As per the 2011–12 data from the Department of Commerce, Ministry of Commerce and Industry (India)
[77] CMIE data indicated in 'Role and Contribution of National Pharmaceutical Industry' by IPA. 2011.

pharmacopoeia standards (Indian, European, International, US, British); Trade Related Intellectual Property Rights (TRIPS) agreement, International Conference on Harmonization (ICH) agreement etc.

Apart from the various laws and regulations provided by national and international authorities, the industry is expected to conduct its own internal audits and inspections to ensure proper quality of all its products (self-regulation).
This report explains the quality-related export policies, structures and processes and highlights potential risks and gaps in the current process.

Sub-section 1. The Indian Pharmaceutical Export Market

1. Overview of the Indian Pharmaceutical Market

1.1. Evolution of the Indian Pharmaceutical Market

The figure 10[78] depicts some of the major policies and events in the evolution of the Indian pharmaceutical sector, especially focusing on regulations for the quality of exports. A detailed overview is present in the Appendix 2.

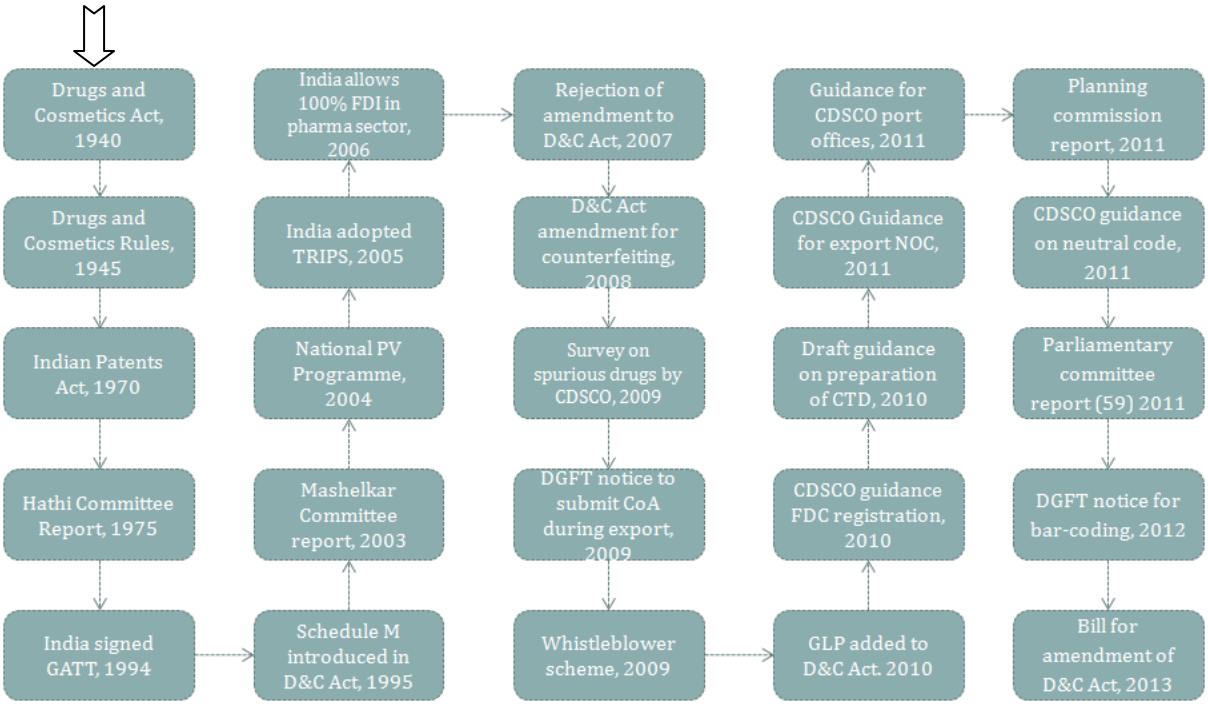


Figure 10: Evolution of the Indian Pharmaceutical Industry

The D&C Act was passed in 1940, which provided central legislation for pharmaceuticals and other health products. It provided regulation for import, manufacture, distribution and sale of pharmaceuticals, and cosmetics in the country. Several amendments to the D&C Act have since been passed by parliament in order to regulate exports and the quality of pharmaceuticals produced in the country. For example, to control spurious pharmaceuticals, the government incorporated Schedule M in the D&C Act of 1995 that lays down GMP in accordance with WHO standards. At the same time, a few proposed amendments have been rejected, most notably in 2008 and more recently in 2013, which attempted to strengthen the powers of CDSCO and bring a greater degree of regulation of exports[79]. The various amendments relevant to the research are discussed in Chapter 2.

[78] Empower research. CDSCO.Pharmexcil
[79] Parliamentary standing committee report[79] on The Drugs and Cosmetics (Amendment) Bill, 2013 (Ministry of Health and Family Welfare, India).

Apart from the D&C Act, several parliamentary and other committee reports have guided the Indian pharmaceutical sector, most notably the Hathi Committee Report of 1975 and the Mashelkar Committee Report of 2005. The Hathi Committee Report eventually led to the establishment of CDSCO, the national regulatory body of the Indian pharmaceutical sector.

In terms of growth of the Indian pharmaceutical sector, the first big change occurred between 1970 and 2005 when 'product patents' were abolished and 'process patents' were introduced. As a result, companies could produce any product using a different chemical synthesis pathway, which in turn led to a significant innovation by generic manufacturers. From 2005 to the present day, patents for several pharmaceutical products worth billions of dollars have expired. These innovations in manufacturing by generic companies, coupled with expiration of patented drugs, have played a vital role in the emergence of Indian manufacturers as global leaders in production of generic pharmaceuticals.

The situation has changed dramatically since 2005, with India adopting the Trade Related Intellectual Property Rights (TRIPS) agreement and agreeing to product patent protection. India has now been focusing on products whose patents have expired and is venturing into the development of innovative products or 'New Chemical Entities', albeit with minimal success. According to a McKinsey study conducted for the Department of Pharmaceuticals (DoP)[80], US$ 300 billion worth of pharmaceuticals are expected to go off-patent by 2015 and the value of generics from these off-patent drugs is estimated at US$ 100 billion.

Another interesting observation is that after India allowed 100% Foreign Direct Investment in the pharmaceutical sector in 2006, several foreign Multi-National Companies (MNCs) established their units in India and acquired local Indian companies—for example, six major Indian companies were acquired by foreign MNCs from 2006 to 2010.

1.2. Market Size

There are several sources for determining the market size of Indian pharmaceutical domestic consumption and exports. The complexity in determining the numbers is due to the definition of market size not being uniform across different sources. For example, various sources include not only pharmaceutical formulations but also either one or more of the following categories:

- Bulk drugs (APIs and intermediaries)
- Vaccines,
- Medical supplies
- AYUSH (Ayurveda, Unani, Sidha and Homeopathic) commodities,
- Others

For the purpose of this study, data has been compiled from several sources. The domestic consumption values have been converted to US$ (using average annual exchange rates for the period), and hence the trend also includes exchange rate variations year over year.

[80]McKinsey & Company. Capturing the India advantage. India Pharma Summit Working Paper 2009.

The Indian pharmaceutical domestic consumption has grown from an estimated US$ 9 billion in 2005–2006 to US$ 16 billion[81] in 2012–2013 (refer to Appendix 3 for details). On the other hand, India's pharmaceutical exports estimated at around US$ 10 billion in 2012–13[82] is up from merely US$ 2 billion in 2005–2006 (as per Department of Commerce data).

Figure 11 depicts the growth trend over the past eight years:

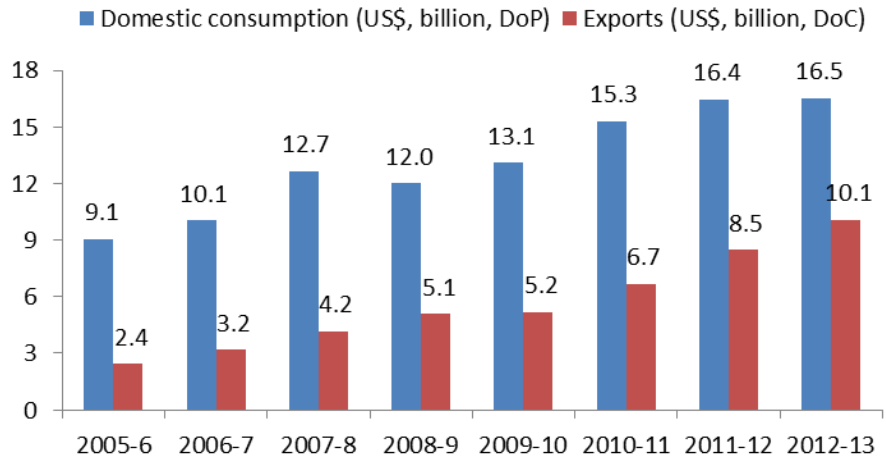


Figure 11: Indian Pharmaceutical Market Trend

It is also estimated that 50 companies accounted for more than 70% of the export market and 350 companies account for more than 85% of the export market[83]. The top 50 companies and their sales/market share are listed in Appendix 4.

1.2.1. Formulations versus Bulk Drugs

As per Pharmexcil's annual report for 2012–2013: India's export of finished dosage forms is approximately 65%, while bulk drugs account for about 35%. Based on another report by BCG[84], the total export of APIs and advanced intermediaries from India for 2013 was estimated at US$ 4.3 billion.

India also imports large amount of APIs, especially from China. The leading pharmaceutical companies in India import 30–70% of their API needs. Most of the APIs and intermediates are sourced from China; other sources of API include Italy, Germany, USA and others. In value terms, 58% of the total imports are sourced from China, or 80% in terms of volume. The total import of APIs and advanced intermediaries in 2013 was estimated at US$ 3.4 billion. For some of the finished dosage forms, India is entirely dependent on APIs from China[85].

[81] Department of Commerce. Export import data (2005-2013) and Annual report, Department of pharmaceuticals. 2012.
[82] Department of Commerce. Export import data (2005–2013).
[83] CMIE data indicated in 'Role and Contribution of National Pharmaceutical Industry' by IPA. 2011.
[84] BCG. Towards end-to-end leadership in select APIs.2013 .
[85] BCG. Towards end-to-end leadership in select APIs. 2013.

1.2.2. Value versus Volume of Pharmaceuticals

It is often quoted in various studies that the Indian pharmaceutical industry is ranked 3rd globally in volume and 14thin value, supplying around 10% of total global production [86] . According to another study by McKinsey[87] the industry is ranked 3rd globally in volume and 10th in value, supplying around 10% of total global production. Also, by 2020 it is expected to grow to US$ 55 billion, second highest in terms of volume (after the US market).

However, none of the above sources provide a basis for the calculation. To determine the current status in terms of the size of production and export *volume*, a separate study will have to be conducted.

1.2.3. Generic versus Branded Pharmaceuticals

A large number of Indian pharmaceutical companies produce generic medicines after the innovator's patent expires. However, these companies market the medicines with a brand name, thus making them 'branded' generics. About 90% of the Indian pharmaceutical market, by value, is dominated by branded generics. The remaining 10% are either innovator branded pharmaceuticals or 'generic' generics[88].

1.3. Structure of the Indian Pharmaceutical Market

> *The level of complexities in own manufacturing, contract manufacturing, loan licensing and switching API sources makes it very complicated for the international authorities to regulate. An initial inspection during registration by an NDRA only gives them a single snapshot of what's happening at that point of time. What happens in the next 3–5 years (before registration) is really difficult to find and understand.*
>
> ------- Mr. Arun Kapoor, Head-Regulatory Affairs, Modi-Mundi Pharma

The Indian pharmaceutical market is aptly captured by the above quote. Some of the key factors contributing to the complexity (with respect to quality of exports) are:

- **APIs sourcing:** API sourcing is a critical step in the manufacturing of pharmaceuticals. The leading pharmaceutical companies in India import 30–70% of their API needs. In value terms, 58% of the total imports are sourced from China, or 80% in terms of volume[89]. This creates a huge dependence on China, to the extent of 100% for a number of finished dosage

[86]Indian pharmaceutical industry; Department of pharmaceuticals; and FICCI.Ministry of chemicals and fertilizers. Planning commission report [Internet. Available from:,http://planningcommission.gov.in/aboutus/committee/wrkgrp12/wg_pharma2902.pdf .
[87] 'Generic' generics are those drugs which are marketed without a brand name. McKinsey & Company. India Pharma 2020: Propelling access and acceptance, realising true potential [Internet]. 2012. Available from:
[88] CII, PWC. India Pharma Inc.: Capitalising on India's Growth Potential [Internet]. 2010. Available from: http://www.pwc.in/assets/pdfs/pharma/PwC-CII-pharma-Summit-Report-22Nov.pdf.
[89]BCG .Toward End–to–End Leadership in Select APIs –Analysing India's dependence on imports for API production. 2013.

forms. Another regular practice is switching of API sources by manufacturers to lower costs or replace bottlenecks. A number of manufacturers do so without notifying the importing country's NDRAs, which may or may not be required.

- **Outsourcing practices in manufacturing:** Every company that wishes to manufacture pharmaceuticals must obtain a product-specific manufacturing licence, which is issued by the state DRA and is valid for a specific manufacturing plant for a defined period of time. There are companies that obtain these licences to manufacture their own products in their own factories. Then there are factories that obtain these licences but manufacture products for a 'third party' company called loan manufacturers. Approximately 1/3rd of all manufacturing licenses in India are loan licenses[90]
- **Manufacturers versus exporters:** The different entities in the pharmaceutical export sector can be sub-divided into the following types:
    - Manufacturer / Manufacturer-exporter: Companies that manufacture and market their pharmaceutical products themselves or through the merchant exporters
    - Merchant exporter: Companies that only re-sell a manufacturer's product, but do not have their own manufacturing facilities
    - Loan-licensed manufacturer: Companies that only manufacture products for other pharmaceutical companies. These companies are often referred to as 'loan licensed manufacturers' (see figure 12 for an example)

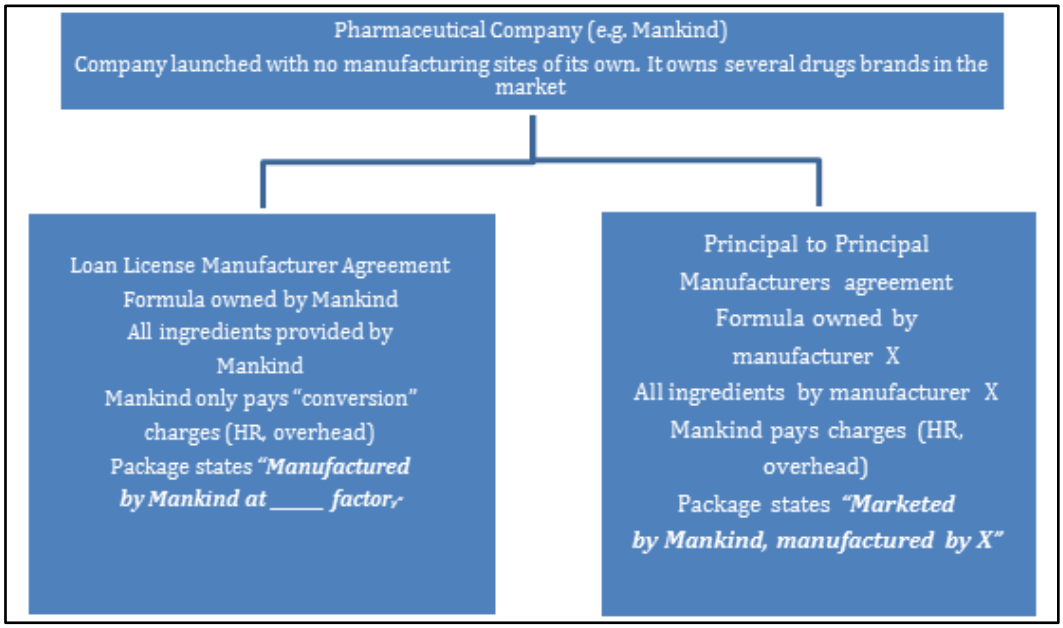


Figure 12: A Case of Contract Manufacturing

- **Use of neutral coding for bulk export:** Pharmaceuticals can be exported in fully finished packs in the name of manufacturer, exporter or the importer or they can be exported in bulk without any labelling using a 'neutral code' (refer to figure 13). Neutral code allows a manufacturer to avoid writing its name and country of origin on the package; instead, an alphanumeric code is used, which identifies the supplier's details. The extent of the use of neutral coding in India when exporting pharmaceuticals is unknown

[90] CDSCO Data [Internet]. Available from: http://cdsco.nic.in/data_bank.htm.

Step 1: *Manufacturer requests / applies for neutral code for a product from CDSCO (1-2 months) which contains a string of alphanumeric code identifying manufacturer and state.*

Step 2: *Manufacturer makes arrangement with importer (can be done in SRA and no-SRA countries)*

Step 3:
Option a) *Manufacturer produces a FPP that is a fully packaged product (with primary and secondary packaging) and agrees with importer to label it as:*

"Manufactured for...."
"Distributed by..." **+ alphanumeric code**
"Imported by..."

Option b) *Manufacturer produces a FPP in bulk (in jars of 1000, 10,000) which are then repacked into blister packs by the importer, who now labels this as:* **"Manufactured by "local importer" + alphanumeric code**

Figure 13: Steps for using a neutral code in India

- **Different accreditations of manufacturers:** At minimum, all Indian manufacturers must have a 'Schedule M', which is a license to manufacture (based on WHO-GMP guidelines) and is issued by the state governments. All manufacturing sites that export from India must be approved jointly by CDSCO (central) and state DRAs and can be described as 'Schedule M+' (there are about 1,200 of these units). Some of these manufacturers have been further certified by the international procurement agents (for example, Crown Agents, SCMS, International Dispensary Association (IDA)[91], UN procurement agents and various large procurement agents that have certified 300–400 manufacturers); several more have been approved by WHO Pre-Qualification Programme[92] (approximately 30–50); and a few hundred manufacturer sites have been approved / inspected by SRAs (for example, USFDA 500–600)[93](refer to figure 14). Most international NDRAs and buyers are not aware of these variations and therefore are missing valuable information for better management of quality assurance.

[91]As per interview with IDA, Mumbai.
[92]Analysis of WHO PQP list for ARVs, ACTs, anti-TB drugs and Reproductive Health medicines.
[93]As per data from Pharmexcil, India (2012) and interview with USFDA, India.

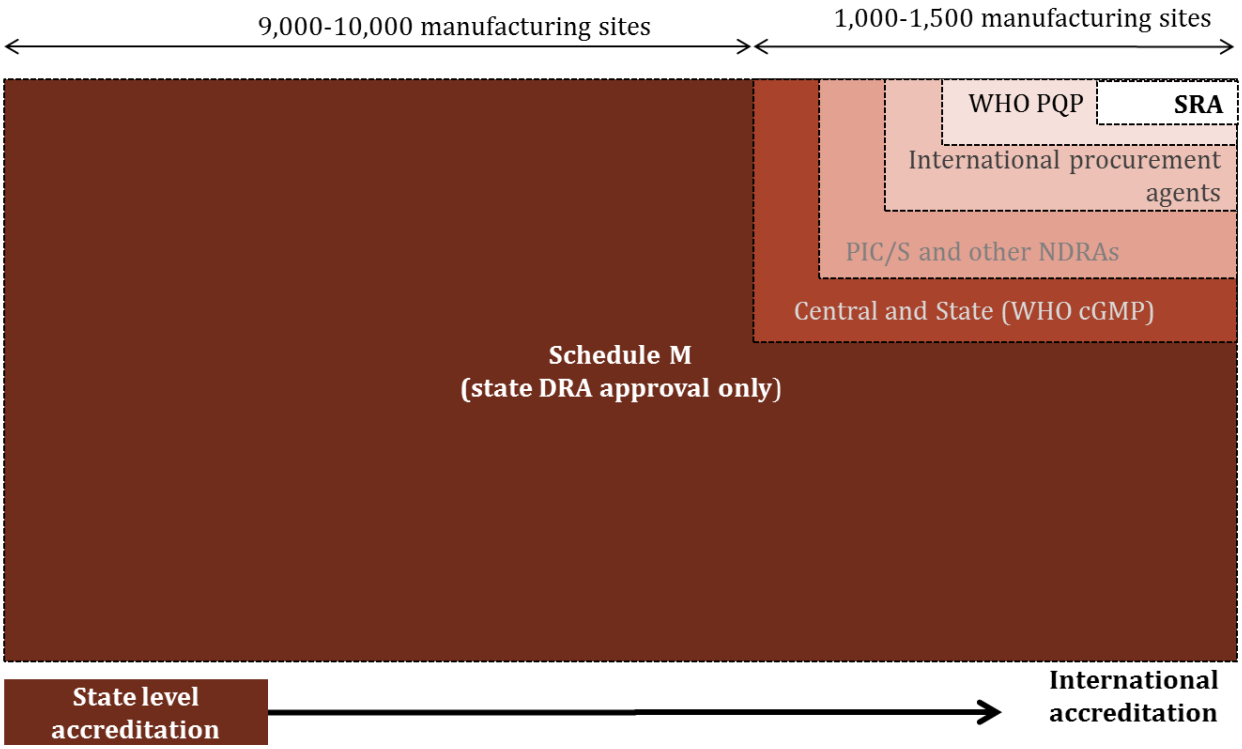


Figure 14: Types of quality accreditation

1.4. Number of Manufacturing Plants

There appears to be little consensus on the number of manufacturers, manufacturing sites and their various segmentations. Instead of reporting a single source, the authors are presenting several sources to highlight the dissonance in the market:

- The Mashelkar committee report of 2003, considered to be the most exhaustive of assessments, estimates that there are 1,333 bulk drug and 4,354 finished pharmaceutical manufacturing licenses
- The Annual Survey of Industries (ASI) estimates that there are 2,968 bulk and finished goods manufacturing units (for 2010–11)
- Confederation of Indian Industry (CII), estimates that there are approximately 8,000 small-medium manufacturing units[94]
- The DoP estimates the number of manufacturing units to be more than 7,000
- The National Pharmaceutical Pricing Authority (NPPA) data from 2007 estimates that there are 8,174 formulation units and 2,389 bulk drug units. Their geographical distribution is presented in figure 16
- More recent data (of 2011) from the CDSCO[95] estimates that the number of manufacturing licenses is 10,373[96]. Out of these, approximately 1/3rd are loan licenses. Their geographical distribution is presented is figure 15

[94] CII. CII's research data.
[95] CDSCO Data [Internet]. Available from: http://cdsco.nic.in/data_bank.htm.

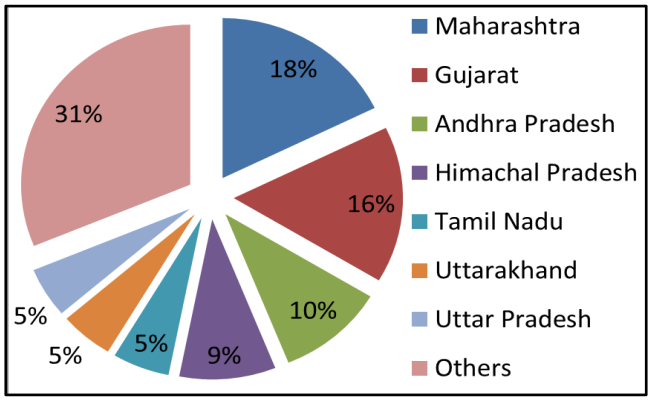


Figure 15: Distribution of Manufacturing Units by State (CDSCO, 2011)

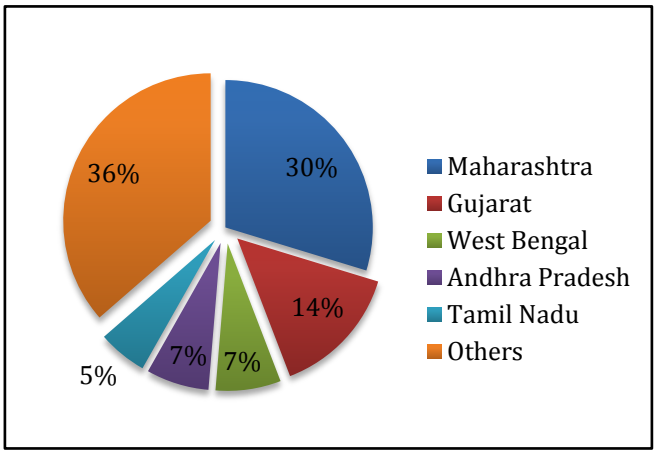


Figure 16: Number of Pharmaceutical Manufacturing Units by State (NPPA, 2007)

It should be noted that five states account for almost 2/3rd of the manufacturing sites, with Maharashtra state being the largest by far. Also, while the overall manufacturing units remain concentrated in 6–7 states, there have been some significant changes in the landscape: Maharashtra's dominance has declined; Himachal Pradesh's and Uttarakhand's prominence has increased; and West Bengal's prominence has declined.

2. The Indian Pharmaceutical Export Market

2.1. Export Market Size

In terms of pharmaceutical exports, India is ranked among the top 15 with an estimated value of US$ 11 billion in 2012[97]. It is interesting to observe that the only two non-high income countries in the top 20 exporters list are China and India (see figure 17).

[96] There are some gaps in the data as CDSCO is still waiting to receive information for Andhra Pradesh and Bihar for loan licences; Arunachal Pradesh, Manipur, Meghalaya and Nagaland for own and loan licences.
[97] WTO data (2012).

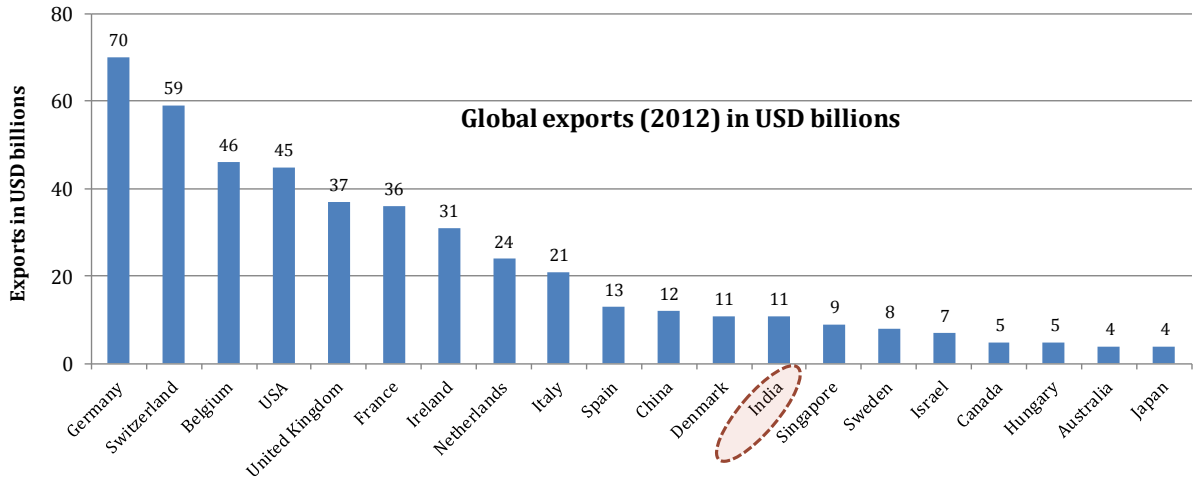


Figure 17: Exports by Country (2012)

Given the growth of the Indian pharmaceutical market to all parts of the world, it is therefore not surprising that India is referred to as the 'pharmacy to the world.' For example:

- Around 10% of the generics market in the United States (US) is controlled by Indian manufacturers[98]
- Around 23% of all product licences in the United Kingdom (UK)[99] are from Indian manufacturers
- In addition, the leading donors of global health programmes such as The Global Fund and the US President's Emergency Plan for AIDS Relief (PEPFAR) also source a substantial percentage of their medicine procurement from Indian manufacturers
- 75–80% of medicines purchased and distributed by global procurement agents such as IDA, Supply Chain Management System (SCMS), Mission-pharmaceutical, etc., are procured from Indian manufacturers
- With respect to disease-specific pharmaceuticals, India has a dominant global market share of antiretroviral (ARVs), (80% in the developing world), pediatric ARVs (90%)[100]; anti-TB drugs and Artemisinin Combination Treatments (ACTs)
- India is also the biggest supplier to UNICEF, which procures drugs, diagnostics, vaccines, medical supplies among other items from India. In 2012, UNICEF procured US$ 558 million worth of services and supplies from India[101]

[98] RNCOS. Booming generics drug market in India [Internet]. 2011. Available from: http://www.researchandmarkets.com/reports/1230863/booming_generics_drug_market_in_india.pdf.

[99] MHRA in India [Internet]. 2013. Available from: http://www.mhra.gov.uk/home/groups/clin/documents/conferenceinfo/con263954.pdf.

[100] Waning B, Diedrichsen E, Moon S. A lifeline to treatment: the role of Indian generic manufacturers in supplying antiretroviral medicines to developing countries [Internet]. JIAS. 2010. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2944814/.

[101] Supplies and Logistics, UNICEF [Internet]. Available from: http://www.unicef.org/supply/index_procurement_services.html.

2.2. Export Destinations

The US is the largest market for Indian pharmaceutical exports. Out of the more than 200 countries to which India exports its pharmaceuticals, the top 10 countries constitute nearly 40% of the entire pharmaceutical exports market of India[102]. See figure 18:

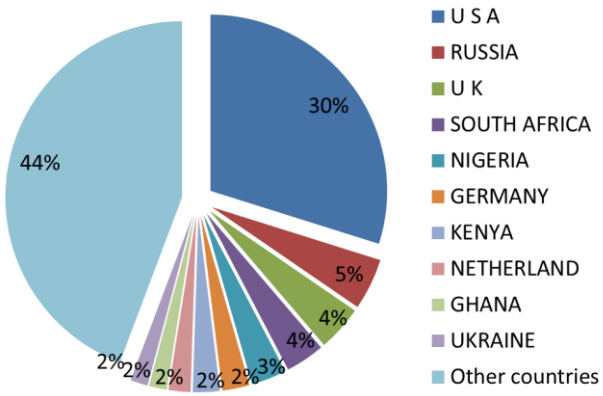


Figure 18: Export Destinations of Indian Pharmaceuticals

2.3. Exports to Africa

Based on the 2011–2012 data from the Department of Commerce, Ministry of Commerce and Industry (India), nearly 49% of the Indian pharmaceutical exports (by value) are to countries with SRAs. The remaining 51% are to countries with semi-regulated or weak DRAs. Half of these non-SRA exports are to African countries, with weak or no regulatory system. See figure 19:

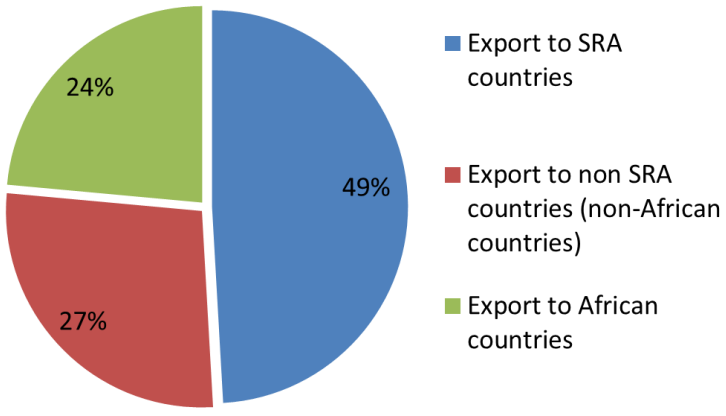


Figure 19: Destination of Indian Pharmaceutical Exports by Regulatory Capacity (2011–2012)

The leading 10 export destinations in Africa contribute to almost 70% of Indian pharmaceutical exports. The remaining exports are fragmented across more than 40 countries[103]. Refer to the figure below:

[102] Export import data (2012–13). Department of Commerce, Ministry of Commerce and Industry.

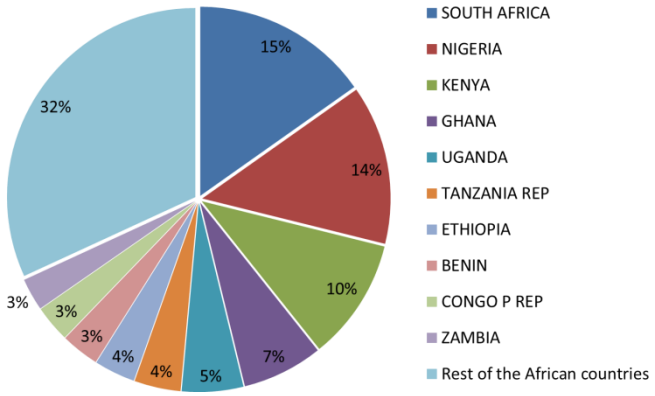


Figure 20: Export to African countries from India (2011–2012)

2.4. Exporting Companies

As mentioned earlier, the leading 50 companies in India contribute to more than 70% of the overall Indian pharmaceutical exports and the top 350 companies contribute to more than 85% of the exports.

As per Pharmexcil's membership list, there are roughly 4,000 companies, out which 50% are merchant exporters, 21% are formulation manufacturers, 16% are bulk drug manufacturers and the rest comprise of herbal products manufacturers and companies providing other health services. It should be noted that any company in India that exports pharmaceuticals, must register with Pharmexcil.

[103] Department of Commerce, Ministry of Commerce and Industry .Export import data (2012–2013).

Sub-section 2. Regulation of Pharmaceuticals and Quality Assurance Systems in India

1. Introduction

In Chapter 1, we described the pharmaceutical market in India, focusing on pharmaceutical exports. This report narrows down the focus to regulatory aspects of the pharmaceutical market in India, especially with respect to the Quality Control of pharmaceutical exports.

In order to describe these regulations, it is important to understand some of the terms we will be using in this report, which have similar yet distinct definitions. These are:

Policy: Polices are the guiding principles for the government and are the declared objectives, which a government seeks to achieve, such as the National Health Policy (NHP) of India. Policies may also be established and enforced by donors that fund purchases of pharmaceuticals.

Parliamentary Report: Parliamentary committees create situational reports, which set down the basis for new legislation. For example, the parliamentary standing committee published a report in 2005, which set the basis for the amendment of the D&C Act (created in 1940)[104].

Legislation: To achieve the targets set in the policies, government introduces bills in parliament to create new laws and legislations. An approved bill becomes a law, which is then enacted by the legislature / governing body. In India, the governing body is parliament—comprising of the LokSabha and the RajyaSabha, which approve the bills to form legislation.

Guideline: A guideline is a statement to assist in implementing a course of action. A guideline aims to streamline processes according to the requirements of an expected practice and also ensures the quality of these processes[105]—as opposed to a law that enforces a certain practice. In order to move the processes as per the legislation, the CDSCO regularly publishes guidelines for its officials and the industry such as guidelines for Zonal offices, port officers, application for export NOC etc.

Standard / Agreement: In the context of this research, a standard or an agreement is an accepted norm, especially in the case of trade and commerce, for example, the TRIPS agreement.

In this report we will be focusing on the legislation and guidelines surrounding pharmaceutical exports from India, as well as the various standards and agreements accepted by the international community with respect to pharmaceutical trade and quality.

[104] PRSI. Legislative Research. The Drugs and Cosmetics (Amendment) Bill, 2007 [Internet]. Available from: http://www.prsindia.org/billtrack/the-drugs-and-cosmetics-amendment-bill-2007-103/.
[105] University of Ballarat. What is Policy, Procedure and Guidelines? Information sheet [Internet]. Available from: http://www.ballarat.edu.au/__data/assets/pdf_file/0019/82162/What_is_a_Policy_Procedure_Guideline.pdf.

2. Regulations for Pharmaceutical Exports in India

2.1. Policies

1. The NHP of India, which was first drafted in 1983 and then later reformulated in 2002, guides the government to achieve the goals stated in the policy and to formulate new legislations and guidelines to achieve those goals. The NHP 2002 endeavours to achieve the several time-bound goals[106]. However, none of the goals have a direct bearing on the export of pharmaceuticals from the country

2. The Drug Policy of India, which was first drafted in 1986, was reiterated in 1994 and later again in 2002[107]. The main objective of the 1994 drug policy was price control for select formulations and bulk drugs. It also put an end to industrial licensing for all bulk drugs while permitting 51% foreign investment for bulk drugs, intermediates and formulations. The policy was re-modified in 2002 adding more objectives like encouraging Research and Development (R&D) processes in the Indian pharmaceutical industry, promoting rational use of pharmaceuticals and strengthening the Quality Control of pharmaceuticals

2.2. Parliamentary and Other Guiding Reports

As stated earlier, parliamentary reports are constituted by parliamentary committees, which generally set down the basis of a new legislation or a new regulation. There have been a few parliamentary committee reports, which led to the formation of new laws, legislations and guidelines. Parliamentary reports that are of high importance with respect to this report are:

1. Hathi Committee Report, a committee which was set up by the Government of India (GoI) upon suggestion by parliament in 1975, provided the idea of creating a National Drug Authority[108]
2. Parliamentary Standing Committee Report on the functioning of CDSCO, 2012 was presented in the Rajya Sabha; it provided a detailed account of the role, responsibilities, strength and weaknesses of CDSCO[109]
3. Planning Commission Working Group Report on food and drugs regulation, which resulted in the formulation of the XIIth Five Year Plan, reviewed food and drug regulatory mechanism in the country to ensure access to Quality-Assured, safe pharmaceuticals and

[106] PRSI. National Health Policy 2002 (India) [Internet] 2002. Available from: http://www.prsindia.org/uploads/media/Clinical%20Establishments/bill146_20071113146_national_health_policy_2002.pdf.
[107] Drug Policy [Internet]. 2002. Available from: http://dbtbiosafety.nic.in/Files/CD_IBSC/Files/2002.PDF and The Decontrol of Drug Prices in India [Internet]. Available form: http://www.ccs.in/ccsindia/interns2002/27.pdf.
[108] Hathi Committee Report [Internet]. Available from: http://www.communityhealth.in/~commun26/wiki/images/b/b5/Hathi_Committee_report_1975.PDF.pdf.
[109] Department-Related Parliamentary Standing Committee on Health and Family Welfare, Fifty-Ninth Report on the Functioning of the Central Drugs Standard Control Organisation (CDSCO) [Internet]. Available from: http://164.100.47.5/newcommittee/reports/englishcommittees/committee%20on%20health%20and%20family%20welfare/59.pdf.

food in the country. The report[110] also reviewed and suggested measures to promote generic pharmaceuticals, strengthen CDSCO, State DRA , drug testing laboratories, etc

4. Parliamentary Standing Committee Report[111] on The Drugs and Cosmetics (Amendment) Bill, 2013 (Ministry of Health and Family Welfare [MoHFW]). This committee conducted a detailed analysis of the amendment and provided its views on its implementation
5. Although not a parliamentary report, the Mashelkar Committee Report[112] is one of the most important assessments of the Indian pharmaceutical sector to date. Submitted in 2003, an Expert Committee under the chairmanship of Dr. R.A. Mashelkar examined all the aspects regarding the regulatory infrastructure and the extent and problems of spurious / sub-standard pharmaceuticals in the country; subsequently the report provided recommendations for the CDSCO and the state DRAs

2.3. Pharmaceutical legislation in India

2.3.1. Overview

The following table 9 summarizes the various laws regulating the different aspects of drug trade in India:

Table 9: Pharmaceutical Legislation in India

Legislation	Description
D&C Act, 1940	This act regulates the import, manufacture, distribution and sale of drugs, and cosmetics in India (See appendix 5)
The Pharmacy Act, 1948	This act regulates the profession of pharmacy in India
The Drugs and Magic Remedies (Objectionable Advertisements) Act, 1954	This act controls the advertisement of drugs, which allegedly contains magical qualities (See appendix 6)
The Narcotic Drugs and Psychotropic Substances Act, 1985	This act regulates the operations related to narcotic drugs and psychotropic substances (See appendix 7)
The Medicinal and Toilet Preparations (Excise Duties) Act, 1956	This act lays down the regulations for collection of excise duties on medicinal and toilet preparations containing alcohol. It also specifies the manufacturing conditions for the same
Indian Patent Act (1970, 2005)	This is a broad act with pharmaceuticals as one part of it. The newest amendment specifies that only product patent will be entertained

While the above-mentioned laws have some indirect impact on the production, sale and distribution of pharmaceutical products, the one that directly impacts the market is the D&C Act of 1940.

[110] Planning Commision. Government of India. Report of The Working Group On Drugs & Food Regulation For the 12th five year Plan [Internet]. Available from: http://planningcommission.gov.in/aboutus/committee/wrkgrp12/health/WG_4drugs.pdf.

[111] PRSI. Seventy-Ninth Report on The Drugs And Cosmetics (Amendment) Bill, 2013 (Ministry of Health and Family Welfare) [Internet]. Available from: http://www.prsindia.org/uploads/media/Drugs%20and%20Cosmetics/SCR-Drugs%20and%20cosmetics.pdf.

[112] CDSCO. Data from CDSCO [Internet]. Available from: http://www.cdsco.nic.in/html/Interim%20Report.htm.

2.3.2. Drugs & Cosmetics Act (D&C), 1940

The D&C Act, 1940 provides the central legislation for pharmaceuticals and cosmetics (including medical devices). It regulates the import, manufacture, distribution and sale of pharmaceuticals and cosmetics in the country. However, it does not explicitly contain laws related to the export of pharmaceuticals from India.

The main objective of the Act is to ensure that the pharmaceuticals available to the people are safe and efficacious, and the cosmetics marketed are safe for use. The following types of products are covered under the D&C Act:

- Allopathic pharmaceuticals
- Ayurvedic, Siddha and Unani pharmaceuticals
- Components of pharmaceuticals
- Devices
- Contraceptives
- Mosquito repellent creams
- Homeopathic medicines
- Cosmetics

There are 6 chapters and 37 schedules in the D&C Act. The chapters relevant to our research are (please refer to Appendix 5 for details):

- Schedule M–GMP and requirements for manufacture of pharmaceuticals under Chapter 4–Manufacture, Sale and Distribution of Pharmaceuticals and Cosmetics. This schedule is the basis for awarding manufacturing licenses to companies and is in line with the globally accepted WHO-GMP guidelines
- Rules 26, 47 and 94[113] of the Drugs & Cosmetics Rules
- The Drugs and Cosmetics (Amendment, 2008) Act also provides deterrent penalties for offences relating to the manufacture of spurious or adulterated pharmaceuticals, which have serious implications on public health. The penalty for manufacture of spurious or adulterated pharmaceuticals currently, is imprisonment for a term that shall not be less than 10 years but may extend to imprisonment for life and a fine that shall not be less than 100,000 GBP (approximately) or three times the value of the confiscated pharmaceuticals, whichever is more. In certain cases, offences have been made cognisable and non-bailable. The Act also provides a tool of compounding of offences for dealing with certain minor offences. Refer to table 10.

[113] See detailed rules in Appendix.

Table 10: Penalties in India for the Offence of Counterfeit Pharmaceuticals as Per the Drugs and Cosmetics (Amendment, 2008) Act

Contravention[114]	Old Punishment	After Amendment Bill 2008
27 (a) For Pharmaceuticals Adulterated – 17-A Spurious – 17-B Likely to cause death or such harm	Imprisonment not less than five years; may extend to life term and with fine of 100 GBP (approximately)	Shall not be less than 10 years; may extend for life and fine not less than 100,000 GBP (approximately) or three times the value of pharmaceutical confiscated
27 (b) Adulterated – 17-A Without valid license – 18 (c)	Not less than one year; may extend to three years and with fine not less than 50 GBP (approximately)	Not less than three years; may extend to five years and fine not less than 100 GBP (approximately) or three times the value on goods confiscated
27 (c) Spurious – 17-B	Not less than three years; may extend to five years and fine 50 GBP (approximately)	Not less than seven years; may extend to life and fine of 3,000 GBP (approximately) or three times the value of the drugs confiscated
27 (d) Other provision	Not less than one year; may extend to two years and with fine	Not less than one year; may extend to two years and with fine of not less than 200 GBP (approximately)

2.3.3. Rejection of Amendment to the D&C Act

As mentioned earlier, the MoHFW had introduced the amendment to the D&C Act in Rajya Sabha in 2007 and subsequently in 2013. On both occasions the bill was rejected. All the recommendations from the 2007 standing committee were incorporated in the new 2013 amendment of D&C Act, which was presented to parliament in August 2013. The bill was referred to the parliamentary standing committee, who reviewed the bill and presented their recommendations to Rajya Sabha on December 18, 2013 in their 79th report. The following provides background of both the bills and reasons why they were rejected. The text has been extracted from the Parliamentary Standing Committee Report from December 2013:

'The Drugs and Cosmetics Act, 1940 is a consumer protection law, which is concerned with the standards and quality of drugs and cosmetics and regulates their import, manufacture, sale and distribution in the country.

'In January, 2003, the Central Government constituted an Expert Committee under the Chairmanship of Dr. R.A. Mashelker, Director General of the Council of Scientific and Industrial Research (CSIR) to undertake a comprehensive examination of drug regulatory issues, including the menace of spurious drugs and to suggest measures to improve the drug administration in the country. The Committee noted that the problems in the drug regulatory system in the country are primarily due to inadequate or weak drug control infrastructure at the State and Central level and therefore, recommended centralised licensing of manufacture of drugs. The Committee further

[114] MoHFW, Government of India. Drugs and Cosmetics Act, 1940 [Internet]. 2003. Available from: http://cdsco.nic.in/html/copy%20of%201.%20d&cact121.pdf .

recommended for a strong, well equipped, empowered, independent and professionally managed Central Drugs Standard Control Organisation (CDSCO) which may be given the status of Central Drug Administration reporting directly to the Central Government.

'With a view to give effect to the recommendations of the Mashelkar Committee, the Central Government introduced the Drugs and Cosmetics (Amendment) Bill, 2007 in the RajyaSabha on 21st August, 2007, which, inter alia, provided for centralised licensing of manufacture of drugs, regulatory provisions for clinical trials and export of drugs and cosmetics, creation of strong, well equipped, empowered, self-managed and independent Central Drugs Authority in place of the existing central drugs regulatory body i.e. the CDSCO and do away with the Drugs Technical Advisory Board.

'The said Bill was referred to the Department-related Parliamentary Standing Committee on Health and Family Welfare for examination and Report. The Committee in its 30th Report made several recommendations, including for creation of a separate Chapter for regulating medical devices. The provisions relating to regulation of clinical trials and exports in the Bill also needed to be made more comprehensive and therefore, the Central Government decided to withdraw the Bill of 2007 and introduce a new Bill, namely, the Drugs and Cosmetics (Amendment) Bill, 2013 excluding the provisions relating to AYUSH drugs for which a separate Bill will be brought before Parliament.

'The new Bill contains, inter alia, a revised approach to the centralised licensing, in respect of seventeen categories of very critical drugs included in the proposed Third Schedule to the Act, a separate Chapter containing regulatory provisions for Medical Devices, more comprehensive provisions for regulating clinical trials and exports and a revised composition of the Central Drugs Authority consisting of, inter alia, Secretaries of seven Ministries and Departments of the Central Government, four State Drugs Controllers and four experts, with the Drugs Controller General (India) as its Member Secretary. The Drugs Technical Advisory Board has been retained.'

Salient features of D&C amendment, 2013 (pertaining to this research) were:

- The Bill contains a revised approach to the centralised licensing in respect of seventeen categories of very critical pharmaceuticals and provides separate regulatory provisions for medical devices. The bill also brings export of pharmaceuticals under the ambit of the D&C Act and proposes the establishment of a Central Drug Authority (CDA) to subsume the existing Central Drugs Standards Control Organisation
- The CDA shall among others, specify guidelines, structures and requirements for the effective functioning of the central and state licensing authorities; review, suspend or cancel any licence or permission issued by them; assess periodically the functioning of the Central Licensing Authority (CLA) and the State Licensing Authorities
- The DCGI is the CLA that has the power to issue, renew, suspend or cancel licences for import, export or manufacture of pharmaceuticals, cosmetics or medical devices or permission for conducting clinical trials. The DCGI also has the sole power to issue licenses for the manufacture, sale and export of 17 categories of critical pharmaceuticals (see Appendix 8 for details) listed in the third schedule:
- No drug or cosmetic or medical device shall be exported without permission or licence or certificate issued by the Central Licensing Authority
- Drug Inspectors / Drugs Control Officer (DCO)

- No drugs control officer should be appointed who has a financial interest in import, export or manufacture
- DCO should take samples during import, export, stocked for distribution etc

The standing committee conducted various meetings with the MoHFW and various other stakeholders and came up with several recommendations. Issues highlighted by various stakeholders (see table 11) on some of the specific portions of the bill[115] are as follows:

Table 11: Issues expressed by various stakeholders on the D&C amendment

Issue	Statement	By
On the composition of CDA	*'Size of Central Drugs Authority (CDA) is too large,' and 'Body of Clinical Experts must be there in the Clinical Body i.e. the Central Drugs Authority (CDA)'*	Gautam Khanna, Federation of Indian Chambers of Commerce and Industry
On Qualifications for the appointment of the DCGI	*'There should be broad spectrum of qualification as criteria for appointment of Drugs Controller General of India.'*	S.K. Gupta, AIIMS
	'Drug Controller (DCGI) should be given the status of special Secretary of Government of India to the Drug Regulator on the same pattern of selection that is followed for selection of the Secretaries of the Ministry of Science and Technology or the Secretary, Department of Health Research.'	Dr. M.K. Bhan, Department of Biotechnology
On the creation of a Central Licensing Authority	*'Need to put in place a performance rating for Central Licensing Authority in the provisions of the Bill itself.'*	Gautam Khanna, Federation of Indian Chambers of Commerce and Industry
	'The permission to manufacture drugs for domestic use or export should be granted by the same authority.'	P.K. Gupta, Confederations of Indian Pharmaceutical Industry
Effect of the bill on Small and Medium Enterprises (SMEs)	*'Centralisation of drug licensing would kill the SME pharma units and further strengthen the already powerful MNCs.'*	Jagdeep Singh, SPIC
	'Drugs and Cosmetics (Amendment) Bill, 2013 would prove detrimental to the small and medium scale industry as they have limited resources at their disposal and it would not be possible for them to approach the Central Licensing Authority for every approval.'	P.K. Gupta, Confederations of Indian Pharmaceutical Industry
About bringing exports under the purview of the D&C Act	*'Keep export of drugs outside the purview of this Bill as it would not only strain the regulatory framework and the available resources but also delay the process of export of medicines.'*	IDMA
On the testing of	*'For pharmaceutical quality, there is no*	Gautam Khanna, Federation of

[115]PRSI. Seventy-Ninth Report on The Drugs And Cosmetics (Amendment) Bill, 2013 (Ministry of Health and Family Welfare) [Internet]. Available from:http://www.prsindia.org/uploads/media/Drugs%20and%20Cosmetics/SCR-Drugs%20and%20cosmetics.pdf.

generics	*bio-equivalence testing for generics outside 'new drug' definition in the Bill.'*	Indian Chambers of Commerce and Industry

The bill was eventually rejected. Some of the major reasons, as per the parliamentary committee report are as follows:

- The Committee was informed that the exporter has to ensure that the pharmaceutical unit whose drugs are proposed to be exported comply with the GMP guidelines issued by the WHO. Hence no further regulation on the export of such drugs would be necessary
- Neither the Mashelkar Committee Report nor the Committee on Health and Family Welfare in its 30th Report on the Drugs and Cosmetics (Amendment) Bill, 2007, recommended the constitution of a (CDA) as proposed in the Bill. Instead, both the Reports recommended for strengthening of the existing Drugs Regulatory Body i.e. CDSCO and a strong Central Drug Administration. The proposed CDA and its composition is unprecedented as no other Regulatory Body in the country or outside the country has such composition and it is not acceptable to the Committee
- The Central Drug Administration should be headed by a Chief Drug Controller General of India of the rank of Secretary / Special Secretary having requisite technical and professional qualifications and experience in various aspects of drugs, medical devices and clinical trials
- The proposed administration should be given adequate autonomy to discharge its functions enumerated under the Act. The Committee therefore, recommended that the words 'Central Drugs Authority' be replaced by 'Central Drugs Administration'
- Central Drugs Administration will be answerable to the MoHFW. The Chief Controller General of India will be selected through Search-cum-selection Committee headed by the Cabinet Secretary
- Review of functioning of CDA by a panel of independent experts in the act itself
- The Committee recommends that in view of the concerns received from various stakeholders on the centralised licensing of Betalactums and Cephalosporins Antibiotics and Parenteral Preparations may be reconsidered
- The committee recommended that the sections for penal provisions for any illegal export (without permission of CLA / CDA) should be deleted

2.4. Pharmaceutical export guidelines

For export of pharmaceuticals from India, the regulatory compliance is as per the registration of the medicinal product in the importing country. At the same time, the GoI controls the Indian pharmaceutical exports by issuing guidelines for pharmaceutical manufacturers and exporters. These guidelines are issued by GoI bodies, especially CDSCO, Directorate General of Foreign Trade (DGFT) and Pharmexcil.

2.4.1. Guidelines issued by CDSCO

As mentioned earlier, CDSCO provides guidelines for the regulation of pharmaceutical exports. CDSCO also issues several documents, which are primarily required by the importing country's NDRA. Some of the key guidelines are:

1. Format for issuance of NOC for export of unapproved / approved new pharmaceuticals / banned pharmaceuticals
2. Guidance from the CDSCO for the duties of the port authority officer (for final approval by the Additional Drug Controller [ADC] at the CDSCO port office)
3. CDSCO notification for neutral coding of bulk drugs
4. List of 17 conditions to fulfil for the export of pharmaceuticals from India

The above-mentioned documents are attached in the Appendix 9, 10, 11 and 12

2.4.2. Guidelines issued by Directorate General for Foreign Trade

DGFT is another authority that controls exports. It issues Import-Export Code (IEC) to the exporter and a Certificate of Origin in some cases. It also issues notifications for export control; for example, DGFT Public Notice 173 (RE-2008)/2004–2009 dated April 13, 2009 (refer to Appendix 13) mentions the ADC's role in the export process, and makes it mandatory for all the exporters to submit CoA during export. DGFT has also authorised all pharmaceutical exporters in India to adopt a track and trace system using barcode technology on pharmaceutical exports as per GS1 global standard. Refer to Appendix 14 for more details.

2.4.3. Guidelines issued by Pharmexcil

All the exporters should be members of Pharmexcil and should have a valid RCMC certificate. More details about the export process and documentations required for pharmaceutical exports from India are discussed in Chapter 3.

3. International Regulations for Pharmaceutical Exports

3.1. WHO guidelines

3.1.1. Good Manufacturing Practices

As mentioned earlier, the primary requirement for any manufacturer involved in the manufacturing of pharmaceuticals either for domestic use or for exports, is to apply for a manufacturing license, which is awarded by the state DRA and is based on compliance with Schedule M of the D&C Act, 1940. This schedule is basically adapted from the WHO-GMP guidelines.

The GMP guidelines are published by the WHO[116] and every country affiliated with the latter has to follow the guidelines to ensure the quality of manufactured products. WHO also provides a checklist for the DRAs to inspect the manufacturing facilities and the format for the certificate, issued on successful completion of inspection.

In addition to Schedule M, the three alternative ways of enforcing GMP in India are:

i. Enforcement whereby the manufacturing sites are directly inspected and approved by the WHO headquarters (under the WHO pre-qualification program)
ii. Enforcement through a cGMP certificate issued by the CDSCO. Inspectors from the CDSCO and state Food and Drug Administration (FDA) inspect the manufacturing facility on the grounds of GMP guidelines and issue the cGMP certificate, if they find the right compliance. There are 1,296 facilities that have been inspected by the CDSCO and have a valid cGMP certificate[117]. This certificate is necessary for Indian companies if they wish to participate in national tenders
iii. Finally, if a company wishes to export pharmaceuticals from India, it needs to apply for a CoPP. This is also awarded by the CDSCO, certifying that the product has been manufactured in a WHO-GMP compliant facility. If a manufacturing plant already has a WHO-GMP certificate (as per the above two enforcement methods), then it does not need to go through the full process. Rather it can simply apply for CoPP (product and country specific) as and when it wishes to export a product

3.1.2. Good Laboratory Practices

GLP are an integral part of the various pharmacopoeia conventions, which a manufacturer has to comply with (as directed by the buyer or as per the domestic market regulations). Hence the drugs should be tested in a GLP compliant laboratory (either manufacturer's own laboratory or any contracted laboratory), the laboratory should have a GLP certificate from the relevant authority or any credible third party, based on conditions stated in the WHO-GLP guidelines[118], which are modified frequently.

[116]WHO. Medicine Documents [Internet]. Available from: http://apps.who.int/medicinedocs/documents/s18679en/s18679en.pdf.
[117] Pharmexcil interviewed by ESH Team .
[118]Handbook, Good Laboratory Practice, Second Edition [Internet], 2009. Available from: http://www.who.int/tdr/publications/documents/glp-handbook.pdf .

In India, laboratories are inspected and certified by the National Accreditation Board for Testing and Calibration (NABL), which bases its certification on the International Organisation for Standardisation (ISO) 17025. Also, the Indian Pharmacopoeia prescribes compliance with WHO-GLP. Discussion about the accreditation of laboratories is covered in Section A – Role of Key Stakeholders.

3.1.3. Good Distribution Practices

The WHO has an established guideline on GDP[119], which lays down all the critical aspects of a good distribution channel for pharmaceuticals. There is no reference of GDP in the D&C Act or any other relevant documents. However, some sections of the D&C Act promote the use of good distribution and have guidance by CDSCO to Zonal offices; there are sections for Zonal officers to ensure good distribution practices of pharmaceuticals. Recently, the CDSCO has published a draft guideline on GDP for biological products.

3.1.4. Good Storage Practices

In accordance with WHO guidance, all customs posts handling pharmaceutical products should be provided with secure storage facilities, compliant with WHO-GSP. These facilities, in the absence of a drug inspector, should be periodically inspected by the DRA to ensure implementation of the GSP.

Additionally, the importing country's agency should alert the customs in advance so that an incoming consignment can be transferred to the designated storage facility without delay and without breaking the cold chain. Consignments of pharmaceuticals should be of high priority for clearance from customs and when there are many consignments, a drug inspector should guide the customs as to which should be given priority. Absence of necessary storage conditions may result in degradation of pharmaceuticals even though they were manufactured properly[120].

In the CDSCO guidance for port officers, there does not appear to be direct reference to storage requirements or guidelines during exports; though it is mentioned that during imports, the pharmaceutical consignments should be stored in licensed premises. In the CDSCO guidance for Zonal officers, there are sections, for Zonal officers, to ensure good storage conditions in warehouses. Also, in the Schedule P of Drugs and Cosmetics Rules, 1945, storage conditions for pharmaceuticals are provided. Although, these are not GSP it is a small component of it. There is no direct reference to GSP with respect to exports of pharmaceuticals from India.

[119] WHO. WHO Good Distribution Practices for Pharmaceutical Products, Annex 5, WHO Technical Report Series 957, 2010 [Internet]. 2010. Available from: http://www.who.int/medicines/areas/quality_safety/quality_assurance/GoodDistributionPracticesTRS957Annex5.pdf.

[120] WHO. Quality Assurance of Pharmaceuticals. Vol. 2, p. 215 [Internet]. 1997. Available from: http://www.who.int/medicines/areas/quality_safety/quality_assurance/QualityAssurancePharmVol2.pdf.

3.1.5. WHO Certification Scheme for international commerce

The WHO-GMP guidelines are the most important guidelines for establishing quality during production of pharmaceuticals and should be strictly adhered to by all the manufacturers. However, to harmonise the situations in all member countries and to promote trade of quality-assured pharmaceuticals, the WHO has established a certification scheme, which would ensure the compliance of the WHO-GMP. This certification scheme acts as an instrument between regulatory authorities of the two countries, involved in the trade, which establishes the quality of the pharmaceuticals. Any regulatory authority, on the request of the other should furnish the following details:

- a specific product is authorised to be placed on the market within its jurisdiction or, if it is not authorised, the reason why that authorisation has not been accorded
- the plant in which it is produced is subject to inspections at suitable intervals to establish that the manufacturer conforms to GMP as recommended by WHO, and
- all submitted product information, including labelling, is currently authorised in the certifying country

Three documents can be requested within the scope of this scheme:

- CoPP
- Statement of licensing status of pharmaceutical product
- Batch certificate of a pharmaceutical product

As India is also a WHO member state, India also provides these three documents when requested by the importing country's DRA. As stated earlier, the CDSCO only provides CoPP to those manufacturers whose facilities are WHO-GMP approved (by CDSCO).

3.1.6. WHO Model Quality Assurance System for Procurement Agencies[121]

WHO's model Quality Assurance system (an inter-agency guideline for WHO, UNICEF, UNDP, UNFPA and World Bank) is an effort to harmonise the procurement practices and ensure delivery of Quality Assured pharmaceuticals to consumers. Almost every other procurement agency has derived their Quality Assurance practices from this WHO guidance.

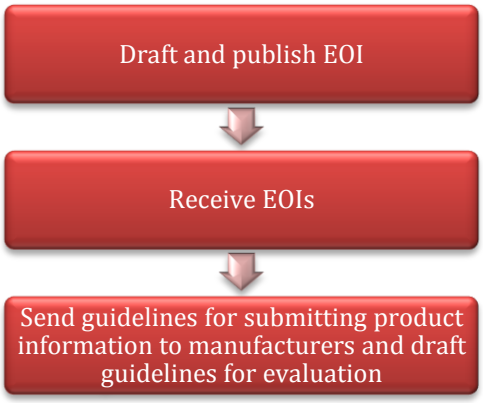
WHO model system consists of four key steps. Elements of Quality Assurance are embedded within the process (such as procurement from pre-qualified suppliers, pre-shipment testing, inspection etc.):

i. Pre-qualification

Pre-qualification is the first step of the procurement process and is divided into two parts; pre-qualification of products and pre-qualification of manufacturers. Following is a detailed chart of the pre-qualification process:

Step 1: Solicit and receive Expression of Interest (EOI)

[121] Inter-agency guidelines; A model quality assurance system for procurement agencies; WHO, UNICEF, UNDP, UNFPA and World Bank; available at http://www.who.int/medicines/publications/ModelQualityAssurance.pdf.



Step 2: Receive product information

Step 3: Screen product information

Step 4: Evaluate product information

Step 5: Plan, prepare and perform inspection of manufacturing facility (to conform cGMP compliance)

Step 6: Finalise assessment process and update pre-qualification list

ii. Purchase

Purchasing of pharmaceuticals should always be from the pre-qualified suppliers and should follow a tender mechanism. All the pre-qualified manufacturers should be monitored regularly to check whether the quality standards are as specified in the original dossier / inspection

iii. Receipt and Storage

The storage of pharmaceutical batches from the manufacturers should be as per the WHO-GSP guidelines. The procurement organisation should ensure that the quality of the products is maintained during receipt and storage. Steps to ensure quality:

- Pre-shipment Quality Control—Each batch of finished product should be tested in an independent laboratory or supplier's laboratory (if the agency is satisfied with the quality processes of the laboratory) and an authentic CoA must be supplied to the agency before shipping the products to the agency
- Receipt of products: Upon receipt of pharmaceutical products at the port (or receiving bays), the agency should conduct a physical inspection of the shipment which includes:
    - Checking of CoA
    - Batch number
    - Label description
    - Possible contamination, damage and tampering
- Post-shipment (procurement) Quality Control
    - Sampling of products and Quality Control testing
    - Rejection of failed batches
- Storage
    - Storage of products should be as per WHO-GSP

iv. Distribution

The distribution of pharmaceutical products should be as per the WHO-GDP guidelines. Distribution of pharmaceutical products should be conducted in compliance with the guidelines as bad distribution practices affect pharmaceutical products. Some pharmaceutical products may even degrade if not subjected to an appropriate environment

3.2. Donor Policies

3.2.1. Global Fund to fight against AIDS, TB, Malaria (GFATM)

The Global Fund quality policies[122] are based on the WHO model Quality Assurance for procurement agencies. The various Quality Assurance elements of the policy are mentioned below:

Pre-qualification and selection:

a. For anti-retroviral, anti-tuberculosis and anti-malarial pharmaceuticals

The pharmaceutical products procured by the Principal Recipients (PR) should be either:

- Pre-qualified by WHO pre-qualification programme
- Approved by SRA
- Recommended by use by an Expert Review Panel (ERP)

ERP process:

- Upon Global Fund's request, an ERP can review the potential risk / benefits associated with an Finished Pharmaceutical Product (FPP) and report its findings to the Global Fund
- ERP eligibility criteria:
    - the manufacturer has submitted an application of pre-qualification / marketing authorization to WHO or an SRA
    - the FPP is manufactured at a site which is pre-qualified by WHO, approved by an SRA or a regulatory authority under PIC/S

b. For all other FPPs

All other FPPs should comply with the relevant quality standards that are established by the National Drug Regulatory Authority of the country

Quality Assurance activities during procurement

- PRs must ensure that procurement is conducted as per the WHO guidelines on model Quality Assurance for procurement agencies
- The PR should ensure that products are subjected to Quality Control activities such as Quality Control testing before shipment, upon receipt and during distribution. Physical examination should also be conducted at various points in time
- For any ERP approved product, the Global Fund will make necessary arrangements for sampling and testing

[122] The Global Fund.QA Policy for Pharmaceutical Products. 2010. [Internet]. Available from: http://theglobalfund.org/documents/psm/PSM_QAPharm_Policy_en/

3.2.2. United States Agency for International Development (USAID)

The quality policies adopted by USAID[123] are governed by the Bureau for Global Health (GH), Office of HIV / AIDS (OHA) and Supply Chain for Health Division (SCH). The procurement process goes through the evaluation of GH/OHA/SCH which is based on the following criteria:

- The manufacturer should have an approval from:
  - USFDA
  - SRA
- The pharmaceutical should be sourced from an approved procurement agent
- The evaluation also takes into consideration the past performance of the vendor
- The products should be tested for Quality Assurance from an acceptable independent testing laboratory

3.2.3. Department for International Development (DfID)

DfID conducts all its procurement through third party organisations. The standards for quality[124] are based on WHO pre-qualification, ERP approval, SRA approval and NDRA approval. DfID relies on third party organisations on Quality Assurance policies but monitors quality regularly.

[123] USAID. ADS Chapter 312, Eligibility of Commodities. Pharmaceuticals. 2011. [Internet]. Available from: http://www.usaid.gov/sites/default/files/documents/1876/312.pdf

[124] National Academy of Sciences. Countering the Problem of Falsified and Substandard Drugs. Gillian J. Buckley and Lawrence O. Gostin. 2013.

3.3. Pharmacopoeia Standards

Pharmacopoeias are the reference standards for finished pharmaceutical products and APIs, which are presented as various monographs. The monographs for various drug products outlined in each of the pharmacopoeias include tests that ensure the purity of pharmaceutical formulations (for example, assay for API, related substances, and impurities) and sterility of pharmaceutical formulations (for example, tests for sterility and bacterial endotoxins).

However, these pharmacopoeias are only for reference / guidance and the various DRAs of the world may demand additional tests to be carried out on the pharmaceutical products in addition to tests outlined in their respective pharmacopoeial monographs; for example, in some monographs of the pharmaceutical products, the test for related substances / chromatographic purity may not be included, but this test could be required by some DRAs.

Manufacturers, while exporting, have to use an international pharmacopoeia during preparation of any pharmaceutical formulation. Some of the commonly used pharmacopoeias are: United States Pharmacopeia (USP), British Pharmacopoeia (BP), European Pharmacopoeia (Ph. Eur) and Japanese Pharmacopoeia (JP). In India, it is mandatory to comply with the Indian Pharmacopoeia (IP) developed by the Indian Pharmacopeial Commission (IPC) for local production and use. In order to harmonise the standards, the WHO has also developed an International Pharmacopoeia (also referred to as IP). Countries that do not have their own pharmacopoeia often refer to one of these as their national standard.

The testing methods for analysis of APIs or FPP are usually outlined in the individual monographs of the various pharmacopoeias. However, if a product monograph does not exist (for example, for patented or proprietary products), then in-house tests may be carried out. It is important that this in-house test is suitably validated according to ICH parameters.

The API and FPP manufacturers must adhere to stringent limits for the various tests carried out on the APIs and FPPs to ensure compliance during the shelf-life. The lower limit for assay must not be less than 90% of label claim throughout the shelf-life for the pharmaceutical product; and the upper limit for assay must not exceed 110 % of label claim for all pharmaceutical product monographs except for antibiotics and vitamins as these are susceptible to degradation during their shelf-life, and therefore formulations containing these products are required to contain overages.

The Drugs and Cosmetics Rules 1945, of India[125], under Schedule V give the standards for non-pharmacopeial pharmaceutical formulations, termed as proprietary medicines. The same is excerpted below for ready reference.

Standards for patent or proprietary medicines:

i. The standards for patent or proprietary medicines shall be those laid down in Indian Pharmacopoeia and if the dosage forms of such medicines do not fall under it, but are

[125] MoHFW, Government of India. Drugs and Cosmetic Rules, 1945 [Internet]. Available from: http://indianhealthservices.in/schedules/Schedule_V.pdf.

included in any other pharmacopoeia, prescribed for the purpose of the Second Schedule to the Act, it shall comply with the general requirements of the dosage of such pharmacopoeia

ii. Without prejudice to the generality of the following paragraphs, dosage forms of patent or proprietary medicines shall comply with the following requirements, namely:

- **Tablets:** Medicines shall comply with requirements for tablets as laid down in the Indian Pharmacopoeia. The nature of coating shall be indicated on the label. Permitted colours may, however, be added and declared on the label. Nature of tablets, such as uncoated, sugar coated or film coated, shall be declared on the label

- **Capsules:** Medicines shall comply with the requirements for capsules laid down in the Indian Pharmacopoeia. However, the capsules shall be free from distortion or shape, discolouration and other physical defects like leakage of power from joints, pinholes or cracks in the capsules

- **Liquid oral dosage forms:** Emulsions and suspensions shall disperse uniformly on shaking. Homogeneous solutions shall contain no sediments. The volume of the product (net content) in the container shall be not less than the labelled volume. The limit for ethanol content of pharmaceutical products shall not be less than 90 % and more than 110 % of the labelled contents

- **Injections and ointments:** Medicines shall comply with the requirements for injections and ointments as laid down in the Indian Pharmacopoeia

iii. The contents of active ingredients, other than vitamins, enzymes and antibiotics, in patent or proprietary medicines shall not be less than 90% and more than 110% of the labelled content; however, for enzymes and vitamins, only for lower limit of 90% shall apply. In all dry formulations containing antibiotics, the limit shall be 90–130% of the labelled contents and in case of liquid antibiotic formulations; the limit shall be 90–140% of labelled contents. Fiducial limits for error for microbiological assay of antibiotics may be estimated depending upon the design of assay procedure. Methods, used for assaying active ingredients shall employ the same basic principles and shall use the same organisms as given in the latest edition of the Indian Pharmacopoeia, or shall follow any other methods as approved by the authority competent to grant licence to manufacture Thus there is a check on the overages added for vitamins, enzymes or antibiotics. The manufacturer cannot escape the regulation by formulating a bad product containing high overages and also one that does not comply with the lower shelf-life limit of 90% of the labels claim, even though it is not a pharmacopeial formulation

iv. All patent or proprietary medicines containing Aspirin shall be subjected to 'Free Salicylic Acid Test' and the limit of such acid shall be 0.75 %, except in the case of soluble-type Aspirin, where the limit of such acid shall be 3%

v. Patent or proprietary medicine to be tested under the provisions of Rule 121-A for pyrogen shall be tested by injecting into rabbits not less than the human dose of the medicine based on body weight of a 60 kg human being. Methodology selected shall be

indicated in the protocol but the dose shall be not greater than five times the human dose based on the body weight of 60 kg man

vi. In injectable patent or proprietary medicines, the test for freedom from toxicity shall be performed as described in the Indian Pharmacopoeia. Dose selected shall be indicated in the protocol but it shall not be less than five times the human dose based on the body weight of a 60 kg human being

Thus it is evident that even the non-pharmacopeial pharmaceutical formulations marketed in India are required to comply with the standards of proprietary medicines, outlined in Schedule V of the Drugs and Cosmetic Rules, 1945 in order to be legally compliant.

Shelf-life

The Schedule P of the Drugs and Cosmetics Rules 1945, of India, mentions the maximum shelf-life for pharmaceutical formulations, along with information about storage conditions to ensure pharmaceutical products that are susceptible to degradation, such as antibiotics, do not lose their potency during the period of their shelf-life. The levels of impurities arising from degradation during the shelf life of the product must also be controlled.

3.4. Regulatory Harmonisation

Regulatory harmonisation means bringing the regulatory systems and processes of different countries to a common level. This offers many benefits to both national DRAs as well as the pharmaceutical industry and has a positive impact for the protection of public health. With regulatory harmonisation, the pharmaceutical companies generate data on common requirements of stability conditions, analytical validations and develop internationally accepted pharmaceutical registration dossiers, which would then be used in most of the countries without duplication of efforts, cost and time. This regulatory harmonisation has brought synergy in regulatory strategy of the pharmaceutical companies for entry into various markets worldwide.

3.4.1. International Conference on Harmonization (ICH)

One such group is International Conference on Harmonization of Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH), which has brought together the regulations of USA, Europe and Japan and is trying to harmonise the regulatory environment of the world.

In order to help other countries harmonise their regulatory environment, there is a Global Cooperation Group (GCG), which was originally formed as a subcommittee of the ICH Steering Committee in 1999 in response to a growing interest in ICH Guidelines beyond the three ICH regions. A few years later, recognising the need to engage actively with other harmonisation initiatives, representatives from Regional Harmonization Initiatives were invited to participate in GCG discussions, namely Asia Pacific Economic Cooperation; Asia Pacific Economic Cooperation; East African Community; Gulf Cooperation Council; Pan American Network on Drug Regulatory Harmonization (PANDRH); and Southern African Development Community. It was further expanded in 2007 and regulators were invited from countries where major production and clinical research are done and who have a history of ICH guideline implementation (Australia, Brazil, China, Chinese Taipei, India, Republic of Korea, Russia and Singapore)[126].

There are other international groups, which are trying to harmonise the regulatory patterns within their member states. Some of them are:

3.4.2. Pan American Health Organization (PAHO)

PAHO is an international public health agency, which serves not only as the specialised health agency of Inter American System but also as the regional office of the WHO Americas. PAHO has 48 member states that also include USA. PAHO through its PANDRH is trying to harmonise the regulatory functions of its member states since 1995 by organising various

[126] ICH. Global Cooperation, About ICH [Internet]. Available from: http://www.ich.org/about/organisation-of-ich/coopgroup.html.

conferences and meetings within the PANDRH[127]. Although PAHO is operational in Latin America, it is described here to show harmonization initiatives across the globe.

3.4.3. Pharmaceutical Inspection Convention and Pharmaceutical Inspection Co-operation Scheme (PIC/S)

PIC/S became operational from 1995 and provides a cooperative environment to all member countries or organisations in the field of GMP. It facilitates exchange of information in the field of GMP and conducts joint training of inspectors from the member organisations. PIC/S has a very unique operation, which allows harmonisation of international GMP activities and ensures compliance of high standards among the member organisations. India is not a member of PIC/S[128].

3.4.4. New Partnerships for Africa's Development (NEPAD)

NEPAD is working to strengthen and harmonise NDRAs across Africa with their pan-African initiative, African Medicines Regulatory Harmonization (AMRH) programme. The objective of the programme is to harmonise the regulatory functions in Africa, build capacity of the NDRA and promote seamless trade of Quality Assured health commodities across Africa. NEPAD is being supported by various global and African donors and all the regional trading blocs in Africa have participated in this initiative[129].

[127]D'Alessio R. PAHO/WHO. Pan American Network for Drug Regulatory Harmonization: An Overview [Internet].Available from: http://www1.paho.org/english/ad/ths/ev/report_secretariat.pdf.
[128]PIC/S. About PIC/S [Internet]. Availabe from: http://www.picscheme.org/pics.php.
[129] AMRH. About AMRH [Internet]. Available from: http://www.amrh.org/.

4. Self-Regulation

As indicated previously, there are more than 10,000 manufacturing sites in India, and given the limited capacity of the central and state regulatory authorities, it is just not feasible for a top-down 'policing' approach to ensure quality of drugs.

As an example, the USFDA has to inspect about 500 Indian manufacturing sites; despite its much smaller manufacturer list and much larger budget, relative to the Indian government, the USFDA finds it extremely difficult to ensure quality through this audit and 'policing' approach. As a result, the USFDA is exploring alternative strategies to promote quality and is focusing on catalysing self-regulation in the Indian pharmaceutical industry.

Self-regulation in manufacturing consists of steps taken by a manufacturing company to ensure compliance with international and national regulations (GMP, GLP and GCP etc.). It can be an effective tool to receive faster approvals, reduce internal fraud and improving industry / media image.

There can be various approaches under self-regulation, such as internal auditing, which prepares a site for the regulatory inspections. Pharmaceutical manufacturing companies are now promoting internal auditing and self-regulation as an important tool for promoting ethical behaviour[130].

Below is an example of measures taken by pharmaceutical manufacturer Cipla, based on findings taken from WHO Public Inspection Report for Pre-qualification, 2011. Some of these may be counted as self-regulation measures:

- Quality Assurance
  - An independent quality assurance team
  - Separate SOP for quality assurance activities, quality assurance team should report to senior management
- SOP for every process (for example product recall, hygiene etc). The SOPs should be revised regularly
- The manufacturing process is revalidated as per approved schedule and protocol periodically or in case of significant change in raw materials, equipment or procedure
- Calibration /qualification and maintenance programs
- Training programme for personnel
- A cleaning programme
- Regularly validated IT systems
- Regular maintenance / calibration / validation of instruments in Quality Control laboratory

[130] Sheth P.D., Desai K., Kulshrestha R. and others interviewed by ESH Team.

Sub-section 3. Overview of the Pharmaceutical Export Process in India

1. The Export Process

In the earlier chapters, we have briefly described the stakeholders in the Indian pharmaceutical industry, particularly the ones involved with exports. We have also described the Indian pharmaceutical market with a special emphasis on pharmaceutical exports from the country, the regulations around them and their Quality Assurance. This chapter focuses on the specific regulations for export and approvals / documents required, thus bringing together the findings from the previous chapters.

There are 13 major ports and 176 other ports[131] in India from where the goods are traded. Out of these, CDSCO port offices are only at 12 ports. Imports and exports are mandated to move through these 12 ports. An export NOC is required from the ADC of the CDSCO port office to export pharmaceuticals from these ports. Apart from the NOC, several documents are also required by the importing country NDRA issued by various Indian authorities especially the CDSCO.

Figure 21 outlines the various steps (documentation) required while exporting a pharmaceutical product from India:

- Company specific: this is required one time at an organisation level (manufacturer and / or the exporter)
- Product specific: this is required for every product intended to be exported from India
- Production batch specific: this is usually required for quality purposes or to be able to trace back the product to its source (and ingredients)
- Export shipment specific: this is the last step in the process and is required to be done every time a shipment is sent

[131] MOSPI. Date from Chapter 22 Shipping [Internet]. Available from: http://mospi.nic.in/Mospi_New/upload/SYB2013/CH-22-SHIPPING/Chapter%20No.22.pdf.

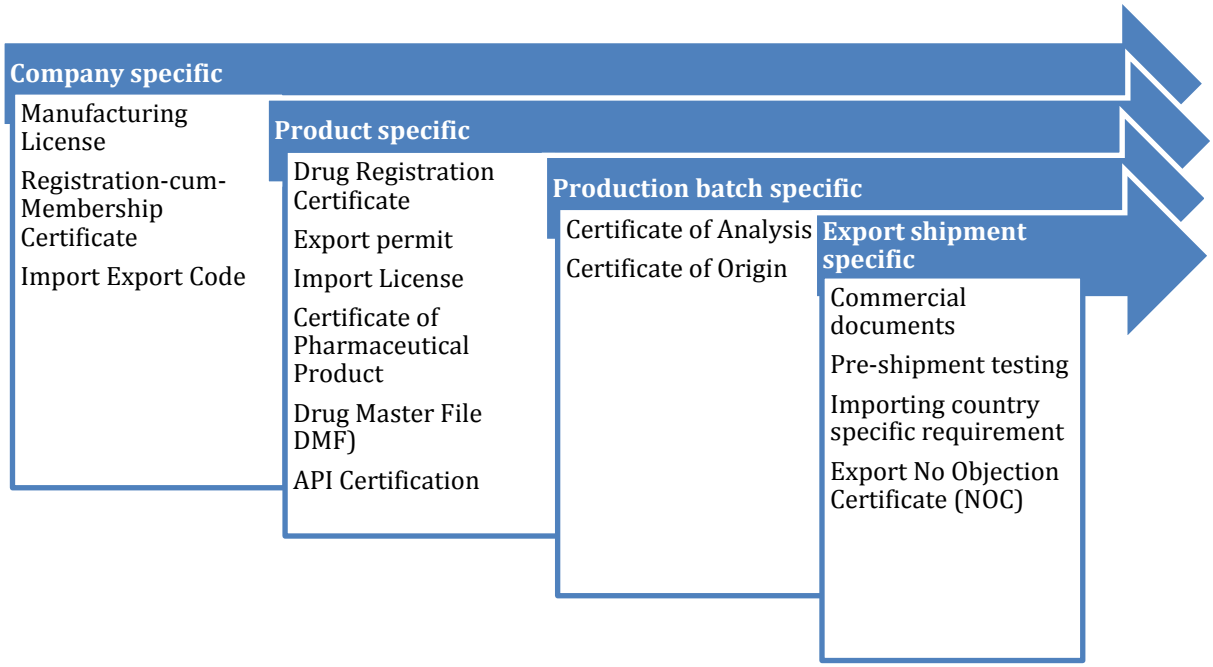


Figure 21: Documentation Required at Each Step of Export of Pharmaceuticals from India

Each of the above steps in the export process and the documentation required at each stage are described below:

1.1. Company specific documentation

1.1.1. Manufacturing license

In India, manufacturing of pharmaceuticals is under the purview of the state DRA, which provides a license for manufacturing. The license number is given by the state DRA to the manufacturer for a particular manufacturing facility, based on requirements mentioned in Schedule M of the D&C Act of 1940. The state DRA inspects the facility prior to awarding the license. This license number is valid for five years for the set of products applied for. For every new pharmaceutical / dosage form to be manufactured in that facility, a new license is required and is categorised under the same facility license. The state DRA may also draw samples from these manufacturing plants from time to time for testing in the state DRA approved laboratories.

As pointed out in the earlier reports, the manufacturer may have manufactured the drug in its own plant (in which case, it has an own license) or in another manufacturer's plant (in which case, has a loan license). The exporter is required to mention the manufacturing license number on all levels of packaging to make an exported pharmaceutical traceable back to the manufacturing plant.

1.1.2. Registration-cum-Membership Certificate (RCMC)

RCMC is mandatory for every exporter that wishes to export pharmaceuticals from India. This certificate is issued by Pharmexcil, for which every exporter has to become a member of the council. A RCMC confirms that the company is eligible for export from India.

1.1.3. Import Export Code (IEC)

IEC, which is required for any exporter from India, is issued by the DGFT, irrespective of the product category. Eligibility condition and legal provisions are given for IEC Code Number Application in Foreign Trade (Regulation) Rules, 1993 Ministry of Commerce, notification No. GSR 791 (E), dated 30-12-1993.

1.2. Product Specific Documentation

1.2.1. Pharmaceutical registration certificate

Before an importer (either private or public) places an order with an Indian company (either merchant-exporter or manufacturer-exporter), it needs to register the pharmaceutical in the importing country. The importer or manufacturer prepares a dossier and submits it to the importing country's NDRA. Depending on the importing country, the requirements vary and correspondingly, the dossier could vary from a few pages to a few hundred pages. Further, the registration of this dossier might take few weeks to few months. For example, the South African NDRA normally takes 12–24 months to register a new pharmaceutical for import. Finally, the product registration may be held under the name of either the manufacturer or the importer, depending on the terms of agreement between the two parties and regulations of NDRA of the importing country.

The importing country's NDRA might be present in India to oversee the export. At this stage, they might visit the manufacturing plant, from where the drug is being manufactured (although this is not mandatory). Importing country's DRA may also be involved in inspections, audits and formal approvals of the manufacturing facility. For example USFDA has inspected 559 manufacturing plants in India[132].

Generally, USFDA standards are considered amongst the toughest to achieve, and the level of adherence to the standards also depends on the capacity of the importing country's NDRA.

1.2.2. Export Permit

DCGI issues additional export permits for new approved, unapproved and banned pharmaceuticals. For example, the manufacturer has to receive an additional approval from the DCGI in the case of a drug not approved for marketing in India, and this approval is based on the

[132]Pharmecxil data (2012).

registration of the pharmaceutical in the country intended for export (that the pharmaceutical is, in fact, allowed to be marketed and sold in the country of import). CDSCO also requires that a copy of label / carton of similar products marketed in that country is also enclosed in the NOC application submitted by the formulation manufacturer.

Additional approval is required for other restricted pharmaceuticals such as from Narcotics Control Bureau (NCB) for narcotics. Definitions for new approved / unapproved / banned pharmaceuticals are mentioned in the Appendix 15. These conditions have been mentioned by CDSCO in a guidance document, as well as under the ADCs role for issuing export NOC (refer to Appendix 9 and 10)[133].

1.2.3. Import License

As discussed above, when a product is to be exported from India, a registration certificate is issued by the importing country. This in itself is a permission to import pharmaceuticals. In addition, import license is granted in certain countries (including India as well) only after the registration certificate is issued. Import license is issued by the importing country's DRA and is as per one of the guidance by the International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH) and WHO for the importing countries.

The validity of import license is determined by the respective DRA and is subject to renewal upon expiry. The import license is product specific. There is also a provision for inspection of the manufacturing facility. However, this depends on the importing country's DRA.

1.2.4. Certificate of Pharmaceutical Product (CoPP)

This certificate, which is in the format recommended by the WHO, establishes status of the pharmaceutical product, the GMP requirements and of the applicant. There is one certificate for each product, since manufacturing arrangements and approved information for different dosage forms and different strengths can vary. Issuance of CoPP is a WHO requirement for all its member countries. CoPP confirms the quality of product being exported out of the country and also establishes the quality and safety of the medicinal products being manufactured under the WHO-GMP guidelines.

In India, CoPP is issued by the Zonal / Sub-Zonal offices of the CDSCO after necessary inspection and clearance. CoPP is only issued to those manufacturers who have a valid WHO cGMP certificate awarded by the CDSCO after necessary inspections. This particular certification is adapted from the WHO-GMP and is valid for a manufacturing plant. Manufacturing plants which have WHO cGMP certification can apply for many national tenders as this an absolute requirement and can also apply for a new, country-specific CoPP at the time of export (rather than going through the full process every time). There are 1,296 facilities that have been

[133]CDSCO, Ministry of Health and Family Welfare, Government of India. Guidance Document on Common Submission Format for Issuance of No Objection Certificate for Export OF Unapproved/Approved New Drugs/Banned Drugs [Internet]. Available from: http://www.cdsco.nic.in/guidane_documents_export_noc.pdf.

inspected by the CDSCO and have a valid WHO cGMP certificate. The CDSCO has adopted the WHO-CoPP format. During issuance of CoPP, CDSCO ensures that the correct composition (including actives and excipients), pack and pack size are used for manufacturing the export batch, as approved by the importing country (based on registration certificate from the importing country for the subject product).

1.2.5. Active Pharmaceutical Ingredient (API) certification

The CDSCO issues a written confirmation for API exported to the European Union (EU) for medicinal products for human use, in accordance with Article 46(2)(b) of Directives No. 2001/83/EC basis the check-list (see Appendix 16). This checklist ensures quality by including documents on impurity profiling, process validation data, analytical validation report, annual product review summary etc.

Although not every country requires this level of detail for APIs, the source and quality of API's is becoming a more integral part of the quality assurance process.

1.2.6. Drug Master File (DMF) submission134

A DMF is a submission, which is used to provide confidential detailed information about facilities, processes, or substances used in the manufacturing, processing, packaging and storing of pharmaceuticals. There are some countries that require DMF submission like USA (though it's not mandatory), Canada and EU countries. USFDA was the first authority who had established this procedure in 1989 followed by EU and then Canada[135].

USFDA has classified DMFs into five types[136]:

- Type I - Manufacturing Site, Facilities, Operating Procedures, and Personnel
- Type II - Drug Substance, Drug Substance Intermediate, and Material Used in Their Preparation, or Drug Product
- Type III - Packaging Material
- Type IV - Excipient, Colorant, Flavor, Essence, or Material Used in Their Preparation
- Type V - FDA Accepted Reference Information

The submission of a DMF is not required by law or NDRA regulation. A DMF is submitted solely at the discretion of the holder. A DMF may be used to support an Investigational New Drug Application (IND), a New Drug Application (NDA), an Abbreviated New Drug Application (ANDA), another DMF, an Export Application, or amendments and supplements to any of the above.

[134] DMF is not required particularly during export but is an important document for registration of product.
[135] Active Pharmaceutical Ingredient Master File (APIMF) Procedure, Sultan Ghani, WHO. 2010. Available from: apps.who.int/prequal/trainingresources/pq_pres/.../3-1a_APIMF.ppt.
[136] Guidelines for Drug Master Files, CDER, USFDA, DHHS, 1989. Available from: http://www.fda.gov/Drugs/DevelopmentApprovalProcess/FormsSubmissionRequirements/DrugMasterFilesDMFs/ucm073164.htm.

A DMF is not a substitute for an IND, NDA, ANDA or Export Application. It is not approved or disapproved. Technical contents of a DMF are reviewed only in connection with the review of an IND, NDA, ANDA, or an Export Application[137].

Filing a DMF at the USFDA by a company is an indication that the company has a facility complying with the USFDA requirements. In 2011, a total of 7,866 Type II DMFs were active (Type II DMFs are filed most often, which were filed since 1,956. Out of this, India stood on top with 2,759 active Type II DMFs contributing to 35% of total active type II DMFs. India was followed by USA with 1,323 filings, followed by China with 870 filings[138].

In EU, after the revision of the law, DMFs are called ASMF i.e. Active Substance Master File and is only applicable to Active Substances (APIs).

Only one country in Sub-Saharan Africa, South Africa, requires DMF's for product registration. Other countries in SSA, may request for some API information. For example, Nigeria's NAFDAC requests for details of the source of APIs, while most other African countries do not ask for this information. This is summarized in the figure 22:

Table 12: Global requirement for DMF for APIs

	Drug Master File (DMF)	**Non - DMF**	
		Detailed API information	Little /no API information
Relative quality (purity, impurities, categorisation)	High	Medium	Low
Relative cost	10	4	1
Regulatory requirements	SRA and only South Africa in African continent; International procurement agents also submit DMF	Nigeria, Zimbabwe, Tanzania, Uganda (now)	Most of francophone Africa, Sudan, Liberia and others
NDRA inspections	Yes	No	No
Filing requirements if change in API source made	Need to file a type II (major variation) which requires new stability studies of FPP to ensure it complies with original specifications of regulatory approval		Minimal requirements

[137] Guidelines for Drug Master Files, CDER, USFDA, DHHS [Internet]. 1989. Available from: http://www.fda.gov/Drugs/DevelopmentApprovalProcess/FormsSubmissionRequirements/DrugMasterFilesDMFs/ucm073164.htm.

[138] Rau.B.S, Appaji.P.V, Dynamics of Drug Master Filings at United States Food and Drug Administration. The Pharma Review [Internet]. June 2012. Available from: http://pharmexcil.org/uploadfile/ufiles/4DynamicsDrugMasterFilingsUSFDA01may2012.pdf.

1.3. Production Batch Specific Documentation

1.3.1. Certificate of Analysis (CoA)

CoA is a requirement of the importing country's DRA, as well as the CDSCO port office and ascertains the composition and purity of the pharmaceutical being exported. It is issued by either a manufacturer-approved laboratory or an approved laboratory of the importing country's DRA or a laboratory approved by the CDSCO. A valid CoA is mandatorily checked at the time of export and is one of the key documents, based on which an ADC authorises a NOC. Officials of the Drugs Control Department may retain a sample for the purpose of reference and tracking.

1.3.2. Certificate of Origin (CoO)

CoO establishes that the product exported has been manufactured in India. This certificate is mandatory as per the Foreign Trade Policy of India and is issued to the manufacturer. CoO, in some cases is mandatorily required by the importing country, as well. CoO can be classified into two categories: a) CoO as per preferential agreements and b) Non-preferential CoO. Pharmexcil is authorised by DGFT to provide for the entire non-preferential CoO, whereas there are certain organisations like Federation of Indian Export Organisations, Export Inspection Council (EIC) and DGFT that are responsible for issuing CoO for preferential agreements.

1.4. Export shipment specific documentation

1.4.1. Commercial Documents

The importer prepares the purchase order, letter of credit and other commercial documents that are required by the exporter. For the purpose of this study, which is focused on quality of pharmaceuticals, these documents are not relevant and hence, are not described in detail, here.

1.4.2. Pre-shipment Testing

If the product is to be purchased using donor funds, it may have to undergo pre-shipment testing (for example, under the Global Fund Quality Assurance policy, a pharmaceutical present under the ERP category will have to mandatorily undergo a pre-shipment testing by a Global Fund approved Quality Assurance laboratory). Procurement agents like the IDA also conduct a pre-shipment test before shipping the product.

1.4.3. Importing Country Specific Requirement

There are a few countries that have imposed additional steps for pharmaceutical exporters. ADCs have been mandated by CDSCO to perform these additional steps for example National Agency for Food and Drug Administration and Control (NAFDAC) (see guideline in Appendix

17), the regulatory authority of Nigeria has appointed QCS consultants in India to ensure the quality, safety and efficacy of the pharmaceuticals imported from India to Nigeria. QCS consultants conduct pre-shipment inspections and pre-shipment testing for more than 140 companies in India who export to Nigeria. QCS has selected seven laboratories in various parts of the country who conduct the testing[139].

While the idea is beneficial for the importing country, the implementation becomes challenging at the port office because:

- Numerous applications to be checked by ADC per day for exports and any additional step makes it difficult to review documents within time
- The laboratories selected by importing country DRA may or may not be of sufficient credibility

Refer to an excerpt from the conversation with an ADC below:

'Our responsibilities are guided by the CDSCO document. Whenever any importing country DRA imposes new rules, it sometimes becomes challenging for us to inspect those export shipments. We only get limited time to inspect the shipments and we get numerous applications on a daily basis and to check for some additional requirements is sometimes very difficult.

For example, some DRA would tell us to check whether the CoA has been issued by the laboratory approved by them. But what if that laboratory is not even approved by CDSCO? We know that there is a potential risk but we have to let go the consignment.'

– ADC, CDSCO

1.4.4. Export No Objection Certificate (NOC)

The final approval to export pharmaceuticals from India comes from the CDSCO port officer, which issues an export NOC. The port officer may also retain a sample for testing. Thus, the port officer ensures that the importing country has approved the formulation to be exported. These requirements are mentioned in the CDSCO guidelines for port officers. Please refer to the Appendix 9 for details.

139NAFDAC .Guidelines for clearance of imported drugs and related products in Nigeria, Ports inspection directorate [Internet]. Available from: http://www.nlipw.com/wp-content/uploads/2013/08/GUIDELINES-FOR-CLEARANCE-OF-IMPORTED-DRUGS-HUMAN-AND.pdf, http://www.localjobswebsite.net/job-manager-mumbai-qcs-5-to-10-years-experience-jobs-india_NiD_674051.html.

2. Quality Control During the Export Process

As mentioned in Section 1 of this report, there are a few Quality Control procedures that Indian exporters and manufacturers have to follow, based on guidance from Indian regulators such as the CDSCO, DGFT, Pharmexcil etc, as well as the international regulators such as the importing country NDRA, donors, etc. The following table 12 summarises the key documents required for exporting pharmaceuticals from India (as mentioned in the previous section) with a focus on quality control procedures:

Table 13: List of Documentation Required for Exporting Pharmaceuticals from India

S.No.	Description	Issued to	Issuing authority	Key requirement	Frequency of issuance and validity
1. 	Manufacturing license	Manufacturer	State FDA / CDSCO[140]	• Manufacturing site must be in compliance with Schedule M of the D&C Act , 1940 • Site must be inspected by the state DRA • Random samples are also withdrawn as part of surprise visits	Once in every five years; annual inspection by the state DRA
2.	RCMC	Manufacturer / Exporter	Pharmexcil	Any company that is exporting finished pharmaceuticals and bulk drugs from India (including merchant exporters, bulk drug manufacturers etc)	One-time (renewable every five years)
3.	IEC	Manufacturer / Exporter	DGFT	Fill application form and submit to DGFT office	Valid for lifetime of exporter
4. 	Drug registration certificate	Exporter / Importer	Importing country's DRA	Varies by importing country (product registration dossier)	Renewable upon expiry
5.	Export permit	Exporter / manufacturer	CDSCO	CDSCO issues export permits for new approved / unapproved and banned pharmaceuticals in the country	One time
6.	Import license	Exporter / Manufacturer	Importing country's DRA	Varies by the importing country	One-time (subject to renewal upon expiry)

[140] Only for a new product solely intended for export.

7. 	CoPP	Manufacturer	CDSCO (Zonal / Sub-Zonal office)	• Manufacturer should have CDSCO issued WHO-GMP certificate • CDSCO format based on WHO-CoPP format • Manufacturing plants, which have a WHO-GMP certificate from the CDSCO, only need to apply for a product specific CoPP (country and product specific) at the time of export; the CDSCO only issues CoPP to those manufacturers who have their facilities WHO-GMP approved by CDSCO	Issued per product; renewal depends on the shelf-life of the product
8. 	DMF	Manufacturer submits this to USFDA	USFDA (there is no issuance)	DMF is not mandatory by FDA regulation but it is the discretion of the manufacturer to submit or not	Per product
9. 	API certification	Manufacturer / Exporter	CDSCO	API certification is required for all APIs manufactured in India which are exported to EU region	Per API consignment
10. 	CoA	Manufacturer	Manufacturer's laboratory or CDSCO-approved laboratory or Importing country-approved laboratory	None	Batch wise
11.	CoO	Manufacturer / Exporter	Various authorities (Pharmexcil, EIC, DGFT)	None	Per export batch wise
12.	Commercial documents	Manufacturer/exporter	Importer / Buyer	Purchase order, Letter of Credit etc	Per shipment
13. 	Pre-shipment testing	Donor approved laboratory	Donor / Procurement agent	Depends on the donor. For example,under the Global Fund quality assurance policy, a drug present under the ERP category will have to mandatorily undergo a pre-shipment testing by a Global Fund approved Quality Assurance laboratory	Per shipment

14.	Importing country specific requirement	Importing country approved agency	Importing country NDRA	Depends on the importing country NDRA. For example, Nigeria's NAFDAC has appointed QCS consultants in India to conduct pre-shipment inspections and testing for companies in India who export to Nigeria through seven laboratories in various parts of the country	
15.	Export NOC	Exporter / Manufacturer	CDSCO port officer (ADC)	This is the last step of the process. Refer to Appendix 9 for an exhaustive list	Per shipment

Indicates these documents are linked to a quality control procedure (versus commercial documents)

Appendix

1. List of SRAs and PIC/S countries

SRA Countries[141]

- European Union member States (Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, The Netherlands and United Kingdom
- Japan
- United States
- Switzerland, Canada, Australia, Norway, Iceland, Liechtenstein

PIC/S Countries[142]

Argentina, Australia, Austria, Belgium, Canada, Taiwan, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Ireland, Israel, Italy, Latvia, Liechtenstein, Lithuania, Malaysia, Malta, Netherland, New Zealand, Norway, Poland, Portugal, Romania, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sweden, Switzerland, Ukraine, United Kingdom and United States of America

[141] List of SRA countries [Internet]. Available from: http://www.stoptb.org/assets/documents/gdf/drugsupply/List_of_Countries_SRA.pdf.
[142] List of PIC/S countries [Internet]. Available from: http://www.picscheme.org/members.php.

2. Evolution of the Indian Pharmaceutical Sector

Table 14: Events in Indian Pharmaceutical Sector Related to Quality

S. No.	Event	Area of focus / Implications	Year
1	Drugs and Cosmetics (D&C)Act	Manufacture, sale and distribution of drugs and cosmetics	1940
2	Drugs and Cosmetics Rules	Rules for the above	1945
3	Indian patent Act	Banished product patents, allowed process patents, growth driver for domestic pharmaceutical market	1970
4	Hathi Committee Report	Provided the idea of creation of National Drug Authority	1975
5	General Agreement on Tariffs and Trade – WTO membership	India came under WTO laws of international trade by signing the General Agreement on Tariffs and Trade – WTO membership	1994
6	Introduction of Schedule M in D&C act	WHO Good Manufacturing Practices becomes mandatory for the industry	1995
7	Mashelkar committee report	Assessed CDSCO and state DRAs, provided recommendations to strengthen the regulatory structure, assessed the extent of spurious and substandard drugs in the country	2003
8	Launch of the National Pharmacovigilance programme	The first National Pharmacovigilance programme for the country	2004
9	India adopts TRIPS	Process patents were banned and only product patents were allowed	2005
10	Rejection of amendment to D&C Act proposed by MoHFW	To include exports under the bill and formation of Central Drug Authority	2007
11	India allowed 100% Foreign Direct Investment	It allowed foreign companies to increase their presence in India, 6 major Indian companies were bought by foreign MNCs	2006
12	Last amendment of D&C Act	Penalties for counterfeiting were increased	2008
13	Country wide survey on spurious drugs	CDSCO found 0.101% and 6% of spurious drugs and sub-standard drugs, circulating in the market	2009
14	Submission of CoA during export	In order to strengthen the export process, DGFT issued a notice for all exporter / manufacturer to submit CoA during export	2009
15	Whistleblower scheme	Launched by MoHFW/CDSCO, the Whistleblower scheme is the Ministry of Health's initiative to stem the flow of spurious drugs in the country	2009
16	GLP addition to D&C Act	GLP addition to D&C Act and it's becoming operational has made mandatory for pharmaceutical R&D laboratories to follow WHO GLP guidelines (also applicable to pharma analytical laboratories to some extent)	2010
17	Market authorisation of FDC	Draft guidance on market authorisation of FDC	2010
18	Import / manufacture / marketing approval for new drugs	Draft guidance on preparation of CTD for import / manufacture / marketing approval for new drugs	2010
19	NOC for export of unapproved/ approved new drugs/ banned drugs	To strengthening of export process, a guidance document on Common submission format for issuance of No Objection Certificate for export of unapproved / approved new drugs / banned drugs	2011
20	Functions and responsibilities	A Guidance document for Strengthening of registration,	2011

	of Zonal, Sub-Zonaland port offices of CDSCO	inspection and export process was issued by CDSCO	
21	Planning commission report	A report on state of regulatory environment in the country by Planning commission suggests that CDSCO and state DRAs need up gradation in infrastructure and manpower. The commission also set aside budget for all the activities (Report of the working group on drugs and food regulation for the 12th five year plan)	2011
22	Neutral code labelling guidance by CDSCO	For strengthening of export process, CDSCO gave guidance to state DRAs on neutral code labelling	2011
23	CDSCO functioning report	A report by Parliamentary standing committee on CDSCO after an assessment of the functioning of CDSCO and recommendations to improve it (59th report on functioning of CDSCO by Parliamentary standing committee (Rajya Sabha), 2012)	2012
24	Change in CDSCO mission	After recommendations from the parliamentary standing committee, CDSCO aligned its mission towards public health	2012
25	Rejection of amendment to D&C Act	A report by a parliamentary standing committee on the amendment of the bill stated no need for including exports under the D&C Act and forming of an unprecedented Central Drugs Authority, amongst others	2013

3. Indian Pharmaceutical Market Data

Table 15: Indian pharmaceutical market data

Year	Domestic consumption (US$, billion)	Categories included	Source	Exports (US$, billion)	Categories included	Source	Number of companies
2005–6	9.1	Formulations, Bulk drugs	Department of Pharmaceuticals	2.4	Chapter 30 of the harmonised ITC-HS classification system	Department of Commerce	All
2006–7	10.1	Formulations, Bulk drugs	Department of Pharmaceuticals	3.2	Chapter 30 of the harmonised ITC-HS classification system	Department of Commerce	All
2007–8	12.7	Formulations, Bulk drugs	Department of Pharmaceuticals	4.2	Chapter 30 of the harmonised ITC-HS classification system	Department of Commerce	All
2008–9	12.0	Formulations, Bulk drugs	Department of Pharmaceuticals	5.1	Chapter 30 of the harmonised ITC-HS classification system	Department of Commerce	All
2009–10	13.1	Formulations, Bulk drugs	Department of Pharmaceuticals	5.2	Chapter 30 of the harmonised ITC-HS classification system	Department of Commerce	All
2010–11	15.3	Formulations, Bulk drugs	Department of Pharmaceuticals	6.7	Chapter 30 of the harmonised ITC-HS classification system	Department of Commerce	All
2011–12	16.4	Formulations, Bulk drugs	Department of Pharmaceuticals	8.5	Chapter 30 of the harmonised ITC-HS classification system	Department of Commerce	All
2012–13	16.5	Formulations, Bulk drugs	Department of	10.1	Chapter 30 of the harmonised ITC-HS classification	Department of Commerc	All

			Pharmaceuticals		system	e	
2009–10	12.9	Formulations, Bulk drugs	Planning commission	8.7	Formulations, Bulk drugs	Planning Commission	All
2009–10	12.4	Formulations, Bulk drugs	CMIE	7.7	Formulations, Bulk drugs	CMIE	350 publicly listed
2009–10	-	-	-	6.3	Formulations, Bulk drugs	CMIE	50 publicly listed
2012	-	-	-	10.8	SITC Rev.3 code 54	WTO	All
2012–13	-	-	-	9.3	Formulations	Pharmexcil annual report, 2012-13	All

Chapter 30[143] of the harmonised ITC-HS classification system includes pharmaceutical formulations, several medical supplies and AYUSH commodities. However, it is estimated that the maximum contribution of categories other than pharmaceutical formulations in the above mentioned data is limited to less than 10% of the overall export value.

SITC Rev.3 code 54 consists of[144]:

- 541 – Medicinal and pharmaceutical products, other than medicaments of group 542
- 542 – Medicaments (including veterinary medicaments)

[143] Indian Trade Classification (HS).Chapter 30 Pharmaceutical Products [Internet]. 2007. Available from: http://www.dgciskol.nic.in/itchs2007/pdfs/CHP_30.pdf.

[144] United Nations Statistics Division.SITC Rev.3 code 54 [Internet]. Available from: http://unstats.un.org/unsd/cr/registry/regcs.asp?Cl=14&Lg=1&Co=54.

4. List of Top 50 Companies from the CMIE Data of 2009–2010 (In Terms of Value of Pharmaceuticals Exported)

Table 16: List of top 50 exporting companies (2009–2010)

S.No.	Company	% share of export (2009-10)
1	Dr. Reddy's Laboratories Ltd.	8.2%
2	Cipla Ltd.	7.9%
3	Ranbaxy Laboratories Ltd.	7.6%
4	AurobindoPharma Ltd.	5.7%
5	Lupin Ltd.	5.7%
6	Matrix Laboratories Ltd.	4.2%
7	Orchid Chemicals & Pharmaceuticals Ltd.	2.7%
8	Cadila Healthcare Ltd.	2.6%
9	Sun Pharmaceuticals Industries Ltd.	2.3%
10	Divi's laboratories Ltd.	2.3%
11	IPCA Laboratories Ltd.	2.1%
12	Wockhardt Ltd.	1.9%
13	Glenmark Generics Ltd.	1.8%
14	Strides Acrolab Ltd.	1.5%
15	Biocon Ltd.	1.3%
16	Torrent Pharmaceuticals Ltd.	1.2%
17	J B Chemicals & Pharmaceuticals Ltd.	1.1%
18	Micro Labs Ltd.	1.1%
19	Piramal Healthcare Ltd.	1.0%
20	Fresenius Kabi Oncology Ltd.	1.0%
21	Arch Pharmalabs Ltd.	0.9%
22	Surya Pharmaceutical Ltd.	0.9%
23	Nectar Lifesciences Ltd.	0.9%
24	Alembic Ltd.	0.9%
25	Granules India Ltd.	0.9%
26	Shasun Pharmaceuticals Ltd.	0.8%
27	Plethico Pharmaceuticals Ltd.	0.8%
28	Panacea Biotech Ltd.	0.8%
29	Dishman Pharmaceuticals & Chemicals Ltd.	0.8%
30	Claris Lifesciences Ltd.	0.8%
31	Ind-Swift Laboratories Ltd.	0.7%
32	Unimark Remedies Ltd.	0.7%
33	Glenmark Pharmaceuticals Ltd.	0.7%
34	Aventis Pharma Ltd.	0.6%
35	Ajanta Pharma Ltd.	0.6%
36	D S M Anti infectives India Ltd.	0.6%
37	Kudos Chemie Ltd.	0.6%
38	NeulandLaboratoris Ltd.	0.5%
39	Flamingo Pharmaceuticals Ltd.	0.5%
40	Cadila Pharmaceuticals Ltd.	0.5%

41	Macleods Pharmaceuticals Ltd.	0.5%
42	Shilpa Medicare Ltd.	0.5%
43	ShanthaBiotechnics Ltd.	0.4%
44	Aarti Drugs Ltd.	0.4%
45	Wanbary Ltd.	0.4%
46	Parabolic drugs Ltd.	0.3%
47	Unichem Laboratories Ltd.	0.3%
48	Indoco Remedies Ltd.	0.3%
49	S M S Pharmaceuticals Ltd.	0.3%
50	Sequent Scientific Ltd.	0.3%
*an average exchange rate of 47.41 (for 2009-10) is considered		

5. Excerpts from the Drugs & Cosmetics Rules, 1945 Relevant to Exports

Rule 26: Purchaser of drugs or cosmetics enabled to obtain test or analysis — Any person [or any recognised consumer association, whether such person is a member of that association or not] shall, on application in prescribed manner and on payment of prescribed fee, be entitled to submit for test or analysis to a Government Analyst any drug [or cosmetic] purchased by him [or it] and to receive a report of such test or analysis signed by the Government Analyst.

Rule 47: Report of result of test or analysis: An application from a purchaser for test or analysis of a drug under Section 26 of the Act shall be made in Form 14 A and the report of test or analysis of the drug made on such application shall be supplied to the applicant in Form 14-B.

Rule 94: Exemption of certain drugs from certain provisions of this Part— (1) Labels on packages or containers of drugs for export shall be adapted to meet the specific requirements of the law of the country to which the drug is to be exported but the following particulars shall appear in a conspicuous position on the innermost container in which the drug is packed and every other covering in which that container is packed:

a) name of the drug;
b) the name, address of the manufacturer and the number of the licence under which the drug has been manufactured;
c) batch or lot number;
d) date of expiry, if any.

[SCHEDULE M]

[*See* Rules 71, 74, 76 and 78]

GMP and requirements of premises, plant and equipment for pharmaceutical products

6. Relevant Portions of the Drugs & Magic Remedies Act, 1954

- Section 6: Prohibition of import into and export from India of certain advertisements:
    - No person shall import into, and export from, the territories to which this Act extends any document containing an advertisement of the nature referred to in Section 3, or Section 4, or Section 5 and any documents containing any such advertisements shall be deemed to be goods of which the import or export has been prohibited under Section 19 of the Customs Act, 1878 and all the provisions of that Act shall have effect accordingly

- Section 4: Procedure to be followed in prohibiting import into, and export from, India of certain advertisements:
    - (1) if the customs collector believes that any consignment contains documents of the nature referred to in Section 6, he may, and if requested by an officer appointed for the purposes by the Central govt, shall detain consignment and dispose it off in accordance with the provisions of the Customs Act, 1878, and the rules made there under, and shall also inform the importer or exporter of the order so passed

    - (2) if the importer or exporter who has given an undertaking under the first provision to sub rule (1) is required by the customs collector to return the consignment or any portion thereof, he shall return the consignment or portion thereof within ten days of the receipt of the notice

7. Relevant Portions of the Narcotic Drugs & Psychotropic Substances Act, 1985

An Act to consolidate and amend the law relating to narcotic drugs, to make stringent provisions for the control and regulation of operations relating to narcotic drugs and psychotropic substances 1(to provide for the forfeiture of property derived from, or used in, illicit traffic in narcotic drugs and psychotropic substances, to implement the provisions of the International Convention on Narcotic Drugs and Psychotropic Substances) and for matters connected therewith.

- **Section 9(vii):** Power of the Central Government to permit, control and regulate the import into India and export from India and trans-shipment of narcotic drugs and psychotropic substances:
    - (i) prescribe the forms and conditions of licences or permits for the manufacture, possession, transport, import inter-State, export inter-State, sale, purchase, consumption or use of psychotropic substances, the authorities by which such licences or permits may be granted and the fees that may be charged therefore

- **Section 9 (vii)(j)** prescribe the ports and other places at which any kind of narcotic drugs or psychotropic substances may be imported into India or exported from India or transshipped; the forms and conditions of certificates, authorisations or permits, as the case may be, for such import, export or trans-shipment; the authorities by which such certificates, authorisations or permits may be granted and the fees that may be charged therefore

- **Section 23:** Punishment for illegal imports in to India, export from India or transhipment of narcotic drugs and psychotropic substances. Whoever, in contravention of any provision of this Act or any rule or order made or condition of licence or permit granted or certificate or authorisation issued thereunder, imports into India or exports from India or trans-ships any narcotic drug or psychotropic substance shall be punishable:
    - where the contravention involves small quantity, with rigorous imprisonment for a term, which may extend to six months, or with fine, which may extend to ten thousand rupees or with both
    - where the contravention involves quantity lesser than commercial quantity but greater than small quantity, with rigorous imprisonment for a term, which may extend to ten years, and with fine, which may extend to GBP 1,000 (approximately)
    - where the contravention involves commercial quantity, with rigorous imprisonment for a term, which shall not be less than 10 years but may extend to 20 years and shall also be liable to fine,which shall not be less than GBP 1,000 (approximately) but which may extend to GBP 2,000 (approximately)

8. 17 Categories of Critical Pharmaceuticals

The DCGI also has the sole power to issue licenses for the manufacture, sale and export of 17 categories of critical pharmaceuticals which are:

- Sera
- Solution of serum proteins intended for injection
- Vaccines, and includes DNA vaccines and vaccines containing living genetically engineered organisms
- Toxins
- Antigens and anti-toxins
- Anti-biotics (Betalactums and Cephalosporins)
- Parenteral preparations meant for parenteral administration
- Hormones and preparations containing hormones
- r-DNA derived medicines
- RNA interference based products
- Monoclonal anti-bodies
- Cellular products and stem cells
- Gene therapeutic product
- Xenografts
- Cytotoxic substances (anti-Cancer medicines)
- Blood products;
- Modified Living Organisms

9. Format for Issuance of NOC for Export of Unapproved / Approved New Drugs / Banned Drugs

Introduction

A manufacturer holding valid license copy in Form25 and Form28 can obtain NOC from Zonal offices of the CDSCO for export purpose only for approved / unapproved new drugs / banned drugs in India.

Purpose

Requirement for the common submission format for issuance of NOC for export of unapproved / approved new drugs / banned drugs from India. This document made as per guidelines issued by the Ministry of Health and Family Welfare (MoHFW) for export purpose and Rule 94 of the D&C Act, 1940.

Scope

This document is applicable for the manufacturer to obtain NOC from Zonal offices of the CDSCO for export purpose.

Procedure

Requirement for Common Submission Format for issuance of NOC for export of unapproved / approved new drugs / banned drugs from India

The Following documents are required to be submitted in the following manner and order for issue of the NOC for export of drugs from India:

1. Covering Letter: The covering letter is an important part of the application and should clearly specify the intent of the application. The list of documents that are being submitted (index with page numbers) as well as any other important and relevant information may be provided in the covering letter. The covering letter mentioning list of products to be exported clearly indicating name of the drug, dosage form, composition and strength pack size along with quantity and country to be exported duly signed and stamped by the authorised signatory, indicating the name and designation of the authorised signatory along with the name and address of the firm.Each application should be made by the manufacturer only.

2. Purchase Order:

a. Order from the foreign buyer either in the name of manufacturer or in the name of trader mentioning list of products to be exported clearly indicating name of the drug, dosage form, composition and strength pack size duly signed by the competent authority with specific destination point of the importing country. In case of purchase order in the name of trader further a letter from the trader in the name of manufacturer is required to be submitted along with the application

b. It should be signed by the competent authority / person with a valid purchase order number and recent date not more than six months prior to the application made by the firm

3. Manufacturing License: License issued by the State Licensing Authority should be enclosed along with each application for the required location to manufacture the drug for export purpose.

4. Performa Invoice:

a. A copy of Performa Invoice from the importing country should accompany with application for import of unapproved APIs used in the drug formulation

b. A copy of Performa Invoice duly signed by the competent authority should be addressed to the manufacturer mentioning the required quantity of the bulk drug

5. Registration Certificate:

a. For the export of drugs, which are banned in India by Central Government, coming under list of drugs prohibited for manufacture and sale through gazette notifications under section 26a of D&CA, 1940 by the MoHWF

b. A copy of registration certificate from the specific importing country along with composition and strength of the drug should accompany with the application

c. Registration certificate should be provided in the name of manufacturer

While processing such applications the following conditions shall be taken into consideration:

1. The application shall provide copy of valid export order and NOC will be issued on a case by case basis against each such order

2. The applicant shall identify the premises where the drug will be manufactured for export

3. The applicant should mention whether the batch to be exported has undergone Quality Control testing or shall be tested at the destined site

4. The applicant shall ensure that the drug manufactured on the basis of NOC given as per (1) above is exported and that no part of it is diverted for domestic sale in India

5. The applicant shall make available for inspection of the appropriate authorities, on completion of the export orders, information regarding each consignment dispatched, remaining stock of drug and related raw materials and intermediates in hand

6. The applicant shall ensure physical destruction of all unexported quantity of drugs. This should be included as a condition of manufacturing license issued to the applicant by the State Licensing Authority

7. The applicant shall ensure that the drug for which NOC has been given shall cease to be manufactured or exported if the drug is prohibited in future in the country or in the importing country

Guidelines for the Export of Drugs Issued by the MoHFW

Subject: Clarification about issuing NOCs for manufacture of new–unapproved drugs solely for export.

With reference to the above subject, the undersigned is directed to inform you that following consultation with the Ministry of Law and in consonance with their advice, you may resume the earlier practice of issuing NOCs to applications received for the above purpose:

While processing such applications the following conditions shall be taken into consideration:

1. The application shall provide copy of valid export order and NOC will be issued on a case by case basis against each such order

2. The applicant shall identify the premises where the drug will be manufactured for export

3. The applicant should mention whether the batch to be exported has undergone Quality Control testing or shall be tested at the destined site

4. The applicant shall ensure that the drug(s) manufactured on the basis of NOC given as per (1) above is exported and that no part of it is diverted for domestic sale in India

5. The applicant shall make available for inspection of the appropriate authorities, on completion of the export orders, information regarding each consignment dispatched, remaining stock of drugs and related raw materials and intermediates in hand

6. The applicant shall ensure physical destruction of all unexported quantity of drugs. This should be included as a condition of manufacturing license issued to the applicant by the State Licensing Authority

7. The applicant shall ensure that the drug for which NOC has been given shall cease to be manufactured or exported if the drug is prohibited in future in the country or in the importing country

It is requested that immediate action may be taken to Operationalize the process and a report on action taken in this regard to clear the pending applications may be sent to this office by 22.3.99. A monthly agreement may hereafter be sent of the NOCs issued by DCG (I) in an appropriate format.

10. Guidance from the CDSCO for the Duties of the Port Authority Officer

Export of Drugs and Cosmetics [145]

XX. Export of Drugs & Cosmetics

1. Even though there is no chapter in the Act covering the export of Drugs & Cosmetics, but there is a reference about the ADC's role in the Customs Appraising Manual which is reproduced below:-

Customs Appraising Manual V – Export of Drugs & Cosmetics

In case of export consignments also, before the Shipping Bills are finally passed, ADC's No Objection should be obtained for consignments of Drugs & Cosmetics, he should also follow all the instructions given by the ADC prior to the actual export of the goods.

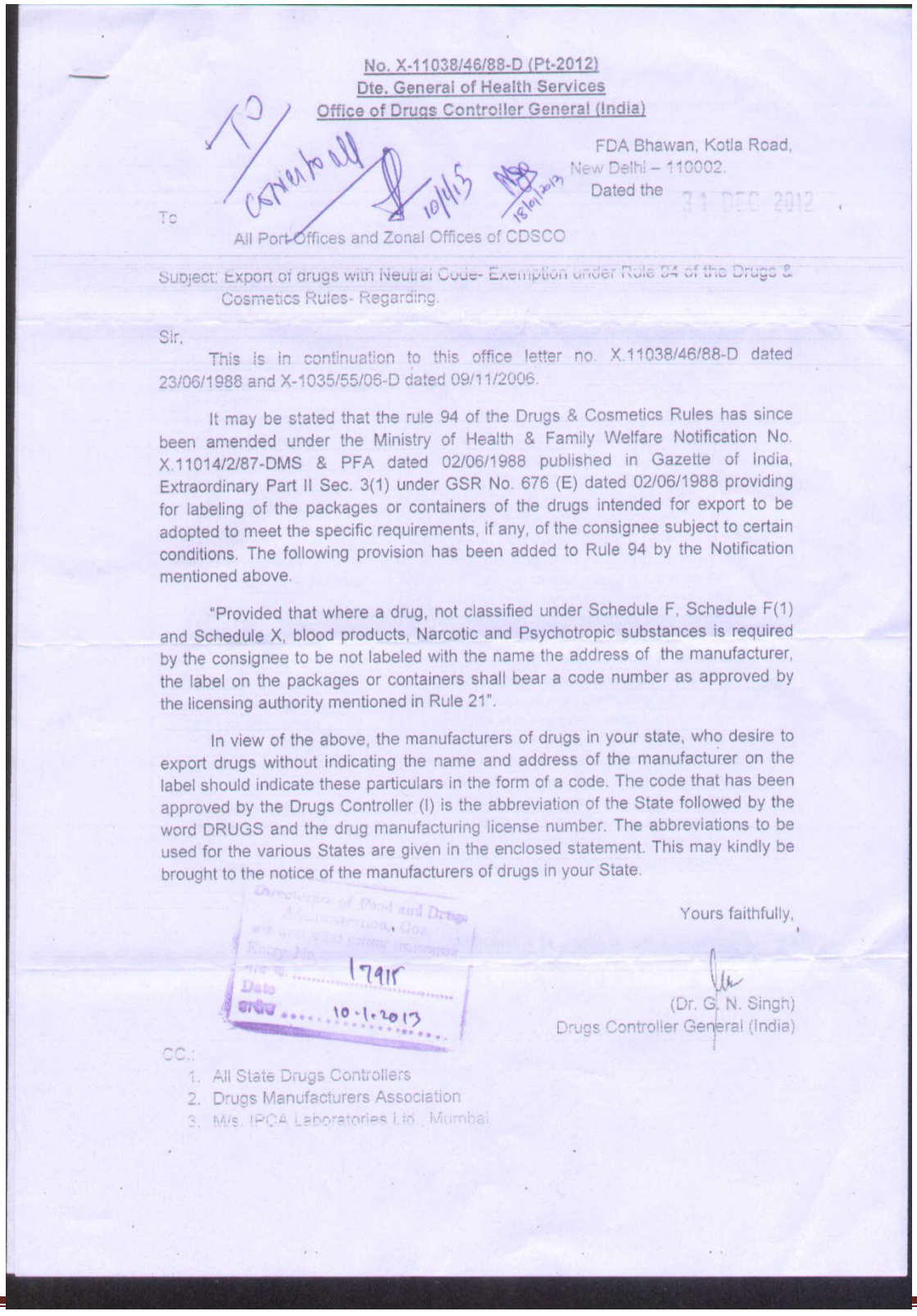
2. In addition to the above, DGFT Public Notice 173 (RE-2008)/2004-2009 dated 13th April 2009 also mentions the ADC's Role. A copy of Public Notice is attached herewith in the **Appendix – X.**

Port Officer scrutinizes the Shipping Bills for :-

1. Particulars in the form of ADC Export Sheet (**Appendix 11** for format)
2. Compliance to Rule 94 and 47 of Drugs and Cosmetics Rules
3. Compliance to the Drugs & Magic Remedies (OA) Act and Rules
4. Export permissions issued by the Drugs Controller General (I) for new drugs / banned drugs / fixed dose combinations / medicines beyond Schedule V limits / medicines with neutral code / special code / without labels etc. which are not permitted for marketing in India.
5. Export permits issued by the Narcotic Commissioner for Narcotic and Psychotropic substances and precursor chemicals and forward quarterly and annual statements of exports to DCGI / Narcotic Commissioner for onward transmission to International Agencies.
6. Certificate of analysis issued by the manufacturer for the subject product or a copy of certificate of analysis issued by approved laboratory of the importing country / FDA; or a copy of Certificate of Analysis issued by a laboratory approved by Drugs Controller under Drugs & Cosmetics Act 1940 and the rules made there under.

[145] CDSCO. Guidelines for Port Officers on Import and Export of Drugs and Cosmetics [Internet]. 2009. Available from: http://cdsco.nic.in/Guidlines%20for%20Port%20officers.pdf.

11. CDSCO Notification for Neutral Coding of Bulk Drugs



No. X-11038/46/88-D (Pt-2012)
Dte. General of Health Services
Office of Drugs Controller General (India)

FDA Bhawan, Kotla Road,
New Delhi – 110002.
Dated the 31 DEC 2012

To

All Port Offices and Zonal Offices of CDSCO

Subject: Export of drugs with Neutral Code- Exemption under Rule 94 of the Drugs & Cosmetics Rules- Regarding.

Sir,

This is in continuation to this office letter no. X.11038/46/88-D dated 23/06/1988 and X-1035/55/06-D dated 09/11/2006.

It may be stated that the rule 94 of the Drugs & Cosmetics Rules has since been amended under the Ministry of Health & Family Welfare Notification No. X.11014/2/87-DMS & PFA dated 02/06/1988 published in Gazette of India, Extraordinary Part II Sec. 3(1) under GSR No. 676 (E) dated 02/06/1988 providing for labeling of the packages or containers of the drugs intended for export to be adopted to meet the specific requirements, if any, of the consignee subject to certain conditions. The following provision has been added to Rule 94 by the Notification mentioned above.

"Provided that where a drug, not classified under Schedule F, Schedule F(1) and Schedule X, blood products, Narcotic and Psychotropic substances is required by the consignee to be not labeled with the name the address of the manufacturer, the label on the packages or containers shall bear a code number as approved by the licensing authority mentioned in Rule 21".

In view of the above, the manufacturers of drugs in your state, who desire to export drugs without indicating the name and address of the manufacturer on the label should indicate these particulars in the form of a code. The code that has been approved by the Drugs Controller (I) is the abbreviation of the State followed by the word DRUGS and the drug manufacturing license number. The abbreviations to be used for the various States are given in the enclosed statement. This may kindly be brought to the notice of the manufacturers of drugs in your State.

Yours faithfully,

(Dr. G. N. Singh)
Drugs Controller General (India)

CC.:

1. All State Drugs Controllers
2. Drugs Manufacturers Association
3. M/s. IPCA Laboratories Ltd., Mumbai.

12. List of 17 Conditions to Fulfil for the Export of Pharmaceuticals from India

PHARMACEUTICALS EXPORT PROMOTION COUNCIL
(Set up by Ministry of Commerce, Govt. of India)

COPY

Date : 29-01-2010

News / Story reproduced with thanks:- Pharmabiz

CDSCO issues stringent norms for pharma exporters

Friday, January 29, 2010 08:00 IST
Nandita Vijay, Bangalore

Direct link to the News/Story:-

The Central Drugs Standard Control Organization (CDSCO) has issued a set of new rules to the pharma exporters in the country to be adhered to by them while doing international trade. The new rules, which contains 17 points to be strictly followed by the exporters, have been issued to the industry and are effective from January 1, 2010.

In Karnataka too, CDSCO office of the Assistant Drugs Controller (ADC), Sub Zone Bangalore has in a circular No. ADC/TECH/BSZ dated January 1, 2010 highlighted 17 points to be followed by the exporters in the state. The circular now calls for documents to obtain no objection certificate (NOC) from the ADC for export of drugs and cosmetics.

The order mandates the companies to provide a shipping bill along with custom report marked for the ADC NOC. The original copy of the invoice in duplicate should be signed by the authorized authority. A sample of the drugs from the consignment sealed or signed by the customs officer should be submitted. The labels in the case of bulk drugs should be duly signed and stamped by the head of Quality Control or Quality Assurance department. The same practice needs to be followed for outer cartons of subsequent packs.

Among the submissions to be made are certificate of analysis, current Good Manufacturing Practices (cGMP), certified copy of permission for production of the drugs and cosmetics in the list approved by the Central FDA or state drugs controller, separate permission from the DCGI or state drugs control authority in the case of new drugs and approval should also be sought from the DCGI in case of drugs exclusively for export purpose.

Export authorization should be sought from the Commissioner of Narcotics Bureau, Gwalior and import authorization from the government of the importing country in case of narcotics and psychotropic substances. In the case of neutral label, a code allotment letter from the DCGI or state licensing authority should be sought. Companies should also provide details of Certificate of Pharmaceutical Products (CoPP)

For export of vaccines and biologicals, companies should provide batch release certificate from Central Research Institute, Kasauli or the National Chemical Laboratory, Pune. In the case of export of finished formulations to Nigeria, a QCS certificate or ARIL inspection report should be made available. The Merchant Exporters should submit purchase invoice of each drug, wholesale license, DCGI permission in the case of new drugs, neutral code certification from manufacturers for supply of drugs for export and English translation for labels of foreign language certified by the authorized authority.

The CDCSO has also insisted on custom or excise sealed samples would be accepted for clearance of consignment through CFS or foreign post offices. In addition to these documents, other requirements would depend on a case-to-case basis to ascertain the authenticity of the consignment. The order has also called for signing of the documents by the head of the company identified according to the rules under Section 34 of the Drugs & Cosmetics Act 1940.

The CDCO would not accept photocopies or fax versions of the certificates but insists on notary attested documents.

The following [146]minimum documents are required of for obtaining ADC NOC for export drugs and cosmetics:

- Shipping bill along with Custom marking for ADC NOC
- Original Copy of invoice, packing list in duplicate duly signed by the authorized person.
- Certificate of analysis
- Certified copy of Manufacturing License along with product permission and / or Certified copy of CoPP or Free Sale certificate issued by the State / National Drug Control Authority
- Representative samples of Drugs / Cosmetics from the Shipment / consignment sealed by the customs / excise officer
- Uncontrolled copy of labels (in case of bulk drugs) carrying the seal and signature of the head of Quality Assurance / Quality Control department to be produced.
- Only custom / excise sealed samples are accepted for the clearance of Shipments / consignment through CSF / Foreign Post Office / ICD / CWC etc
- Permission / Approval from DCG(I) in case of Export of New Drug
- In case of Drugs Exported against a Quantity Based Permission, Original Copy of the same issued by the O/o DCG(I) to be produced

Narcotic Drugs & Psychotropic Substances

- Export Authorisation in original issued by Commissioner Narcotics Bureau Gwalior and Import Authorisation from Govt. of the importing country in the case of exports of Narcotic and Psychotropic substances/precursors.

NIGERIA Requirement

- QCS Certificate inspection report to be produced in the case of export to Nigeria.

Biological Products (Vaccine & Sera)

- Batch release certificate from CRI Kasauli/NCL Certificate for export of Vaccines and other Biological

Neutral Labels

- In the case of Neutral Label, Neutral code allotment letter from the State Drugs Controller/ FDA / KTK / DRUGS / MFG. LICENSE NO.

Merchant Exporter

- In the case of merchant exporters the following are the documents to be produced:
- Whole/Retail sale License.
- DCG(I) permission in the case of export of a new drug.
- Purchase bills

[146] Pharmexcil. Export Requirements [Internet]. Available from:http://pharmexcil.org/uploadfile/ufiles/1552921617_Export_Requirment.ppt.

Drugs intermediates and Chemicals

- Flow chart
- Reference of Standard Books for its end use justification
- CAS no of intermediates and Chemicals
- CoA

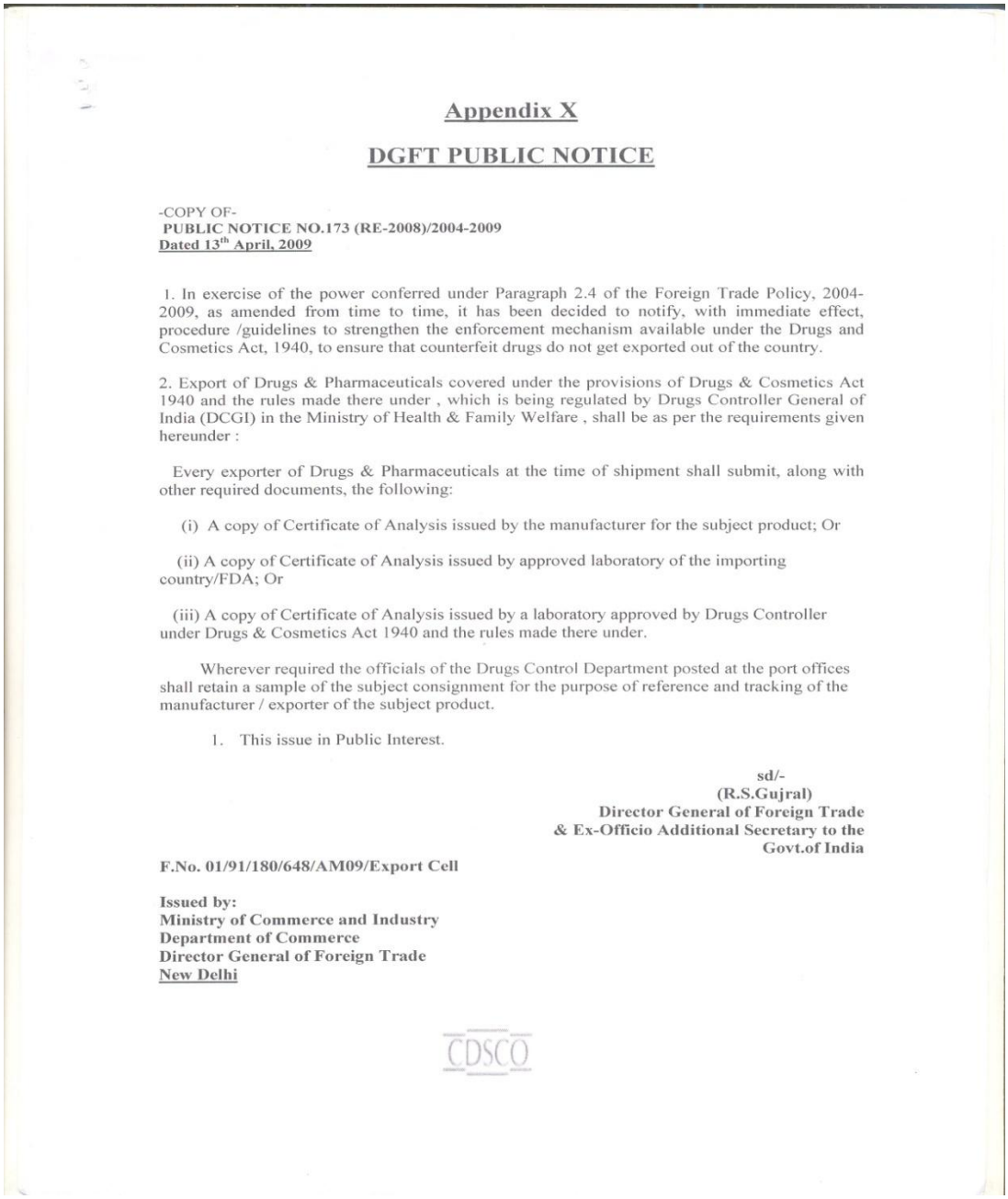
Advance license

- Copy of the advance license to observe the compliance conditions of Advance license like Rule / circular 9 and other special condition
- Custom / Excise sealed samples to establish at least the identity of exported material

Export of Imported material

- Copy of the import License-form 10
- CoA
- Details of bill of entry, invoice and COA

13. DGFT Notice Related to Export of Counterfeit Drugs



Appendix X

DGFT PUBLIC NOTICE

-COPY OF-
PUBLIC NOTICE NO.173 (RE-2008)/2004-2009
Dated 13th April, 2009

1. In exercise of the power conferred under Paragraph 2.4 of the Foreign Trade Policy, 2004-2009, as amended from time to time, it has been decided to notify, with immediate effect, procedure /guidelines to strengthen the enforcement mechanism available under the Drugs and Cosmetics Act, 1940, to ensure that counterfeit drugs do not get exported out of the country.

2. Export of Drugs & Pharmaceuticals covered under the provisions of Drugs & Cosmetics Act 1940 and the rules made there under , which is being regulated by Drugs Controller General of India (DCGI) in the Ministry of Health & Family Welfare , shall be as per the requirements given hereunder :

Every exporter of Drugs & Pharmaceuticals at the time of shipment shall submit, along with other required documents, the following:

(i) A copy of Certificate of Analysis issued by the manufacturer for the subject product; Or

(ii) A copy of Certificate of Analysis issued by approved laboratory of the importing country/FDA; Or

(iii) A copy of Certificate of Analysis issued by a laboratory approved by Drugs Controller under Drugs & Cosmetics Act 1940 and the rules made there under.

Wherever required the officials of the Drugs Control Department posted at the port offices shall retain a sample of the subject consignment for the purpose of reference and tracking of the manufacturer / exporter of the subject product.

1. This issue in Public Interest.

sd/-
(R.S.Gujral)
Director General of Foreign Trade
& Ex-Officio Additional Secretary to the
Govt.of India

F.No. 01/91/180/648/AM09/Export Cell

Issued by:
Ministry of Commerce and Industry
Department of Commerce
Director General of Foreign Trade
New Delhi

CDSCO

14. DGFT Notice Related to Track and Trace System for Pharmaceutical Exports

DGFT has mandated all the pharmaceutical exporters in India to adopt a track and trace system and use it for pharmaceutical exports with the barcode technology as per GS1 global standard:

1. Primary level packaging—Incorporation of 2D (GS1 Data matrix) barcodes on medicines at strip / vial / bottle etc encoding unique product identification code and unique serial number of the primary pack—to be mandatory from 1st July, 2014
2. Incorporation of barcodes (1D or 2 D) encoding unique product identification code, batch number, expiry date and unique serial number of the secondary pack—in effect from 1st January, 2012
3. Incorporation of barcodes (1 D) encoding unique product identification code, batch number, expiry date and unique serial number of the tertiary pack (shipper / carton)—in effect from 1st October, 2012

15. Definition of New Approved / Unapproved and Banned Drugs

New Approved Drug: The pharmaceuticals/bulk drugs, which have not been used in the country to any significant extent under the conditions which it is prescribed or recommended and, which has not been recognised by the licensing authority (CDSCO) as safe and effective. A new drug continues to be ***new*** for a period of four years after the date of its first approval or its inclusion in the Indian Pharmacopeia, whichever is earlier.

New Unapproved Drug: A new drug that is not yet registered in India

Banned Drug: Drugs that are being prohibited for manufacture or sale in India by the regulatory authority (CDSCO)

16. Checklist for Documents to Be Submitted to the EU

Checklist for documents to be submitted for application of "Written Confirmation" for active substances exported to the EU for medicinal products for human use, In accordance with Article 46(2)(b) of Directives No. 2001/83/EC

1. Covering Letter – The covering letter is an important part of the application and should clearly specify the intent of the application (whether the application is being submitted for the first time, whether the application is for re-issue or is for the additional products to an existing Written Confirmation) the list of documents that are being submitted (Index with page no's) as well as any other important and relevant information may be provided in the covering letter. The covering letter should be duly signed and stamped by the authorized signatory, indicating the name & designation of the authorized signatory alongwith the name and address of the firm.
2. An Authorization letter in original issued by the Director/Company Secretary/Partner of the firm revealing the name & designation of the person authorized to sign (along with the name and address of the firm) on behalf of the firm should be submitted at the time of submission of the application Duly self attested photocopies of the Authorization letter may be submitted at the time of submission of subsequent applications.
3. Copy of GMP certificate issued as Certificate of Pharmaceutical Product issued as per WHO guidelines, USFDA, EDQM, etc. if any
4. Copy of Manufacturing License issued by SLA
5. List of all APIs approved by SLA.
6. List of Products applied for issue of "Written Confirmation" for active substances exported to the EU for medicinal products for human use, in accordance with Article 46(2)(b) of Directives No. 2001/83/EC
7. List of SOPs and STPs
8. Summary of Stability data (3 batches) Accelerated/ Real time (as prescribed)
9. List of Equipment and Instruments
10. List of Technical staff, their qualification, experience and their approval by SLA.
11. Manufacturing Layout Plan as approved by SLA
12. Validation Master Plan

13. Summary of Process validation data for 3 batches of each product.
14. Export data of last 3 years
15. Good Distribution Practices followed by the firm.
16. Summary of Annual Product review.
17. Summary of Market Complaint Review
18. Summary data of Impurity profiling
19. Summary data of Analytical Method Validation
20. Good Distribution Practices followed by the firm.
21. NSQ reports
22. Legal undertaking stating that Inspection/ Investigation reports of any regulatory inspection by Indian regulatory Authority including Show Cause Notices/ Suspensions/ Cancellations if any shall be communicated to "Competent Authority" i.e. DCG(I), CDSCO within 15 working days.
23. Site Master File (as specified under WHO TRS 823)

17. NAFDAC Import Guidelines for Pharmaceuticals

NATIONAL AGENCY FOR FOOD & DRUG ADMINISTRATION & CONTROL

PORTS INSPECTION DIRECTORATE

GUIDELINES FOR CLEARANCE OF IMPORTED DRUG(S) (HUMAN AND VETERINARY) AND RELATED PRODUCT(S) IN NIGERIA
NAFDAC/PID/001/00

A. GENERAL

1. These guidelines are for the interest of the general public and in particular importers of registered pharmaceutical and related product(s) into Nigeria.

2. Please be informed that all importation of Drugs and related products must be by pharmaceutical companies that registered the products.

3 These guidelines are also intended for importers of registered medical devices except that pharmacist and retention of premises licenses issued by Pharmacist Council of Nigeria are exempt documents for clearance from the port of entry.

4 It is necessary to emphasize that, no drugs and related products should be manufactured, imported, exported, advertised, sold or distributed in Nigeria unless it has been registered in accordance with the provisions of Act Cap F33 LFN (formerly decree 19 of 1993) and the accompanying guidelines.

5 Please note that the importation of unregistered drug product(s) or registered drug products by persons or companies other than those that registered the products should be regarded as a violation.

6 Vaccines and biologicals **must** be accompanied by functional cold chain monitoring devices at the ports of entry and must be maintained according to stipulated conditions at company's warehouse.

B. APPLICATION

1 The application should be by the company that registered the product(s) with NAFDAC or company granted "Letter of Authorisation" by the party that registered the products. It should be noted that such importations are restricted to only registered source(s) as stated on the Product Registration Certificate(s).

2 The applicant should make available to Ports Inspections Directorate, NAFDAC the following pre-shipment information before any drug consignment arrives Nigeria from any part of the world:-

a. Name of the drug product(s)
b. Manufacturer's Name and Address
c. Quantity being imported
d. Various pack sizes, strength of the drug(s) and the dosage form
e. Batch number(s), Manufacture and Expiry dates

f. Conveying Vessel and expected date of arrival

C DOCUMENTATION

1 To ensure that the quality, safety and efficacy of the drugs imported from **India, China and Egypt**, comply, NAFDAC appointed analysts to inspect and analyze products in these countries before shipment into Nigeria as follows.

1.	INDIA	QCS Consultants
2.	CHINA	NHU LABS LTD
3.	EGYPT	Inspection & Testing Group (ITG)

a. All drugs and related product(s) from the listed countries should be issued '**Clean Report of Inspection and Analysis'** before shipment into Nigeria**.**

b. The Current Pharmacist's Annual License to Practice as a Pharmaceutical Chemist issued by Pharmacist Council of Nigeria

c. The Current Premises/Retention Certificate issued by Pharmacist Council of Nigeria

d. The following shipping documents should be submitted for obtaining "First Stamp":

i. Single Goods Declaration (SGD) Form,
ii. Commercial Invoice
iii. Risk Assessment Report
iv. Form M
v. Bill of Lading/Airway Bill
vi. Packing List

e. Photocopy of Narcotics Permit to import and Permit to clear (where applicable)

f. Evidence of valid product registration certificate with NAFDAC

g. Certificate of Analysis (Original) issued by the manufacturer

2 Originals of all the above documents should be sighted

D. TARRIFF

1 All payments to the Agency must be in bank draft in favour of National Agency for Food and Drug Administration & Control and the following fees, as appropriate should apply per product covering inspection and analysis

2 Inspection fee per consignment of an ethical drug (prescription) is Twenty thousand naira (₦20, 000.00) plus 5% VAT,

3 Laboratory Analysis fee per product of an ethical drug (prescription) is Fifty thousand naira (₦50, 000.00) plus 5% VAT,

Section 3: Dynamics of African Regulatory Environment for Pharmaceutical Imports from India (the 'demand side')

Photo courtesy: http://www.ipwatchdog.com/2014/02/16/the-future-of-global-health-depends-on-strong-iprs/id=48138/

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Introduction

The pharmaceutical market size of Africa was estimated at approximately US$ 20 billion in 2011, while that of Sub-Saharan Africa[147] was estimated at US$ 7.5 billion (less than 40% of the overall Africa market size)[148]. Pharmaceutical imports account for nearly 60% to 70% of the overall market size which is US$ 11.5 billion for the entire African continent and US$ 5.1 billion for Sub-Saharan Africa[149]. European Union (EU) countries and India are the biggest exporters of pharmaceuticals to African countries; interestingly, exports to Africa from India are also routed through the EU. It was mentioned during an interview with Food, Medicines and Health Care Administration and Control Authority (FMHACA), the NDRA for Ethiopia, that a significant value of Indian pharmaceutical exports is routed from EU countries like France and Belgium to Ethiopia. Pharmaceutical export to Sub-Saharan Africa from India is nearly US$ 1.4–1.6 billion, while export to the entire continent is nearly US$ 1.8–2.0 billion.

For ensuring the quality of imports, most importers and procurement organisations conduct minimal quality assurance during the procurement process, but instead rely on their respective National Drug Regulatory Authorities (NDRAs). Unfortunately, as suggested by the WHO study[150], most NDRAs in Africa have limited capacity to control the quality of their imports.

In order to gain a thorough understanding of the dynamics of import-related quality assurance in Africa, in-country research was conducted in Ethiopia, Kenya and Ghana. In these countries the researchers met with procurement organisations in the public and private sector, international and national non-governmental organisations [NGOs], national drug regulatory authorities, donor funds and Quality Control laboratories. Various aspects relating to import of pharmaceuticals in these countries were discussed, with particular reference to shipments from India.

The results show that the three countries have established drug regulatory authorities, but procedures to control the pharmaceutical imports in these countries (in terms of policies, legislation and guidelines) have only recently been established (less than 10 years ago) and are still being strengthened. Also, the capacity of enforcing authorities and the implementation of the regulations remains weak. A comparison of the market size, imports, procedures for importing and Quality Control during imports are summarised in table 16:

[147]This report focuses on Sub-Saharan Africa excluding South Africa because the magnitude of poor quality pharmaceuticals is far greater in this region.
[148]IFPMA data (2011).
[149]IFPMA date (2011).
[150] WHO. Assessment of medicines regulatory systems in sub-Saharan African countries. 2010. [Internet] Available from http://apps.who.int/medicinedocs/documents/s17577en/s17577en.pdf.

Table 17: Comparison of different criteria relating to import of pharmaceuticals in Ethiopia, Kenya and Ghana

Criteria	Ethiopia	Kenya	Ghana	Source
Pharmaceutical market size (US$, million, 2011)	383	440	303	IFPMA
Population (million, 2011)	91	41	25	CIA world fact book
Pharmaceutical consumption per capita (US$, 2011)	4.2	10.7	12.2	Empower research and analysis
Pharmaceutical imports (US$, million, 2011)	280	332	150	IFPMA, UN COMTRADE
Imports as % of Market size	73%	75%	50%	IFPMA
Import from India (US$, million, 2011)	68	149	57	IFPMA, UN COMTRADE
Import from India as % of total Imports	25%	45%	38%	IFPMA, UN COMTRADE
Registration format	Common Technical Document	Common Technical Document	Common Technical Document	Empower research and analysis
Time taken for product registration	1–2 years	1 year	6 months	Empower research and analysis
Physical inspection of manufacturing facility during product registration	Yes	Yes	Yes	Empower research and analysis
Pre-shipment testing	No	Yes, occasionally (not mandatory)	No	Empower research and analysis
Post-shipment testing	Yes, occasionally (not mandatory)	Yes, occasionally (not mandatory)	Yes, occasionally (not mandatory)	Empower research and analysis
Post-marketing surveillance	Yes, random samples, limited tests	Yes, random samples and based on PV data	Yes, random samples	Empower research and analysis
Quality Control laboratories	1 ISO 17025 certified	2 WHO pre-qualified, 1 ISO 17025 certified	1 ISO 17025 certified	Empower research and analysis
Special procedure for Indian suppliers	Yes, during market authorisation	No	No	Empower research and analysis
Notes:				
All figures in US$ million from 2011, except wherever noted				

Research and analysis also included 23 procurement organisations from the three selected African countries–Ethiopia, Ghana and Kenya–and several global organisations. The interaction was based on a procurement questionnaire and interviews.

The organisations were a mix of private sector, public sector, procurement agencies and NGOs. Total procurement value of all 23 organisations exceeded US$ 3 billion annually (for 2012). The larger organisations purchase over 1,000 products worth more than US$ 500 million annually while the smaller organisations purchase less than 10 products worth less than US$ 10 million. In terms of health commodity procurement, the organisations buy more pharmaceutical products (almost half of the procurement organisations spend more than 70% of their budget on pharmaceuticals) than non-pharmaceutical health commodities (diagnostics, devices, supplies etc). India is the largest supplier of pharmaceuticals to these organisations, and source on average, at least 50% of their total pharmaceutical need from Indian suppliers.

Regarding the quality of imported products, different procurement organisations conduct different levels of Quality Assurance activities. While the private sector procurement organisations conduct very few Quality Assurance activities, the international procurement agents and NGOs conduct a lot more of Quality Assurance activities. Other procurement organisations such as public sector buyers, national procurement agents and NGOs, have varying levels of Quality Assurance activity.

The variation in Quality Assurance activities is directly correlated with source of funds—international procurement agents and NGOs with international donor funds exercise more stringent Quality Assurance behaviour; private sector importers, whose main aim is to maximize profit, conduct minimal quality assurance activities.

Sub-section 1. Overview of the African Pharmaceutical Market

The pharmaceutical market size of Africa was estimated at approximately US$ 20 billion in 2011, while that of Sub-Saharan Africa was estimated at US$ 7.5 billion (less than 40% of the overall Africa market size) (see figure 22)[151].

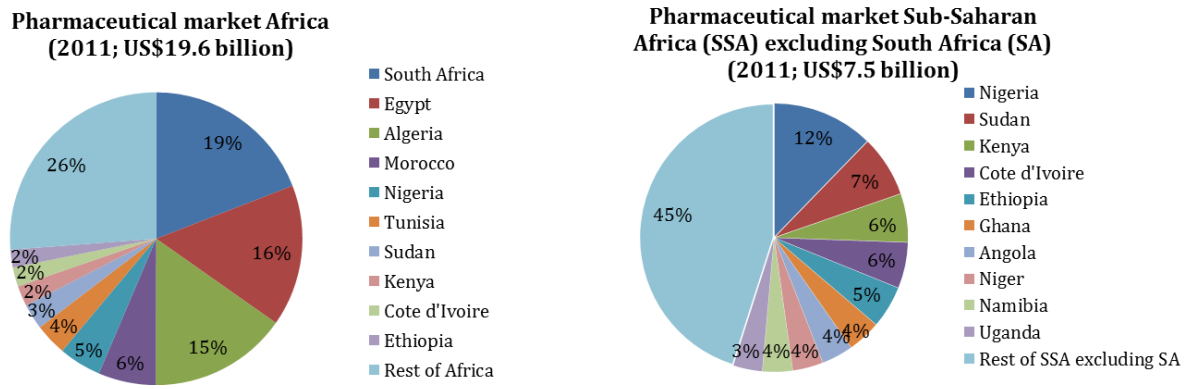


Figure 22: Pharmaceutical Market Size of Africa and Sub-Saharan Africa (excluding South Africa)

Pharmaceutical imports account for nearly 60% of the market in Africa; and as high as 70% of the market for Sub-Saharan Africa, indicating heavy international dependence for pharmaceuticals[152] (see figure 23).

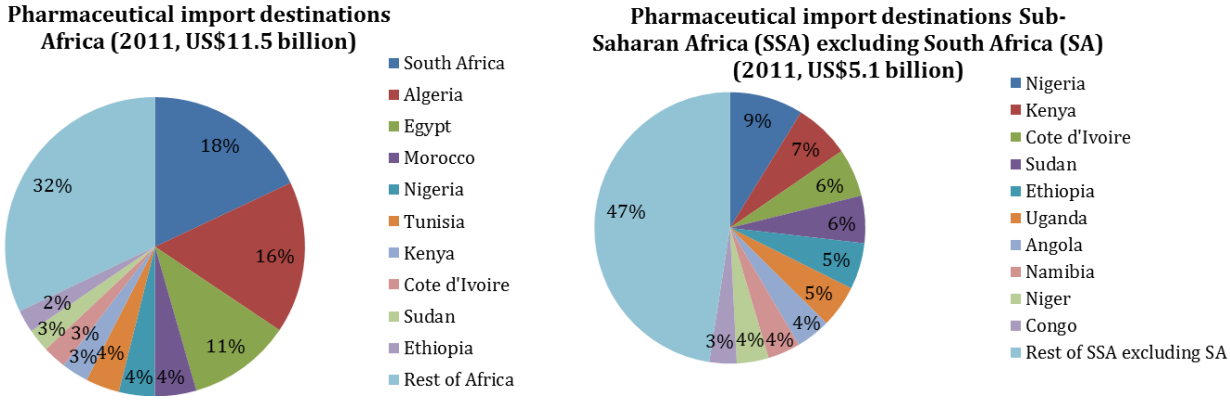


Figure 23: Pharmaceutical Imports to Africa and Sub-Saharan Africa (Excluding South Africa)

European Union (EU) countries and India are the biggest exporters of pharmaceuticals to African countries; interestingly, exports to Africa from India are also routed through the EU. It was mentioned during an interview with Food, Medicines and Health Care Administration and

[151]IFPMA data (2011).
[152]IFPMA data (2011).

Control Authority (FMHACA), the NDRA for Ethiopia, that a significant value of Indian pharmaceutical exports is routed from EU countries like France and Belgium to Ethiopia. Hence the share of Indian imports to Africa is potentially higher. Refer to the breakup of pharmaceutical imports in Africa and Sub-Saharan Africa below[153] (see figure 24):

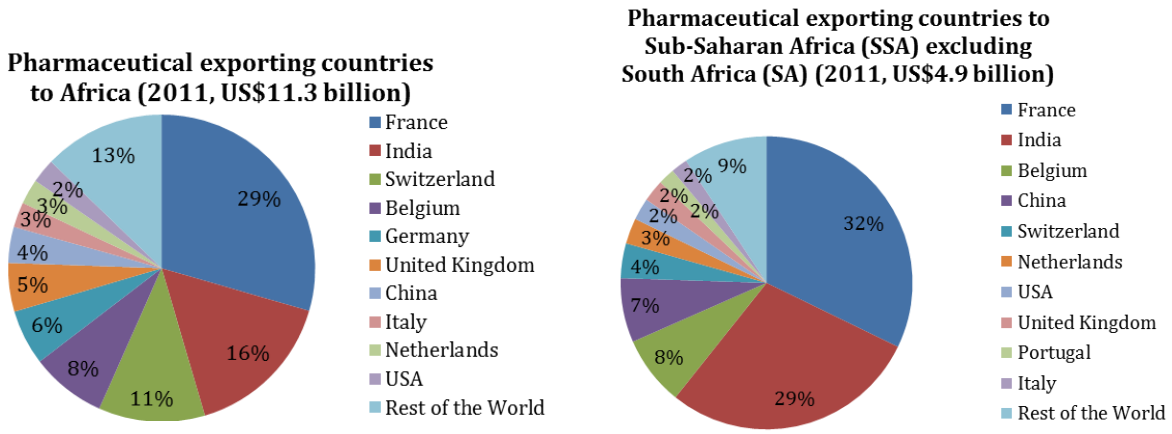


Figure 24: Pharmaceutical Exporting Countries to Africa and Sub-Saharan Africa (Excluding South Africa)

Minor differences exist in the total import figures due to different sources.

Pharmaceutical export to Sub-Saharan Africa from India is nearly US$ 1.4–1.6 billion, while export to the entire continent is nearly US$ 1.8–2 billion.

The following chapter specifically discusses the case of Ethiopia, Kenya and Ghana with respect to import of pharmaceuticals from India.

[153]UN COMTRADE Data [Internet]. Available from: http://comtrade.un.org/.

Sub-section 2. Case Study of Ethiopia, Kenya and Ghana (with a Focus on Indian Imports)

Overall, the three countries have established drug regulatory authorities, but several studies have shown that their capacity is weak, especially with respect to control of the quality of pharmaceutical imports. The procedures to control the pharmaceutical imports in the three countries (in terms of policies, legislation and guidelines) have been recently established (less than 10 years ago) and are being gradually strengthened. Also, the capacity of the enforcing authorities and the implementation of regulations remain weak[154]. This creates a high risk situation, where products of mixed quality are being imported into Africa, and where quality assurance is either minimally conducted or not being conducted at all.

1. Ethiopia

1.1. Pharmaceutical Sector

1.1.1. Overview of the Ethiopian Pharmaceutical Market

Total market

Pharmaceutical market of Ethiopia in 2011 was estimated to be US$ 422 million with an annual growth rate of approximately 14% (as per a Frost & Sullivan[155]). However, the International Federation of Pharmaceutical Manufacturers & Associations (IFPMA) estimated the total market size in 2011 to be US$ 383 million[156].

Imports

The Ethiopian market depends heavily on imported pharmaceuticals. According to Ethiopian Revenue and Customs Authority (ERCA), the total value of imported pharmaceuticals was approximately US$ 268 million in 2011[157]. This is more than 60% of the total market size.

As per another source, IFPMA, the total import of pharmaceuticals in 2011 was US$ 280 million. This is nearly 75% of the US$ 383 million pharmaceutical market as per IFPMA mentioned earlier.

[154] WHO. Assessment of medicines regulatory systems in sub-Saharan African countries. 2010. [Internet] Available from http://apps.who.int/medicinedocs/documents/s17577en/s17577en.pdf.
[155] Frost & Sullivan. James S. Analysis of the pharmaceutical industry in Ethiopia [Internet]. Available from: http://www.slideshare.net/SamanthaJames_5/analysis-of-the-pharmaceutical-industry-in-ethiopia-adapted-sales-brochure.
[156] IFPMA. The Pharmaceutical Industry and Global Health, Fact and Figures 2012 [Internet]. Available from: http://www.ifpma.org/fileadmin/content/Publication/2013/IFPMA_-_Facts_And_Figures_2012_LowResSinglePage.pdf.
[157] ERCA. ERCA External Trade Statistics, 2011 (data extracted as per HS code 30, except for Vaccines) [Internet]. Available from: http://www.erca.gov.et/index.jsp?id=import_export_info.

Local production

The local production of pharmaceuticals in Ethiopia is low compared to pharmaceutical imports. According to a study by Frost & Sullivan[158], local manufacturing in Ethiopia accounts for only 20% of the pharmaceutical market; the rest of the products are imported. As per IFPMA estimates, local production accounted for approximately US$ 103 million in 2011 (local consumption + exports – imports), which is about 27% of the total pharmaceutical consumption.

The local pharmaceutical manufacturing industry appears to lack specialised skills and technology to maintain basic manufacturing standards required for securing government tenders. The industry also lacks capacity and the domestic manufacturers are at a constant struggle to meet the demands in the private sector[159]. The larger local manufacturing companies include Addis Pharmaceutical Factory and Ethiopian Pharmaceutical Manufacturing Factory. They focus on supplying for government tenders, rather than trying to compete in the private sector. However, the government is trying to promote the local manufacturing sector by providing various incentives. One such incentive is the relief of import duty for raw materials used in the manufacture of pharmaceuticals. According to the research conducted, there is no import duty levied on raw materials used in manufacturing finished products to help promote local manufacturing. The import duty on finished pharmaceutical products in Ethiopia is 8%[160].

Exports

Pharmaceutical exports from Ethiopia are negligible, compared to the domestic consumption. In 2011, the IFPMA estimated the total exports from Ethiopia at US$ 1.4 million.

1.1.2. Pharmaceutical Import Market in Ethiopia

Importing countries

As represented in figure 25, imports from India are the highest in Ethiopia, accounting for more than a quarter of total imports (approximately US$ 68 million out of a total of US$ 268 million in 2011). This is as per the Cost Insurance and Freight value of imports by country of origin, extracted from ERCA for HS code 30 (except vaccines for human medicines and veterinary medicines).

[158]Naidoo S. Outlook for the pharmaceutical sector in Ethiopia. Frontier Market Network [Internet].Sat, 08 Dec 2012 08:45. Available from: http://www.frontiermarketnetwork.com/article/816-outlook-for-the-pharmaceutical-sector-in-ethiopia.
[159]Naidoo S. Outlook for the pharmaceutical sector in Ethiopia. Frontier Market Network [Internet].Sat, 08 Dec 2012 08:45. Available from: http://www.frontiermarketnetwork.com/article/816-outlook-for-the-pharmaceutical-sector-in-ethiopia.
[160] FMHACA. Medicine and medical devices Import , export and wholesale companies regulation (Only Amharic language version) [Internet]. Available from: http://www.fmhaca.gov.et/standardsdirectivesguidelines.html.

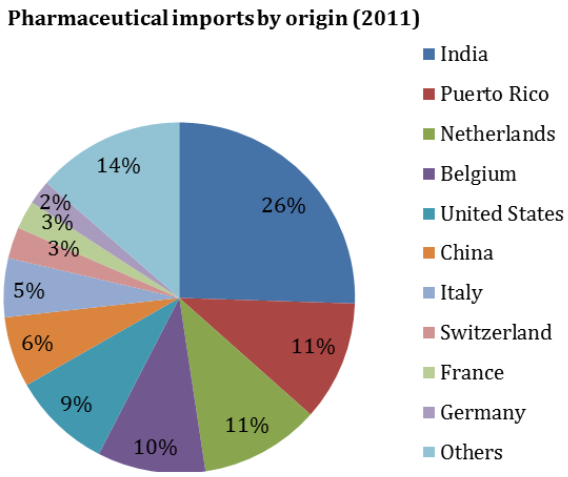


Figure 25: Pharmaceutical Imports in Ethiopia (By Country of Origin)

Major importers

Import and wholesale of pharmaceutical and other medical supplies in Ethiopia are done by the public sector, private sector, NGOs and international organisations. According to the Food, Medicines and Health Care Administration and Control Authority of Ethiopia (FMHACA), there are 114 registered pharmaceutical products and medical supplies importers, and wholesalers of human and veterinarian products in the country.

Pharmaceutical imports by the public sector in Ethiopia is dominated by the Pharmaceutical Fund and Supply Agency (PFSA), a government body created by the Ethiopian government in mid-2007 for supplying both program and essential pharmaceuticals, as well as to serve as the distribution entity for vaccines, other health facility supplies and laboratory equipment. PFSA acts as a sole distributor of health-related materials to all public facilities within the country[161]. In addition to imports, PFSA distributes pharmaceutical products and medical supplies to all regions through its wholesale distribution branch offices located in different regions. Refer to table 18 for the leading pharmaceutical importers in Ethiopia.

Table 18: Leading Pharmaceutical Importers in Ethiopia[162]

Rank	Importer Name	Ownership
1	PFSA	Government
2	Pathfinder	NGO
3	Equatorial Business Group PLC	Private
4	ZAF Pharm	Private
5	DAT International Trade PLC	Private

[161]The World Bank.Ethiopia Improving Health Systems Public Sector Healthcare Supply Chain Strategic Network Analysis and Design [Internet].May 2009. Available from: http://siteresources.worldbank.org/INTHIVAIDS/Resources/375798-1103037153392/SupplyChainFinalReportEthiopia.pdf.

[162] Interview with FMHACA.

6	DKT Ethiopia	NGO
7	Medtech Ethiopia	Private
8	Caroga Pharma Ethiopia	Private
9	Integrated Family Health Program (IFHP)	NGO
10	SaronPharma-Chemical PLC	Private

1.2. Import Regulations, Processes and Quality Control

1.2.1. Pharmaceutical Import Regulations

The National Drug Policy of Ethiopia, which was first formulated in 1993, provides goals for the Ministry of Health in Ethiopia to safeguard the interest of the people of the country[163]. On the basis of this policy, the government formulates various legislations and regulations.

One of the laws, which was formulated by the government in 1999, was the 'Drug Administration and Control Proclamation number 176/99[164],' which replaced the old 'Pharmacy regulation number 288/64' of 1964. This legislation set down the establishment of FMHACA as the pharmaceutical regulatory authority of Ethiopia. This legislation also set down the powers and duties of the authority. However, this legislation did not cover imports as one of the duties for FMHACA.

The government then promulgated a new legislation in 2009, 'Drug Administration and Control Proclamation number 661/2009[165],' which included both imports and exports to be regulated by FMHACA.

In 2010, the government formulated the legislation, 'Ethiopian Food, Medicine and Healthcare Administration and Control Authority Regulation number 189/2010[166],' which established FMHACA as an autonomous government office that shall be accountable to the Ministry of Health.

To implement and put into action the various legislation formulated by the Government, FMHACA has formulated many directives and standards, which apply to the local pharmaceutical industry and to all manufacturers / exporters exporting to Ethiopia. The directive that controls the import of pharmaceuticals and other health commodities into

[163] FMHACA. National Drug Policy of the Transitional Government of Ethiopia [Internet]. Available from:http://www.fmhaca.gov.et/documents/drugPOLICY.pdf.
[164]FMHACA. The FederalNegaritGazeta of The Federal Democratic Republic of Ethiopia (5th Year No. 60 Addis Ababa - 29th June 1999) [Internet]. Available from: http://www.fmhaca.gov.et/documents/NEGARIT_GAZETA.pdf.
[165]FMHACA. The FederalNegaritGazeta of The Federal Democratic Republic of Ethiopia (16th Year No. 9 Addis Ababa - 13th January, 2010)[Internet]. Available from: http://www.fmhaca.gov.et/documents/Proclamation_661.pdf.
[166]FMHACA. The FederalNegaritGazeta of The Federal Democratic Republic of Ethiopia (16th Year No. 51 Addis Ababa -23rd August, 2010) [Internet]. Available from: http://www.fmhaca.gov.et/documents/Negarith.pdf

Ethiopia is the Medicine Import, Export and Wholesaler Control Directive, 2005 (which is an updated version of the Medicine and Medical Device Import and Export Directive, 2004[167]).

1.2.2. Food, Medicines and Health Care Administration and Control Authority of Ethiopia (FMHACA)

The pharmaceutical regulatory body in Ethiopia is the **FMHACA**, which has an autonomous status under the Ministry of Health (MoH). FMHACA has the legal mandate to control pharmaceutical imports and is also responsible for licensing imports of medicines into the country[168]. The FMHACA is mandated to regulate the following '4Ps:'

- **Practice**: health care practices
- **Premises**: healthcare facilities, food establishments, ports, etc
- **Professional**: all health professionals
- **Product**: From production to consumption of medicines, medical equipment and devices, food and food supplements, herbal products, cosmetics, complimentary and traditional medicines

The FMHACA workforce includes a public health professional, nurse, medical laboratory technologist, environmental health professional, general medical practitioner, health science professional, pharmacist, data administrator, librarian, agro-chemist, health science technician, medical equipment maintenance engineer and information technologist.

These resources are organised as follows:
FMHACA is headed by a Director General and organised into the following eight supportive directorates:

- Human and Financial Management Directorate
- Quality and Compliance Directorate
- Medico-Legal Service Directorate
- Inspection and Surveillance Directorate
- Health Institution and Professional Licensing Directorate
- Food and Medicine Quality Assessment Directorate
- Food and Medicine Registration and Licensing Directorate
- Regulatory Standard Setting and Information Delivery Directorate

Apart from these directorates, there are two departments:

- Standards and Licensing, with four offices
- Inspection and Enforcement with three offices

[167] FMHACA. Medicine and Medical Device Import and Export Direction [Internet]. Available from: http://www.fmhaca.gov.et/documents/Medicine_and_Medical_Device_Import_and_Export_Directive.pdf.
[168] FMHACA. About FMHACA [Internet]. Available from:http://www.fmhaca.gov.et/aboutus.html.

Following (figure 26) is the organogram of FMHACA, which lists all the departments.

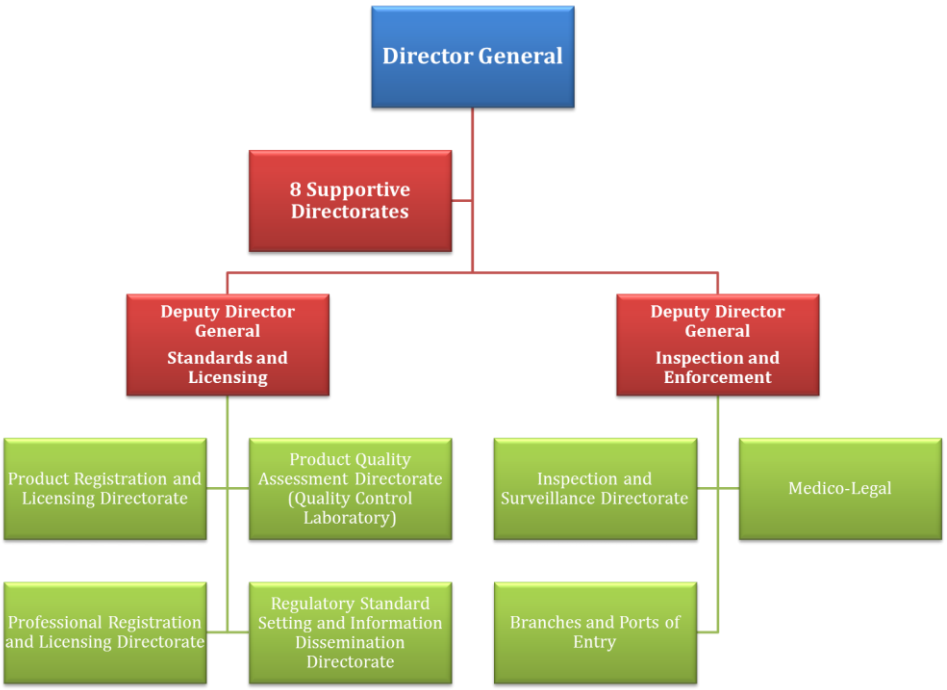


Figure 26: Organisational Chart of FMHACA

1.2.3. Import process

The 'Medicine Import, Export & Wholesaler Control Directive, 2005' lists the requirements for import of pharmaceuticals (which are only written in Amharic, the local language). Based on the interviews conducted with local officials (with reference to the directive), the import of pharmaceutical products is limited only to those listed in the National Drugs List and by licensed importers. However, in special or emergency situations, medicines not listed in the National Drugs List can be imported as well.

Product registration

Any manufacturing company / exporter (henceforth termed as exporter) wishing to export a product to Ethiopia has to first register the product with FMHACA. The FMHACA may allow import of unregistered medicines only in specific circumstances. The exporter should then have a buyer / importing agent (henceforth termed as the importer) in Ethiopia who communicates with the FMHACA on the exporter's behalf. This importer may belong to the manufacturer's registered Ethiopian office itself, or might be a separate entity.

For registration, the manufacturing company has to compile a dossier in the Common Technical Document (CTD) format (based on International Conference on Harmonisation [ICH] guidelines), which is then submitted to FMHACA. In addition to the dossier, the manufacturer

should also submit a Certificate of Pharmaceutical Product (CoPP) issued by the source country FDA, the actual sample in its final package, together with its Certificate of Analysis (CoA) and working standards, if any. The CoA should contain the generic name, manufacturing date, expiry date, batch number, batch size, test date and storage conditions of the medicines. Manufacturing sites not approved by Stringent Regulatory Authority (SRA) or pre-qualified by World Health Organization (WHO) are inspected by a team of three FMHACA inspectors.

First-time registration dossier includes pre-clinical data with a fee of US$ 700. However, the fee for the products, which do not need bioequivalence data to be submitted at the time of registration, is US$ 500[169]. Current regulation necessitates re-registration before the end of every five[170] years, with a fee of US$ 200.

Based on the interviews conducted, certificate for new product registration requires on average 1–2 years for manufacturers in non-SRA countries. However, FMHACA plans to expedite this process to a much shorter time frame in the coming future for those products, which are already registered in an SRA country. Manufacturing sites that are approved by SRA are also not inspected by FMHACA. However, submission of Good Manufacturing Practices (GMP) certificate issued by SRAs remains a necessary requirement for import. A draft letter based on this guideline has been released for importers planning to procure products from SRA approved countries. Please refer to Appendix 1 for the letter.

Pre-shipment process

Once a product is registered in Ethiopia, each importation request has to be authorised by the FMHACA. The importer makes the request by filling a purchase order, based on which the importer is issued a pre-import permit certificate. If the exports are originating from India or China, the importer also has to submit a copy of the registration certificate issued by FMHACA, the batch analysis certificate and the Certificate of Origin (CoO) to receive the pre-import certificate.

The pre-import permit certificate has a validity of three months for narcotic and psychotropic medicines and nine months for all other medicines[171]. With the pre-import permit, the exporter can then apply for the export documents in the source country and finally export the product from the exporting country (India in this case). FMHACA doesn't conduct pre-shipment inspection or testing.

[169] Interview with FMHACA officials. September, 2013.
[170] FMHACA. Guidelines for registration of human drugs (page 28) [Internet]. Available from: http://www.fmhaca.gov.et/documents/Guidlines_for_registration_of_human_drugs.pdf.
[171] FMHACA. Medicine E I W Control Directive [Internet]. 2005. Available from: http://www.fmhaca.gov.et/documents/Medicine_E_I_W_control_Directive.pdf.

Post-shipment process

Once the product is shipped, the following documents are checked at the port of entry[172]:

- Registration Certificate
- CoA for each imported batch
- CoO
- Packing list, and
- Bill of lading

All imported medicines are inspected by the FMHACA inspectors at the port of entry. The FMHACA inspectors conduct visual inspection of imported products against the samples submitted by the manufacturer at the time of registration. At the port of entry, the shelf life should not be less than 60% for products with shelf life of three years or more and 50% for products with shelf life of two years or less[173]. The medicines imported for aid purposes should have a shelf life of 50% on arrival at the port of entry. The inspectors may also collect samples for testing in the FMHACA's Food and Medicine Quality Control laboratory (under Product Quality Assessment Directorate) if the visual inspection fails or if they have any suspicion of counterfeiting. FMHACA also selects samples for testing once the product is on the market (post-market surveillance).

1.2.4. Quality Control Process

Following are the various stages of the quality control process exercised by the Ethiopian NDRA[174]:

- Registration: In the case of registration, all test parameters are performed according to the pharmacopoeia method used in the United States Pharmacopeia (USP), British Pharmacopeia (BP), European Pharmacopeia and International Pharmacopeia etc.
- Pre-shipment testing: Pre-shipment testing is not conducted by the FMHACA currently
- Post-shipment testing: Post shipment testing is conducted occasionally on suspicion of counterfeiting. The FMHACA inspectors present at the port only conduct visual inspection of the imported product against the reference product submitted during registration. They check for labelling, storage condition, expiry date, manufacturing site etc. Post-shipment testing is not mandatory.
- Post-marketing surveillance: In the case of post-marketing surveillance, selected product samples (especially antiretroviral, anti-malarial and antibiotics) from the market are tested. Only critical parameters such as assay, dissolution, sterility, identification and content uniformity tests are performed.

[172]FMHACA. Medicine E I W Control Directive [Internet]. 2005. Available from: http://www.fmhaca.gov.et/documents/Medicine_E_I_W_control_Directive.pdf.
[173]FMHACA. Medicine E I W Control Directive [Internet]. 2005. Available from: http://www.fmhaca.gov.et/documents/Medicine_E_I_W_control_Directive.pdf.
[174] Interview of FMHACA, 27th September, 2013 and data from USP / PQM.

Quality Control laboratory

There is no WHO pre-qualified laboratory in Ethiopia. Quality Control testing is performed at the FMHACA's Food and Medicine Quality Control laboratory. The laboratory is technically supported by USP under Promoting the Quality of Medicines program (USP / PQM). With the technical support of USP / PQM, the laboratory was certified by ACLASS, which is equivalent to ISO/IEC 17025 certification[175]in 2011. It achieved this by fulfilling the requirements of ISO 17025 in seven of its tests: high performance liquid chromatography; pH; ultraviolet absorption; dissolution; Karl-Fischer titration; loss on drying; and uniformity of dosage unit. The equipment in the laboratory is sourced from Shimadzu, Perkin Elmer, Pharma test, Camag and other well-known analytical equipment manufacturers.

One of the major problems at the laboratory is the lack of trained human resources. This is one of the main reasons why testing is not done as extensively as it should be (especially post-shipment and post-marketing surveillance). Currently there are 21 Pharmacists, 4 chemists, 2 microbiologists, 4 pharmacy technicians and various supporting staff, making up a total of 40 personnel at the FMHACA laboratory. Other problems include:

- Laboratory equipment maintenance
- Absence of local companies that can service analytical equipment
- Budget constraint to acquire all necessary laboratory supplies
- Absence of local suppliers for some laboratory supplies and the long lead time to procure most of the laboratory supplies
- Lack of microbiological testing facilities

Results of the products tested

The research team requested the post-marketing surveillance testing data from FMHACA[176] and PFSA. The following data was requested: total number of samples collected; total number of tests conducted, findings of the various tests; main problem drugs and main problem 'countries'.

However, no formal answers were received. Since this is a politically sensitive topic, it is not surprising that this data was not shared with the research team.

Informal discussions with FMHACA, however, reveal that there are counterfeit and substandard products in circulation. The most common problems are the presence of unregistered products, counterfeit products and leakage of products from government to private sector.

[175] ACLASS (brand name) is an ISO/IEC 17025 certification for laboratories provided by ANSI–ASQ accreditation board company. Details available from: http://www.aclasscorp.com/.
[176] Interview of FMHACA, 27thSeptember, 2013.

2. Kenya

2.1. Pharmaceutical Sector

2.1.1. Overview of the Kenyan Pharmaceutical Market

Total market

The Kenyan pharmaceutical market size in 2011 was estimated at US$ 440 million by the IFPMA[177]. Based on the National Health Accounts (NHA) database by WHO, the total pharmaceutical expenditure in Kenya in 2011 was US$ 450 million.

Imports

As per IFPMA, Kenya's pharmaceutical import in 2011 was estimated to be US$ 336.5 million, which is more than 75% of the pharmaceutical consumption in the country.

As per UN COMTRADE, the pharmaceutical import in Kenya in 2010 was reported to be approximately US$ 332 million.

Local production

The local production of pharmaceuticals in Kenya was estimated to be US$ 178 million in 2011. This is approximately 40% of the domestic market consumption. However, not all of it is consumed in the domestic market—approximately 42% of the US$ 178 million is exported (refer to the next section). These are estimates based on import, export and local consumption from IFPMA (local production = local consumption + exports – imports).

There are 42 public and private sector pharmaceutical manufacturing companies in Kenya[178]. Most of the manufacturing companies, however, do not operate at full capacity because of a shortage of qualified personnel and variations in GMP standards, thus they do not supply donor agencies. Some national companies have invested in improving their GMP standards to be in line with WHO guidelines. Kenya relies on imported raw materials for the manufacturing of pharmaceutical products.

Exports

In recent years, the local pharmaceutical manufacturing companies have started exporting to other countries within Africa. As per IFPMA, the value of pharmaceutical exports from Kenya in the year 2011 has been estimated to be US$ 74.5 million. The pharmaceuticals are exported to

[177] IFPMA. The Pharmaceutical Industry and Global Health, Facts and Figures 2012 [Internet]. Available from: http://www.ifpma.org/fileadmin/content/Publication/2013/IFPMA_-_Facts_And_Figures_2012_LowResSinglePage.pdf.
[178] UNIDO. Pharmaceutical Sector Profile: Kenya [Internet]. Available from: http://www.unido.org/fileadmin/user_media/Services/PSD/BEP/Kenya_Pharma%20Sector%20profile_TEGLO05015_Ebook.pdf.

countries in the East African Community (EAC), as well as the Common Market for Eastern and Southern Africa (COMESA) countries with Tanzania and Uganda receiving most of the country's exports.

2.1.2. Pharmaceutical Import Market in Kenya

Importing countries

India is Kenya's biggest source of pharmaceutical imports. The value of India's exports to Kenya was approximately US$ 149 million in the year 2010, as per UN COMTRADE data[179], which was 45% of the total import to the country in 2010. Refer to figure 27:

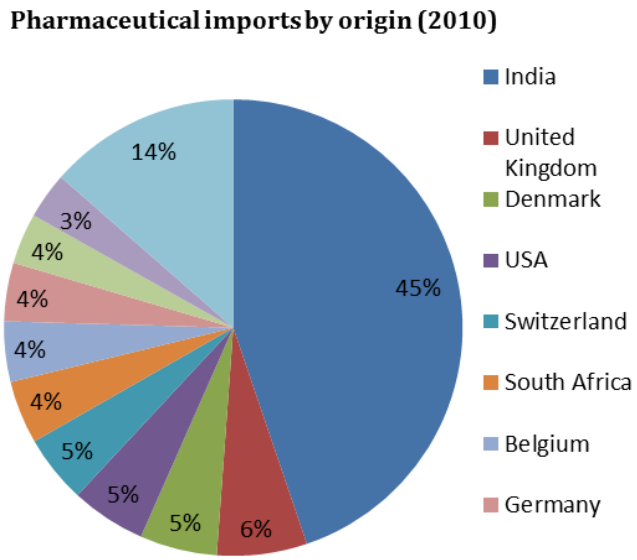


Figure 27: Pharmaceutical Imports in Kenya by Country of Origin

Major importers

The Pharmacy and Poisons Board (PPB) didn't provide the importers data to the research team, however, through secondary research; the research team was able to identify some of the major public sector importers in Kenya.

[179] UN COMTRADE. UN COMTRADE database [Internet]. Available from: http://comtrade.un.org/.

Public Sector

Kenya Medical Supplies Agency (KEMSA), is the national procurement agency for pharmaceuticals under the Government of Kenya, which procures for around 4,000 dispensaries and 511 health centres across Kenya[180].

Mission for Essential Drugs and Supplies (MEDS) is another organisation (NGO), which procures pharmaceutical products for 1,000 health care providers, 150 NGOs and other government and community based projects[181].

Private Sector

Kenyan laws make provisions for the licensing of wholesalers and distributors who import from outside the country. However, a list of Good Distribution Practices (GDP) approved private sector importers (distributors / wholesalers) does not exist[182].

2.2. Import Regulations, Processes and Quality Control

2.2.1. Pharmaceutical Import Regulations

The Kenya Pharmaceutical Policy of 2008 drives the Kenyan pharmaceutical sector. This policy outlines strategies for the government to provide pharmaceutical services and the key institutional frameworks and processes to ensure access to medicines for its citizens. It also guides the various organisations in their duties and powers. The Kenya National Pharmaceutical Policy itself is a successor to the Kenya National Drug Policy formulated in 1994 and was the basis for revision of the Pharmacy and Poisons Act in 2008.

The Pharmacy and Poisons Act came into force in 1957 under chapter 244 of the Kenyan legislation. The Act established the PPB to control the pharmacy profession and the pharmaceutical trade. This act has been modified a few times since then. The latest version of this act, revised in 2009 (based on the National Pharmaceutical Policy of 2008), provides new laws not only for the board, but also for the manufacture of medicinal substances and the import and export of pharmaceutical products. This law also includes the National Quality Control Laboratory and covers its duties and powers[183].

[180]UNIDO. Pharmaceutical Sector Profile: Kenya [Internet]. Available from: http://www.unido.org/fileadmin/user_media/Services/PSD/BEP/Kenya_Pharma%20Sector%20profile_TEGLO05015_Ebook.pdf.
[181]UNIDO. Pharmaceutical Sector Profile: Kenya [Internet]. Available from: http://www.unido.org/fileadmin/user_media/Services/PSD/BEP/Kenya_Pharma%20Sector%20profile_TEGLO05015_Ebook.pdf.
[182]WHO.Kenya Pharmaceutical Country Profile [Internet]. Available from: http://www.who.int/medicines/areas/coordination/kenya_pharmaceuticalprofile_december2010.pdf.
[183]WHO. The Pharmacy And Poisons Act Chapter 244 [Internet]. Available from: http://apps.who.int/medicinedocs/documents/s18245en/s18245en.pdf.

The Pharmacy and Poisons Act established PPB as the National Drug Regulatory Authority of Kenya. To achieve the goals of the policy and to implement duties written in the law, there are various guidelines that PPB issues to the industry. These guidelines relate to various aspects of the pharmaceuticals trade; for example, registration of pharmaceutical products. A full list of guidelines can be found on the PPB website[184].

Another law related to the import of pharmaceuticals is the imports, exports and essential supplies Act, chapter 502, 2006. The Act makes provision for the control of import and export of pharmaceutical products, besides other goods[185]. As per this act, Department of Trade and Supplies, which is under Ministry of Trade is mandated to control imports and exports of all commodities.

2.2.2. Pharmacy and Poisons Board (PPB)

The PPB is the National Drug Regulatory Authority of Kenya, which was set up under the Pharmacy and Poisons Act, 1957. There are nine departments and one Quality Control laboratory under the scope of the PPB. The head of PPB is the Registrar, who directly manages the National Quality Control Laboratory (NQCL). The Deputy Registrar at PPB oversees the nine departments and reports to the Registrar. There is a Director for each of the nine departments. PPB has 22 Pharmacists, 8 Pharmaceutical Technologists, 9 Directors, 1 Deputy Registrar and 1 Registrar in total. Refer to the organogram in figure 28:

[184]PPB. About PPB [Internet]. Available from: http://pharmacyboardkenya.org/?page_id=401.
[185]The Imports, Exports and Essential Supplies Act Chapter 502 [Internet]. Available from: http://kenyalaw.org/kl/fileadmin/pdfdownloads/RepealedStatutes/Imports_ExportsCap502.doc.

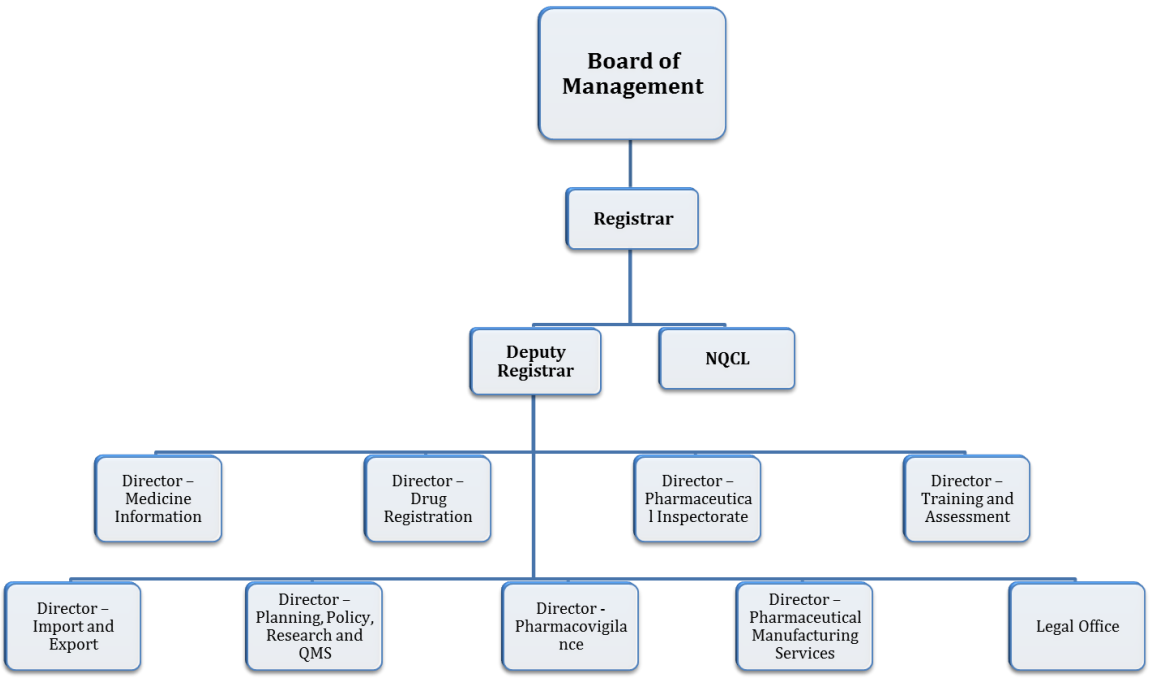


Figure 28: Organisational Chart of PPB

The major functions of PPB[186] are:

- Registration of products (either marketed by domestic manufacturers or imported in the country)
- Regulating pharmaceutical services in the country
- PPB ensures that every manufacturer operating in Kenya or exporting to Kenya complies with the country's GMP requirements (based on WHO GMP guidelines)
- Inspection of wholesalers and retailers in Kenya to ensure GSP and GDP
- Quality Control of imports[187]: the role of PPB is to register pharmaceutical products and test them as part of post-marketing surveillance

2.2.3. Import Process

In Kenya, the Imports, Exports and Essential Supplies Act, chapter 502, 2006, and Pharmacy and Poisons Act, chapter 244, make provision for the control of imports of pharmaceutical products, which fall under division 54. Only importers registered with the Pharmacy and Poisons Board can conduct imports and the importers also require an authorisation from the Ministry of Foreign Trade. Based on the interviews conducted, the pharmaceutical import process in Kenya is outlined below:

[186] PPB. Core functions, PPB [Internet]. Available from: http://pharmacyboardkenya.org/?page_id=44.
[187] Interview with PPB, 30 September, 2013.

Product registration

In Kenya, the application for pharmaceutical registration can be made by[188]:

- The patent holder
- The manufacturer
- An authorised Local Technical Representative (LTR) of the manufacturer

The application should be filled in English, in CTD format (as per ICH guidelines). A new application for registration should include:

- Three samples of the smallest commercial pack(s) from one batch with batch CoA issued by a recognised Quality Control laboratory (in this case, all WHO pre-qualified laboratories in Kenya and within the East African Community and Drug Analysis Research Unit (DARU), School of Pharmacy, University of Nairobi)
    - An original CoPP (in WHO Format) on official papers of the issuing competent drug regulatory authority
    - A site master file in case the product is manufactured at a plant(s) not inspected and approved by PPB
    - Non-refundable application fee of US$ 1,000 for registration of medicines in Kenya and GMP inspection fees (US$ 4,000) for facilities not yet inspected by PPB

PPB evaluates the applications on a first-in-first-out basis (FIFO) unless the product meets the fast tract criteria. If the application is from a manufacturer who is manufacturing the product in a new manufacturing site, not inspected by the PPB, PPB will conduct an inspection of the site or use other means to verify whether the facility complies with current GMP Regulations.

In general, a new application takes 12 months to be evaluated after which a certificate of registration is granted under chapter 244, Pharmacy and Poisons Act.

Pre-shipment process

Once the product is registered, importation requests are authorised by PPB in accordance with the Pharmacy and Poisons Act, chapter 244, and by Department of Trade and Supplies, in accordance with the imports, exports and essential supplies Act, chapter 502. The importer has to submit requests to both these authorities in order to import products into Kenya.

The importer has to import pharmaceutical products within the time period specified on both import permits. These import permits can be used by the exporter (in this case, Indian exporter) to apply for necessary documents in the source country for export.

[188] PPB. Republic of Kenya Registration of Drugs Guideline.To Submission of Applications [Internet]. Available from: http://pharmacyboardkenya.org/downloads/?file=drug_reg_guidelines.pdf.

Post shipment process

Once the shipment arrives at the designated ports in Kenya (which are Jomo Kenyatta International Airport, Kilindini-Mombasa Port, Eldoret and Kisumu), the Kenya Revenue Authority and the custom officials checks the imports and collects the following:

- Customs and excise taxes
- Import license from PPB
- Original commercial invoice
- Packing list
- Original bills of lading
- Original test result / report / CoA
- Original CoO for Preferential Trade Area Partners such as COMESA
- Import declaration form and the receipt
- Insurance debit note
- Importers value declaration

2.2.4. Quality Control process

> *'To place the goods in this market there is a robust system of registration. I would look at how people get goods here? How is our registration process? How do we ensure that the quality of medicines is maintained when the product gets here? What is it that they are doing when the products get here?' says the Head Imports and Exports, PPB.*

Quality Assurance activities

The quality assurance activities conducted by PPB are[189]:

- Registration: In the case of registration, three (3) samples of the smallest commercial pack(s) from one batch are withdrawn. These samples are sent to one of the PPB-approved laboratories for inspection and testing. The laboratory issues a CoA for the samples tested and also prepares a separate detailed report of the actual method used to test each sample and the result obtained. The samples are retained for post-shipment inspection, if required

- Pre-shipment testing: There is no provision of pre-shipment inspection or testing in any law or guideline. However, according to the local officials, pre-shipment inspection is carried out sometimes for some imports (as decided by the PPB)

[189] Interviews with: PPB, 30 September, 2013; NQCL, 1stOcttober, 2013; MEDS, 2nd October and 29th October, 2013.

- Post-shipment testing: When a consignment arrives at a port, the custom officials alert the pharmaceutical inspectors (PPB) in case of any suspicion of poor quality medicines. If the PPB inspectors find any flaws in the consignment, they draw samples for Quality Control testing. Customs legislation provides for two verification stages: (i) immediate verification while the merchandise is still under customs control and (ii) post-clearance verification. This provides avenues for post-shipment inspection and general inspection by the pharmaceutical inspectors. Post-shipment inspection is conducted by the inspectors of PPB, of the samples provided during registration

- Post-marketing surveillance: In the case of post-marketing surveillance, samples are withdrawn from the market by PPB for testing. Also, PPB has a pharmacovigilance department, which is mandated to monitor and report adverse pharmaceutical reactions and poor quality products. This is done either manually or electronically

Quality Control laboratory

There are two WHO pre-qualified laboratories in the country:

iii. Mission for Essential Medicines (MEDS)
iv. National Quality control Laboratory (NQCL)

Other laboratory also used for pharmaceutical product testing:

ii. Drug Analysis Research Unit (DARU) at the School of Pharmacy

The Drug Registration Department was set up in 1982 and the department contracted DARU to carry out Quality Control tests of the pharmaceuticals. The NQCL was then established in 1992 through an Act of Parliament Cap 244 of the Pharmacy and Poisons Act. The NQCL is the major technical arm of the PPB, responsible for evaluating the quality of medicines and selected medical devices.

MEDS is ISO 9001:2008 certified. DARU is also ISO 9001:2000certified. NQCL is in the process of applying for ISO 17025 certification.

Capacity

Based on the interviews conducted, NQCL is able to test 1,500–2,000 products annually with a lead time of 42 working days. Majority of the products tested are from the PPB. NQCL also gets samples from neighbouring countries' regulatory bodies.

MEDS can test approximately 1,000 products annually with a lead time of 21 days. Of the 1,000 products tested, 50% were from MEDS suppliers, while the other 50% were from other importing organizations in Kenya.

Personnel

NQCL has a total of 43 staff members with 25 being technical staff, while MEDS has a total of six staff members stationed at the laboratories all of which are technical staff. DARU utilises members of the faculty and has 10 academic staff, 6 technical staff and 2 administrative staff members.

Equipment and types of analysis

Wherever possible, methods from official compendia, BP, IP and USP are used for testing. In cases where no compendia methods are available, the manufacturer's in-house methods are used as it is or after adaptation.

The main equipment and tests that are available in the country include[190]:

- Wet Chemistry / Instrumentation Unit
  - Uniformity of weight
  - Uniformity of content
  - Disintegration
  - Friability
  - Identification
  - Assay (UV, Titration and HPLC –[>7])
  - Dissolution (Dissolution testers –[>7])
  - pH determination
  - Polarimetry
  - Viscosity

- Biological Analysis
  - Sterility testing
  - Microbial limit testing
  - Bacterial endotoxin testing
  - Microbiological Assay

Detection of poor quality pharmaceuticals

In terms of pharmacovigilance, there are written guidelines to monitor and report poor quality pharmaceutical products on the market[191]. Samples are obtained from the market based on the adverse event reports obtained from the field and are taken to the laboratories for testing.
Once tested, if the sample fails, the products are recalled from the market by the PPB in conjunction with the supplier or manufacturer. If the product is detected to be of poor quality

[190]WHO. WHO List of prequalified Quality Control Laboratories, Prequalification Programme: Access to quality control laboratories that meet recommended international norms and standards for the analysis of products, version 27th Edition, 13 November 2013 Laboratories [Internet]. Available from: http://apps.who.int/prequal/lists/pq_qclabslist.pdf.
[191]WHO. Guidelines for the national Pharmacovigilance System in Kenya, Second Edition, February 2008 [Internet]. Available from: http://apps.who.int/medicinedocs/en/d/Js18079en/.

before registration, the product will not be registered in the country and the manufacturers / suppliers will be notified of this. The sample size required for testing depends on the type of tests. For tablets the minimum number of samples is 100 tablets for the particular batch. Syrups and suspensions would require a minimum of 20x100ml bottles from each batch[192].

Results of the products tested

The failure of pharmaceutical products as reported in the paper, 'Counterfeiting of Drugs and the Necessity of Quality Control Systems in Developing Countries,' at DARU and NQCL is as follows[193] (see table 19):

Table 19: Failure Rates (%) of Pharmaceutical Products analysed at NQCL

	1996-2001	2002-2003	2004-2005	2006-2007
Number of Drugs Analyzed	107	442	1139	955
Local drugs (%)	41	40	27	28
Imported drugs (%)	59	60	73	72
Overall failure (%)	31	27	13	15
Local drugs (% failure)	23	32	19	24
Imported drugs (% failure)	35	24	10	12

It should be highlighted that NQCL, a WHO PQ lab has been conducted quality testing since 1996, and has increased the number of tests almost 10 fold over the past 10 years. Given the importance of the imported drugs circulating in the market, NQCL's has increased its rate of testing of imported drugs. The overall failure rate of all pharmaceuticals stands at about 15%, however, the rate of failure of locally manufactured products has remained the same over the past 10 years at about 27% average; while the failure rate of imported pharmaceuticals has declined by more than 60%, to about 12%--half the failure rate of locally manufactured drugs.

[192]Interview with NQCL, 1st October 2013.
[193]Kibwage I. O. Counterfeiting of Drugs and the Necessity of Quality Control Systems in Developing Countries. Interdisciplinary Courses on Development and Cultures, Katholieke University Leuven, pp 1- 12 [Internet].2008. Available from: http://chs.uonbi.ac.ke/sites/default/files/chs/chs/Prof.%20Kibwage%20speach2_0.pdf.

3. Ghana

3.1. Pharmaceutical Sector

3.1.1. An Overview of the Ghanaian Pharmaceutical Market

Total market

The market size for pharmaceuticals in Ghana was estimated at US$ 303 million in 2011, as per the IFPMA report[194]. The pharmaceutical market in Ghana is dominated by the private sector (majority of the local manufacturers and importers are from the private sector)[195].

Imports

The total pharmaceutical imports to Ghana was estimated at US$ 127 million in 2011, as per the IFPMA report, which is about 42% of the total market size (reported by IFPMA)[196].

As per UN COMTRADE data[197], the pharmaceutical imports are reported to be US$ 150 million. WTO data shows that Ghana imported US$ 170 million worth of pharmaceuticals[198] in 2011.

Local production

The local pharmaceutical production in Ghana was estimated at US$ 186 million in 2011, as per the IFPMA report[199] (local consumption + exports – imports). This is more than 60% of the local consumption of US$ 303 million in 2011. In 2005 there were 34 licensed pharmaceutical manufacturers in Ghana, all of which are GMP[200].

The leading manufacturers[201] in the country are listed in table 20, and they are all from the private sector.

[194] IFPMA. The Pharmaceutical Industry and Global Health Fact and Figures 2012 [Internet]. Available from: http://www.ifpma.org/fileadmin/content/Publication/2013/IFPMA_-_Facts_And_Figures_2012_LowResSinglePage.pdf.
[195] Interview with FDA Ghana officials, September 2013.
[196] IFPMA. The Pharmaceutical Industry and Global Health Fact and Figures 2012 [Internet]. Available from: http://www.ifpma.org/fileadmin/content/Publication/2013/IFPMA_-_Facts_And_Figures_2012_LowResSinglePage.pdf.
[197] UN COMTRADE. UN COMTRADE data [Internet]. Available from: http://comtrade.un.org.
[198] WTO. WTO data [Internet]. 2011. Available from: http://stat.wto.org/StatisticalProgram/WSDBStatProgramSeries.aspx?Language=E.
[199] IFPMA. The Pharmaceutical Industry and Global Health Fact and Figures 2012 [Internet]. Available from: http://www.ifpma.org/fileadmin/content/Publication/2013/IFPMA_-_Facts_And_Figures_2012_LowResSinglePage.pdf.
[200] WHO. Ghana Pharmaceutical Country profile, published by Ghana Ministry of Health in collaboration with WHO [Internet]. Available from: http://www.who.int/medicines/areas/coordination/Ghana_PSCPNarrativeQuestionnaire_03022012.pdf.
[201] Interview with FDA Ghana officials, September 2013.

Table 20: Top 10 Manufacturers in Ghana

S.No.	Company	Type
1	Danadams	Private Sector
2	M&G Pharmaceuticals	Private Sector
3	Phyto-Riker Pharmaceuticals Ltd	Private Sector
4	Kinapharma Ltd	Private Sector
5	Ernest Chemist Ltd	Private Sector
6	Ayrton Drugs Ltd	Private Sector
7	Kama Industries Ltd	Private Sector
8	AmponsahEffah Pharmaceuticals Ltd	Private Sector
9	Sharp Pharmaceuticals Ltd	Private Sector
10	PZ Cussons Ltd	Private Sector

Exports

The total pharmaceutical exports from Ghana were estimated at US$ 10 million[202] in 2011, as per the IFPMA report.

3.1.2. Pharmaceutical Import Market in Ghana

Countries of import

Based on data from UN COMTRADE[203], the pharmaceutical imports from India are nearly 38% of the total pharmaceutical imports in Ghana, estimated to be approximately US$ 56 million (out of US$ 150 million total imports). Imports from India are more than the combined imports from the top 5 other countries (see figure 29).

[202] IFPMA. The Pharmaceutical Industry and Global Health Fact and Figures 2012 [Internet]. Available from: http://www.ifpma.org/fileadmin/content/Publication/2013/IFPMA_-_Facts_And_Figures_2012_LowResSinglePage.pdf.
[203] UN COMTRADE. UN COMTRADE Data [Internet]. Available from: http://comtrade.un.org.

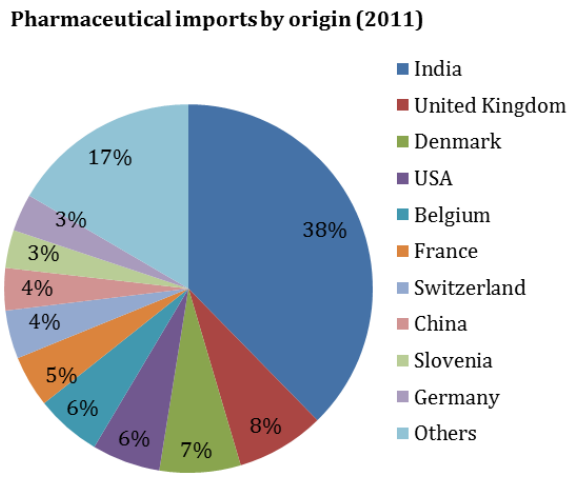


Figure 29: Pharmaceutical Imports in Ghana by Country of Origin

Major importers

The Ghana pharmaceutical industry is dominated by the private sector, which imports more pharmaceuticals into Ghana than the public sector or the international NGOs. In the public sector, the MoH procurement unit has a major share in the country's imports. The table 21 shows the leading importers in Ghana, both from the private sector and the public sector[204].

Table 21: Leading Importers in Ghana

S. No.	Company	Type
1	Tobinco Pharmaceuticals	Private Sector
2	Gobalks Laborex	Private Sector
3	Ernest Chemists Ltd	Private Sector
4	Ministry of Health Procurement Unit	Government Sector
5	Kama Health Services	Private Sector
6	Gilligold Pharmaceuticals	Private Sector
7	East Cantonments Pharmacy	Private Sector
8	Unichem Chemists	Private Sector
9	Unicom Chemists	Private Sector
10	Geo Pharmacy	Private Sector

[204]Interview of FDA Ghana officials. September 2013.

3.2. Import Regulations, Processes and Quality Control

3.2.1. Pharmaceutical Import Regulations

The National Drug Policy guides the pharmaceutical sector in Ghana. The first edition of National Drug Policy was released in 1999, which was subsequently revised in 2004[205]. The goal of the policy is to ensure access to safe and effective pharmaceutical products. To achieve this goal, the policy also lists the processes and institutions responsible for carrying out these processes.

The Food and Drugs Act formulated in 1992 highlights the structure, powers and duties of the Food and Drugs Authority and also lists various processes to control the manufacture and sale of pharmaceutical products in Ghana. This law provides the standards for sale of food and pharmaceuticals in the country.

The Public Health Act, 2012[206]brings together legislations, which includes Tobacco Control, Vaccination, Quarantine, Clinical trials, Food and Drugs, Communicable diseases, Vector control and Environmental sanitation. It has a wide scope, with one of its sections highlighting the objectives and functions of the Food and Drugs Authority[207]. The Food and Drugs section in the Public Health Act, 2012 is the revised version of the Food and Drugs Act, 1992 and sets out the rules for registration and import of drugs into the country. Food and Drugs Act, 1992 hence became a part of the wider Public Health Act, 2012.

The above legislations place FDA as the Drug Regulatory Authority of Ghana. In order to implement the process written in the Food and Drugs Act and to achieve the objectives of the National Drug Policy, FDA Ghana has formulated various guidelines for the industry; for examples, guidelines for licensing of wholesalers, importers, exporters and distributors.

3.2.2. Food and Drugs Authority (FDA), Ghana

Under the Public Health Act of 2012, the FDA of Ghana (which is controlled and supervised by the MoH) is responsible for controlling the import of pharmaceuticals into the country. It works as per the 'The Food and Drugs Law' that was passed in 1992 to control the manufacture, importation, exportation, distribution, use and advertisements of food, pharmaceuticals, cosmetics, medical devices and household chemical substances[208]. The FDA has nine supporting

[205] WHO. Ghana National Drug Policy [Internet]. Available from: http://apps.who.int/medicinedocs/documents/s16185e/s16185e.pdf.
[206] Government of Ghana.Public Health Act, 2012 [Internet]. Available from: http://www.tobaccocontrollaws.org/files/live/Ghana/Ghana%20-%20Pub.%20Health%20Act%202012%20-%20national.pdf.
[207] Ghana Food and Drugs Act [Internet]. Available from: http://www.wipo.int/wipolex/en/text.jsp?file_id=225584.
[208] FDA, Government of Ghana. Annual Report, Food and Drugs Authority [Internet]. 2012. Available from: http://www.fdaghana.gov.gh/images/stories/pdfs/Annual%20Reports/Annual%20Report%202012.pdf.

departments and is divided into two divisions, which is further sub-divided into five divisions[209]:

- Food
  - Food Safety Division
  - Food Inspectorate Division
- Drugs
  - Drug Registration and Inspectorate Division
  - Cosmetics, Medical Devices and Household Chemicals Division
  - Safety Monitoring and Clinical Trials Division

The nine sub-departments are:

- Internal audit unit
- HR unit
- Public education and communications unit
- Project research and MIS department
- Finance department
- Administration department
- Import and export control department
- Laboratory services department
- Regional offices

With regard to pharmaceutical imports and quality, the most important departments in FDA Ghana are the Drug Registration and Inspectorate Division, and the Import / Export Control Department, which are both discussed in detail below. The organisational chart is also presented in figure 30.

[209] FDA. About Divisions [Internet]. Available from: http://www.fdaghana.gov.gh/index.php?option=com_content&view=article&id=3&Itemid=13.

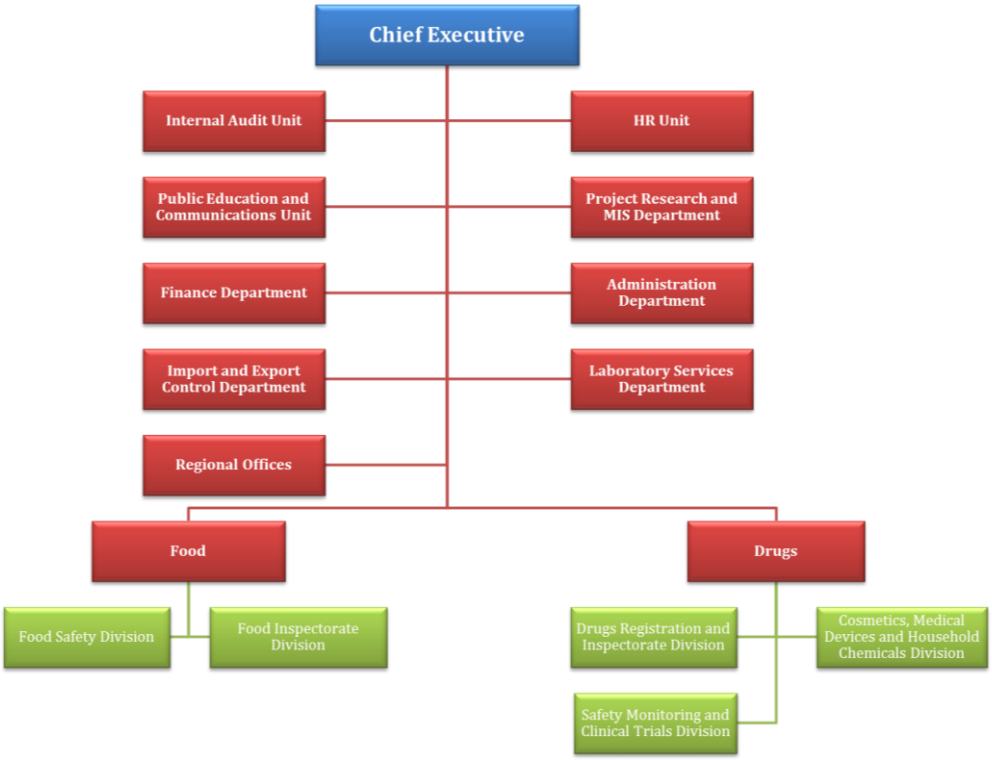


Figure 30: Organisational Chart of Ghana FDA

The Drug Registration and Inspectorate Division are responsible for registration of pharmaceuticals in the country and for ensuring quality of registered products. There are four departments in this division, namely:

- Drug Evaluation and Registration Department
- Herbal Medicine Department
- Drug Enforcement Department
- Tobacco and Substance of Abuse Department

The Import and Export Control Department (IECD)[210] is one of the nine supporting departments, and the objective is to ensure that imported food and pharmaceutical products are safe, of good quality and efficacious (in the case of medicines). The IECD seeks to achieve the above through the following:

- Confirming the authenticity of imported products through inspections at the port
- Identifying unregistered imported products for registration
- Continually widening the scope of regulation at the ports of entry to include all imported products that fall under the FDA's Ghana remit as per the Public Health Act of 2012

[210] Interview with: FDA Ghana officials, September 2013 and FDA Ghana [Internet]. Available form: http://www.fdaghana.gov.gh/index.php?option=com_content&view=article&id=10&Itemid=21.

HR Capacity at the FDA:

The HR capacity at Ghana FDA is presented in table 22[211].

Table 22: HR Capacity of the FDA

Employee Categories	Total Staff Strength
Permanent	491
Temporary	24
National Service Personnel	65
Seconded Staff	13
Total	**593**

3.2.3. Import process

In Ghana, the imports are controlled as per the Food and Drugs Act (which is a part of the wider Public Health Act, 2012). According to these laws:

- No one can import pharmaceuticals into the country unless the pharmaceutical product is registered with the FDA
- A Quality Assurance certificate (issued by the Drug Regulatory Authority of the exporting country) should accompany the registration certificate during import

The complete series of events during an import is as follows:

Product registration

All exporters should have a local representative in Ghana through which the application should be submitted. The local representative has to be a registered pharmaceutical wholesale company or an accredited manufacturer's representative in Ghana.
The process of registration must be in conformity with the guidelines issued by FDA Ghana, which was developed in line with section 118 of the Public Health Act, 2012. FDA Ghana follows the ICH's CTD, on all the registration processes for allopathic pharmaceuticals / medicines and directs all the applicants to apply in this format only. The applicant should also submit samples of the Finished Pharmaceutical Product (FPP) based on the FDA's sample schedule and should also provide reference standards if it is a new chemical entity[212].

After submission of all the required documents, the FDA starts the evaluation process, which is done on a 'FIFO' basis (first-in-first-out) unless the pharmaceutical product meets the expedited

[211] FDA, Government of Ghana. Annual Report, Food and Drugs Authority [Internet]. 2012. Available form: http://www.fdaghana.gov.gh/images/stories/pdfs/Annual%20Reports/Annual%20Report%202012.pdf.
[212] FDA, Government of Ghana. Guidelines for Registration of Allopathic Drugs (Human and Veterinary) [Internet], 2012. Available from: http://www.fdaghana.gov.gh/images/stories/pdfs/downloads/drugs%20guidelines/GUIDELINES%20FOR%20REGISTRATION%20OF%20ALLOPATHIC%20DRUGS%20(HUMAN%20&%20VETERINARY).pdf.

review process. During evaluation, the FDA may request for any additional information, which should be submitted by the applicant within 12 months.
The FDA may carry out inspections (or use other means, when it cannot conduct an inspection) if the application is from a new manufacturing site, to confirm that the manufacturing site complies with cGMP regulations.

For all imported generic medicines, the FDA charges US$ 3,000 for registration; and for all new chemical entities, the charge is US$ 4,500[213]. The FDA takes six months to evaluate all the documents and issue a registration certificate to the applicant. The registrations are valid for three years after which applicants have to re-register the product.

Pre-shipment process

Once a product is registered, every import requires an approval from FDA Ghana. Every importer in Ghana who wishes to import and distribute pharmaceutical products must obtain an import (and distribution) license from Ghana's FDA[214]. The importer has to fill an application form, following which the FDA issues the license after conducting necessary inspections (if required). The application form should have the following details:

- The name, full business address, location / site address and telephone numbers (including mobile numbers) of the licensee
- All trade or business names used by the licensee
- Addresses, telephone numbers and the names of contact persons for all facilities used by the licensee for storage, handling and distribution of regulated products
- The type of ownership or operation (i.e., partnership, corporation or sole proprietorship)
- The name(s) of the owner and / or operator of the licensee, including:
  - If a person, name of the person
  - If a partnership, name of each partner and name of the partnership
  - If a corporation, name and title of each corporate officer, and director and corporate names
  - If a sole proprietorship, full name of the sole proprietor and name of the business entity

The FDA also checks other details like past performance of the importer and whether the importer has had any convictions in the past or not. The FDA requires the importer to furnish details of the facilities, storage conditions, security conditions etc. The FDA also inspects the importer's facility before issuing the license.

[213] FDA, Government of Ghana. Approved Fee Schedule [Internet]. 2009. Available from: http://www.fdaghana.gov.gh/images/stories/pdfs/Quick%20links/APPROVED%20FEE%20SCHEDULE.pdf.
[214] FDA, Government of Ghana. Guidelines for Licensing of Wholesalers, Importers, Exporters and Distributors of Regulated Products, [Internet]. 2012. Available from: http://www.fdaghana.gov.gh/images/stories/pdfs/downloads/drugs%20guidelines/GUIDELINES%20FOR%20LICENSING%20OF%20WHOLESALERS,%20IMPORTERS,EXPORTERS%20&%20DISTRIBUTORS..pdf.

With the import license, the exporter can then apply for the export documents in the source country and finally export the product from the exporting country (India in this case).

Post shipment process

Once the shipment lands at the designated port in Ghana (Tema port, which is a seaport, and Kotoka International Airport, which is a dry/air-port) the custom officials and the IECD of FDA Ghana inspect the shipment.

The major role of custom officials at the port is to collect the import duty levied and also to inspect the imports (for all its commercial documents; for example, lading bill, purchase order etc). The IECD of the FDA is also present at these ports to oversee the operations[215]. The IECD officials authenticate the imported pharmaceutical products at the port and also look for unregistered products entering through these ports. The officials take random samples from the consignment for quality control testing. The Drug Enforcement Department (of the Drug Registration and Inspectorate Division) also conducts post-marketing surveillance after the pharmaceutical products reach the market. The samples are collected randomly and tested in the Quality Control laboratory.

According to the FDA, all pharmaceutical products should be stored at appropriate temperatures and under proper conditions defined on the label of the pharmaceutical product or as per the Schedule 4 of the Public Health Law[216].

3.2.4. Quality Control processes

Following are the various stages of the quality control process[217]:

- Registration: During registration of the product, the FDA inspects the manufacturer and facility where the pharmaceuticals are being manufactured. The inspections are carried out for every manufacturer, whether the manufacturer is from an ICH country or a country with semi-regulated or less regulated Drug Regulatory Authority. For every registered pharmaceutical, the FDA conducts inspections every five years for foreign manufacturers, and annually for locally registered manufacturers
- Pre-shipment inspection: The FDA does not conduct pre-shipment testing of pharmaceuticals

[215]Interview of FDA Ghana officials.September 2013 and FDA.About Import and Export Control Department [Internet]. Available from: http://www.fdaghana.gov.gh/index.php?option=com_content&view=article&id=10&Itemid=21.

[216] FDA, Government of Ghana. Guidelines for Licensing of Wholesalers, Importers, Exporters and Distributors of Regulated Products [Internet]. 2012. Available from: http://www.fdaghana.gov.gh/images/stories/pdfs/downloads/drugs%20guidelines/GUIDELINES%20FOR%20LICENSING%20OF%20WHOLESALERS,%20IMPORTERS,EXPORTERS%20&%20DISTRIBUTORS..pdf.

[217] Interview of FDA Ghana officials.September 2013 and FDA, Government of Ghana.Guidelines for Stability Testing Of Active Pharmaceutical Ingredients and Finished Pharmaceutical Products [Internet]. 2013. Available from:http://www.fdaghana.gov.gh/images/stories/pdfs/downloads/drugs%20guidelines/GUIDELINES%20FOR%20STABILITY%20TESTING%20OF%20ACTIVE%20PHARMACEUTICAL%20INGREDIENTS%20AND%20FINISHED%20PHARMACEUTICAL%20PRODUCTS.pdf.

- Post-shipment testing: The FDA conducts post-shipment inspection testing. The FDA takes random samples from each batch and tests the samples for quality
- Post-marketing surveillance: The Drug Enforcement Department (of the Drug Registration and Inspectorate Division) conducts post-marketing surveillance after the pharmaceutical products reach the market. The samples are collected randomly and tested in the quality control laboratory

Quality Control laboratory

There are no WHO pre-qualified laboratories in Ghana. The FDA has a Quality Control laboratory, which is ISO 17025 certified. The laboratory tests up to 5,000 samples each year[218]. The most important test that the FDA conducts for the FPP and Active Pharmaceutical Ingredients is the stability test. All other tests are conducted in accordance with pharmacopeia standards[219].

More data could not be collected because of the unwillingness of Ghana FDA officials. There is little secondary information available about the FDA quality control laboratory.

Results of the products tested

According to the FDA, the failure rate for the pharmaceuticals during the post-shipment or post-marketing surveillance testing is around 7–10% and the pharmaceuticals that fail the tests are mostly imported from India. During the tests, the FDA has found that the pharmaceuticals fail in assay tests for active ingredients, products deteriorate and sometimes they are counterfeit.

Some of the findings from the specific post-marketing surveillance activities are as follows:

'Ghana FDA's Drug Inspectorate department conducts post-marketing surveillance activities and also conducts raids on getting information for some counterfeit activities. Recently, Ghana FDA has banned Bliss GVS Pharma Ltd. India from importation and distribution of all medicinal products into Ghana. This was the result of a fake anti-malarial drug this company was importing into Ghana and using Ghanaian children as clinical trial subjects without any authorisation from Ghana FDA. This drug is not registered in India.

'In a similar case, the FDA has also found out that out of over 100 medicines manufactured by Bliss GVS Pharma, and imported by Tobinco Pharmaceuticals in Ghana, only seven got the necessary approvals. The FDA has also found fake and unregistered medicines in the premises of Tobinco pharmaceuticals and also directed Tobinco Pharmaceuticals to recall all the unregistered pharmaceuticals from all across Ghana.' See Appendix 2 for details.

[218] Interview with FDA Ghana officials, October 2013
[219] FDA Ghana. Guidelines for stability testing of Active Pharmaceutical Ingredients and Finished Pharmaceutical Products [Internet]. Available from: http://www.ich.org/fileadmin/Public_Web_Site/ICH_Products/Guidelines/Quality/Q1F/Stability_Guideline_WHO.pdf.

The FDA also issues warnings to the general public on the counterfeit and fake medicines available on the market. One such example is—FDA has issued a warning to the general public for the medicines manufactured by two Chinese companies, Yikang Pharmaceutical Company and Nantong Jinghua Pharm and imported by the Ghanaian company, Lymens Medical Supplies.

Sub-section 3. Overview of Quality Assurance Activities of Procurement Organisations

As discussed in Part 1: Role of key Stakeholders in the Indian Pharmaceutical Quality System for Export, the procurement organisations can be classified into public sector buyers, private sector buyers, procurement agents (national and international) and NGOs (national and international). These organisations are responsible for procuring either for a country (e.g. KEMSA or for multiple countries (e.g. IDA Foundation). In reference to our research, we are focusing on procurement organisations in Africa, which procure pharmaceuticals largely from India.

The main objective of this section is to collect and compare the quality assurance activities of various procurement organizations. A few examples of procurement organisations with stringent Quality Assurance policies have also been presented in the report,

The analysis below is based on interactions with 23 procurement organisations operational globally, in the three selected African countries viz. Ethiopia, Ghana and Kenya and in some other developing countries (India, Ukraine). The interaction was based on a mix of interviews and questionnaire (as mentioned in the methodology section).

1. Profile of the Procurement Organisations

Following is an analysis of the profile of the respondent organisations, based on the typology created in Part 1: Role of key Stakeholders in the Indian Pharmaceutical Quality System for Export:

1. **Registration (type of organisation):** The following table 23 lists the organisations interacted with:

Table 23: Type of Procurement Organisations

Private sector importer	Procurement agent (national and international)	NGO (national and international)	National procurement organisation (Government)
Dominion pharmaceuticals (Kenya)	PFSCM (International)	PSI India	Ukrainian Center for Control of Socially Dangerous Diseases (Ukraine)
Caroga Pharma (Ethiopia)	DKT Ethiopia	PSI Kenya	KEMSA (Kenya)
YOHA international (Ethiopia)	IDA Foundation (International)	MEDS (Kenya)	MoH Ghana procurement unit
Veteran pharmaceuticals Ltd (Kenya)	CHMP Kenya	PSI Global	PFSA (Kenya)

	Mission Pharma (International)	MSI (International)	Kenya AIDS Control Project
	SCMS Ethiopia	KEMRI/CDC (Kenya)	
	UNFPA (International)[220]	IFRC (International)	

2. **Size of procurement organisation:** Total procurement value of all 23 buyers exceeded US$ 3 billion annually (for 2012). The larger procurement organisations purchase more than 1,000 different products worth more than US$ 500 million annually; the smaller procurement organisations purchase less than 10 products worth less than US$10 million. See figure 31:
   - The procurement of less than US$10 million, which constitutes 45% of the pie chart, is represented mainly by the national procurement organisations. These organisations purchase a large number of products but their procurement value is on the lower side because of low coverage
   - Majority of the procurement organisations purchase 101–500 products (see figure 32)

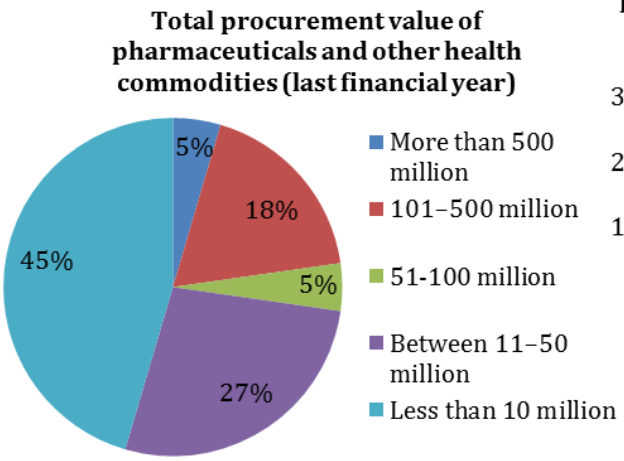


Figure 31: Procurement Value of Pharmaceuticals

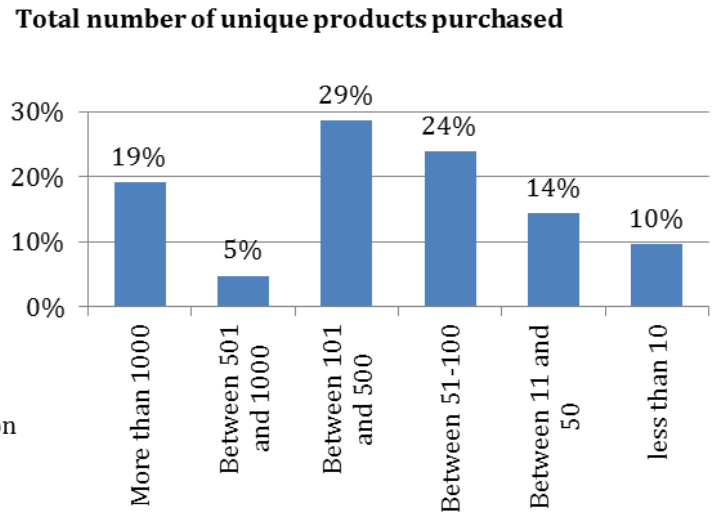


Figure 32: Number of Unique Products Purchased by the Procurement Organisations

3. **Type of products procured:** Procurement organisations buy more pharmaceuticals (almost half of the procurement organisations spend more than 70% of their budget on pharmaceuticals) than non-pharmaceutical health commodities (diagnostics, devices, supplies etc). There are some exceptions like PSI Kenya and MSI, which procure non-pharmaceuticals more than they do pharmaceuticals. Refer to table 24:

[220]UNFPA is a multilateral organization and has been included here from a procurement standpoint.

Table 24: Category of Procurement

S.No.	Name of Organization	Procurement of pharmaceuticals (% of total)	Procurement of non-pharmaceuticals (% of total)
1.	PFSCM	80%	20%
2.	IFRC	60%	40%
3.	Marie Stopes	40%	60%
4.	UNFPA	80%	20%
5.	IDA Foundation	80%	20%
6.	PSI Global	35%	65%
7.	CHMP Kenya	60%	40%
8.	Missionpharma	70%	30%
9.	KEMRI/CDC	60%	40%
10.	Ukrainian Center for Control of Socially Dangerous Diseases	60%	40%
11.	PSI India	100%	0%
12.	PSI Kenya	20%	80%
13.	KEMSA, Kenya	70%	30%
14.	MEDS, Kenya	75%	25%
15.	Kenya AIDS Control Project	20%	80%
16.	DKT Ethiopia	45%	55%
17.	PFSA, Ethiopia	55%	45%
18.	Caroga Pharma, Ethiopia	80%	20%
19.	YOHA International Pharmaceuticals	85%	15%
20.	Dominion Pharmaceuticals	95%	5%
21.	Veteran Pharmaceuticals	80%	20%

4. **Supplier source:** India is the largest supplier of pharmaceuticals to the various procurement organisations (more than 70% of the organisations source 50-100% of their total pharmaceutical need from Indian suppliers). Refer to table 25.
    - Procurement organisations buy very little pharmaceuticals from China (majority source less than 25% of their pharmaceutical procurement from China)
    - There are some national procurement organisations, which buy most of the products locally and rely less on Indian and Chinese suppliers; for example, KEMRI / CDC, Kenya AIDS Control Project

Table 25: Procurement Source: From India and China

S.No.	Name of Organization	Procurement from India (% of total)	Procurement from China (% of total)
1.	PFSCM	60%	15%
2.	IFRC	60%	30%
3.	Marie Stopes	35%	15%
4.	UNFPA	-	15%
5.	IDA Foundation	60%	35%
6.	PSI Global	60%	15%
7.	CHMP Kenya	15%	0%
8.	Missionpharma	60%	25%
9.	KEMRI/CDC	10%	10%
10.	Ukrainian Center for Control of Socially Dangerous Diseases	35%	15%
11.	PSI India	100%	0%
12.	PSI Kenya	65%	5%
13.	MEDS, Kenya	65%	25%
14.	Kenya AIDS Control Project	20%	15%
15.	DKT Ethiopia	60%	0%
16.	PFSA, Ethiopia	65%	-
17.	Caroga Pharma, Ethiopia	65%	0%
18.	YOHA International Pharmaceuticals	100%	0%
19.	Dominion Pharmaceuticals	80%	15%
20.	Veteran Pharmaceuticals	90%	5%

5. **Distribution network:** The procurement organisations selected for the study were a mix of national (distributing their products in a single country) and multi-national organisations (distributing their products in multiple countries). Refer to figure 33:

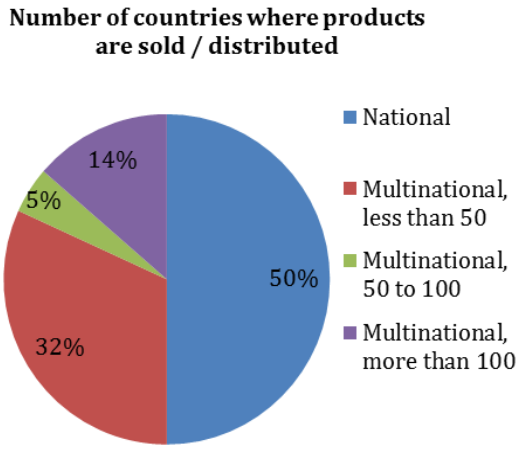


Figure 33: Distribution Network of the Procurement Organisations

6. **Funding source:** Funding source for the organisations is a mix of private sector, Government (public sector) or donor funds. Around 60% of healthcare financing in Africa is from the private sector. Approximately 30% is contributed by the public sector (varies significantly by country) and approximately 10% of Africa's healthcare expenditure is financed directly by donor aid[221].

2. Quality Assurance Activities Conducted by the Procurement Organisations

This section analyses the Quality Assurance activities of some of the procurement organisations interacted with, based on various parameters ranging from physical inspection of manufacturing facilities, pre-shipment testing to post-marketing surveillance.

Most procurement organisations rely on support from NDRAs for Quality Assurance activities, especially the ones which do not have an internal Quality Assurance system. Unfortunately, NDRAs in Africa have limited capacity to control the quality of imports. As an example, Indian manufacturers produce more than 60 biological therapeutics[222] or biosimilars, (for example, Interferon, Erythropoietin, Insulin, Rituxmab), which are a relatively new category of health commodities. A biosimilar is a biological product produced by genetic engineering techniques and claimed to be 'similar' in terms of safety, efficacy and quality to a reference biologic. Sales and registration of biological products in African countries is starting to grow, however, there is weak or no capacity for African NDRAs to assess and register these types of bio-similar products.

As per a WHO report: 'Assessment of medicines regulatory systems in Sub-Saharan African countries,' a series of assessments conducted from 2003 to 2009 showed that in general, the 26 Sub-Saharan African countries surveyed did not have sufficient capacity to effectively regulate quality of imports. An excerpt from the report:

> *"On the whole, countries did not have the capacity to control the quality, safety and efficacy of the medicines circulating on their markets or passing through their territories".*
>
> ------- Assessment of medicines regulatory systems in sub-Saharan African countries, WHO

Different procurement organisations conduct different levels of Quality Assurance activities. Two extreme responses are presented below: one for the private sector buyers, who conduct very few Quality Assurance activities and the other for international procurement agents and

[221]Estimates from WHO World Health Report 2005, 2006 and NHA reports for Ethiopia, Kenya, Malawi, Nigeria, Rwanda, Tanzania, Uganda, Zambia, and Zimbabwe; extracted from IFC.The Business of Health in Africa - Partnering with the Private Sector to Improve People's Lives [Internet]. Available from: http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2008/06/10/000333037_20080610012512/Rendered/PDF/441430WP0ENGLI1an10110200801PUBLIC1.pdf.

[222] CDSCO data. 2013

NGOs, which conduct a lot more Quality Assurance activities. For the other procurement organisations such as public sector buyers, national procurement agents and NGOs, the results are mixed.

Source of funding has a direct relationship to the level of quality assurance conducted. Normally, organisations funded by donor funds tend to have a greater level of Quality Assurance activities compared to organisations funded by the Government (public sector) or by the private sector. A number of international procurement agents and NGOs are funded by donor funds; hence, these organisations depict stringent Quality Assurance behaviour also.

1. **Private sector buyers -** Key observations are as follows (refer to figure 34):
   - Four private sector buyers reported their quality assurance activities
   - Despite sourcing most of the pharmaceuticals from India and China, the buyers follow no particular Quality Assurance processes
   - Only one buyer out of the four conducts pre-shipment testing, however, they do not utilise a WHO pre-qualified / ISO certified laboratory
   - As evident from the graphic below, private sector importers have less stringent Quality Assurance procedures

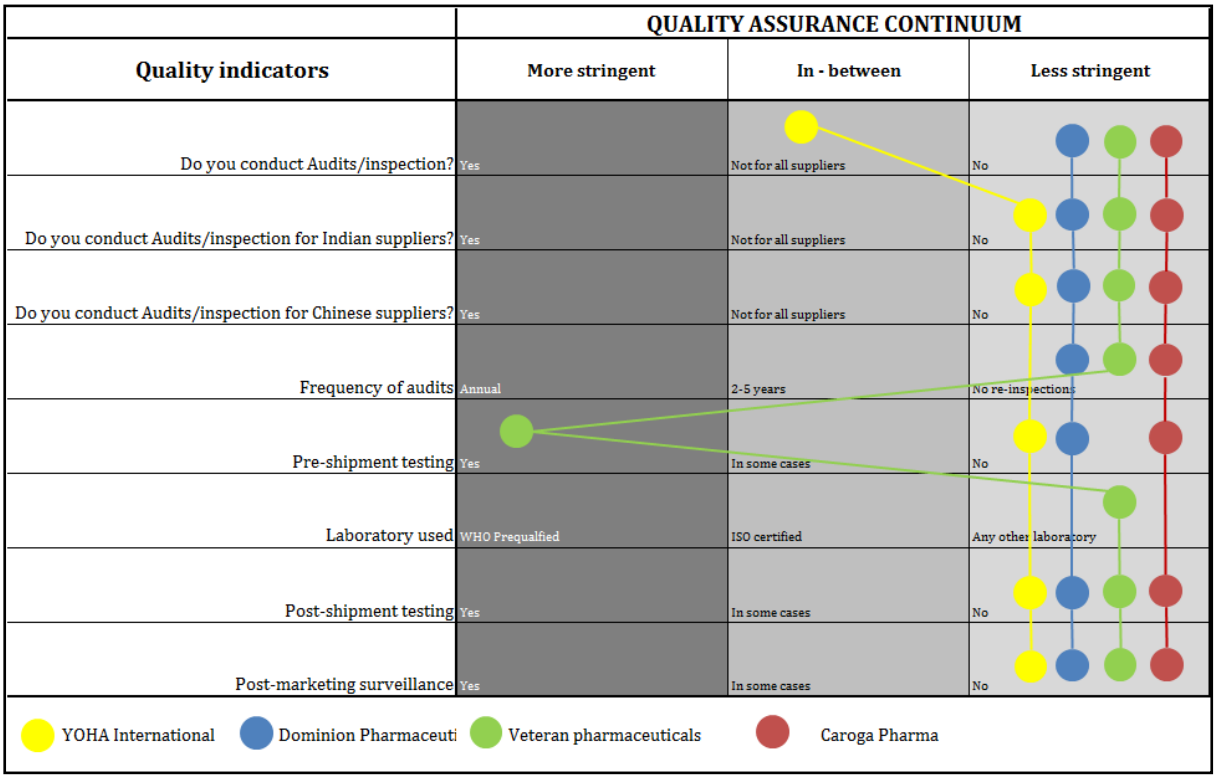


Figure 34: Mapping of Quality Assurance for Private Sector Imports

2. **International procurement agents and NGOs**—Key observations are (refer to figure 35):
    - All the organisations conduct a physical inspection of the manufacturing facilities and re-inspect the site within 2–5 years of the initial inspection
    - Pre-shipment testing is adopted by all the organisations, preferably utilising a WHO pre-qualified laboratory

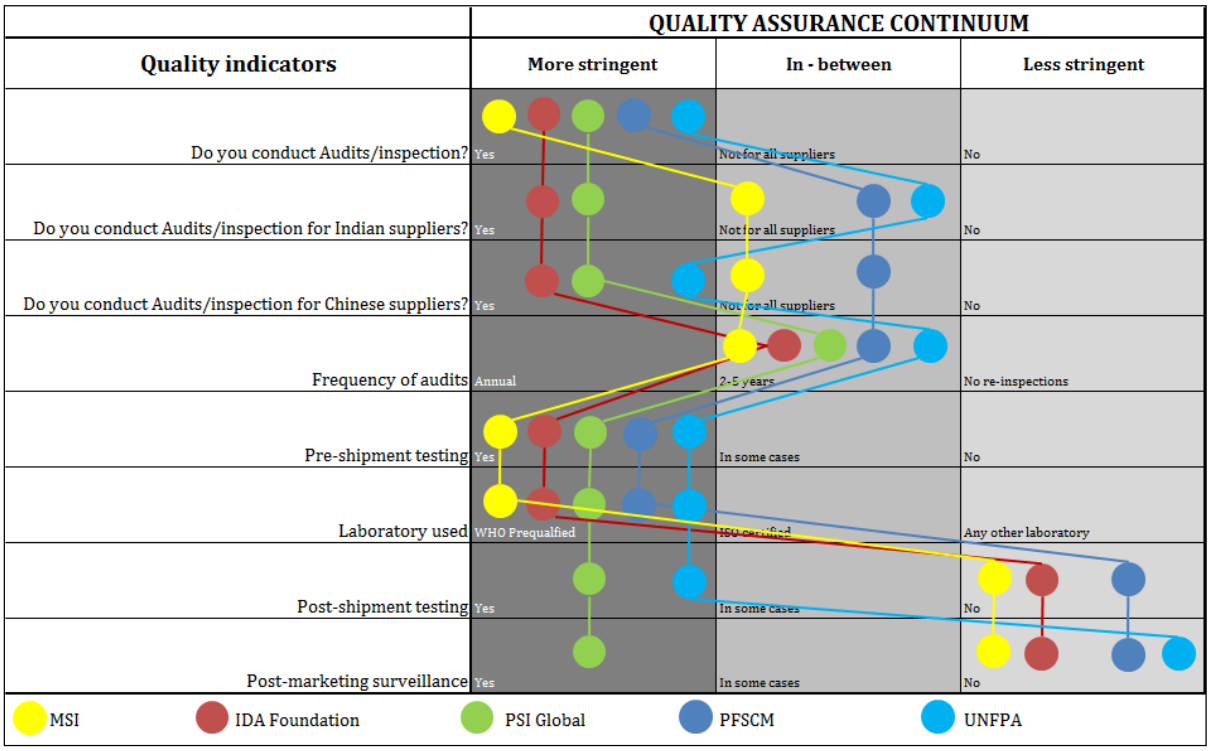


Figure 35: Mapping of Quality Assurance for International Procurement Agents / NGOs

3. Case study of selected procurement organizations with stringent QA policies

3.1. International Dispensary Association (IDA) Foundation

As mentioned earlier, IDA procures majority of its pharmaceuticals from India. IDA conducts more than US$ 200 million of procurement on an annual basis, with approximately 70% of the products being sourced from India. IDA has a permanent sourcing office in Mumbai from where it conducts its procurement activities. The following observations are based on interviews with the IDA Foundation team regarding their procurement activities in India.

IDA's Quality Assurance policy is very stringent. Key characteristics are:

- IDA assesses the manufacturing operations of the company before selecting them as their supplier

- IDA recognises WHO pre-qualification and registration of products in SRA countries. Hence, IDA does not assess dossiers for the products which are either WHO pre-qualified or registered in an SRA country, but verifies if those products comply with WHO/SRA standards
- The quality testing services are outsourced to a WHO pre-qualified laboratory (Vimta Laboratories)
- For marketing, IDA develops its own labels and leaflets. IDA also registers its own products, which it distributes under its own label
- IDA does not select any contract or loan license manufacturer
- GDP certification of a production facility is provided by MoH, Netherlands

Following are the Quality Assurance steps in the supplier selection process:

i. Manufacturing site approval

IDA has developed their own internal standards to approve a manufacturing facility, which they practice internationally with all their suppliers. The facility approval involves the following steps:

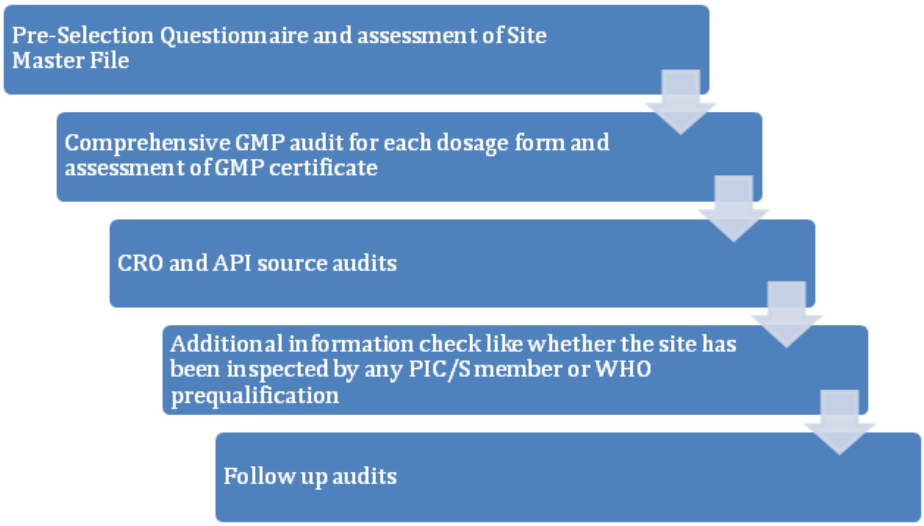


Figure 36: Steps for Manufacturing Site Approval

ii. Product approval

The next step is to assess the products and approve them for procurement. The steps involved in product approval are as follows:

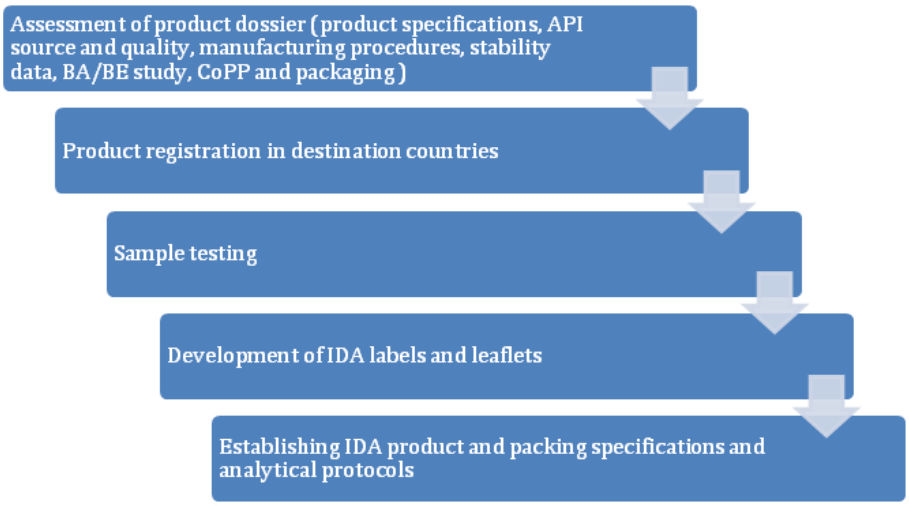


Figure 37: Product Approval Process

iii. Batch control and monitoring / post-shipment monitoring

After procuring the commodities from the supplier and before supplying it to the destination country / organisation, IDA conducts another set of testing. The details are shown in the following figure:

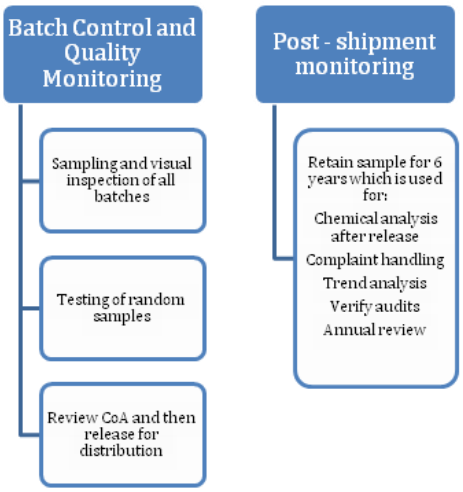


Figure 38: Steps in Batch Control and Post-shipment Monitoring

3.2. Partnership for Supply Chain Management (PFSCM)[223]

The analysis below is presented based on secondary research.

The Quality Assurance activities of PFSCM are strict and are similar to IDA. PFSCM conducts procurement through open tenders. PFSCM does not conduct physical inspection or Quality Control testing for those sites, which comply with PFSCM's primary Quality Assurance norms. The manufacturers have to furnish various documents in order to prove the compliance with PFSCM's quality norms which are:

- Manufacturing should be at a manufacturing site approved by:
  - US Food and Drug Administration (FDA) or other SRA's[224] or national drug regulatory authorities of countries whose standards and operations are comparable to the FDA in its robustness
  - Other acceptable manufacturing site approvals include WHO (WHO Public Inspection Report published on WHO website)

- Finished pharmaceutical products that are pre-qualified by the WHO Pre-qualification Program, products manufactured at a site that is WHO-Geneva GMP certified, products approved by a stringent regulatory authority and finished pharmaceutical products recommended for use by the Global Funds Expert Review Panel (ERP)

- FPPs manufactured at a site inspected and approved by SCMS / USAID

- Products manufactured at a site approved by PFSCM under special conditions where USAID issues a waiver after successful completion of physical inspection of site and laboratory testing of samples from the batch

The documents required by PFSCM from any manufacturer to prove the first three points above are:

- Proof of registration in a SRA country or a valid SRA GMP certificate
- An SRA inspection report or proof of WHO pre-qualification of the product
- A WHO Public Inspection Report (WHOPIR)
- Written proof that the product is recommended by the ERP

Other requirements by PFSCM:

- Products are expected to comply, if tested, to monograph requirements of USP, IP or BP as specified in country registration dossiers

[223] RFP, PFSCM. PFSCM's quality assurance norms [Internet]. Available from: http://pfscm.org/portal/pls/portal/!PORTAL.wwpob_page.show?_docname=2851481.PDF. Accessed on January 2014

[224] As per PFSCM, SRA constitutes Australia, European Medicines Agency (EMA), Canada, Japan, Switzerland, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom.

- Stability tests should be conducted under specified conditions. Expiry date mentioned on the label should be guaranteed by the manufacturer
- The primary packs should have both manufacturing and expiry dates

3.3. Médecins Sans Frontières (MSF)

The analysis below is presented based on interviews with the MSF[225],[226] India team.

MSF leverages the pre-qualification conducted by various international organisations during supplier selection. MSF does not conduct the physical inspection of those manufacturing facilities, which are:

- WHO pre-qualified
- Approved by SRA countries (if product is registered in SRA countries)
- Approved by Global Fund ERP or EMA article 58
- Other international agencies like UNICEF

In case the manufacturing facility is not approved by any of the above organisations / mechanism, MSF experts first review the dossier and then conduct physical inspection of the manufacturing facility.

3.4. Missionpharma

Missionpharma[227] conducts nearly US$ 100 million of procurement on an annual basis, with approximately 60% from India. The analysis below is presented based on interviews with the Missionpharma team in India.

Missionpharma's quality assurance activities are embedded within the procurement and supply cycle. See representation in figure 39:

Figure 39: Missionpharma's Quality Control and Quality Assurance Processes

[225] Data gathered from interview with MSF. 2013
[226] Although MSF belongs to civil society group in the framework, but is described here because they also conduct procurement.
[227] Data gathered from interview and secondary research. Mission Pharma. Quality Management [Internet]. Available from: http://www.missionpharma.com/media(634,1033)/Quality_Management_-_English.pdf.

Missionpharma pre-qualification and Quality Assurance system:

- Desktop evaluation: Missionpharma experts review the dossiers submitted by the manufacturers
- Site and product approval: Missionpharma auditors audit the manufacturing facility and collect samples of products. The audit is based on cGMP practices and includes:
  - Production methods and processes
  - Test methods and specification
  - API quality
  - Control facilities and laboratories
  - Raw data analysis
  - Stability studies
  - Release parameters and process
  - Labelling and packing processes
- Procurement of products follows after the manufacturing facility is qualified
- Before release of the products, Missionpharma experts conduct a visual examination of the batch, draw samples from the batches for re-test and review the CoA
- They store the retained samples for future testing and release that batch
- The batches which are not released are blocked
- Missionpharma regularly visit the manufacturing facility to check whether the processes conform with pre-defined criteria
- The distribution processes of Missionpharma are also verified by an external agency

Appendix

1. Letter from FMHACA to All the Market Authorisation Holders

Date: June 8, 2012

FOOD, MEDICINE AND HEALTHCARE ADMINISTRATION AND CONTROL AUTHORITY OF ETHIOPIA TO ALL PHARMACEUTICALS MARKET AUTHORIZATION APPLICANTS

The authority has been working hard to facilitate market authorisation process and now, we are implementing a new expedited strategy with regard to GMP inspection and Dossier evaluation as part of marketing authorisation to provide a better service to the public as well as to applicants.

Therefore, the authority kindly requests applicants who have already applied for market authorization to submit the following information's regarding **GMP approved manufacturing lines** and **registered product(s)** by *stringent regulatory authorities* within **three weeks** period.

Requirements:-

- Copy of valid cGMP certificate given by SRA
- An applicant claiming of having registration certificate issued by SRA's should submit complete dossiers as per the national guideline for registration of pharmaceutical product
- In case of WHO pre-qualification program accepted products, final acceptance letter and copy of WHO public assessment report
- Copy of the Marketing Authorization issued by the relevant SRA
- If the composition / formulation, strength, specifications, etc. are different from the product for which the WHO-type Product Certificate(s) was issued, then arguments and/or data to support the applicability of the certificate(s) — demonstration of pharmaceutical equivalence and bioequivalence should be submitted
- If the primary packaging material of the product is different from the one approved by the drug regulatory authorities of the ICH regions and associated countries or WHO PQP, then stability testing data should be reviewed in its entirety
- Written commitment letter to notify the Authority whenever there is pending variation, notice of concern, withdrawal and recall is initiated the same shall be communicated to the Authority
- Written commitment letter that indicates in the event the product is withdrawn from the market the same shall be notified to the Authority

- Evidence of minimum five (5) years of current and continuous manufacturing experience and a copy of the last Annual Product Report as described in Appendix 1 of pharmaceuticals registration guideline
- SRA approved manufacturers in SRA region are expected to submit COA of commercial batches from accredited laboratories and SRA approved manufacturers in non-SRA region should submit samples of actual products for the purpose of laboratory analysis

N.B. For detailed information please refer to the strategic document and each applicant is expected confirm that the information submitted by the manufacturer is factual and should take responsibility on the behalf of the manufacturer.

2. FDA Ghana Post-Marketing Surveillance Findings

DR. STEPHEN K. OPUNI

FDA/COMM/PR/02/13/1 7th February 2013

The News Editor

Dear Sir,

FDA WARNS OF SUBSTANDARD MEDICINES ON THE MARKET

The Food and Drugs Authority (FDA) wishes to alert the general public particularly importers, wholesalers, retailers, hospitals, clinics, maternity homes and other health facilities against patronizing medicines manufactured by and imported from ***YIKANG PHARMACEUTICAL COMPANY LIMITED*** and ***NANTONG JINGHUA PHARM.CO LIMITED,*** both of China since some of their medicines have been found to be substandard.

The importer of the substandard medicines, a Ghanaian company by name **Lymens Medical Suppllie.** located at Kokomlemle, Accra managed to bring the substandard medicines into the country without registering them with the Food and Drugs Authority, as required by law.

The FDA, in collaboration with the United States Pharmacopoeia (USP), sampled uterotonics from various hospitals, clinics, pharmacies maternity homes and other health facilities throughout the country for testing to assess their efficacy.

Uterotonics (oxytocin and ergometrine injections) are medicines used to induce labour or control bleeding from the uterus after child delivery.

In addition, benzyl penicillin injection (an antibiotic) which was manufactured and imported from Yikang Pharmaceutical Company was also found to be substandard, implying that anyone given this antibiotic for treatment of infection will develop complications.

Fake and substandard oxytocin when given to women after child delivery will fail to control bleeding from the uterus and can result in death. This will eventually lead to increased maternal mortality rate and therefore make it difficult for us as a nation to achieve the United Nations Millennium Development Goal (No. 5) which is about reducing maternal mortality and improving maternal health.

Meanwhile, the Food and Drugs Authority will not allow any medicine manufactured by these two companies to be imported to Ghana until Good Manufacturing Practice (GMP) inspections are conducted on the companies by the FDA and their facilities are found to be of good standard for the manufacturing of safe and quality medicines.

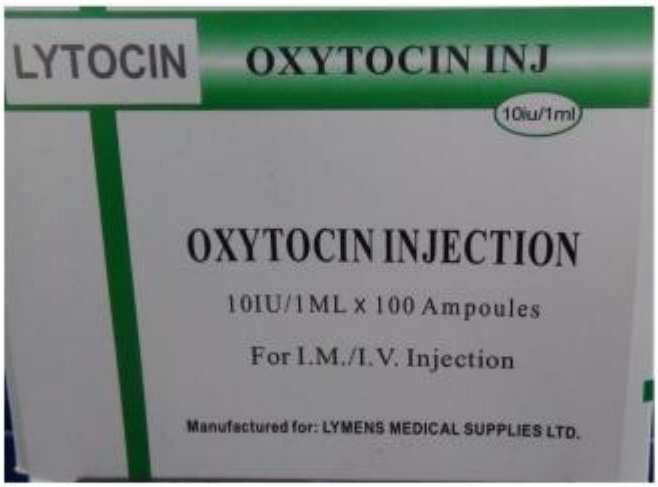
Lymens Medical Supplies, the importer of the substandard medicines is assisting the FDA in further investigations.

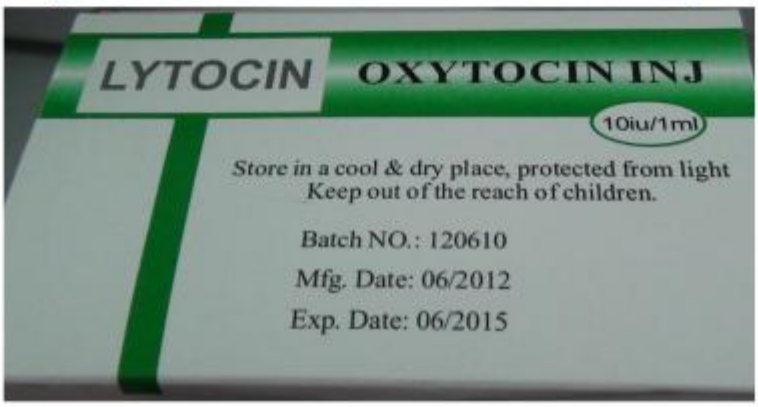
Facilities and individuals having stocks of Oxytocin, Benzyl penicillin and any other medicine manufactured by ***YIKANG PHARMACEUTICAL COMPANY LIMITED*** and ***NANTONG JINGHUA PHARM.CO LIMITED*** are hereby directed to handover their stocks to the nearest office of the FDA for safe disposal.

Additionally, information from the general public on persons in any practice of endangering public health and safety with respect to FDA's mandate is most welcomed through any of the following contact numbers; 0244337235, 0246809509 or 0544863418.

Dr. Stephen K. Opuni

Chief Executive





DR. STEPHEN K. OPUNI

FDA/COMM/PR/11/09/13 2nd October 2013

The News Editor

Dear Sir,

BLACKLISTING OF BLISS GVS PHARMA LTD, INDIA FROM MANUFACTURING MEDICINAL PRODUCTS FOR THE GHANAIAN MARKET

The Food and Drugs Authority (FDA) as mandated by the Public Health Act, 2012 Act 851 has with immediate effect banned the importation and distribution of all medicinal products manufactured by Bliss GVS Pharma Limited, Dombivli (E) 421 201 Dist-Thane, India into Ghana.

This is as a result of the manufacture and distribution of medicinal products into the country without adherence to the registration requirements as enshrined in the Public Health Act of 2012, Act 851, a process which assures the quality, safety and efficacy of all medicinal products used in Ghana.

The company manufactured a fake antimalarial medicine (**GSUNATE PLUS SUPPOSITORIES)** which was imported onto the Ghanaian market. The efficacy and safety of this antimalarial medicine has not been ascertained since there has not been any clinical trial study to justify the use of this medicinal product for the treatment of Malaria.

The manufacturer has not registered this drug in the country of origin (India) even though malaria is prevalent in India. The manufacturer is therefore without the requisite regulatory authorization using Ghanaian children as clinical trial subjects.

The Director of Bliss GVS Pharma Ltd India, the company that manufactured Gsunate Plus Suppositories, has confessed to the FDA that this antimalarial medicine is not used for treatment of malaria in children in India. The Director of Bliss GVS Pharma Ltd, India also admitted that the Gsunate Plus Suppository is a **FAKE** antimalarial medicine.

Malaria is the number one cause of Out Patients Department (OPD) attendance and the highest cause of child mortality (death) in Ghana. The use of fake antimalarial medicine can result in treatment failures, complications and preventable deaths in children. This poses a threat to the attainment of the Millennium Development Goals Nos. 4 and 6, which seek to reduce child mortality and combat HIV, Malaria and other diseases respectively.

The company has also manufactured and distributed onto the Ghanaian market many other medicinal products which have not been evaluated and duly registered as required by law.

The quality, safety and efficacy of these medicines manufactured by GVS Bliss Pharma Ltd can therefore not be guaranteed as they could pose a threat to public health and safety.

Due to the above reasons and in order to ensure utmost protection of Public Health and Safety of Ghanaians, the Food and Drugs Authority has therefore **blacklisted BLISS GVS PHARMA LTD, INDIA from manufacturing of medicines and other medicinal products for the Ghanaian market.**

Section 4: Recommendations for Promoting Exports of Quality Pharmaceuticals between India and Africa

Picture courtesy: https://encrypted-tbn2.gstatic.com/images?q=tbn:ANd9GcTOgL5ZU7_Fwo1hOUvjtWzdQSVea5OXYczlnvwI1ieuZ8fS6MSLkw

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Framework for Recommendations

Based on the analysis of the research and discussions with various key opinion leaders, IPE Global and the DfID team from health, trade, global and private sector, the following recommendations have been formulated. These recommendations have been segmented into five categories based on various stakeholder groups:

1. Support to Indian government drug regulatory authority at the central and state levels (government to government recommendations)
2. Support to African drug regulatory authorities and African buyers of Indian pharmaceuticals (Africa-focused recommendations)
3. Support to Indian pharmaceutical suppliers and industry associations (supplier-focused recommendations)
4. Promote African Pharmaceutical Quality Control Laboratories and Testing (quality-focused recommendations)
5. Support Indian suppliers and international buyers to find and use better quality supply chain (supply chain-focused recommendations)

Each recommendation is described in detail below.

Recommendation 1: Support to Indian Government Drug Regulatory Authority at the Central and State Levels

Background

The Central Drugs Standard Control Organisation (CDSCO), under the Ministry of Health and Family Welfare (MoHFW), is India's National Drug Regulatory Authority and is headed by the Drugs Controller General of India (DCGI). Additionally, every state in India has its own state DRA. The Drugs &Cosmetics Act of 1940 (D&C Act) grants state DRAs the power to control the manufacture and sale of pharmaceuticals within their states. As a result, both central and state DRAs share the responsibility of ensuring pharmaceutical quality and safety in India.

Over the years there has been significant progress towards regulation of pharmaceutical quality in India with respect to the local production and exports (this has been discussed in Part 2 of the report in detail). However, introduction of new policies related to drug control is extremely difficult due to the tension between promoting trade and promoting safety and quality. This is evident with the rejection of the proposed amendment to the D&C Act (once in 2008 and again in 2013), which attempted to strengthen the powers of CDSCO and bring a greater degree of regulation of exports[228].

This is unfortunate, especially because several previous studies and reports[229] have highlighted major gaps in the capacity of CDSCO and the state DRAs. For example, the 59th Report on the functioning of CDSCO by Department related Parliamentary Standing Committee on Health and Family Welfare, 2012, estimates that the states require at least 3,200 drug inspectors for regulating the production and sales of pharmaceuticals in the country; however, only 1,349 posts have been sanctioned and only 846 posts are filled (as of 2012). The CDSCO too is understaffed—only 119 positions are filled even though 327 have been sanctioned (as per the report: Initiatives, Achievements and Targets CDSCO, 2001-2020).

Besides human resources, the report highlighted weaknesses in the enforcement of existing regulations and had recommended strengthening of the national and the state DRAs.

Most of these reports, however, reference information from the Mashelkar Committee Report (2003) since that was the last detailed assessment conducted for the state DRAs and since then no new study has been conducted to gauge the current capacity (or has not been made publicly available).

In order to bridge this gap, the MoHFW has budgeted GBP 700 million for the strengthening of CDSCO and state DRAs in the 12thfive year plan (2012–17)[230]; however, the status of utilisation of these funds is not known. It is believed that only a small portion of these funds has been spent.

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[228]MoFW, India. Parliamentary standing committee report on The Drugs and Cosmetics (Amendment) Bill, 2013 [Internet]. Available from: http://www.prsindia.org/uploads/media/Drugs%20and%20Cosmetics/SCR-Drugs%20and%20cosmetics.pdf.

[229]Mashelkar Committee Report (2003); Initiatives, Achievements and Targets CDSCO (2001–2020); 59th Report on functioning of CDSCO by Department related Parliamentary Standing Committee on Health and Family Welfare (2012); Report of Working Group on Drugs & Food Regulations for formulation of 12th five year plan by Ministry of Health and Family Welfare.

[230]MoFW, India. Report of Working Group on Drugs & Food Regulations for formulation of 12thfive year plan [Internet]. Available from: http://planningcommission.gov.in/aboutus/committee/wrkgrp12/health/WG_4drugs.pdf.

In summary, even though India's capability in pharmaceutical production has grown exponentially, both in terms of volume and technical capability, its regulatory capacity has not kept pace; nor has India kept pace with its BRICS partners when it comes to regulations and enforcement.

Key Recommendations

Key recommendations for supporting CDSCO and state DRAs in India:

- Conduct a detailed mapping and analysis of central and state DRA capacity (human resource, infrastructure and funding)
    - Conduct a detailed analysis of the current capacity relative to the need and the change in capacity over time (past 10 years)
    - Map India's drug regulatory enforcement relative to other countries ('BRICS and PIC/S')[231]
- Analyse and remove bottlenecks for existing funds that have been allocated by the Government of India for strengthening of CDSCO and state DRAs
- Strengthen regulatory capacity of state DRAs and CDSCO

Implementability

The implementability of the recommendation is 'medium.'

Potential Challenges and Risks

- The central and state DRAs may not wish to share information about their capacity (or lack of)
- The small-scale manufacturers are among the weakest group in the pharmaceutical sector and make up more than 90% of the market in terms of number of companies. These manufacturers have a 'strong voice' and are not likely to be interested to promote strengthening of state DRA enforcement (as was evident in their vocal rejection of the proposed amendment to the Drugs & Cosmetics Act in December 2013).
- However, the larger (and better quality) manufacturers may be interested in strengthening Indian regulatory standards since many of them already meet or exceed the Indian standards. This intervention should therefore leverage the Indian Pharmaceutical Alliance (IPA) that represents the top 19 Indian manufacturers, which account for almost 40% of the Indian export market[232].

[231] The Pharmaceutical Inspection Convention and Pharmaceutical Inspection Co-operation Scheme (jointly referred to as PIC/S) are two international instruments between countries and pharmaceutical inspection authorities, which provide together an active and constructive co-operation in the field of GMP. PIC/S became operational in 1995. The purpose behind creation of PIC/S was to strengthen the inspection activities related to manufacturing of medicinal products among the participating authorities, promoting quality assurance of the inspections. It also envisaged a framework of sharing of information and experience, to conduct mutual training of inspectors and harmonise the standards and procedures for inspections and Quality Control testing. Currently there are 44 PIC/S members.

[232] As per interview with IPA.

Suggested approach for Implementation

- India is one of the key BRICS countries and helping India to be one of the leaders in drug quality in BRICS could be another approach to engage with CDSCO and state DRAs
- The research could be conducted in collaboration with WHO India, which may have easier access to working with the Indian government

Potential Implementing Partners

Multilateral organisations: WHO India
Indian organisations: CDSCO and state DRAs, and Indian Pharmaceutical Alliance

Impact

Strengthening the regulatory capacity of Indian regulatory organisations will help to promote quality of pharmaceuticals produced and consumed globally. The timeline for impact will be in the medium-long term (>3–5 years).

Recommendation 2: Support to African Drug Regulatory Authorities and African Buyers of Indian Pharmaceuticals

Background

Sub-Saharan Africa imports nearly 70% of its pharmaceutical needs from other countries[233], approximately half of which is being imported from India. Private sector is the biggest importer in Africa, contributing to more than half the pharmaceutical imports, but conducts very limited due diligence on quality of imported products—as some of the importers stated 'that is the job of my national drug authority, not mine.'

Unfortunately, NDRAs in Africa have limited capacity to control quality of imports. As per WHO's report: 'Assessment of drug regulatory systems in Sub-Saharan African countries,' a series of assessments conducted from 2003 to 2009 showed that in general, the 26 Sub-Saharan African countries surveyed did not have sufficient capacity to effectively regulate quality of imports. An excerpt from the report mentions: 'On the whole, countries did not have the capacity to control the quality, safety and efficacy of the medicines circulating on their markets or passing through their territories.'

In addition, there are various complexities, information asymmetries (and even 'information opacities') in the Indian manufacturing sector that make it even more difficult for the NDRAs (and the buying organisations) to control the quality of the imported product. The main complexities are:

1. **Fragmented industry with consolidated sectors:** India's pharmaceutical industry is highly fragmented with more than 10,000 manufacturing units. Of these, only about 1,200[234] sites export pharmaceuticals (about 12%) and only 350 sites (3.5%) account for 85% of the exports[235] and 2/3rd of these exporting sites are concentrated in just three states (Gujarat, Maharashtra and Andhra Pradesh), with remainder of the sites being spread across 17 states. Knowing which companies and which states are the major supplier of pharmaceuticals can help to manage quality more strategically

2. **Different accreditations of manufacturers:** At minimum, all Indian manufacturers must have a 'Schedule M', which is a license to manufacture (based on WHO-GMP guidelines) and is issued by the state governments. All manufacturing sites that export from India must be approved jointly by CDSCO (central) and state DRAs and can be described as 'Schedule M+' (there are about 1,200 of these units). Some of these manufacturers have been further certified by the international procurement agents (for example, Crown Agents, SCMS, International Dispensary Association (IDA)[236], UN procurement agents and various large procurement agents that have certified 300–400 manufacturers); several more have been approved by WHO Pre-Qualification Programme[237] (approximately 30–50); and a few hundred manufacturer sites have been approved / inspected by SRAs (for example, USFDA

[233]Analysis of data extracted from UN COMTRADE (2011) and the Department of Commerce, India, (2012).
[234]Pharmexcil (India) data (2012).
[235] CMIE data indicated in Role and Contribution of National Pharmaceutical Industry by IPA (2011).
[236]As per interview with IDA, Mumbai.
[237]Analysis of WHO PQP list for ARVs, ACTs, anti-TB drugs and Reproductive Health medicines.

500–600)[238](this has been discussed in Part 2 of the report in detail). Most international NDRAs and buyers are not aware of these variations and therefore are missing valuable information for better management of quality assurance

3. **Outsourcing practices in manufacturing:** There are different kinds of pharmaceutical companies in India—some have their own production, some that outsource or 'loan-license' a small part of their production and some pharmaceutical 'marketing' companies that 'loan-license' most / all of their production. Approximately 1/3rd of all pharmaceutical manufacturing licenses in India are loan licenses and manufacture for other companies and exporters[239]. For a buyer, it is important to know the 'pedigree' of the various materials in order to ensure quality assurance along the entire supply chain. Unfortunately this is not easy to achieve given the layers upon layers of outsourcing.

4. **Use of neutral coding for bulk export:** Pharmaceuticals can be exported in fully finished packs in the name of manufacturer, exporter or the importer or they can be exported in bulk without any labelling using a 'neutral code'. Neutral code allows a manufacturer to avoid writing its name and country of origin on the package; instead, an alpha-numeric code is used, which identifies the supplier's details. This leads to significant 'information opacity', especially for the end consumer. The extent of the use of neutral coding in India while exporting pharmaceuticals is unknown. Most international NDRAs and buyers are not aware of these variations and therefore are missing valuable information for better management of quality assurance

5. **Capacity of Quality Control laboratories in India:** There are seven central government laboratories and 29 state government laboratories in India. Some of the central and state laboratories are International Organization for Standardization (ISO) / National Accreditation Board for Testing and Calibration Laboratories (NABL)[240] certified, while the others are not. CDSCO has approved around 135 independent, private laboratories in India for quality testing. These laboratories have different kinds of approvals / certifications (by CDSCO or NABL or WHO or USFDA etc). Given the large number of manufacturing units in India, these laboratories are insufficient in number and capacity[241]. Apart from these, there are a large number of manufacturer-owned, in-house drug testing laboratories. Knowing which laboratories are good and independent, can be a valuable tool in managing drug quality

6. **Issuance of Certificate of Analysis (CoA) from a manufacturer's laboratory:** A CoA indicates that the pharmaceutical product conforms to a specific standard of quality (United States Pharmacopeia [USP], BP etc). The CoA is a key document to verify the quality of pharmaceutical product and is mostly produced by manufacturer's own

[238]As per data from Pharmexcil, India (2012) and interview with USFDA, India.
[239]As per analysis of data from 'National List of Drug Manufactures / Loan Licensee and COPPs Holder in the Country 'by CDSCO (updated 11/08/2011).
[240] National Accreditation Board for Testing and Calibration Laboratories (NABL) is an autonomous body under the aegis of Department of Science & Technology, Government of India. Government of India has authorised NABL as the accreditation body for Testing and Calibration of Laboratories. NABL provides an accreditation based on ISO 17025.
[241]Mashelkar Committee Report (2003); Initiatives, Achievements and Targets CDSCO (2001–2020); 59th Report on functioning of CDSCO by Department related Parliamentary Standing Committee on Health and Family Welfare, (2012).

laboratory (only a few NDRAs, donors and international procurement agents / NGOs insist on using an independent quality-assured laboratory[242]; for example, Global Fund insists on using a WHO PQ lab or an ISO lab and the National Agency for Food and Drug Administration and Control has pre-qualified its own set of laboratories[243]). Most international buyers and NDRAs do not request for independently issued COA, but rely on the manufacturer

7. **Quality and source of Active Pharmaceutical Ingredients (APIs):** Active Pharmaceutical Ingredient (API) is the key ingredient for pharmacological action in the body. Following are the major issues with APIs:
   i. Dependence on imports from China: The leading pharmaceutical companies in India import 30–70% of their API needs. In value terms, 58% of the total imports are sourced from China, or 80% in terms of volume[244]. In recent years, there have been many quality-related problems with imported APIs, which has forced the Indian NDRA (CDSCO) to inspect the API manufacturers in China on a routine basis (that was earlier conducted on an annual basis)
   ii. Inspection of the API supplier: API source is usually not inspected by most African NDRAs. SRAs, WHO PQP and several international procurement agents usually audit the API manufacturer
   iii. Cost of APIs: The cost of APIs from quality-assured API manufacturers (i.e. with Drug Master File [DMFs]) is 10 times more than those without DMFs. Therefore, manufacturers often switch between API sources to lower costs or replace bottlenecks, without notifying NDRAs. In most African countries, switching API source does not involve submission of a 'major variation' document (it does in SRA countries, South Africa and several others).

   Most international buyers and NDRAs are not aware of the potential risk for not asking and verifying information around APIs

8. **Export of biologicals and bio-similar products:** Indian manufacturers produce more than 60 biological therapeutic products or bio-similars (for example, interferon, erythropoietin, insulin, rituxmab). CDSCO has recently published guidelines for registration of these products in India and now suppliers are exporting these products to Africa. Sales and registration of biological products in African countries is starting to increase; however, there is weak or no capacity in African NDRAs to assess and register these types of bio-similar products

Unfortunately most of the NDRAs and buying organisations are not aware of these complexities in the Indian pharmaceutical manufacturing sector and they don't have access to an easy reference or a guide of 'quality-certified' products with information about their regulatory status.

[242] CDSCO. Guidelines for port officers on import and export of drugs and cosmetics.
[243] As per interviews conducted with various Indian and African authorities.
[244] Toward End–to–End Leadership in Select APIs –Analysing India's dependence on imports for API production (BCG, 2013).

In summary, a large amount of pharmaceutical imports of variable quality are flooding the African continent, which has relatively weak NDRAs and therefore are not able to effectively control the quality of imports.

Key Recommendations

Following are the recommendations for African NDRAs and buyers in Africa:

- Guide NDRAs to better understand and therefore better regulate Indian pharmaceutical imports and guide African buyers to purchase more strategically from India by:
  - Being aware of the complex nature of the Indian pharmaceutical industry, including fragmentation and consolidation in the market; multiple types of quality accreditation of manufacturers; outsourcing practices in manufacturing; risks of neutral coding; awareness of various types of accredited Quality Control laboratories; importance of independent CoA reporting; importance of gathering API quality information; and better knowledge of how to register biological therapeutics / bio-similars

- Increase awareness about good quality laboratories available in India for use by NDRAs and global buyers:
  - Create a database of Quality Control laboratories in India that are NABL, WHO PQ and / or SRA approved. The same list can be expanded for Africa and other countries
  - Increase awareness of this list through various communications channels

- Support buyers to strategically source good quality pharmaceuticals from India (through the creation of an International Buyer's Guide)

Implementability

The Implementability of the recommendations is 'high.

Potential Challenges and Risks

There are no major challenges in implementing these recommendations.

Suggested approach for Implementation

The focus of these recommendations is a mix of: a) gathering market intelligence (database of Quality Control laboratories, database of quality suppliers and information about how Indian pharmaceutical industry operates); b) creating awareness; and c) building capacity.

Potential Implementing Partners

Gathering pharmaceutical industry market intelligence:

- Databases: Pharmexcil, Industry associations, NDRAs of SRA countries, WHO PQ databases, CDSCO, NABL and Empower School of Health[245]
- Market and industry intelligence: Empower School of Health and others

Creating awareness and capacity building:

- Demand side stakeholders: NDRAs of African countries, procurement agents, African industry and import associations and African Drug Regulatory Agency
- Supply side stakeholders: Pharmexcil
- Capacity building organisations**:** BP, USP, USFDA, MHRA (other SRA) and Empower School of Health

Impact

These recommendations will lead to greater awareness, improved capacity and better access to practical tools for promoting access (through imports) to better quality pharmaceuticals. The initial impact can be realised within 1–2 years (short term) and greater impact within 3–5 years (long term).

[245]Pharmexcil is a Government of India organisation focused at promoting pharmaceutical exports from India; Empower intends to create this database in collaboration with Pharmexcil

Recommendation 3: Support to Indian Pharmaceutical Suppliers and Industry Associations for Promoting Self-Regulation

Background

'Policing' (inspecting, auditing and testing) vis-à-vis self-regulation:

As indicated previously, there are more than 10,000 manufacturing sites in India, and given the limited capacity of the central and state regulatory authorities, it is just not feasible for a top-down 'policing' approach to ensure quality of drugs.

As an example, the USFDA has to inspect about 500 Indian manufacturing sites; despite its much smaller manufacturer list and much larger budget, relative to the Indian government, the USFDA finds it extremely difficult to ensure quality through this audit and 'policing' approach. As a result, the USFDA is exploring alternative strategies to promote quality and is focusing on catalysing self-regulation in the Indian pharmaceutical industry.

Self-regulation in manufacturing consists of steps taken by a manufacturing company to ensure compliance with international and national regulations (GMP, GLP and GCP etc). It can be an effective tool to receive faster approvals, reduce internal fraud and improving industry / media image.

There can be various approaches under self-regulation, such as internal auditing, which prepares a site for the regulatory inspections. Pharmaceutical manufacturing companies are now promoting internal auditing and self-regulation as an important tool for promoting ethical behaviour.

Key Recommendations:

- Increase awareness of global best practices in self-regulation
- Provide support to industry in implementing best practices

Implementability

The implementability of the recommendation is 'medium.'

Potential Challenges and Risks

Creating awareness is not expected to have any major challenges; however, implementation of self-regulation may be challenging since majority of the manufacturing companies in India are small and may not wish to invest in self-regulation. It may be a challenge to showcase improvement vis-à-vis the investment, especially when enforcement by the national and state authorities is variable.

Suggested approach for Implementation

- Collaborate with an organisation or association that will champion the cause; Indian organisations should consider teaming up with USFDA, which is planning a long-term strategy to promote self-regulation
- If possible, structure the intervention in response to a crisis in the industry (several of them are already front page news; for example, the irregularities at Ranbaxy)
- Involve industry associations and other international regulators

Potential Implementing Partners

- International NDRA: MHRA, USFDA, TGA, Health Canada and other NDRAs from SRA countries
- Indian organisations: Pharmexcil, CDSCO / State DRAs and Industry associations

Impact

The time to impact for self-regulation will be long-term (more than 3–5 years), as it will require a significant change in industry behaviour.

Recommendation 4: Strengthen African Pharmaceutical Quality Control Capacity

Background

As noted earlier, Sub-Saharan Africa imports nearly 70% of its pharmaceutical needs, most of which are imported from non-SRA countries (India, China, Middle East and other African countries). Given the weak NDRAs (and weak laboratory testing) across most parts of Africa, it is not surprising that there are a number of well-documented cases of poor quality, SSFFC (sub-standard, spurious, falsified, falsely-labelled and counterfeit) pharmaceuticals circulating in the African continent.

There are five WHO PQ pharmaceutical testing laboratories in Sub-Saharan Africa. Out of 48 SSA countries, only Kenya, Tanzania and South Africa have WHO PQ laboratories[246]. In addition, the Global Fund lists three ISO 17025 laboratories from Ethiopia, Zimbabwe and Cape Verde[247], which are considered to be of adequate quality. Besides, very few accreditation boards in Africa are members of the International Laboratory Accreditation Cooperation[248].

Several organisations in Africa, in the public and private sector, are interested in strengthening or establishing new pharmaceutical testing laboratories of high quality (WHO PQ or ISO 17025).

Key Recommendations

- Map list of high-quality drug testing laboratories in Africa
- Strengthen Quality Control lab capacity in Africa by catalysing investment and technology transfer for the upgradation and creation of new laboratories in Africa.

Implementability

The implementability of this recommendation is 'high.'

Potential Challenges and Risks

There are no real challenges in implementation.

Suggested approach for Implementation

- The first step should be to create a comprehensive database of drug testing laboratories in Africa and to assess their capacity

[246] WHO. List of WHO prequalified laboratories (as at 17 Feb 2014)[Internet]. Available from: http://apps.who.int/prequal/lists/pq_qclabslist.pdf.
[247]The Gobal Fund. List of ISO 17025 Quality Control laboratories compliant with 'the Global Fund' QA requirements (version-15, 17 September 2013).
[248]ILAC. List of International Laboratory Accreditation Cooperation members (Updated on 30 Aug 2010) [Internet]. Available from: https://www.ilac.org/Membersdetails.html.

- After determining the gaps, explore strategies for strengthening the laboratory capacity
- Countries would need to secure funding for establishing pharmaceutical testing laboratories
- Build laboratories in target countries and simultaneously strengthen human resources

Potential Implementing Partners

- UKAS, BP, USP and other organizations involved in quality control
- Africa organizations (local partners in each country/region, Quality certified laboratories in Africa)
- India (Quality certified laboratories in India)

Impact

Creating an infrastructure of good quality drug testing laboratories supported with training of human resources should lead to greater awareness (and eventually control) of pharmaceutical quality. The availability and use of these laboratories would promote pharmaceutical quality.

Recommendation 5: Support Indian Suppliers and International Buyers to Strengthen the Pharmaceutical Supply Chain

Background

A key gap in the pharmaceutical industry is the ability of the supply chain to maintain the quality of the drugs during the period of its shelf-life. A typical pharmaceutical product spends over 90% of its life (ranging from 2–5 years) in the supply chain, which includes international shipping, in-country transportation and storage. Quality of the infrastructure, such as warehousing and transportation, in India and Africa varies widely (from international GDP standards to inhospitable). High-heat and humidity environments can accelerate the deterioration of pharmaceuticals, and this is of special concern for products that are heat sensitive, fragile, have a narrow therapeutic index, or are poorly bio-available. So even though a product may be manufactured according to cGMP conditions and tested by an accredited GLP laboratory, it may not survive in the supply chain.

Furthermore, although the pharmaceutical distributors such as wholesalers and transporters in most developing nations are licensed, majority of them do not have any type of quality accreditation. Only a few international procurement agents and NGOs such as IDA and Missionpharma get accredited for WHO Good Storage Practices (GSP) and Good Distribution Practices (GDP). These issues are relevant in both the public and private sector.

To bridge this gap (poor supply chain and no quality accreditation), the manufacturers have to review the distributors / wholesalers on a regular basis to ensure the quality of the supply chain. Since there are no third-party service providers, manufacturers have to engage in this non-core activity by themselves. As a result, the same wholesaler may be audited several times by many different manufacturers in the same year—this process is redundant and inefficient.

Key Recommendations

- Guide suppliers and buyers to use better quality pharmaceutical distributors, wholesalers, C&F agents and transporters (as per WHO GDP and GSP guidelines):
  - Develop a system for accrediting distributors and wholesalers, which would be trusted by suppliers and buyers
  - Map the accredited distributors and make the list available to suppliers and buyers
  - Promote the use of accredited distributors
  - Collaborate with organisations such as USP, International Federation of Pharmaceutical Wholesalers (IFPW) and its member organisations (that include Alliance Boots Plc [UK], Cardinal and McKesson [USA]). During initial discussion, IFPW has shown a positive interest in supporting this activity]

Implementability

The Implementability of this recommendation is 'high.'

Potential Challenges and Risks

There are no significant challenges in implementing this recommendation. For example, Empower School of Health team has participated in conducting similar mapping of state warehouses across 30 states in Nigeria and across 15 different countries on behalf of Global Fund.

Suggested Approach for Implementation

- Collaborate with suppliers, buyers and IFPW to develop a methodology for accreditation based on GDP and GSP standards
- Conduct assessments and map the findings
- To narrow the focus, target larger distributors first, or conduct a complete mapping in a particular state or district

Potential Implementing Partners

- Pharmaceutical distribution and wholesale associations (British Association of European Pharmaceutical Distributors and International Federation of Pharmaceutical Wholesalers)
- United States Pharmacopeia
- Empower School of Health

Impact

Use of better / stronger supply chain will lead to greater assurance of quality-assured products reaching the patients and better health outcomes. The impact of this intervention can be realised in 2–3 years.

Summary of Recommendations

The following figure 40 and table 26 provides a summary of the recommendations:

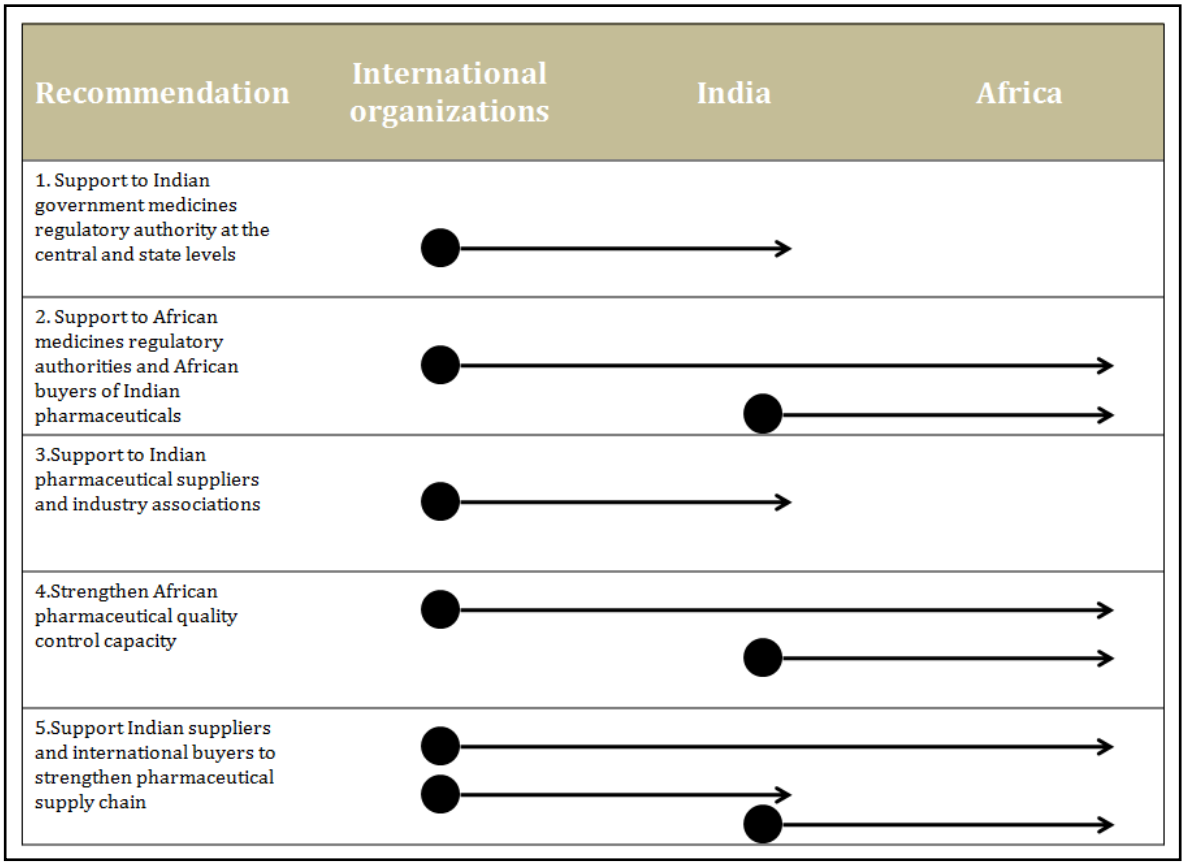

Figure 40: Flow of Technical Support for Each Recommendation

Table 26: Type of Recommendation

Type of Recommendation	Recommendation	Source of Technical Assistance
Support to Indian government drug regulatory authority at the central and state levels	Conduct a detailed mapping and analysis of the capacity of central and state Drug Regulatory Authorities (DRAs), including human resources, infrastructure and budget	From international organisations to Indian government (for example, MHRA, British Pharmacopoeia, [BP], USP, USFDA and WHO)
	Analyse and remove bottlenecks for existing funds allocated by the Government of India for strengthening of national and state DRAs in India	
	Strengthen regulatory capacity of national and state DRAs in India	
Support to African drug regulatory authorities and African buyers of Indian pharmaceuticals	Guide NDRAs to better regulate Indian pharmaceutical imports and African buyers to source more strategically (provide information on the complex nature of the Indian pharmaceutical industry, including multiple types of quality accreditations of manufacturers, use of layers of 'middle-men', managing 'coded' products with no manufacturer details on the packaging, regulating biological therapeutics / bio-similars etc)	From international and Indian organisations to African drug regulatory authorities and African buying organisations (for example, MHRA, BP,USFDA, USP, Pharmexcil, Empower etc)
	Increase awareness and use of certified Quality Control laboratories available in India for use by NDRAs and global buyers before goods are exported from India	
	Support buyers to strategically source good quality pharmaceuticals from India (through the creation of an International Buyer's Guide)	
Support to Indian pharmaceutical suppliers and industry associations for promoting self-regulations	Increase awareness of global best practices in self-regulation	From international organisations (MHRA,USFDA, TGA etc.) to Indian industry and their associations
Strengthen African pharmaceutical Quality Control capacity	Map need and capacity of Quality Control laboratories and testing in Africa	From international and Indian organisations to DRAs and private manufacturers (for example, UKAS, BP, USP, WHO PQ laboratories worldwide etc)
	Strengthen Quality Control laboratories' capacity in Africa	
Support Indian suppliers and international buyers to strengthen the pharmaceutical supply chain	Map and accredit storage and distribution organisations (wholesalers, distributors and transporters)	From international organisations to Indian and African organisations; and from Indian organisations to African organisations (for example, British Association of European Pharmaceutical Distributors and International Federation of Pharmaceutical Wholesalers)

Overall Appendix

Questionnaires used for Primary Research

The questionnaire used in this project has been leveraged from the project, "Strategic Sourcing of Indian Pharmaceuticals: A Blueprint for Creating a Global Buyer's Guide". Both these projects were carried out simultaneously due to their synergies and overlap of stakeholders. For this purpose, the two questionnaires were merged together.

For NDRAs and QC Laboratories in Africa

1. **General Information of Pharmaceutical Market for Finished Pharmaceutical Products**
   (Please provide the following data in US$)
   a. Total pharmaceutical market size of the country
   b. Total market size by funder (government and donor vs. private sector [out of pocket])
   c. Source of pharmaceuticals
      i. % of market from domestic production (all manufacturers) US$
      ii. % of market from imports (US$)
         1. Value of imports by country (+ include imports from India)
         2. Value of imports by government, NGO and private sector (estimates are fine, based on some source)
   d. Top 10 Importers of pharmaceuticals and their sales in US$ and their market share
      (For each company, include name, government owned or private sector owned)
         1. List of largest imported products
   e. Top 10 manufacturers of pharmaceuticals and their sales in US$ and their market share
      i. For each company, include name, government owned or private sector owned

2. **National Drug Regulatory Authority (NDRA) Overview**
   a. Describe the structure of the NDRA, departments, manpower and budget
   b. What is the NDRA's role in imports and quality control?
   c. Describe the NDRA's organisational capacity (strengths and weaknesses all in the context of controlling quality of imports) based on studies/ research conducted by the NDRA, WHO or other technical body
      i. Human resource (number of pharmacists / chemists / analysts)
   d. Product registration process
      ii. What is the registration process for
         1. New drugs vs. generic pharmaceuticals?
         2. Pharmaceuticals from SRA vs. other countries, especially India and China?
         3. Manufacturer sites and pharmaceuticals approved by SRA vs. those that are not?
      iii. For each scenario, how long does it take?
      iv. How often do you have to re-register the dossier?
      v. What is the cost of registration? Re-registration?
      vi. Specifically for Indian suppliers, are there any specific additional requirements?
      vii. Are all manufacturer sites inspected? Only non-SRA? India? China?
      viii. Do you follow the CTD guidelines?

3. **Import Regulations and Process**
   a. Which organisations are involved in regulating imports? Indicate name and short summary about the organisation and which Ministry?
   b. Please summarise the relevant legislation / laws / requirements that control imports

i. Are there any additional requirements for pharmaceutical imports from India? China? Other countries?
ii. Are there any lesser (easier) requirements for pharmaceutical imports from SRA countries?

c. What is the role of Customs and how are they involved in import of pharmaceuticals?
i. Duty payment? Inspection of imports? Testing?
ii. Are there any special requirements for India? China? Or less requirements for imports from SRA?

d. Which are the main ports for drug imports in the country?
i. Indicate name, location, sea / air, dry / wet, approx value of imports from each port etc

e. Import license
i. What is the process of getting an import licence for a pharmaceutical?
ii. Are there different requirements for India? China? SRA?
iii. What are the requirements of getting an import license? What documents are needed?
iv. How easy / difficult is it to get such a license? Specifically for importing from India? China? SRA?

f. Importing a registered drug
i. What is the import process for pharmaceuticals that are already registered?
ii. For each step, please indicate who is responsible for that step? Importer, exporter, NDRA or other authority?

4. **Quality Assurance (by NDRA)**

a. Product Quality Assurance activities conducted (circle all that apply):
i. Does your organisation (or contracted organisation) conduct physical inspection and audits of product manufacturer, production facility? (Y/N)
ii. Are inspections conducted by your own organisation? (Y/N)
iii. Are inspections conducted for all suppliers? (Y/N)
iv. Conducted for all Indian suppliers? (Y/N)
v. Conducted for all Chinese suppliers? (Y/N)
vi. Conducted for all ICH country suppliers? (Y/N)
vii. Frequency of inspections: annually; once every 2 years; other: _____

b. Product testing
i. Do you conduct pre-shipment testing? (Y/N). If yes, answer below questions:
1. Tests are conducted by (circle one or more):
a. Your own organisation
b. Supplier organisation
c. Third party Quality Control lab
2. The product testing lab / organisation is (circle more than one if appropriate):
a. WHO pre-qualified or approved by stringent regulatory authority
b. Approved by country in which it is operating (National license)
c. ISO certification 07125
d. Approved by your own organisation
e. Other
3. Which products are tested?
a. All products; some products: _____ _____ (Explain in few words)
b. All batches; some batches; _____ _____ (Explain in few words)
4. Do you conduct post-shipment testing (as soon as it arrives in your country / warehouse)? (Y/N). If yes, please answer:

a. Testing is conducted by (circle one or more):
    i. Your own organisation
    ii. Third party organisation

5. Do you conduct post-market surveillance (randomly collected from the market / supply chain and tested)? (Y/N)
6. Total number of products tested per year (by you, others, as long as it was instructed by your organisation) (Encircle any one option):
    a. <10
    b. 11–100
    c. 101–500
    d. 501–1000
    e. 1001–5000
    f. >5000
7. Which types of tests and inspection are conducted routinely?
8. What is the approximate failure rate of pharmaceuticals?
    a. <1%
    b. Up to 2%
    c. 3.1–5%
    d. 5.1–7.5%
    e. 7.6–10%
    f. 10.1–15%
    g. 15.1–20%
    h. > 20%
9. What is the source country with the most failure rates?
    a. US / EU / and other rich countries?
    b. Middle East countries
    c. India
    d. China
    e. Other
10. What are the top 2–3 reasons of poor quality? (bad packaging, labelling issue, product deterioration, counterfeit, assay (active ingredient problems) and others) (List them below):
    a. _____
    b. _____
    c. _____

For Procurement Organisations in Africa and Globally

Format of questionnaire for the online survey of potential buyers

Questionnaire on Pharmaceutical Purchases, Quality and Sourcing
(To be completed by procurement organisations and importers)

Dear Participant:

Empower School of Health is working on a UK DfID-funded project with a goal to improve quality, reduce cost and increase supply security of key global health commodities.

The objective of this questionnaire is to obtain a better understanding about:

a) The scope and scale of the procurements that are being undertaken on a regular basis (value, products and suppliers)
b) Challenges in finding quality suppliers for some products
c) What type of product quality-related activities are currently being conducted

This questionnaire should not take more than 10 minutes to complete and requests for 'general' and 'approximate' information. You are requested to **circle boxes** and **mentionY (Yes)** or **N (No)**. We do not need exact details for this research—indicative levels are adequate.
The questionnaire should be filled out by various types of procurement organisations including:

- NGOs undertaking significant levels of medical commodity procurements, both self and externally funded: Save the Children, CARE, Red Cross, MSF, PSI, MSI, DKT, JSI, MSH, FHI etc
- UN agencies: UNICEF, UNDP, UNFPA, WHO, IAPSO, UNIPAC etc
- Procurement organisations: IDA, Mission pharma, Action Medeor, MEDS, AMREF, SCMS, GIZ, GDF, CHAI etc
- Government procurement organisations: PFSA Ethiopia, KEMSA Kenya, Ghana MoH procurement unit etc

Date: _____

1) Organisation's details:

   a) Name of person(s) completing this form: Mr. / Ms. _____
   b) Contact details (email and phone no.):_____
   c) Organisation's name: _____
   d) Country of operation (if your procurement activities are for several countries, please indicate number of countries):_____
   e) Major product categories (check all that apply):
      i) Pharmaceuticals:
      ii) Diagnostics kits and reagents:
      iii) Medical and hospital supplies:
      iv) Medical devices (equipment):
      v) LLINS and other health-related commodities:

2) Number of products purchased:
   a) Total number of unique products purchased (circle any one of the following):
      i) <10

ii) 11–50
iii) 51–100
iv) 101–500
v) 501–1000
vi) >1000

3) Information about suppliers (for questions a–c, circle any one option):
   a) Estimated number of suppliers from India (pharmaceuticals and commodities):
      i) <10
      ii) 11–20
      iii) 21–50
      iv) 51–100
      v) >100

   b) Estimated number of suppliers from China (pharmaceuticals and commodities):
      i) <10
      ii) 11–20
      iii) 21–50
      iv) 51–100
      v) >100

   c) On average, how many suppliers do you have per product?
      i) 1
      ii) 2–3
      iii) 4–5
      iv) More than 5

   d) How do you search for new suppliers? (mark all that are relevant):
      i) Manufacturer's directory (what type? Name? _____)
      ii) Internet search (any special websites? _____)
      iii) International pharmaceutical Conferences (which ones are best? _____)
      iv) International tours and visits with industry associations:
      v) Visits by company sales reps?
      vi) Other ways?

   e) What criteria would you like to use to search for new suppliers? (check all the points that are of your interest. Put double check for points that are of high interest):
      i) How old the company is
      ii) Total number of employees
      iii) Total sales of company (annual)
      iv) Location of companies' offices around the world
      v) Product range and registration status in other countries
      vi) Names of some of the company's well known global clients
      vii) Proven 'quality standard' of some type? (for example what? _____)
      viii) Any wrong doing by company in other countries (company is delisted, company's products are recalled, etc)
      ix) Price given to me compared to price given to other buyers (in other countries, other tenders)

f) Is your organisation interested in identifying more quality suppliers for the products it purchases: **Y/ N**

i) For which product categories do you have the greatest need to find more suppliers (you can choose more than one option; mark H for high, M for Medium, L for Low):

(1) Pharmaceuticals:

(a) Reproductive health: _____(List any specific products)
(b) Maternal and child health: _____ (List any specific products)
(c) HIV (not ARVs but other pharmaceuticals for opportunistic infections): _____ (List any specific products)
(d) Malaria (beyond ACTs): _____ (List any specific products)
(e) Hepatitis B / C:_____
(f) Antibiotics:_____
(g) Antifungal: _____
(h) Anti-diabetics: _____
(i) Therapeutic and nutritional supplements:_____
(j) Anti-cancer: _____
(k) Cardiovascular pharmaceuticals (beta blockers, antilipidemicsetc): _____
(l) Other: _____

(2) Non Pharmaceuticals:

(a) Diagnostics: _____
(b) Medical and hospital supplies: _____
(c) Medical devices: _____
(d) LLINS and other health commodities: _____
(e) Other: _____

4) Procurement (circle any one option)

a) Total procurement value of health commodities—pharmaceuticals and all health commodities (last financial year):
   i) < 10 million
   ii) 11–50 million
   iii) 51–100 million
   iv) 101–500 million
   v) >500 million

b) Total procurement of **pharmaceuticals**, as percent of health commodities:_____ % of total (approximately)
c) Total procurement of **non-pharmaceuticals health commodities**: _____ % of total (approximately)
d) Total procurement of **pharmaceuticals** from **India**: _____% of total **pharmaceuticals procurement**
e) Total procurement of **non-pharmaceuticals health commodities** from **India**:_____ % of total **non-pharmaceuticals health commodity procurement**
f) Total procurement of **pharmaceuticals** from **China**: _____ % of total **pharmaceuticals procurement**
g) Total procurement of **non-pharmaceuticals health commodities** from **China**: _____ % of total **non-pharmaceuticals health commodity procurement**

h) Number of countries for which you are buying health commodities (circle any one option):
   i) only 1
   ii) 1–5
   iii) 6–10
   iv) 11–50
   v) 51–100
   vi) >100

5) Product Quality Assurance activities conducted (circle all that apply):

a) Does your organisation (or contracted organisation) conduct physical inspection and audits of product manufacturer, production facility? (Y/N)
   i) Are inspections conducted by your own organisation? (Y/N)
   ii) Are inspections conducted for all suppliers? (Y/N)
      (1) Conducted for all Indian suppliers? (Y/N)
      (2) Conducted for all Chinese suppliers? (Y/N)
      (3) Conducted for all ICH country suppliers? (Y/N)
   iii) Frequency of inspections: annually; once every 2 years; other: _____

b) Product testing:
   i) Do you conduct pre-shipment testing? (Y/N)
      (1) Tests are conducted by (circle one or more):
         (a) Your own organisation
         (b) Supplier organisation
         (c) Third party organisation
      (2) The product testing lab / organisation is (circle more than one if appropriate):
         (a) WHO pre-qualified or approved by SRA
         (b) Approved by country in which it is operating (National License)
         (c) ISO certification 07125
         (d) Approved by your own organisation
         (e) Other

      (3) Which products are tested?
         (a) All products; some products: _____ _____ (Explain in few words)
         (b) All batches; some batches; _____ _____ (Explain in few words)

   ii) Do you conduct post-shipment testing (as soon as it arrives in your country/warehouse)? (Y/N)
      (1) Conducted by (Encircle one or more):
         (a) Your own organisation
         (b) Third party organisation
   iii) Do you conduct post-market surveillance (randomly collected from the market / supply chain and tested)? (Y/N)
   iv) Total number of products tested per year (by you, others, as long as it was instructed by your organisation) (Encircle any one option):
      (1) <10
      (2) 11–100
      (3) 101–500

(4) 501–1000
(5) 1001–5000
(6) >5000

v) Which types of tests and inspection are conducted routinely?

vi) What is the approximate failure rate of pharmaceuticals:
(1) <1%
(2) 1.1 to 2%
(3) 3.1 to 5%
(4) 5.1 to 7.5%
(5) 7.6 to 10%
(6) 10.1-15%
(7) 15.1-20%
(8) over 20%

vii) What is the source country with the most failure rates?
(1) US/EU/ and other rich countries?
(2) Middle East countries
(3) India
(4) China
(5) Other

viii) What are the top 2–3 reasons of poor quality? (bad packaging, labelling issue, product deterioration, counterfeit, assay (active ingredient problems and others)
(1) _____
(2) _____
(3) _____

For Pharmaceutical Manufacturers in India

Dear Respondent,

Thank you on behalf of Empower School of Health for a sparing few minutes on this short, but important survey.

Empower School of Health is conducting research for the Department for International Development (DfID), UK Government with the objective of promoting '**Quality Indian Pharmaceutical Exports'** to Global Health programs in developing countries. A brief description of DfID and Empower School of Health is also attached at the end of the survey.

The objective of the survey is to find out if you as a pharmaceutical manufacturer / exporter are willing to provide information about your products to prospective Global Health buyers in low and middle income countries.

Please provide a Yes / No if you will be willing to share the information in the questions (if not, please mention why). Please note that at this stage we do NOT want any detailed information—but simply a Yes if you will be willing to share this information and why, if you choose No:

Name of the company: _____
Approximate total sales (most recent year): _____
Approximate total exports (most recent year): _____
Name of the respondent: _____
Designation / Department: _____
Email: _____
Phone: _____

		Are you willing to provide this information?	If not, then why?	Ease of gathering the data (easy / difficult)
Company information	Years of operation (when founded)			
	List of countries where you have your own offices			
	List of countries and cities where you have manufacturing plants			
	Do you export directly to countries, or do you sell your products to export agents?			
Financial information	Total sales (most recent year)			
	Total exports (most recent year)			
	Sales to Global Health programs (most recent year)			
	Rank by sales in India and by export value			

	Top 10 products by sales (for India and for exports)			
Product information	List of products by therapeutic category (both branded and generic)			
	List of products registered in Stringent Regulatory Authority (SRA) countries			
	List of products registered in other countries			
	List of products approved by the WHO Prequalification (PQ) program			
	List of products approved by any UN agency			
	List of products approved by an international procurement agency (indicate which organisation)			
	Price of the product			
	Delivery lead time			
Client information	List of major global clients you are supplying, have Long-term agreements (LTAs) or are empanelled with:			
	UN agencies—which ones? (for example, World Bank, WHO, UNFPA, etc)			
	International procurement agents and public health programs (for example, IDA)			
	International government agencies			
	Names of Donors that have funded your sales			
Any other information that you would want to share that may be useful for the prospective buyers				

List of Respondents

Methodology Review Workshop 1

	Participant	Organisation	E-mail id
1	Mr. Alex George	Action Aid India	Alex.George@actionaid.org
2	Mr. Billy Stewart	DfID India	Billy-Stewart@dfid.gov.uk
3	Ms. Daljeet Kaur	IPE Global	dkaur@ipeglobal.com
4	Dr. Dinesh Abrol	JNU and ISID	dinesh.abrol@gmail.com
5	Ms. Gurjeet Kaur	Action Aid India	Gurjeet.Kaur@actionaid.org
6	Ms. Namrata Yadav	IPE Global	nyadav@ipeglobal.com
7	Dr. Praful Sheth	International Pharmaceutical Federation (FIP)	pdsheth@hotmail.com
8	Dr. Sakthivel Selvaraj	Public Health Foundation of India	shakti@phfi.org
9	Mr. Sanjay Saha	Empower School of Health	sanjay.saha@empower.net.in
10	Dr. Sunil Nandraj	Ex-WHO Advisor for Government of India	sunil.nandraj@gmail.com
11	Ms. Manisha Gupta	Empower School of Health	Manisha.gupta@empower.net.in
12	Prof. Paul Lalvani	Empower School of Health	paul.lavani@empower.net.in
13	Ms. Sabina Barnes	DfID India	S-Barnes@dfid.gov.uk
14	Dr. Shyama Nagrajan	IPE Global	snagarajan@ipeglobal.com
15	Dr. Varun Katyal	Empower School of Health	Varun.katyal@empower.net.in

Methodology Review Workshop 2

	Participant	Organisation	E-mail id
1	Mr. Vijay Paulraj	USAID	vpaulraj@usaid.gov
2	Ms. Sabina Barnes	DfID	s-barnes@dfid.gov.uk
3	Ms. Jaya Singh Verma	DfID	Js-verma@dfid.gov.uk
4	Mr.Ranjan Chakravarty	Ranbaxy laboratories	ranjan.chakravarti@ranbaxy.com
5	Ms.Leena Menghaney	MSF	leena.menghaney@geneva.msf.org
6	Mr. Ravi Shankar	Marie Stopes International	ravi.shankar@mariestopes.org.in
7	Mr. Kaushik Desai	DIA India	kaushikdesai10@gmail.com
8	Dr. Devina Bajpayee	IPE Global	dbajpayee@ipeglobal.com
9	Prof. Paul Lalvani	Empower School of Health	paul.lalvani@empower.net.in
10	Mr. Siddharth Srivastava	Empower School of Health	srivastava.siddharth@gmail.com
11	Mr. Sanjay Saha	Empower School of Health	sanjay.saha@empower.net.in

Results Review Workshop

	Participant	Organisation	E-mail id
1	Dr. Nel Druce	DfID India	
2	Ms. Sabina Barnes	DfID India	S-Barnes@dfid.gov.uk
3	Ms. Roli Asthana	DfID India	
4	Dr. Dinesh Agarwal	IPE Global	dagarwal@ipeglobal.com
5	Mr. Raghav	IPE Global	
6	Prof. Paul Lalvani	Empower School of Health	paul.lalvani@empower.net.in
7	Mr. Siddharth Srivastava	Empower School of Health	srivastava.siddharth@gmail.com
8	Mr. Sanjay Saha	Empower School of Health	sanjay.saha@empower.net.in
9	Ms. Prabhleen Arora	Empower School of Health	prabhleen.arora@empower.net.in
10	There were several other members present partly or for entire duration of the meeting		

List of Interviews

	Organization	Country	Interviewee	Designation	Method of data collection
1	USAID	Ethiopia	Mr. Keith Hummel		F-2-F interview
2		Kenya	Dr. Padma Shetty		F-2-F interview
3	DfID	Ethiopia	Mr. Kassa Mohammed	Health Advisor	F-2-F interview
4		Kenya	Mr. Milka Choge	Reproductive Health Advisor	F-2-F interview
5		Ghana	Mr. Shamwill Issah	Health Advisor	F-2-F interview
6	Clinton Health Access Initiative	Ethiopia	Dr. Yigeremu Abebe Asemere	Country Director	F-2-F interview
7		Kenya	Mr. Tony Oyier	Program Manager, New Initiatives	F-2-F interview
8	Caroga Pharma	Ethiopia	Mr. Abenet Denbeni		F-2-F interview + Questionnaire
9	Yoha International	Ethiopia	Mr. Daniel Waktole		F-2-F interview + Questionnaire
10	SCMS	Ethiopia	Ms. Loren B Wille		Questionnaire
11	FMHACA	Ethiopia	Mr. Daniel Yami		F-2-F interview
12	DKT International	Ethiopia	Mr. Andrew Piller		F-2-F interview + Questionnaire
13	World Bank	Kenya	Dr. Ramana Gandham	Lead Health Specialist, Africa Region	F-2-F interview
14	Pharmacy and Poisons Board	Kenya	Dr. Fred Siyoi	Deputy Registrar	F-2-F interview
15	National Quality Control Laboratory	Kenya	Dr. Hezekiah Chepkwony	Director	F-2-F interview
16		Kenya	Dr. Ernest Mbae	Deputy Director	
17		Kenya	Dr. Serah Mukiri	Deputy Director	
18	PSI Kenya	Kenya	Mr. Chris Jones	Country Representative	F-2-F interview + Questionnaire
19	PSI Kenya	Kenya	Mr. Dorcas Odondo Wafula	Supply Chain Director	
20	PSI India	India	Sharad Bhargava		Questionnaire
21	PSI Global	Global	Munish Mehrotra		Questionnaire
22	Kenya Medical Supplies Agency	Kenya	Mr. Kabuchi		F-2-F interview + Questionnaire
23		Kenya	Ms. Beatrice Rosana		
24	Mission For Essential Drugs And Supplies	Kenya	Dr. Wycliffe Nandama	Purchasing Manager	F-2-F interview + Questionnaire
25		Kenya	Dr. Stephen T. Kigera	Quality Assurance Manager	
26		Kenya	Mr. Jonathan	Training Manager	

			Mbului		
27	Kenya Aids Control Project	Kenya	Ms. Dinah Amwayi	Finance Administrator	F-2-F interview + Questionnaire
28	MoH Procurement Unit	Ghana	Joyceyn Azeez		Questionnaire
29	Ghana FDA	Ghana	Not willing to share name		Questionnaire
30	PFSCM	Global	Robert Staley		Questionnaire
31	International Federation of Red Cross and Red Crescent Societies	Global	Selma Bernardi		Questionnaire
32		Kenya	Dr. Asha Mohammmed	Deputy Secretary General_Region Management and Programs	F-2-F interview
33		Kenya	Dr. James Kisia	Deputy Secretary General	
34		Kenya	Sylvia Khamati-Logendo		
35	Marie Stopes International	Global	Jason Bower		Questionnaire
36	UNFPA	Global	Miranda Hansen		Questionnaire
37	Ukrainian Center for Control of Socially Dangerous Diseases	Ukraine	Strashuk Sergey	Procurement Manager	F-2-F interview + Questionnaire
38	IDA Foundation	India	Daan Istha		F-2-F interview + Questionnaire
39	Dominion Pharmaceuticals	Kenya	Larry Kamamia		Questionnaire
40	CHMP (Centrale Humanitare Medico Pharmaceutique)	Kenya	Ms. Veronica Thuku Gakuo		Questionnaire
41	Mission Pharma	India	Vidyashankar Gopalkrishnan		Telephonic interview + Questionnaire
42	Veteran Pharmaceutical Ltd.	Kenya	Mr. Paul Nganga		Questionnaire
43	KEMRI/CDC	Kenya	Mr. Victor Mudhune		Questionnaire
44	PFSA	Ethiopia	Not willing to share name		F-2-F interview + Questionnaire
45	Ranbaxy	India	Ranjan Chakravarti		F-2-F interview + Questionnaire
46	IPCA	India	Rahul Kapadia	Sr.GM- Institutions	Questionnaire
47	MedoPharm	India	Sanjaydas Mohapatra	Technical & Operations	Questionnaire
48	Prime Pharma	India			Questionnaire
49	Micro Labs	India	Tavinder Vasudeva		F-2-F interview + Questionnaire
50	GCCPL	India	Gautam Shah		F-2-F interview
51	CDSCO	India			F-2-F interview
52	Ministry of Health and Family Welfare	India	Mr. Arun Panda		F-2-F interview

53	Pharmexcil	India	Dr. P.V.Appaji	Director General	F-2-F interview
54	National Institute of Biologicals	India	Dr. Surinder Singh	Director	F-2-F interview
55	FDA-Maharashtra	India	Mr. Ram Banarse	Addiitonal Drug Controller	F-2-F interview
56	USFDA	India	Dr. Altaf Lal	Director	F-2-F interview
57	USAID	India	Dr. James Browder	Deputy Director	F-2-F interview
58	WHO-SEARO	India	Dr. Mehboob Rahman		F-2-F interview
59	MSF	India	Ms. Leena Menghaney		F-2-F interview
60	CHAI	India	Mr. Harkesh Dabbas		F-2-F interview
61	SEAR Pharm	India	Dr. P.D. Sheth		F-2-F interview
62	Indian Pharmaceutical Alliance	India	Dr. D.G.Shah		F-2-F interview
63	Public Health Foundation of India	India	Dr. Shakthi Selvaraj		F-2-F interview
64	Drug Information Association	India	Dr. Kaushik Desai		F-2-F interview
65	Jawaharlal Nehru University	India	Dr. Dinesh Abrol		F-2-F interview
66	Ethiopian Embassy India	India	Mrs. Gennet Zigde		F-2-F interview
67	Dabur	India	Mr. Moloy Mitra		F-2-F interview
68	Regulatory Wisdom	India	Ms. Rashmi Kulshrestha		F-2-F interview
69	Public Health Foundation of India	India	Dr. Sunil Nandraj		F-2-F interview

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About Empower and the Authors

Empower School of Health was established by a group of professionals formerly from United Nations (WHO, Global Fund), and private corporate sector; all of whom have a rich and varied experience at senior management levels. Empower works in 30 countries across Latin America, Africa, Asia and Eastern Europe to strengthen institutional capacity of global health programs. It also advises donors and countries on sourcing, pricing, quality and drug regulations. Empower is actively involved with several African Drug Regulatory Authorities in helping to build their capacity. Empower has 7 offices across India with more than 200 staff and 50 independent consultants globally.

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Photo Journey of the Project

Billboard at Nairobi Airport


FMHACA Addis

Bill Gates Foundation meeting in Addis Ababa

PHOTO JOURNEY OF THE PROJECT

Ghana FDA


MEDS Kenya

MEDS Kenya

MEDS prequal lab Kenya


Pharmacy in Nairobi