IPA Quality Forum – Reflections on the journey so far

Vikas Bhadoria
Senior Partner, McKinsey & Company

IPA CONFERENCE | FEBRUARY 2019
IPA Quality Forum is in the 3rd phase of its journey to help the Indian pharma industry achieve excellence in quality.

- **Phase 1:** Activation & Mobilization
  - May 15

- **Phase 2:** Developing Best practices design of key elements of Quality Systems
  - Mar- 2016
  - Jan- 2017

- **Phase 3:** Embedding & sustaining the best practices + Capability Building
  - Jan- 2018
  - Jan- 2019
Performance snapshot on compliance outcomes

Brief update on initiatives taken by IPA QF in 2018

Priorities going forward
The Industry has continued to show progress- Inspection outcomes in India have improved and are now more in line with global outcomes.

Outcomes of inspections

Global

<table>
<thead>
<tr>
<th>Year</th>
<th>OAI</th>
<th>VAI</th>
<th>NAI</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>1,839</td>
<td>136</td>
<td>875</td>
<td>2,048</td>
</tr>
<tr>
<td>2015</td>
<td>1,881</td>
<td>165</td>
<td>974</td>
<td>2,110</td>
</tr>
<tr>
<td>2016</td>
<td>1,880</td>
<td>148</td>
<td>1,042</td>
<td>2,070</td>
</tr>
<tr>
<td>2017</td>
<td>1,573</td>
<td>165</td>
<td>894</td>
<td>2,003</td>
</tr>
<tr>
<td>2018</td>
<td>1,228</td>
<td>53</td>
<td>728</td>
<td>1,303</td>
</tr>
</tbody>
</table>

India

<table>
<thead>
<tr>
<th>Year</th>
<th>OAI</th>
<th>VAI</th>
<th>NAI</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>102</td>
<td>27</td>
<td>45</td>
<td>174</td>
</tr>
<tr>
<td>2015</td>
<td>124</td>
<td>66</td>
<td>30</td>
<td>220</td>
</tr>
<tr>
<td>2016</td>
<td>176</td>
<td>119</td>
<td>39</td>
<td>334</td>
</tr>
<tr>
<td>2017</td>
<td>145</td>
<td>80</td>
<td>43</td>
<td>268</td>
</tr>
<tr>
<td>2018</td>
<td>174</td>
<td>76</td>
<td>91</td>
<td>241</td>
</tr>
</tbody>
</table>

Indian inspections as a share of global

6% 11% 9% 9% 14%

FDA inspection data for CDER and Drug Quality Assurance projects, for Jan – Dec cycle (February 25, 2019)

1 Data from Jan – Dec cycle

SOURCE: FDA inspection data for CDER (Drug Quality Assurance), data pull on Feb 25, 2019
There has been a reduction in data reliability, and investigation & root cause assessment related errors; Gap in manufacturing systems and lab controls are now a leading source of non-compliance.

### Nature of observations (% of WL & 483 observations)

<table>
<thead>
<tr>
<th>Category</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data reliability &amp; Good documentation practices</td>
<td>41%</td>
<td>46%</td>
<td>20%</td>
<td>17%</td>
</tr>
<tr>
<td>Investigations &amp; root cause assessment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lab controls</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>10%</td>
<td>8%</td>
<td>17%</td>
<td>9%</td>
</tr>
</tbody>
</table>

- Gaps in adherence to good shopfloor practices or SOPs
- Gaps in manufacturing / packaging / process equipment reliability
- Failure to establish laboratory controls that include scientifically sound and appropriate specifications, standards, sampling plans
- Failure to ensure that test procedures are scientifically sound
- Inadequate controls of computer & other data systems
- Gap in prevention of unauthorized access
- Incomplete data in lab records
- Incomplete data in batch production records

SOURCE: US FDA Warning letters & 483 observations available in public domain
India’s GMP compliance for EMA sites continues to be a concern

GMP Non-compliance issued by EMA

Number of sites

<table>
<thead>
<tr>
<th>Year</th>
<th>India</th>
<th>EU</th>
<th>China</th>
<th>RoW</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>8</td>
<td>5</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>2015</td>
<td>12</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>2016</td>
<td>18</td>
<td>9</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>2017</td>
<td>13</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2018</td>
<td>16</td>
<td>7</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Share of global total

- 2014: 38%
- 2015: 25%
- 2016: 50%
- 2017: 23%
- 2018: 43%

1 Numbers shown for FY - FY14 taken as Oct 2013 to Sep 2014; Similarly for FY15, 16 & 17

SOURCE: EudraGMP (as of 21st Feb 2019)
Indian Pharmacos continue to lag behind global peers on several indicators of quality - OSD Example

Global performance is indexed at 100%

Quality outcomes
- Recall events: 250%
- Customer complaints: 89%

Productivity
- QC productivity: 52%
- QA productivity: 41%

Operational and Quality maturity
- Yield: 97%
- Right first time: 97%
- Deviations rate: 111%
- Deviations due to supplier material issues: 140%
Performance snapshot on compliance outcomes

Brief update on initiatives taken by IPA QF in 2018

Priorities going forward
IPA Quality Forum undertook various activities in 2018 to build capability across the industry while continuing to drive best practice design and wider industry outreach (1/2)

### Capability building

**Advanced GMP workshops for middle-management capability building**

**Topics covered**
- Batch Failure Investigation
- Complaints – Investigation and review
- Data Integrity
- Good documentation practices

**Blue print for capability building of middle managers finalised**

**Skills to be developed**
- Leading sustainable quality transformations:
  - Leading self: Understanding the right mindsets and behaviors related to quality at the individual and group level
  - Leading others: Understanding how to influence change
- Effective governance: Learning how to drive effective performance dialogues using metrics
- Role modeling & building a quality culture: Learning to role-model quality & build a robust quality culture

**Delivery channel / methodologies**
- Change Leaders Forum: 2-3 day site leadership efforts / workshops at site level:
  - Identifying key mindsets and behaviors limiting culture of quality at organizational and individual level
  - Understanding how to lead change at scale and influence key internal and external stakeholders
  - Action planning to shift limiting behaviors & embed a world-class quality culture
- Individual 1-1 coaching sessions:
  - Personalized development based on key skill gaps
  - Action planning & goal setting
- Go & See: Visiting one of the best-in-class sites globally to showcase best practices in operations & quality

**Compliance & quality manufacturing teams**

**Skills to be developed**
- Setting up strong quality systems:
  - Fundamental understanding of unit operations
  - Investigations & root cause assessment
  - Good documentation practices
  - Process Validation Lifecycle management of product
- Driving performance on the shop floor:
  - Leadership
  - Effective shop floor dialogues
  - Advanced interpersonal skills (e.g., decision-making)
- Building a robust quality culture:
  - Developing trust & transparency
  - Rewards & Recognition
  - Cross-functional collaboration

**Delivery channel / methodologies**
- Case-study-based classroom sessions:
  - Conducted by multidisciplinary experts from the industry & McKinsey Leadership Institute
  - Cases based on real-time issues / non-comformities / non-compliance from the industry
- Digital & e-learning modules: Web & smartphone-based applications to provide refreshers during downtime (e.g., travel time)
- Mock reviews & performance dialogues: Practicing & coaching by industry experts on conducting GMP Data review sessions
IPA Quality Forum undertook various activities in 2018 to build capability across the industry while continuing to drive best practice design and wider industry outreach (2/2)

2 Best practice design

Guidelines on key quality topics

Good Documentation Practice (GDP) Guideline

‘Market complaints handling’
(to be published)

3 Broader industry outreach

IPA conference 2018

- Bringing **manufacturers and regulators together** to facilitate discussions resulting in **meaningful and actionable outcomes**
  - **Focus on quality** – the most vital element of the pharmaceutical industry
Going forward, IPA aims to further drive the capability building agenda and drive quality best practices in R&D – Phase 5

- **A** Capability building with continued focus on dissemination and adoption within individual companies
- **B** Integrating quality to R&D with focus on
  - Analytical method development
  - Product robustness
- **C** Continued engagement with regulatory agencies & industry *(IPA conference, Advanced GMP workshop etc.)*
Contents

Performance snapshot on compliance outcomes

Brief update on initiatives taken by IPA QF in 2018

Priorities going forward
While Indian pharma are at different stages in their Quality journey, many are now striving to achieve sustained excellence in Quality.

**Characteristics**
- Ensure key sites achieve full compliance vis-à-vis regulatory guidelines / expectations
- Complete ongoing remediation efforts in timely and effective manner
- Achieving 24X7 Audit Readiness

**STEP 1**
Achieve 100% compliance across key sites

- Set-up the right quality system & processes
- Introduce quality metrics & benchmark with best-in-class
- Designing the right quality organization & governance model

**STEP 2**
Put in place a robust Quality systems

- Scale up single-site quality improvement initiatives to the full network
- Building quality culture & capabilities across levels within the organization (incl. middle managers, supervisors & shop floor operators)
- Drive quality, delivery & productivity in an integrated manner
- Adopt next-generation (Ops 4.0) technologies to drive continuous improvement in operations

**STEP 3**
Achieve sustained excellence in Quality
We believe there are 5 key priorities for Indian pharmacos

Proactive Approach to Quality vs. Reactive: Put in place risk-based approached to improve product & process quality, and achieve 24x7 compliance

Drive Quality, Delivery & Productivity in an integrated manner: Deploying Production Systems to drive integrated operations excellence across the networks

Leverage Digital & Advanced Analytics (Industry 4.0) tools to drive next-gen operations excellence: Deploying several use cases across Manufacturing, Quality, Supply Chain & Cost excellence to drive significant performance improvement

At scale capability building across the organization: Leveraging experts, interactive breakout exercises on real life case examples and gamified learning to build capability

Holistic site transformation: Setting up a digital plant of the future through interventions across functions and processes, leveraging IoT, augmented reality and advanced and predictive analytics
# Digital lighthouse transformation at Bayer

## Situation

- **Volume increase** of 30% requiring a 24/7 production cycle
- **Increased portfolio complexity** – leading to an increase in c/o
- **50% additional workforce** with limited previous experience

## What did we do

- **Driving impact through selected Digital & Advanced Analytics applications**
- Extracting data from different sources (SAP, LIMS, ERP, Data warehouse, PLC, Excel)
- Creating a standardized “Plant Data Lake”

## Impact

<table>
<thead>
<tr>
<th>QC lab productivity</th>
<th>+50% increase of lab productivity by applying advanced schedule optimization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changeover</td>
<td>-30% reduction in time on tablet press using smart glasses</td>
</tr>
<tr>
<td>OEE</td>
<td>+40-50% OEE increase on packaging line supported by AA insights and Digital performance management</td>
</tr>
<tr>
<td>Deviations</td>
<td>-80% reduction in deviations since applying advanced analytics (0% reoccurrent)</td>
</tr>
<tr>
<td>Deviation handling/closure time</td>
<td>-90% reduction of deviation closure time by AA based deviation advisor tool</td>
</tr>
</tbody>
</table>

**SOURCE:** McKinsey Analysis
THANK YOU