Six Predictions for 2020
China Pharmaceutical & Health Care

February, 2020
From a survey launched by Deloitte in response to the COVID–19 outbreak among 104 leading pharmaceutical company executives in China ...

Almost all respondents set out plans in facilitating daily business operation and employee health monitoring

- Establish a crisis management team to allow a faster decision making: 67%
- Track health, location and travel data base for all employees: 84%
- Implement flexible work arrangement for your employees: 90%
- Set a business continuity & recovery plan: 65%
- Adjust business performance target in 2020: 28%

Yet, ~40% of respondents still believe there’s an increasing uncertainty in meeting their 2020 FY targets

Q: How did your company respond to the crisis? [Multiple choices]

- Establish a crisis management team to allow a faster decision making: 67%
- Track health, location and travel data base for all employees: 84%
- Implement flexible work arrangement for your employees: 90%
- Set a business continuity & recovery plan: 65%
- Adjust business performance target in 2020: 28%

Q: How do you foresee the crisis will impact on your business revenue in 2020?

- Revenue will drop down in 2020 within 20%: 38%
- Revenue will drop down in 2020 more than 20%: 21%
- Sales can catch up later to meet the target in 2020: 15%
- Sales will go up with the rising medical demand in 2020: 20%
- Unknown: 6%

Source: Deloitte survey N=104
These uncertainties are primarily perceived to be driven by increasing challenges in sales & marketing and supply chain management.

Q: Within your business priorities, what are the most difficult challenges to overcome during this crisis? (Please prioritize top 3)

- Manufacturing capacities will be an issue to meet the sales target: 23%
- Warehousing and Logistics can’t deliver products to the market: 37%
- Marketing and sales activities can’t resume due to the restriction: 76%
- R&D activities can’t resume, such as clinic trials: 30%
- Employees remote working is less effective: 39%
- Market fluctuation with changing demands: 43%

Q: On what aspects does this crisis impact your enterprise most? (Please prioritize top 3)

- Manufacture capability deployment: 14%
- Supply chain management: 59%
- Business channels model: 45%
- Human resources allocation: 32%
- Financing pressure from income, cash flow and cost: 51%
- Customers retaining and growing: 33%

Source: Deloitte survey N=104
To mitigate the impact, survey respondents believe that supply chain, digital channel and enhanced collaboration are priorities.

<table>
<thead>
<tr>
<th>Plan</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Implement new tech (web/mobile) to sustain client services</td>
<td>38%</td>
</tr>
<tr>
<td>Strengthen supply chain management</td>
<td>43%</td>
</tr>
<tr>
<td>Speed up digital transformation</td>
<td>39%</td>
</tr>
<tr>
<td>Speed up new product launch</td>
<td>28%</td>
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<tr>
<td>Invest more on online business</td>
<td>42%</td>
</tr>
<tr>
<td>Optimize human resources</td>
<td>38%</td>
</tr>
<tr>
<td>Strengthen collaboration with local government and hospitals</td>
<td>50%</td>
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</tbody>
</table>

Source: Deloitte survey N=104
Anticipated short–term impact to pharmaceutical companies in China

- **R&D, Clinical trials management**
  - E.g. Trial program suspended, potential delay to new product launch timeline

- **Procurement & Manufacturing**
  - E.g. Lack of raw materials as well as labor forces to resume production

- **Sales Visit & Marketing Promotion**
  - E.g. Difficult or unable to engage target customers, losing key accounts
We made six predictions on the industry involvement after the virus outbreak

**Short term**

1. Accelerated healthcare system upgrade, with a more emphasized focus toward public healthcare resource optimization and disease prevention infrastructure setup

2. Increased adoption of healthcare technology, including healthcare big data for disease management, and AI-based tools to support clinical decisions

3. Increasing role and decision power of Center of Disease Control (CDC)

**Long term**

4. Increasing urge to review existing supply chain model for better visibility and efficiency

5. The need to further invest in digital capabilities for customer engagement

6. Potential tuning of portfolio & investment interest in -
   - Enhancing prevention care portfolio e.g. Dx kits, vaccines, AI based Dx services and applications, etc.
   - Close ecosystem building to capture business opportunities from early Dx to treatment follow up
Predictions – Further accelerated healthcare system upgrade

Key observation: The outbreak of COVID-19 has again exposed capacity and capability issues in the healthcare system, e.g. limited inpatient capacity of Class III hospitals, insufficient diagnose and treatment capability and infrastructure in CII and below hospitals, etc.

We predict that COVID-19 will be a key trigger to accelerated invest in primary care infrastructure

Public system will continue to improve ...

- Class III
  - Current status: Number: 2.5K
    - No. of visit: 1335Mn
    - No. of visit yoy: +7.4%
  - Future positioning: Preserved resources for Specialty and Critical Care

- Class I & II & unclassified
  - Current status: Number: 29.7K
    - No. of visit: 1293Mn
    - No. of visit yoy: +2.9%
  - Future positioning: Care for rehabilitation and common / chronical diseases

- Community Healthcare
  - Current status: Number: 94.6K
    - No. of visit: 3277Mn
    - No. of visit yoy: +1.5%
  - Future positioning: The “Gate Keeper” Early diagnosis and health management

... with a particular focus in primary care

- Future Community Care Center
  - Health consult
  - Disease screening
  - eRx and drug delivery
  - ... ...
    - Chronical patients from upper class hosp.
    - Follow up patients from specialty care in upper class
    - Future community healthcare center- A collaboration of both public and private resources

Note: 1. Accumulated number of visits from Jan. 2018 to Sep. 2018.  2. Includes community health center, township health center, clinics, and village clinics
**Predictions – Increased adoption of technology in healthcare offerings**

**Key observation:**

- **After the outbreak, the application of big data and epidemic prevention has gained more attention from the government level:** The Meeting of the Standing Committee of the Political Bureau of the CPC Central Committee on February 3rd stressed that “to promote the open sharing of relevant data and case information to accelerate the research on virus origin and transmission mechanism, improving prevention and control measures”

- **As the "2019 Global Artificial Intelligence Health Summit" also suggested,** "AI + Medical Imaging" will become one of the most promising field in healthcare providers with potential for commercialization. E.g. In Shanghai, over 20 Class III hospitals have introduced AI assisted diagnosis and treatment research programs, with the goal to facilitate clinical pathway efficiency for patients

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<thead>
<tr>
<th>Prevention</th>
<th>Diagnosis</th>
<th>Treatment</th>
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<tr>
<td><strong>E.g. Open source analytical platform for virus gene sequencing</strong></td>
<td><strong>E.g. AI enhanced imaging diagnosis</strong></td>
<td><strong>E.g. AI embedded early drug R&amp;D facilitation</strong></td>
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**Vaccine development:** Study of virus gene sequencing to support vaccine R&D - National Genomics Data Center released the COVID-19 resource library on Jan 22nd, integrating the research results of a number of global institutes on COVID-19, to assist the R&D of vaccine

**AI diagnosis of COVID-19 patients:** a new set of AI diagnostic technology for COVID-19 was developed by Damo and Alibaba Cloud - The technology can accurately interpret CT image of suspected case in 20s with a 96% accuracy, which greatly improves diagnostic efficiency

**Drug Screening and Development:** Alibaba Cloud and the Global Health Drug Discovery Institute (GHDDI) is developing a big data and AI drug development platform, using relevant preclinical and clinical data to facilitate the calculation of targets and molecular properties

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Digital Technology & Big data application in public health management – "Health QR Code" for COVID – 19 control & monitoring

- **Introduction**
  - On Feb. 11th, Hangzhou took the lead in the "Hangzhou Health QR Code" for COVID-19 prevention and control
  - The code is in accordance with the requirements from a series of epidemic control regulation enacted by Zhejiang and Hangzhou govt. To facilitate the travel demand of the people and those who are waiting to enter Hangzhou, this digital tool is adopted to minimize the risk of serious outbreak when huge amount of people return to work/school from other cities
  - Till Feb. 18th, over 100 cities have adopted this digital management tool, while nationwide launching

- **How does it work**
  - Based on Alipay, use tricolor QR code (red/yellow/green) as a digital health certificate
  - Quarantine measures will be determined by checking code
  - Application scenarios: transportation hubs (airports, railway stations, highway toll stations); community and office building entrances, etc.

- **Next Step**
  - Under the guidance of the E-Government Office of the General Office of the State Council, Alipay is accelerating the development of a unified national health code system
  - The national code is expected to launch on Feb. 24th

- **Future Scenarios**
  - The technology can be used to create "National e-health code" to solve the data island problem among hospitals
  - Patients in any hospital can use the code to access their personal health data throughout the whole process of treatment
  - Doctors can quickly understand the patient’s past cases, greatly improving the efficiency of the hospital visit
  - Help with stratified care, two-way referral, health management, online hospital visit, etc.

<table>
<thead>
<tr>
<th>How to use</th>
<th>How does it work</th>
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<tbody>
<tr>
<td>Login Alipay</td>
<td>Self-Description: applicants conduct online declaration</td>
</tr>
<tr>
<td>Choose region</td>
<td>Database establishment and data crosscheck</td>
</tr>
<tr>
<td>Self-Assessment</td>
<td>Area/places screening</td>
</tr>
<tr>
<td>Finish Application</td>
<td>Dynamic real-time update: the code will automatically change color if the applicant finishes required quarantine or updated declared info</td>
</tr>
<tr>
<td>QR code Generated</td>
<td>No quarantine required</td>
</tr>
<tr>
<td></td>
<td>7-day Quarantine</td>
</tr>
<tr>
<td></td>
<td>14-day Quarantine</td>
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Predictions – Potential enhancing decision power of CDC’s in the future

**Healthy China 2030**
Sets guiding principles of public health provider system design: “Higher emphasis on disease prevention ... and allocate more resource in primary care.”

**The 12th meeting of the Central Committee for comprehensively deepening reform**
“Focus on improving institutional mechanism for disease prevention and control of major epidemic, improving national public health emergency management system”

Therefore we foresee that the role of CDC system will become increasingly important in the future ...

**Comparison of government budget for China CDC, China public hospital and that for US CDC**

**China CDC**
The government’s funding to CDC in 2019 was ¥ 0.45bn, **down by 14.9% YoY** compared to 2014

**China Public hospital**
The government’s funding to public hospitals in 2019 was ¥ 5bn, **up by 38.8% YoY** compared to 2014

**US CDC**
US CDC has an **annual budget of more than $12 billion**, or nearly $40 per person

Funding for CDC continues to decline and resources are comparably inadequate

**After the outbreak of COVID-19**

What to expect after COVID-19...

- Balance resource spending on prevention, diagnosis and treatment, increase funding for CDC
- Full empowerment of role of CDC
- Optimize the talent structure and improve the management system
- Increase the efforts in public health education to build the understanding of “prevention comes first”
Predictions – Increasing urge for companies’ to review existing supply chain gaps and improvement opportunity for efficiency

Key observation:

Pharma company engagement opportunities

1. **Co-improve disease control & prevention**
   - Closer collaboration with public healthcare providers and research entities in disease epidemiology and drug screening and development
     - Talents
     - Infrastructures
     - Funding

2. **Form unified standard to improve efficiency**
   - **Logistics integration**: Multi-warehouse cooperation; supply chain integration via integration of information flow and logistics plans
   - **Operational mgmt.**: Unified ERP system of key subsidiaries

3. **Enhance influence on target customers**
   - **Hospital services**: Support further transformation of public healthcare provider reform
   - **B2B2C platforms**: Enrich the distribution network through more B2B and B2C platforms

4. **Explore new channels to engage end users**
   - **O2O model by online and offline integration** to provide value added purchase options and other pharmacy services for patients

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**Short-term angle: new channel / models to mitigate operating risks**

**Long-term angle: integrated supply chain model to facilitate business strategy & planning**
The virus outbreak significantly limits the physical interaction with healthcare providers – more adoption of patient centric engagement model will be further accelerated.

### Predictions – Further emerging of patient – centric engagement model

- **Consultation service**
  - Pathological consultation
  - Multi-disciplinary team (MDT)

- **Follow-up system**
  - Enable better patient compliance

- **Genetic testing**
  - Empower physician with up-to-date diagnostic capability

- **Patient education**
  - Reduce the communication cost between physician and patients

- **Injection center**
  - Solve the safety issues in drug injection

- **In-hospital PHI**
  - Provide in-hospital situational insurance

- **Big data company**
  - Provide big-data platform to enhance the research capability
The outbreak of COVID-19 on the other hand exposes existing unmet needs in disease prevention, diagnosis and treatment, with increasing focus in regulatory approval reform, we foresee more investment in:

**Examples**

**Prevention**
- Establish an efficient vaccine development process and conduct thorough research on known pathogens in order to respond quickly to outbreaks of infectious diseases: after the Outbreak of H1N1 flu in the United States, States, due to the fully established process of influenza virus vaccine development, H1N1 vaccines were approved by FDA within only 5 months; Sanofi has accelerated the development of COVID-19 vaccine using gene recombination technology and the candidate vaccine for SARS

**Diagnosis**
- Develop diagnosis measures with higher sensitivity, response speed, and convenience, such as better POCT solution: continuously improving POCT technology from quality control, cost, flux, interconnection and other aspects - For contagious diseases, improve POCT’s sensitivity and convenience can avoid missing out on infected patients as well as explore the possibility of conducting at-home testing
- AI Diagnostic Technology and Platform: Tsinghua University Launched COVID-19 Intelligent Diagnostic System to improve diagnostic capability of primary hospitals

**Treatment**
- Discover new anti-viral drug MoA: Example: capsid inhibitors (CAI), a new antiretroviral mechanisms, has successfully completed preclinical studies; a new implanted anti-HIV drug "islatravir" developed by Merck achieved good results in Phase I clinical trial
- Design efficient drug screening process and platform to shorten the response time of new pathogens: potential application includes using AI technology to improve the efficiency and speed of drug target screening as well as new indication of mature drugs, etc.

**Enhanced diagnostics tools and technology**

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Key implications to pharmaceutical companies in China

How can we capture the emerging opportunities moving forward?

- Embrace accelerated adoption for future healthcare service and product delivery model
- Conduct supply chain integration and optimization
- Participate in disease prevention infrastructure building
- Explore opportunities in health big data and AI in disease prevention and treatment, public health risk identification
- Partner with government entities for broad market healthcare professionals education
- Revisit in-market product strategy to capture potential opportunity immediately after virus outbreak
- Revisit future portfolio to prioritize specific products or identify potential BD opportunities
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