Mylan NV

Generic medicine manufacturer
Stock exchange: NASDAQ • Ticker: MYL • HQ: Hatfield, UK • Employees: 35,000

PERFORMANCE

Mylan performs well overall in its evaluated Research Areas when compared to other generic medicine manufacturers in scope.

Responsible Manufacturing: Performs well. Reports environmental risk-management strategy for own sites, including completed risk assessments based on discharge limits and commitments for future supplier evaluation.

Appropriate Access: Performs well. Files for registration for all relevant off-patent products in access countries. Reports pricing strategies that account for socioeconomic conditions. Reports strategies to ensure continuous supply to access countries.

Stewardship: Middle-performing. Its educational programmes have comprehensive conflict of interest (COI) mitigation. It has no marketing or sales practices that aim to address appropriate use and it does not adapt its brochures or packaging.

SALES AND OPERATIONS

Therapeutic areas: Anaesthesia; Cardiovascular diseases; Dermatology; Gastroenterology; Infectious diseases; Metabolic diseases; Oncology; Pain management; Respiratory diseases; Women's health

Business segments: North America; Europe; Rest of World

Product categories: Biosimilars; Consumer health; Generic medicines and innovative medicines

Manufacturing & supply: Mylan reports that it supplies its antibacterial and antifungal medicines across 75 countries, 38 of which are low- and middle-income countries.

M&A since 2018: None in the antibacterial and/or antifungal sectors

PORTFOLIO for diseases in scope

Comparatively large portfolio: At least 173 products (89 unique INNs): 138 antibacterial medicines; 34 antifungal medicines; 1 antibacterial and antifungal medicine combination

Essential medicines: 32% (56) of products are on the 2019 WHO EML

AWaRe medicines*: 26 Access group; 13 Watch group; 1 Reserve group

Anti-TB medicines*: 6 (incl. 1 Watch group, 2 Reserve group)

Performance in the Benchmark

Overall score 13% 21/40

Performance by Research Area

<table>
<thead>
<tr>
<th>Research Area</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&amp;D</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>60%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access</td>
<td>70%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stewardship</td>
<td>13%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Revenues by product (2018)

- 1.5 bn USD
- 11.4* bn USD
- 9.8 bn USD

Revenues by region (2018)

- 3.0 bn USD
- 4.1 bn USD
- 11.4* bn USD

* Segments do not add up to 11.4 bn USD due to rounding.

* Listed on the 2019 WHO EML (Section 6)

The number of products is based on data from public sources, IQVIA, and data submitted by the company. It may not account for Mylan's entire portfolio.
OPPORTUNITIES FOR MYLAN

Expand availability and affordability of delamanid and pretomanid. Mylan in-licensed two (out of three) of the new multidrug-resistant tuberculosis (MDR-TB) medicines approved in over half a century: delamanid from Otsuka and pretomanid from the TB Alliance. Mylan should, as reportedly planned, continue to expand the availability of these medicines by ensuring that it files for registration in the remaining applicable access countries, prioritising those with a high burden of MDR-TB, and where it has the right to register. Per its reported commitment, Mylan should continue to collaborate with its partners to support accelerated registration and increased affordability.

Register and manufacture delamanid and pretomanid. Mylan has not yet implemented its strategy with third-party suppliers of antibacterial APIs and/or third-party suppliers of antibacterial APIs and drug products. The company has committed to promoting and implementing the AMR Industry Alliance manufacturing framework, including supplier assessments. After the period of analysis, Mylan notified its suppliers in writing of the framework expectations and discharge limits. Mylan can use the framework to manage the discharge limits of its suppliers. As a member of the AMR Industry Alliance, Mylan reports a strategy to limit AMR (or more stringent PNECs), as published by the AMR Industry Alliance. It has used this framework to monitor and manage the discharge limits of its suppliers. Mylan reports having a system to maintain high-quality antibacterial production, consistent with international GMP standards. This includes yearly internal audits and tracking of corrective actions. In April 2018, an FDA drug quality inspection identified non-conformities with cGMP at one of the company’s sites producing antibacterials, resulting in an official request for corrective action. The company reports that the site has taken corrective actions.

Expand its environmental risk-management strategy, including discharge limits, to third-party suppliers and external private waste-treatment plants. Mylan has an environmental risk-management strategy and auditing processes for its own manufacturing sites, including discharge limits. The company can ensure that these limits, as well as the strategy, extend fully to the sites of third-party suppliers and external private waste-treatment plants, including auditing and discharge-monitoring processes.

Decouple sales incentives from sales volumes and/or avoid deploying sales agents. In order to mitigate the risk of inappropriate use of its antibacterial and/or antifungal medicines, Mylan can decouple sales incentives from sales volumes and/or avoid deploying sales agents, as appropriate.

CHANGES SINCE 2018

- Partnered with the TB Alliance in April 2019 to provide access to investigational TB treatments, including a global license to manufacture and commercialise pretomanid.
- Conducted environmental risk assessments at own sites using the AMR Industry Alliance framework and PNECs; started promoting the framework and limits among suppliers in July 2019.
- First company to receive WHO prequalification in 2018 for the antifungal flucytosine, on the 2019 WHO EML, for the treatment of cryptococcal meningitis.
- Granted a license from Otsuka Pharmaceuticals to prioritise access to delamanid (Delyba®) for multidrug-resistant TB (MDR-TB) in South Africa, India and other high burden TB countries.
- Involved in two AMR surveillance programmes in India from 2018 onwards. It supports the Revised National TB Control Programme and a study on ICU patients.

PERFORMANCE BY RESEARCH AREA

A RESEARCH & DEVELOPMENT

As a research and development (R&D) organisation, Mylan is not evaluated in this Research Area. Mylan reports a collaboration with the TB Alliance to market and manufacture, respectively, the new anti-TB drug pretomanid, developed by the non-profit TB Alliance as part of two combination regimens: one with the medicines bedaquiline and linezolid (BPaMZ regimen) for the treatment of extensively drug-resistant or MDR-TB that is treatment-intolerant or non-responsive and another with the medicines bedaquiline, moxifloxacin and pyrazinamide (BPaMZ regimen), for drug-sensitive and MDR-TB. FDA approval for pretomanid was obtained on August 2019.

B RESPONSIBLE MANUFACTURING

B.1 Environmental risk-management strategy for own sites

Mylan reports a strategy to minimise the environmental impact of wastewaters and solid waste from antibacterial manufacturing at its sites, which includes audits. The company reports setting discharge limits for all antibacterials manufactured at its sites based on PNECs to limit AMR (or more stringent PNECs), as published by the AMR Industry Alliance. It has used these limits to conduct an initial risk assessment at its own sites.

Mylan has not yet implemented its strategy with third-party suppliers of antibacterial APIs and/or drug products. The company has committed to promoting and implementing the AMR Industry Alliance manufacturing framework, including supplier assessments. After the period of analysis, Mylan notified its suppliers in writing of the framework expectations and discharge limits. There is limited information on the requirements the company makes of external private waste-treatment plants in terms of environmental strategy, audits and antibacterial discharge limits.

B.2 Publicly discloses some information on environmental risk management

Mylan publishes some components of its environmental risk-management strategy. Further, it is a member of the AMR Industry Alliance, which publishes a list of recommended antibacterial discharge targets. Mylan does not publish: (1) the results of environmental audits, whether conducted at its own sites, the sites of suppliers or external private waste-treatment plants; (2) a list of these suppliers and waste-treatment plants; or (3) the levels of antibacterial discharge from its own sites.

B.3 Has system to maintain production quality for own and suppliers’ sites; regulator requested official corrective action

Mylan reports having a system to maintain high-quality antibacterial production, consistent with international GMP standards. This includes yearly internal audits and tracking of corrective actions. In April 2018, an FDA drug quality inspection identified non-conformities with cGMP at one of the company’s sites producing antibacterials, resulting in an official request for corrective action. The company reports that the site has taken corrective actions. Mylan reports requiring suppliers to abide by regulatory and company quality standards. This includes submitting suppliers to a qualification process, after which a quality agreement is established. It reports conducting risk-based audits of suppliers that hold them to the same standards as internal sites and collaborating with suppliers to implement corrective and preventive actions.
C.1 Registering on-patent products
Mylan was not eligible for this indicator as it does not have on-patent antibacterial or antifungal medicines or vaccines in its portfolio.

C.2 Pricing strategies for on-patent products
Companies were not scored for this indicator as the available data was insufficient for a comparative analysis. Mylan reports that it considers the socioeconomic conditions within each market in its pricing strategies for off-patent antibacterial or antifungal medicines or vaccines. These strategies include negotiations with customers, public/private partnerships and tender programmes. Mylan reports that in 2018 it provided 59 billion doses of medicine to over 165 countries at an average price of USD 0.19 per dose.

C.3 Several strategies to ensure the continuous supply of relevant products
Mylan’s performance is stronger than other generic medicine manufacturers evaluated when it comes to taking steps to ensure the continuous supply of its relevant products to access countries. It reports several strategies to achieve this aim. It has a Rapid Response Advanced Planning system that looks 24 months ahead and regular meetings with external stakeholders to discuss forecasting. To address the secure supply of ingredients, it has a global supply network of over 40 sites, makes use of dual sourcing and maintains safety and strategic stocks. To mitigate against falsified medicines reaching the supply chain, Mylan has several strategies, including using track-and-trace serialisation for its products. Plus, it ensures that contract manufacturers with whom it works also include its 2D data matrix on its products. Mylan also supplies six forgotten antibiotics* (chloramphenicol, fluclaxacillin, nitrofurantoin, sulfamethoxazole/thymethoprim, teicoplanin, and tobramycin) to access countries.

C.4 Comprehensive strategy to mitigate COI
for all educational programmes
The Benchmark analysed four AMR-related educational programmes for healthcare professionals (HCPs) from Mylan. Mylan reports comprehensive COI mitigation for all four programmes. All programmes have all three COI mitigation strategies aimed at by the Benchmark: (1) content is developed independently from its marketing department (i.e., the department does not give editorial input); (2) a pledge not to provide financial or material incentives to participants; and (3) a policy not to use branded materials.

C.5 Reports no information on sales practices or marketing materials that address appropriate use
Mylan does not report whether marketing materials for antibacterial and antifungal medicines take AMR trends and guidelines into account. The company also does not report appropriate sales practices such as decoupling sales agents’ incentives from sales volumes.

C.6 Does not adapt brochures and/or packaging to facilitate appropriate use
Mylan does not provide evidence of adapting its brochures and/or packaging to facilitate appropriate use of its antibacterial and/or antifungal medicines by patients beyond regulatory requirements.

C.7 Antimicrobial surveillance
As a GMM, Mylan is not eligible for this indicator as GMMs have a limited role in AMR surveillance activities. The Benchmark notes that Mylan is active in two AMR surveillance programmes, both in India. It supports the Revised National TB Control Programme. Plus, in June 2019, it reportedly began supporting a multi-center retrospective study of antimicrobial resistance in ICU patients across India. The company reports that results will be published in a peer-reviewed medical journal.

---

** 102 low- and middle-income countries where better access to medicine is most needed. See Appendix VI.
*** See Appendix VII.
* A set of older off-patent antibacterials that are not always marketed or available, due to economic reasons, lack of awareness and lack of demand but are still considered effective as a treatment for bacterial infections. See Appendix VII for citation.