

Supply chain waste in the pharma industry

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The pharmaceutical industry faces significant challenges with supply chain waste, affecting both environmental sustainability and economic efficiency. Jim McGuire and Deborah McElhone from CPI navigate the complex issue here

Supply chain waste refers to inefficiencies that occur throughout the process of producing and delivering medications, which manifests in various forms, including:

1. Expired medications:
Drugs not used before their expiration date, leading to significant financial losses and environmental impact.
2. Overproduction:
Manufacturing more drugs than needed, resulting in excess inventory.
3. Inefficient distribution:
Poor logistics and transportation planning cause product delays and damage, leading to waste.
4. Packaging waste:
Excessive or non-recyclable packaging materials contribute to environmental pollution.
5. Regulatory compliance:
Navigating complex regulations can lead to delays and additional costs, sometimes resulting in wasted resources.

These are just a few examples.

Tackling supply chain waste issues is vital for reducing costs, minimising environmental impact, and ensuring timely delivery of medicines.

Addressing the issues involves improving forecasting, enhancing logistics, adopting sustainable packaging, and streamlining regulatory processes.

Consequences of supply chain waste

Waste in the pharmaceutical industry leads to higher costs for manufacturers and consumers, environmental pollution, resource depletion, and potential shortages of essential medicines, which can impact public health.

Each year, the sector generates approximately 52 megatonnes of CO₂ emissions, equivalent to 11 million cars on the road. Additionally, 85% of healthcare waste is non-hazardous, meaning its processing and disposal by the pharmaceutical industry significantly impacts the environment. ⁽¹⁾

According to the Deloitte Centre for Health Solutions, life science and healthcare companies produce >70% of their emissions within their supply chains. It is a problem that is recognised. Over half of the supply chain executives interviewed were exploring initiatives to optimise energy use, enhance manufacturing efficiency, and reduce emissions and waste in the industry. ⁽²⁾

Many companies are working towards the principles of a circular economy rather than linear (Take, Make, Consume, Waste). Pfizer's 2021 ESG report shows an 18% reduction in total waste generation within a year. Where waste is unavoidable, Pfizer looks at options for reuse or recycling, e.g., their Michigan site operates a solvent recovery facility where recovered spent solvent blends are reused or sold for reuse by other manufacturers. ⁽³⁾

Strategies to reduce supply chain waste

The pharmaceutical industry is actively addressing supply chain waste through various innovative initiatives:

- Improved demand forecasting and inventory management incorporating advanced digital analytics with artificial intelligence will be an enabler for more just-in-time practices where only enough medicine is made to satisfy current demand. The current 'just-in- case' approach often leads to a wastage of medicines at the end of a trial, known as 'overage', which can be as much as 50 or 60%. ⁽⁴⁾ An added advantage of adopting this approach is the ability to supply drugs directly to patients when needed.
- Digital prescriptions, green pharmacies and shelf-life extensions further cut waste by reducing overproduction.
- The "direct-to-patient" production and supply model supports clinical trial recruitment and retention by allowing patients to receive their medications at home. This can reduce waste.
- Personalised medicine also represents a transformative shift in healthcare. It focuses on prevention, precision, and patient-centric care, which improves individual health outcomes and enhances healthcare systems' efficiency and sustainability.
- Clinical trials are crucial for new therapies but are often costly and lengthy. A personalised approach can streamline trials by selecting participants based on genetic markers. This targeted approach increases the likelihood of successful outcomes, accelerates therapy development, and cuts costs.
- Companies are also adopting biodegradable materials and reusable containers and reducing packaging size to reduce waste.
- Efficient transportation, including improved cold chain logistics and recycling programmes, helps minimise spoilage and material waste. Sustainable raw materials and eco-friendly packaging are becoming standard.
- Additionally, renewable energy and the decarbonisation of supply chains are key focuses. These efforts collectively enhance sustainability, demonstrating the industry's commitment to reducing its environmental footprint.

We have developed the PACE (Pharmacy Automation for Clinical Efficiency) platform at CPI's Medicines Manufacturing Innovation Centre. This digitally enabled, automated system integrates advanced hardware and software, enabling the production, packaging, and labelling of multiple drugs in one location without cross-contamination. This paves the way for the adoption of just-in-time manufacturing in the pharmaceutical industry, which will not only accelerate time to market but also significantly reduce waste.

A key component of the big picture is regulatory harmonisation. Coordinating regulations across various regions can reduce the complexity linked to fulfilling different regulatory demands. This requires international collaboration to unify guidelines and practices.

Industry-wide collaboration

Supply chain waste in the pharmaceutical industry is primarily caused by overproduction, inefficient inventory management, and regulatory complexities. These issues lead to expired medications, excessive packaging, and logistical inefficiencies. Consequences include:

- Increased costs.
- Environmental harm due to waste disposal.
- Reduced access to essential medicines.

Addressing these challenges is crucial for improving sustainability and efficiency. As the industry continues to innovate and embrace personalised approaches, the potential for improved health outcomes and reduced environmental impact becomes increasingly significant. This holistic approach not only addresses the immediate needs of patients but also contributes to a more sustainable and responsible healthcare future.

The global pharmaceutical industry and its supply chains are moving towards a new phase of sustainable practices. To achieve economic, environmental, and public health benefits, the pharmaceutical industry needs to unite to reduce supply chain waste, and many examples of this are taking place.

By embracing new digital advances, adopting efficient inventory management, minimising packaging, and streamlining logistics, we can cut costs, lessen environmental impact, and ensure better access to essential medicines. Industry-wide collaboration must lead the way in sustainable practices that benefit the planet and public health. Doing this will make responsible manufacturing and distribution the new standard.

References

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