

Enhancing the Resilience of the Vaccine Supply Chain: the role of redistributed manufacturing



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Context Setting:

Vaccine supply chain is particularly prone to disruption due to:

- Single sourcing arrangements with primary manufacturing suppliers (biologics, cell cultures. Chemicals)
- Balance of power in favour of primary manufacturers (Merck, Lonza)
- Regulatory challenges of approving new suppliers
- Long lead times for primary (bulk) items
- Vaccine strains changing on seasonal basis
- Pandemics
- Cold chain required for significant parts of inbound and outbound logistics

Research Questions:

- 1) How can firms enhance the resilience of the vaccine supply chain?
 - a) What are the root causes of disruptions in the vaccine supply chain?
 - b) Where would the application of additive manufacturing provide the most value in the vaccine supply chain?
 - c) What are the future challenges faced by the vaccine industry and can these challenges be addressed by redistributed manufacturing techniques?

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Aim: To determine how redistributed manufacturing techniques can enhance the resilience of the pharmaceutical supply chain.

Objectives:

- Identify key issues currently affecting the vaccine supply chain including risks and potential sources of disruption
- Work with pharmaceutical firms to determine potential areas of application for redistributed manufacturing techniques
- Determine future challenges for the vaccine supply chain and how redistributed manufacturing can address these challenges

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Benefits and Impact:

- Identify key issues in vaccine supply chain that redistributed manufacturing/additive manufacturing can address
- Identify value proposition for redistributed manufacturing in vaccine supply chain
- Knowledge exchange event with academics and practitioners on enhancing supply chain resilience using redistributed manufacturing techniques
- Follow on studies can collaborate with pharmaceutical firms to tailor additive manufacturing to add value in their supply chain

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Expected Outputs:

- Findings will inform White Paper for Government and industry on how redistributed manufacturing can enhance supply chain resilience
- Findings will be shared with Medical Manufacturing Industry Partnership (MMIP)
- Report of findings given to interview participants to guide future additive manufacturing programmes
- Publications in leading supply chain management journals

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Novelty:

- Additive Manufacturing research adds to current study of radical eco-innovations in supply chains and supply networks
- Initial interviews with senior supply chain executives at GSK and Pfizer indicate additive manufacturing is a relatively unexplored area in the vaccine supply chain

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