

Understanding the sustainability of plasma-derived medicinal products: drivers and consequences of shortages

Miriam Belmonte^{1,3}, Anna Albiero^{1,3}, Filip Callewaert², Julien Patris^{2,4}, Amanda Whittal^{1,4}

1) Dolon Ltd, London United Kingdom; 2) argenx, Ghent, Belgium; 3) These authors contributed equally; 4) These authors contributed equally

BACKGROUND

- Plasma-derived medicinal products (PDMPs), particularly intravenous immunoglobulins (IVIgs)^(a), are essential for treating different rare conditions like primary immunodeficiencies, hemophilia, and neurological disorders¹
- While recognized by the WHO as essential medicines, the growing demand for PDMPs² is constrained by the limited availability of human plasma, raising sustainability concerns³ and impacting patient care
- This research aims to understand the factors impacting supply and availability of PDMPs, with a focus on IVIgs, to support optimization of patient care

METHODS

- A scoping literature search on PDMPs and IVIgs was conducted in April 2024 using PubMed and targeted searches, (date range 2008 to 2024), and keywords such as "supply," "safety," "economics," "burden," and "shortage"
- Two authors screened titles and abstracts, excluding studies on clinical aspects, those outside Europe, United States (US), Canada, and Australia, and publications in languages other than English
- From a total of 6,769 identified hits, 20 studies were included, along with an additional 68 studies identified through targeted searches

RESULTS

The global PDMP market, particularly IVIg, has seen steady growth worldwide and is projected to continue growing in the future²

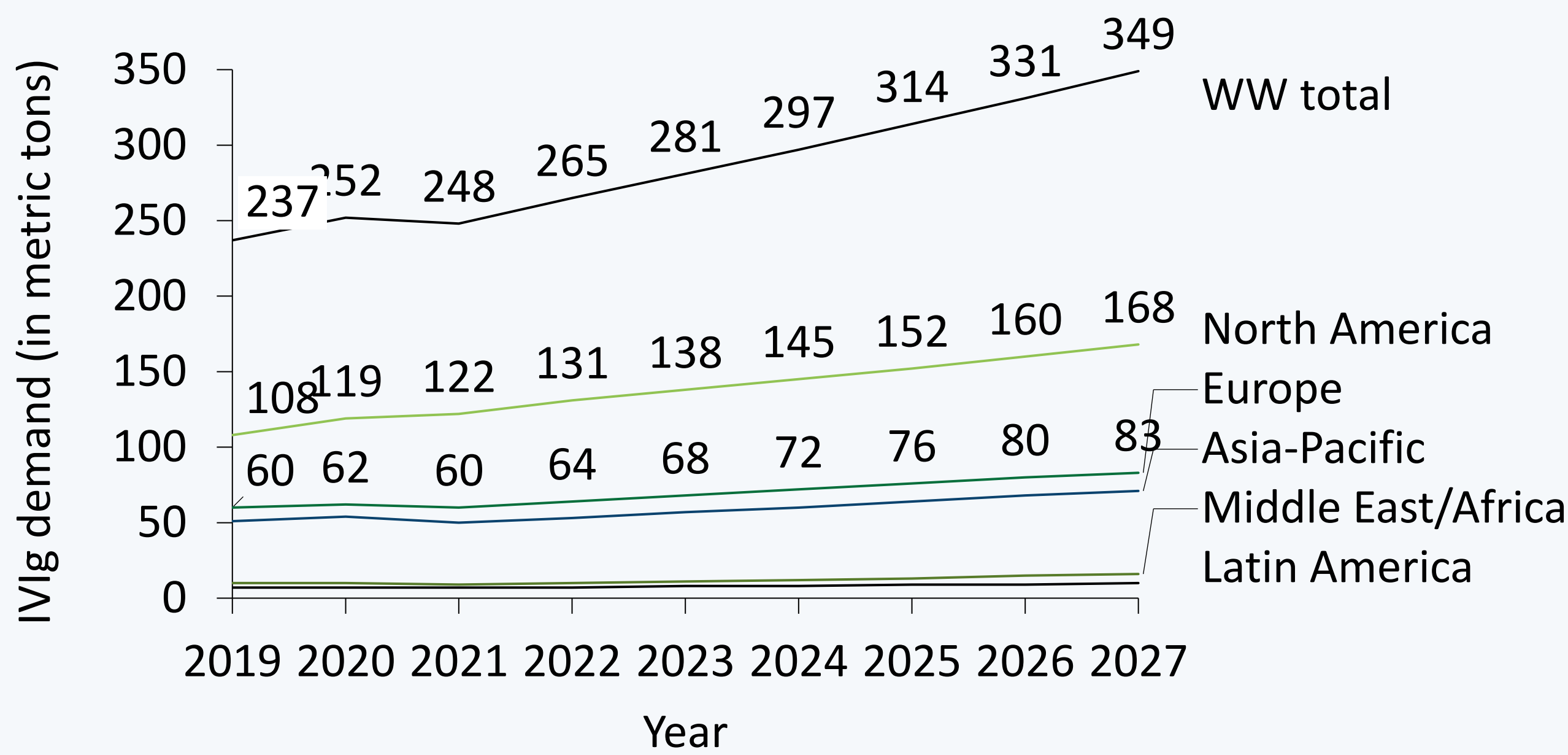


FIGURE 1 Worldwide (WW) IVIg demand from 2019 to 2027 (estimated).
Figure re-adapted from Galduf et al., 2023²

Current plasma global supply indicates limited plasma self-sufficiency⁴, with North America providing nearly 70% of the world's plasma⁵

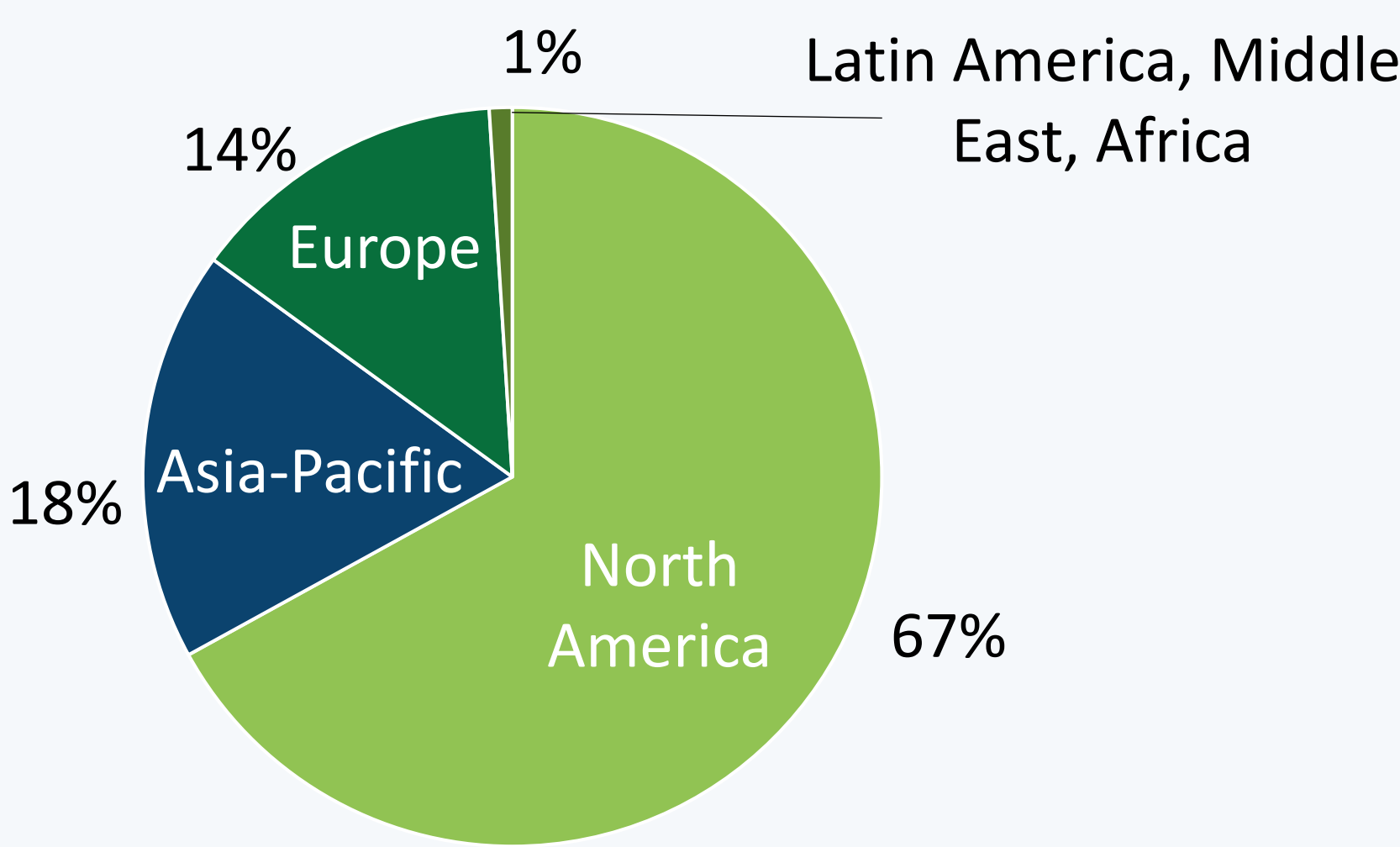


FIGURE 2 Global plasma supply in 2020(b). 67% of plasma was supplied by North America (99% by the U.S.), 18% by Asia-Pacific (75% from China), 14% by Europe, and 1% by Latin America, the Middle East, Africa

In recent years, widespread shortages of IVIgs have been reported across the EU and other regions











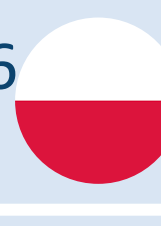
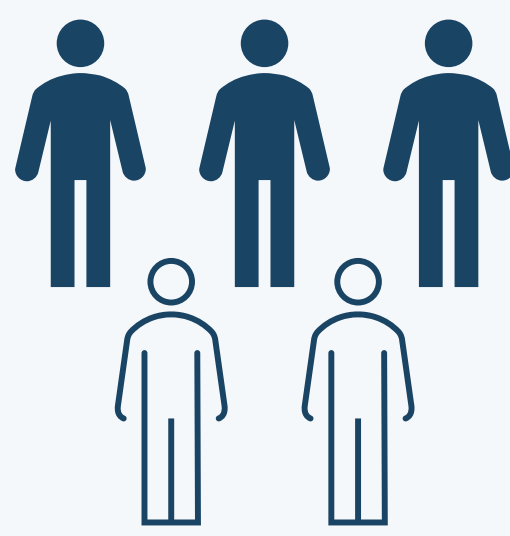
Year	2017	2018	2019	2020	2021	2022
Country	 6	 7  8  9	 10	 11-12  13	 14	 15  16  17
Disease affected	CIDP, LSS, MMN, MG	PID	NR	PID, NR	PID, SID	PID, NR, NR
Key factors contributing to shortages	I) Increasing demand from expanded disease indications ¹⁸⁻²⁰ , II) heavy reliance of plasma supply on imported plasma ³ , III) vulnerability to external factors/disruptions such as regulatory changes (e.g., policies on substances of human origin) ²¹ or global events (e.g., COVID-19) ²²					

FIGURE 3 Instances of documented shortages worldwide, diseases affected and key contributor factors (not exhaustive).

CIDP: Chronic Inflammatory Demyelinating Polyradiculoneuropathy; LSS: Lumbar Spinal Stenosis; MMN: Multifocal Motor Neuropathy; MG: Myasthenia Gravis; NR: Not Reported; PID/SID: Primary/Secondary Immunodeficiencies.

IVIg shortages result in treatment delays, modifications, or switches to less effective alternatives, which can compromise patient outcomes²³

52% of patients* changing IVIg treatment showed clinical score deterioration



*Patient sample included CIDP, MMN or MG

>50% of patients experienced moderate to clinically significant declines in their condition

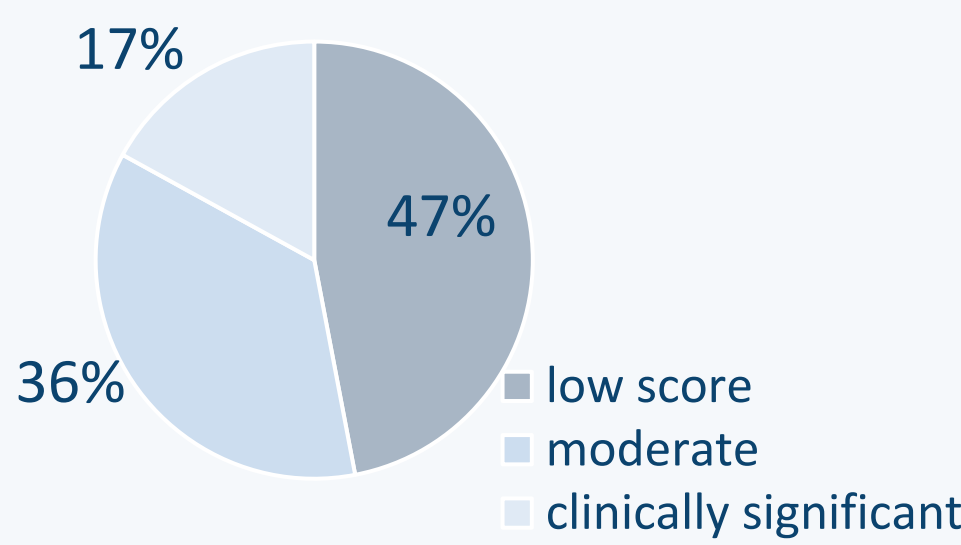


FIGURE 4 Impact of treatment modifications on patients' clinical status.
Results from a study conducted in France at the University Hospital, la Timone, Marseille²³

CONCLUSIONS

- The growing demand for PDMPs, especially IVIgs, is outpacing the plasma supply needed to meet this demand
- The complexity of IVIg manufacturing and the heavy reliance on imported plasma increases global vulnerability to shortages, particularly when supply chains are disrupted
- Widespread IVIg shortages can result in treatment delays and reduced access to essential therapies for patients, with negative impact on patients' wellbeing
- Implementing effective policies (e.g., SoHO) that enhance supply-chain resilience, clinical guidelines, and access to innovative therapies is crucial for alleviating pressure on plasma supplies and ensuring the sustainability and accessibility of plasma-derived products for patients worldwide

REFERENCES

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^(a)IVIg" is used within this research as a general term for immunoglobulins (Igs), as it is the most commonly utilized form

^(b)Production capabilities does not equate self sufficiency due to import/export patterns