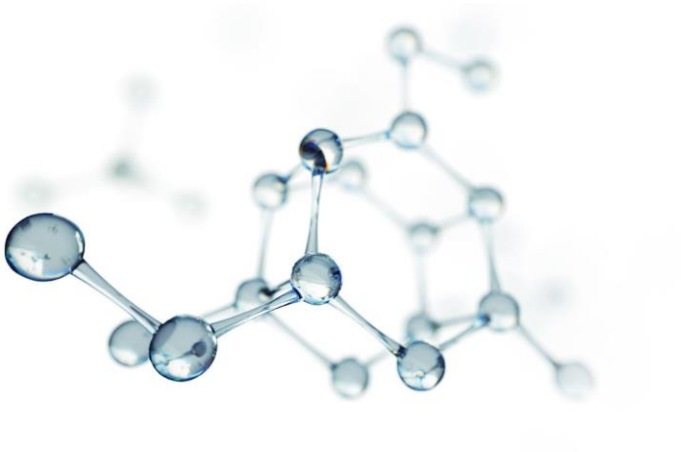

International EU27 pharmaceutical production, trade, dependencies and vulnerabilities: a factual analysis

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INTERNATIONAL EU27 PHARMACEUTICAL PRODUCTION, TRADE, DEPENDENCIES AND VULNERABILITIES: A FACTUAL ANALYSIS

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Content Page

KEY TAKEAWAYS

The degree of EU27 dependency on foreign suppliers of pharmaceutical products became an issue since the outbreak of COVID-19 and has kept EU27 policy makers and policy makers around the world occupied. The instinctive response to a crisis like COVID-19, where import dependencies became visible, is to try to produce more at home, become more protectionist, or aim for autonomy because dependencies feel uncomfortable. When observing what happened in 2020 and 2021, global supply chains have, however, shown remarkable resilience. On May 5, 2021, a Commission Staff Working Document (SWD) on "Strategic dependencies and capacities" was published. This report also concludes that EU27 resilience is strong, but some dependencies exist for specific products.[1] It is a balanced review of some of the issues, especially in terms of the resilience of global supply chains and limited degree of import dependencies that exist.

This study finds – in line with the Commission SWD – that protectionism and autonomy are not the right way to go. It provides evidence on EU27 production, imports, and exports of pharmaceutical products, and on how imports and exports have developed over time. Like the May 2021 Commission SWD, this study focuses on the levels of import dependencies for the EU27 pharmaceutical industry as a whole, and individual product groups in particular, and reaches comparable conclusions on the limited nature of dependencies. But in addition to the Commission study, this study also focuses on export vulnerabilities: the degree to which exports may be negatively impacted if other countries engage in reducing their import dependencies. Export vulnerabilities are the mirror image of import dependencies and are often ignored, while equally important.

Key Takeaway 1: EU domestic pharmaceutical production
51% of EU pharmaceutical products consumed in the EU are manufactured domestically and 53% of consumption is imported from Europe. The largest EU producers of pharmaceutical products are based in Ireland, Germany, France, and Belgium.

Key Takeaway 2: Over 70%-80% of EU pharmaceutical imports come from Europe
The EU27 imported €286 bn of pharmaceutical products in 2019, taking into account intra-EU27 trade and imports from third countries. 81% of pharmaceutical imports in the EU27 come from Europe itself. Looking at quantities, the picture is similar with 71% of pharmaceutical products coming from Europe. For Active Pharmaceutical Products (APIs) we find the highest level of non-EU imports with 23% in volume terms coming from China. This is the highest level of dependency found.

Key Takeaway 3: The EU has a strong and diversified export performance
The EU27 exported €366 bn of pharmaceutical products in 2019 of which 49% was intra-EU trade. EU27 pharmaceutical exports are more diversified in terms of their destination. Third countries account for 16% of EU exports of pharmaceuticals in volume terms. The EU exports mainly Human Medicinal Products (HMP), in which it has a large trade surplus, but also APIs (where it imports are higher than exports in volume terms).

[1] European Commission (2021) "Strategic Dependencies and Capacities", Commission Staff Working Document, May 5, 2021.

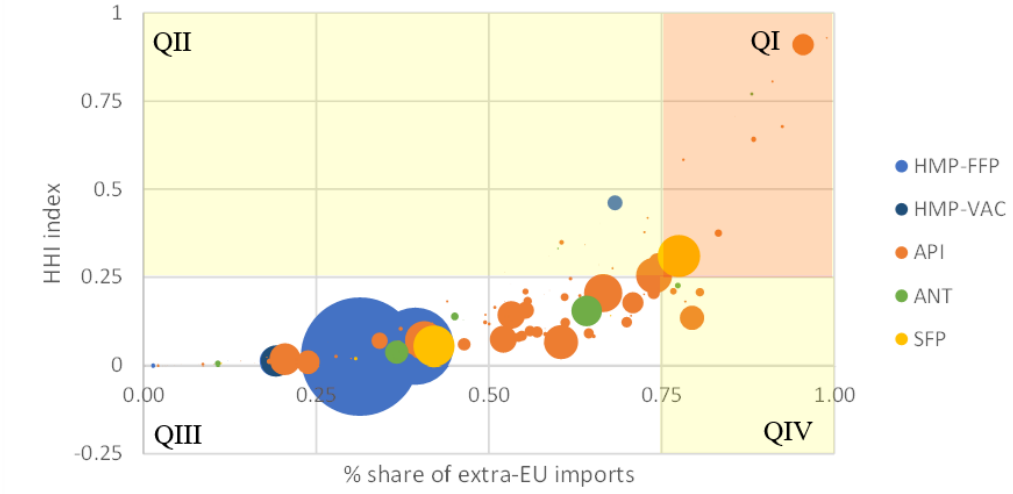
Key Takeaway 4: EU export performance has been strong between 2010 and 2019
Between 2010 and 2019, there was a 78% increase in the value of EU27 exports of pharmaceutical products to other EU27 countries and third countries. The share of EU27 HMP exports that goes to other EU27 countries has been relatively stable during the last ten years while the US continues to be the second destination of EU27 exports throughout the period.

Key Takeaway 5: EU resilience has increased between 2010 and 2019, but China became a more important supplier to the EU
Between 2010 and 2019, the EU27 has seen an increase in the value of imports of pharmaceuticals from other EU27 countries and third countries by 71%. The fact that imports grew slower than exports, suggests that EU27 has produced more domestically and/or added more export value, increasing resilience over the past decade. For EU27 imports of APIs by volume, China has become the most important non-EU27 source of supply, rising from 12% in 2010 to 23% in 2019.

Key Takeaway 6: COVID-19 had a small and temporary effect on EU27 trade
The COVID-19 pandemic has not had a major impact on EU27 trade in pharmaceutical products within and outside the EU27. 2020 intra-EU imports of pharmaceutical products were higher during the most acute months of the pandemic (March – June 2020) than in 2019 but from June onwards trade of pharmaceutical products returned to previous levels.

Key takeaway 7: Product level EU27 import dependencies are very limited
For 115 products, amounting to 87.5% of all EU27 imports, the EU has a low level of dependency (low share of extra-EU imports and diversified supplier base). For 6.4% of EU27 imports (in value terms), the EU has a limited level of dependency, either because the EU27 imports a significant share from outside the EU or has a limited number of suppliers. Only for 14 products EU27 imports from outside the EU are higher than 75% of total EU27 imports *and* the number of suppliers is limited. These 14 products (in QI) represent 6.1% of the value of all pharmaceutical products imported by the EU27.

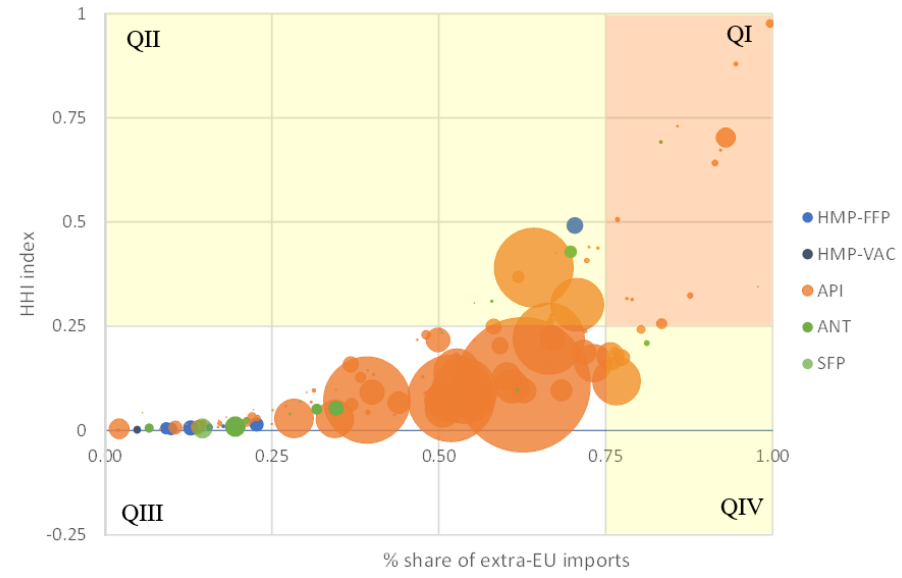
EU27 import dependence (HHI, share of extra-EU imports, value 2019)



Source: Eurostat. Authors' calculations.

Also in volume terms, EU27 dependencies are limited. Only for 0.8% of EU27 imports (QI), the level of dependency is high (combining over 75% of EU27 imports and a limited number of suppliers. For 16.6%, the level of import dependency is limited and for 82.6% (QIII) there is a low level of dependency. The statistics suggest that the way dependencies in volume terms can be reduced most (mainly from QII to QIII) is via diversifying sources of supply (i.e. reducing the HHI index).

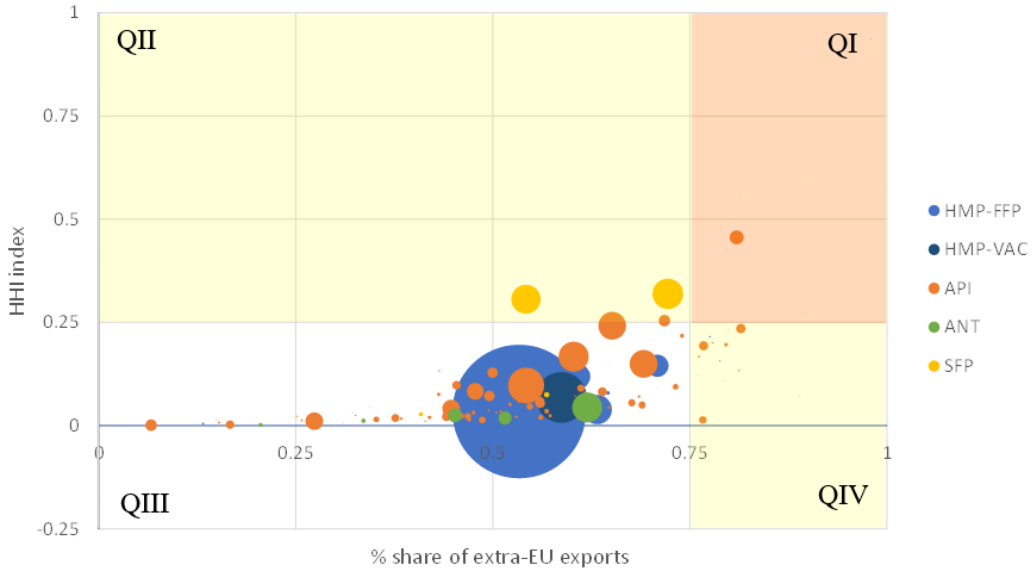
EU27 import dependence (HHI, share of extra-EU imports, volume 2019)



Source: Eurostat. Authors' calculations.

Key takeaway 8: Product level EU27 export vulnerabilities are limited to moderate
The EU27 has a diversified export base and overall a low level of dependency for 94.2% of its exports (in value terms).

EU27 export vulnerability (HHI, share of extra-EU exports, value 2019)

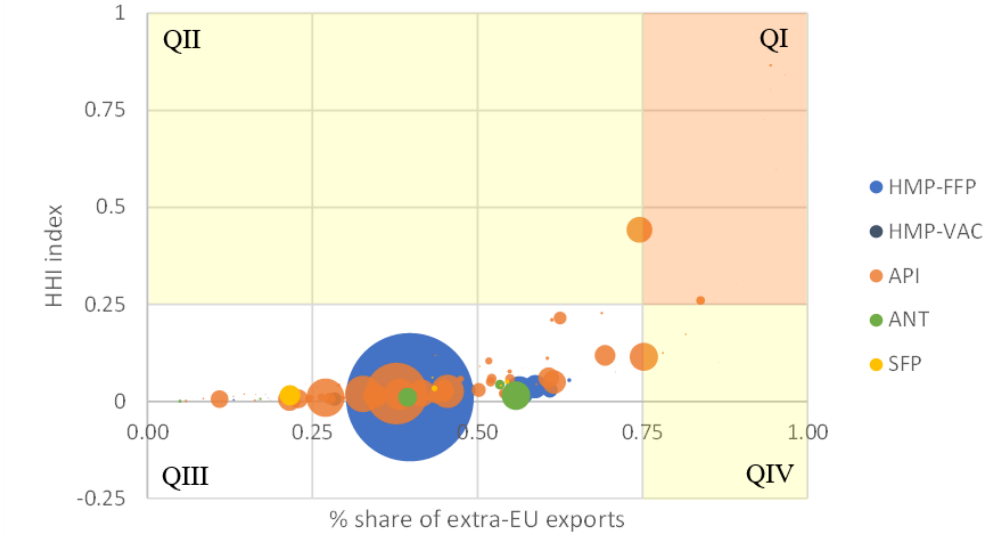


Source: Eurostat. Authors' calculations.

For 11 products (7%) EU27 exports to outside the EU are higher than 75% of total EU27 exports *and* the number of export destinations is limited (QI). These 11 products represent 0.5% of the value of all pharmaceutical products exported by the EU27. However, if we look for the share of exports over 50% going to non-EU countries, EU27 export vulnerabilities rise significantly to 51% of EU27 exports. This implies that EU27 exports are vulnerable to destination partners remaining open to imports from the EU27 – this is especially true for EU exports to the US, Russia, Japan and Canada.

In volume terms, the share of products for which the EU has a high level of vulnerability is 0.2% (QI) and also limited levels of vulnerability are negligible. 99.7% of EU exports in volume terms (at 75% level) has a low level of vulnerability.

EU27 export vulnerability (HHI, share of extra-EU exports, volume 2019)



Source: Eurostat. Authors' calculations.

Key takeaway 9: EU27 import dependency and export vulnerability are linked

The EU27 has a low degree of import dependence, and a diversified export base, when we look at the 75% threshold. But when we look at export dependency when over 50% of exports of a product are exported, we find that 51% of EU27 exports are vulnerable. If the EU27 would reduce import dependency by reshoring supply chains, and others would follow this example (as they are also debating reducing dependencies of their own domestic economies), 51% of EU27 exports could be significantly impacted.

KEY POLICY RECOMMENDATIONS

Based on this study's detailed analysis of production, imports and exports of pharmaceutical products, the time trends we observe, and the calculated levels of import dependency and export vulnerability, we have developed some key policy recommendations for the EU27 for the immediate future and years to come.

Policy Recommendation 1: Do not apply blanket policies for 1%-6% of vulnerable imports

EU27 imports have not been impacted (except for a marginal increase in March/April 2020) significantly by COVID-19, although the visibility of imports and dependencies has increased and captivates policy makers today. Our analysis shows that only 0.8% (in volume terms) and 6.1% (in value terms) of EU27 imports are classified as 'vulnerable', while 94-99% of EU27 imports are either experiencing limited or low levels of import vulnerability. Therefore, for the 94-99% of EU27 imports, no policies are needed, and arguably – given strong global supply chain performance in 2020 and 2021 – also not for the vulnerable 1%-6%. Any such policies would more likely do irreparable harm.

If the EU27, despite its strong current performance in terms of production and exports, nonetheless wants to increase its strategic resilience further, we believe that policies that could lead to tit-for-tat reactions globally are not the way to go. Neither are policies that would reduce the EU economy's agility and flexibility to adjust. Policies we would not recommend, therefore, include reshoring, forced localisation of manufacturing, or forced production of APIs in the EU as well as a general push for 'more autonomy'. These policies reduce an economy's flexibility to adjust in case of a crisis (OECD, 2020) and lead to a lose-lose game if everyone does this, due to the strong international dependencies in trade and investment that characterise our global economy today.[2] Instead, we would recommend the EU27 to look at the following avenues to strengthen its strategic resilience further:

Policy Recommendation 2: Strengthen global supply chains run by companies

Countries do not operate global supply chains; companies do. The EU27 should not retreat from global supply chains but instead support companies in strengthening their supply chains through: 1) Multilateral initiatives like the WTO 'Trade in Healthcare Products' initiative of the Ottawa group – removing tariffs and other barriers to global trade in pharmaceutical products; 2) Include in the EU's bilateral trade agreements clear and special provisions that would come to apply in a (global) pandemic stressing an obligation for the FTA partners to help each other, keep supply chains open, help each other with necessary raw materials, APIs and finished pharmaceutical products, and work together to increase production of necessary medicines. These provisions could also include an element to allow production in partner countries be designated upfront (again in case of a health emergency) for the EU27 (and vice versa); 3) Create a special bilateral dialogue between the EU and US to discuss joint EU and US import dependencies and export vulnerabilities towards third countries, deepen bilateral ties and strengthen openness and transatlantic supply chains.

[2] OECD (2020) "Building resilience in global supply chains for all", OECD Trade Committee, November 2020.

Policy Recommendation 3: Support companies to diversify global supply chains
Companies dislike import dependencies as much as countries because these could pose risks to production and ultimately the delivery of medicines. For those specific products where a high degree of supplier concentration is identified (22 out of 155 products amounting to 3.7% of EU imports), the EU27 should support companies that want to diversify their sources of supply via direct engagement and economic diplomacy, including via its global trade network and via the EU Industrial Strategy.

Policy Recommendation 4: Put more focus on security of supply in procurement
Compared to non-EU suppliers of APIs like China and India, the EU's cost base is much higher. Economically viable production of (critical) ingredients will therefore not likely move to Europe unless accompanied by very sharp increases in costs. Supply chains have also moved out of the EU27 due to a push in procurement contracts for lowest-price offerings. By including a significant weight in the award criteria for public tenders for security of supply, companies are given room to find new solutions to increase security of supply and with that increase the EU's level of resilience.

Policy recommendation 5: Increase the EU27s pandemic preparedness
Global supply chains function very well almost all the time. Also after a short period of stress at the outbreak of the COVID-19 pandemic, they performed very well, increasing production and supply by up to 900% in the face of surging demand. But the first 1-2 months are always challenging as production needs to be ramped up and that takes time. Ensuring for the permanent availability of some idle production capacity to take on unexpected and sudden surges in demand could buy global supply chains time to organise themselves and meet the challenge being faced.

Policy recommendation 6: Incentivise EU27-based production of intermediate and final pharmaceutical products
The EU27 is an attractive place to invest and produce pharmaceutical products, but also has its weaknesses (e.g. the high-cost base mentioned). It is therefore important that industries are not *forced* to relocate parts of production of supply chains to the EU27 but are *encouraged* to do so since this makes market forces fall in line – rather than work against – the EU's policy goal of increasing resilience. The EU could strengthen its attractiveness to manufacturing by: 1) Increasing incentives to manufacture in the EU27 (e.g. tax breaks, quality and security of supply criteria in public tenders) – mainly via a strong industrial strategy ; 2) Increase R&D incentives to ensure that manufacturing in innovative products, which is linked to R&D, has a reason to stay and grow in the EU27 – via the EU pharmaceutical and industrial strategies; 3) Maintain a strong skills base for manufacturing in the EU27 – via the EU employment and skills strategies; 4) Maintain the EU's attractiveness as a global trade hub via the EU new 'Open, sustainable and assertive trade strategy'.[3]

[3] European Commission (2021) "Open, sustainable and assertive EU trade policy", 18 February 2021. URL: https://ec.europa.eu/commission/presscorner/detail/en/ip_21_644 [accessed 1 May 2021].

Policy Recommendation 7: Reduce the EU's export vulnerabilities

While all attention goes to import dependencies, export vulnerabilities are the other sign of the same coin. If countries reduce their import dependencies, they also increase their export vulnerabilities. The EU27 has by far most to lose in this regard. For the EU27, the largest exporter of medicines in the world (63.8% of all medicines exported globally come from the EU27), and also the largest vaccine exporter globally, import reducing measures from trade partners will hurt these exports directly. The EU27 should support its export performance via its bilateral trade network and economic diplomacy and avoid that tit-for-tat measures starting from domestic resilience seriously harm EU27 exports. In particular, the EU should look at its export vulnerability towards the US, Japan, Russia and Canada. If the EU does not have a bilateral trade agreement in place (like for Japan and Canada) that could be used as a vehicle to reduce export vulnerability, the EU should engage pro-actively with key export destinations to ensure open trade (e.g. with the US and Russia).

Policy Recommendation 8: Monitor the EU27's relative global competitiveness

For long-term EU27 competitiveness in R&D and manufacturing of medicines, the EU27 should carefully monitor any competitiveness and industrial support initiatives by its main competitors (e.g. the US, China) and insert this information into a high-level dialogue between EU27 policy makers and key stakeholders, like medicines producers.

1. INTRODUCTION

Context

In Europe, while being in the midst of the COVID-19 pandemic, with light at the end of the tunnel due to the vaccines that have been developed and are becoming available, there is a big discussion about EU27 dependencies regarding pharmaceutical products, in particular Active Pharmaceutical Ingredients (APIs) and chemical raw materials. There are differences between different sub-sectors of the pharmaceutical industry. Several reports have been published on this.

On May 5, 2021, a Commission Staff Working Document on "Strategic dependencies and capacities" was published This report also concludes that EU27 resilience was strong, but some dependencies exist for specific products.[4] The report highlights the importance of the EU Internal Market ("unhindered Treaty freedoms"), competition policy, EU integration in diversified global value chains, and undistorted access to export markets, for crisis preparedness. It is a balanced review of some of the issues, especially in terms of the resilience of global supply chains and limited degree of import dependencies that exist. This document could, however, present a wider range of statistics that show different degrees of dependencies (especially show lower levels of dependency on China and India from many sources) and – for a total picture – does not focus sufficiently on export vulnerabilities that are the mirror image of import dependencies and that are an additional (counter)risk for major economies exporting pharmaceuticals (especially the EU27 as the world's largest pharmaceutical exporter).

EFPIA (2020, 2021) has done surveys among the innovative pharmaceutical membership to find that 77% of APIs for the EU27 are sourced in the EU (EFPIA, 2020).[5] The EFPIA (2021) survey goes into more detail and finds that 64% of APIs are manufactured in Europe. For chemical APIs, India and China together provide 29% of raw materials. But 59% of the origin of raw materials and intermediates for chemical APIs are manufactured in Europe. Medicines for Europe makes clear that global supply chains have been under enormous stress because the pandemic caused a massive demand surge for medicines. A lesson learnt, they indicate, is that there should be support for expanded manufacturing capacity for finished pharmaceuticals and APIs during a crisis, to be achieved through market policies and incentives.[6]

The European Fine Chemicals Group (EFCG) claims that *"Europe has gradually lost its ability to manufacture critical molecules (not only APIs but also their precursors) that form the composition of essential medicines. As a result, the European medicines supply*

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[4] European Commission (2021) "Strategic Dependencies and Capacities", Commission Staff Working Document, May 5, 2021.

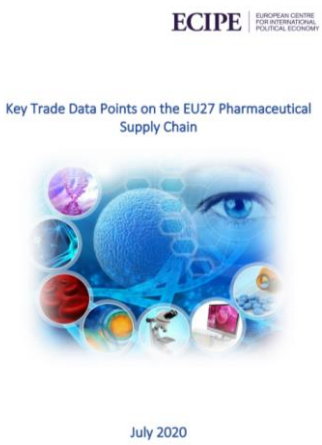
[5] EFPIA (2020), "Resilience and recovery: EFPIA response to the publication of the EU recovery plan", May 2020. URL: https://www.efpia.eu/news-events/the-efpia-view/statements-press-releases/resilience-and-recovery-efpia-response-to-the-publication-of-the-eu-recovery-plan/

[6] Medicines for Europe (2020), "Lessons Learned from COVID-19", Medicines for Europe Policy Paper, June 2020. URL: https://www.medicinesforeurope.com/wp-content/uploads/2020/06/Medicines-for-Europe-Lessons-learned-from-COVID19-policy-paper-10062020.pdf

chain depends for 74% on Asia."[7] [8] However, the data and 2020-report on which EFCG bases itself it not public, so we cannot transparently compare the methodologies used and figures found with our analyses and results. They do seem, however, not to be based on aggregate numbers but on IQVIA product level data. This means that the choice of molecules – if a selection – has a big impact on the dependency levels found.

Key Trade Data Points on EU27 Pharmaceutical Supply Chains (ECIPE, 2020)[9]

Our ECIPE (2020) study titled "Key Trade Data Points on the EU27 Pharmaceutical Supply Chain" did not go into the different sub-sector details but looked at total EU27 imports and exports, both in value and in volume terms (to address correct for the difference between high value added, higher priced innovative intermediates and generic ones), for finished pharmaceutical products, human medicinal products, active pharmaceutical ingredients, antibiotics, and vaccines. This study therefore provides the 'trade-weighted average' of all the sub-sector details because Eurostat does not distinguish between innovative or generic industries. In that study we found that:



- The EU27 imports pharmaceuticals products that arrive from many countries, but the majority of imports come from Europe itself (EU27, UK, and Switzerland).
- Even in terms of import volumes, the EU27 sources most of its imports from the EU27 itself. China come at a distant second place in volumes of pharmaceutical.
- The EU27 itself is the main export destination of EU pharmaceutical products accounting for most of the value of exports and the US comes in second place.

Structure of this ECIPE (2021) study

This study builds on the ECIPE (2020) work, extending the analysis in various ways:

- First – in Chapter 3 – we detail the main outlook for imports and exports but also for domestic EU production for 2019 (in addition to the ECIPE (2020) study).
- Second – in Chapter 4 – we add a time trend to our analysis, also looking at 2010 and 2015 (in addition to the 2019 figures) to see how imports and exports shares have evolved over the last decade. We also comment on the pandemic shock for pharmaceutical products in 2020.
- Third – in Chapter 5 – we broaden the definition of 'dependency' from only the share of imports to also look at the number of sources of supply of pharmaceuticals and intermediates and how these supplies are concentrated.

We use a list of 155 pharmaceutical products in COMEXT (8-digit level of detail) and its equivalent list of 51 pharmaceutical products in PRODCOM as explained in the Annex.

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[7] EFCG (2020), "Building a resilient and sustainable EU Health Industry", December 2020. URL: https://efcg.cefic.org/mediaroom/building-a-resilient-and-sustainable-eu-health-industry/

[8] This is a view that is also presented by the Chemical Pharmaceutical Generic Association Report (2015).

[9] ECIPE (2020). Key Trade Data Points on the EU27 Pharmaceutical Supply Chain. Available at: https://ecipe.org/wp-content/uploads/2020/07/Pharmaceutical-data_July-2020.pdf

This allows for a very detailed level of product analysis. We look at the data from the perspective of Europe, which includes the EU27 (as of February 1, 2020), Switzerland and the UK – as was done in the ECIPE (2020) report.

Some key elements of our analysis are the following:

- Our analysis covers both trade in value (Euro) and trade in volume (tonnes) terms.
- Our analysis of imports and exports flows compares the intra-EU trade and extra-EU trade, as well as production. The report develops a methodology to compare trade and production statistics. In the text, all the countries not considered to be part of the EU27 constitute what we call non-EU or extra EU (but Switzerland and the UK are included in 'Europe').
- The main year of study is 2019, except for Chapter 4, where we look at trends in production, trade, and dependencies, comparing 2010, 2015 and 2019. In addition, we present a short outlook on the import and export situation during 2020, the year of the Covid-19 pandemic.
- In Chapter 5, we present a detail analysis of EU27 import dependency and export vulnerability looking at the market concentration of EU27 imports and exports for each of the product and the share of EU27 imports and exports from non-EU countries.

In the Annex, we provide a description of the methodology used to match production and trade codes, and a short description of the data gathered for the project. We transparently describe all the methodological steps taken. The Annex also includes tables with the selected production codes, trade codes, and the corresponding matching.

2. A SUMMARY OF THE METHODOLOGY

There are three objectives of this study: (1) To match production statistics with trade statistics from Eurostat in order to undertake an analysis of the consumption of EU pharmaceutical products and to understand the relevance of imports for that consumption; (2) To provide a trend analysis in addition to the 2019 statistics to see how imports have evolved over time from 2010 – 2019; (3) To broaden the definition of 'dependency' and 'vulnerability' from import and exports shares only to also looking at the market concentration of international supplies and export destination of pharmaceutical products.

Objective 1: Production and trade statistics

Production values are included in the Eurostat PRODCOM database. This database also includes exports and import data although it does not differentiate from which trade partners the imports are sourced and which markets EU27 products are exported to. Therefore, we use the Eurostat COMEXT database to gather data on exports and imports of pharmaceutical products by country.

We mapped the concordance between CNs used in COMEXT for trade data with the PRODCOM nomenclature used with the production data. We checked that the import and exports figures in PRODCOM were equivalent to the figures reported in COMEXT. We performed several checks and the necessary adjustment to be confident that the PRODCOM exports and imports figures for 2019 were very similar to the exports and import figures published under COMEXT. See Annex 1 for a more detailed explanation.

The assessment of production and trade data to approximate consumption has to be done with caution as Eurostat reports that comparison of production, import, and export data is complicated by the way these statistics are collected[10]. This caveat and a more detailed explanation of the methodology is included in Annex 1.

Objective 2: Time-trend for EU 'dependency' in pharmaceuticals

Trade statistics from COMEXT were collected to present EU27 imports and exports for 2019, 2015, and 2010. An exhaustive analysis of 2019 was done presenting exports and imports of pharmaceutical products by sourcing and destination country and by each pharmaceutical category. To ensure that the conclusions from the 2019 data analysis were consistent, the same analysis was undertaken for 2015 and 2010 showing the relative changes in imports and exports by volume and value for trade partner and product category. In addition, an analysis of the changes in intra and extra-EU exports and imports was done for the year 2020 to explore the potential effects of Covid-19 on the exchange of pharmaceutical products.

[10] "The value of exports cannot always be compared directly with that of sold production. The latter is based on the ex-work selling price, whereas exports are evaluated at the time the goods cross the border. In addition, imported goods can be exported again with a different value, either without being modified or after industrial processing (e.g. textile finishing or surface treatment) which is not linked to external trade in Europroms." Eurostat. Europroms, PRODCOM Data. Available at: https://ec.europa.eu/eurostat/documents/120432/4433294/europroms-user-guide.pdf/e2a31644-e6a2-4357-8f78-5fa1d7a09556

Objective 3: Broadening the definition of EU 'dependency' in pharmaceuticals

The definition of EU27 dependency in imports and EU vulnerability in exports was expanded to include: share of extra-EU import and exports over total EU imports and exports; number of suppliers and export destinations; and the market concentration of imports and exports across countries and for every product. Using this information, we developed a new conceptual framework which classifies EU imports and exports in value and volumes terms in four categories:

(1) High dependency (high extra-EU imports, high supplier concentration).
(2) Limited dependency (low extra-EU imports, high supplier concentration).
(3) Low dependency (low extra-EU imports, low supplier concentration); and
(4) Limited dependency (high extra-EU imports, low supplier concentration).

In addition, we created an analogous framework for EU exports using the term vulnerability instead of dependency. This conceptual framework was populated with our data analysis to show which products the EU presents a high level of import dependency and export vulnerability and how important these products are in terms of their total value and volume.

3. IMPORTS, EXPORTS, AND DOMESTIC PRODUCTION

In the ECIPE (2020) report, we focused on the imports and exports of different categories of pharmaceutical products. For consistency reasons, in this study, we will use the same classification:

- **All pharmaceutical products:**
  - **Human Medicinal Products (HMP)**
    - Finished Pharmaceutical Products (FPP)
    - Vaccines
  - **Finished Pharmaceutical Products (FPP)**
    - Finished Pharmaceutical Products
    - Antibiotics Finished Pharmaceutical Products
  - **Active Pharmaceutical Ingredients**
    - Active Pharmaceutical Ingredients
    - Antibiotics Active Pharmaceutical Ingredients
  - **Vaccines**
  - **Antibiotics**
    - Antibiotics Finished Pharmaceutical Products
    - Antibiotics Active Pharmaceutical Ingredients
  - **Semi-Finished Products (SFP)**

As said before, we use a list of 155 pharmaceutical products in COMEXT (CN8s) and its equivalent list of 51 pharmaceutical products in PRODCOM (PRC) as explained in the Annex. The detailed list of how all these products are classified can be found in Annex. We look at the data from the perspective of Europe, which includes the EU27 (as of February 1, 2020), Switzerland, and the UK – as was done in the ECIPE (2020) report.

3.1 DOMESTIC PRODUCTION AND IMPORTS OF PHARMACEUTICAL PRODUCTS

3.1.1 Domestic EU consumption

EU consumption of pharmaceutical can be approximated as EU production of pharmaceutical minus EU exports plus EU import of pharmaceutical products. However, the comparison of production and trade statistics is complicated since there is not a perfect matching between both datasets. The steps taken to build a dataset that allows for the comparison of EU production and trade statistics is explained in Annex 1. Despite the efforts to match production and trade statistics, the figures produced to proxy for EU consumption must be read with caution since production and trade statistics are not measured in exactly the same way. This lack of comparability leads to EU export figures being higher than EU production for two of the 53 product codes.

Table 3.1 shows EU production, imports, exports, and consumption of pharmaceutical products divided by our main categories, both for domestic EU27 consumption and exports.

Table 3.1. Production, imports, exports, and consumption of EU27 pharmaceutical products (2019)[11]

	Production	Imports	Exports	EU27 Consumption
HMP-FPP	109,863	55,738	137,551	28,050
HMP-VAC	17,655	2,428	12,512	7,571
API	47,052	37,149	39,602	44,600
ANT	8,483	4,478	6,503	6,458
SFP	11,229	9,425	8,875	11,779

Source: Eurostat. Authors' calculations.

The analysis of the data shows more than half (51%) of EU pharmaceutical products consumed in the EU are manufactured domestically. The EU exports more than what it imports across all categories but SFP. As a result of its success exporting pharmaceutical products, the percentage of pharmaceutical production which is consumed in the EU is equal to 26% for HMP-FPP; 43% for HMP-VAC; 95% for API; and 76% for ANT. In the case of SPF, the amounts of production, imports, and exports are of a similar scale. This is probably because SFP are traded across borders to be processed as part of pharmaceutical supply chains. Supply chains and the processing of products must be considered when interpreting the data since some of EU imports might not be destined for domestic consumption but used as inputs for the production of other pharmaceutical products which are later consumed internally or exported outside the EU under a different category.

3.1.2 Domestic EU production by pharmaceutical category

Based on the PRODCOM database, we find that total EU domestic production of pharmaceuticals (both innovative and generic) and APIs are as presented in Table 3.2. After having adjusted the production data to match trade data, the largest domestic production of pharmaceuticals comes from Ireland (€40.3 bn) followed by Germany (€28.0 bn) and France (€21.1 bn). For APIs, the largest producer of these products is Ireland (€13.5 bn), followed by Germany (€9.1 bn) and Italy (€5.0 bn). Total EU domestic production of all pharmaceutical products – the sum of all EU27 Member State levels of domestic production – amounts to €188.7 bn, while the total of EU27 API production is €47.1 bn.

Following the methodology described in Annex 1 that was developed to allow the comparison of production and trade statistics, the production of pharmaceutical is broken down as follows: HMP-FPP (57%); HMP-VAC (9%); API (24%); ANT (4%); and SFP (6%).

To put the figures of EU production of pharmaceutical products into perspective, Table 3.2 below compares EU27 domestic production of pharmaceutical products with imports from its main trade partners that are combined for EU27 domestic consumption and exports. We find that for APP, the EU27 produces 64.2% domestically and imports 35.8%, of which 16.9% from Switzerland and the UK. 18.9% of APPs are imported from outside Europe. For APIs, the share of EU27 domestic production is 57.8% (for EU27

[11] A methodological explanation of the way we have matched and compared production and trade data – including some of the challenges – can be found in Annex 1.

domestic consumption and exports), 17.5% is imported from other European countries and 24.7% is imported from outside Europe, mainly the US, China and India.

Table 3.2. Domestic EU27 production and imports of APP and API for EU27 consumption and exports (2019, values, and percentage)

All Pharmaceutical Products (APP)		
Country	**€ bn**	**% share**
Total	293.6	100.0%
EU27	188.7	64.2%
UK	11.4	4.2%
CH	38.2	13.9%
US	25.5	9.3%
China	6.8	2.5%
India	3.9	1.4%
Rest of countries	12.3	4.2%

Active Pharmaceutical Ingredients (API)		
Country	**€ bn**	**% share**
Total	81.5	100.0%
EU27	47.1	57.8%
UK	2.2	2.7%
CH	12.1	14.8%
US	6.2	7.6%
China	5.3	6.5%
India	2.5	3.1%
Rest of countries	6.1	7.5%

Source: Eurostat. Authors' calculations.

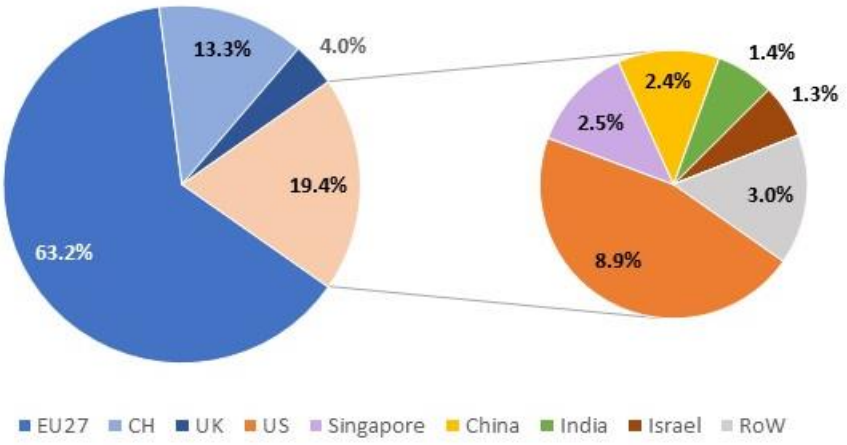
3.2 IMPORTS OF PHARMACEUTICAL PRODUCTS.

3.2.1 EU27 imports (value, volume terms) for All Pharmaceutical Products

Imports in value terms

Focusing on 2019, based on 8-digit detailed products, we find that the EU27 imported €286 bn in all pharmaceutical products from both the EU27 itself and third countries. From these sums, as shown in Figure 3.1, 81.0% of imports in value terms (€231 bn) came from Europe (63.2% comes from EU27, 13.3% from Switzerland and 4.0% from the UK) and 19% from outside Europe, mainly from the US (8.9%), Singapore (2.5%), China (2.4%) and India (1.4%).

Figure 3.1. EU27 imports (values) of all pharmaceutical products (2019, %)



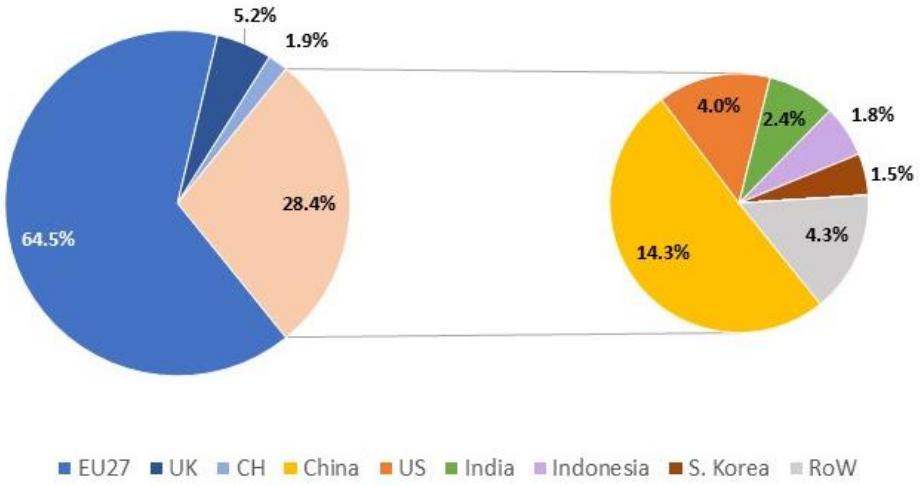
Source: Eurostat. Authors' calculations.

Imports in volume terms

If we focus on quantities, the overview changes. 71.6% of all imports of pharmaceuticals in volume terms come from Europe (64.5% from the EU27 itself, followed by 5.2% from

the UK and 1.9% from Switzerland – a total of 3.9 mln tonnes).[12] The top ten non-European partners also change in order: China is the largest non-European provider of pharmaceuticals with 14.3% of the total volume, followed by the US (4.0%) and India (2.4%). Total EU27 imports in 2019 in volume terms amounted to 5.5 million tonnes.[13] This is shown in Figure 3.2.

Figure 3.2. EU27 imports (volumes) of all pharmaceutical products (2019, %)



Source: Eurostat. Authors' calculations.

3.2.2 EU27 imports (value, volume terms) by pharmaceutical category

Imports in value terms

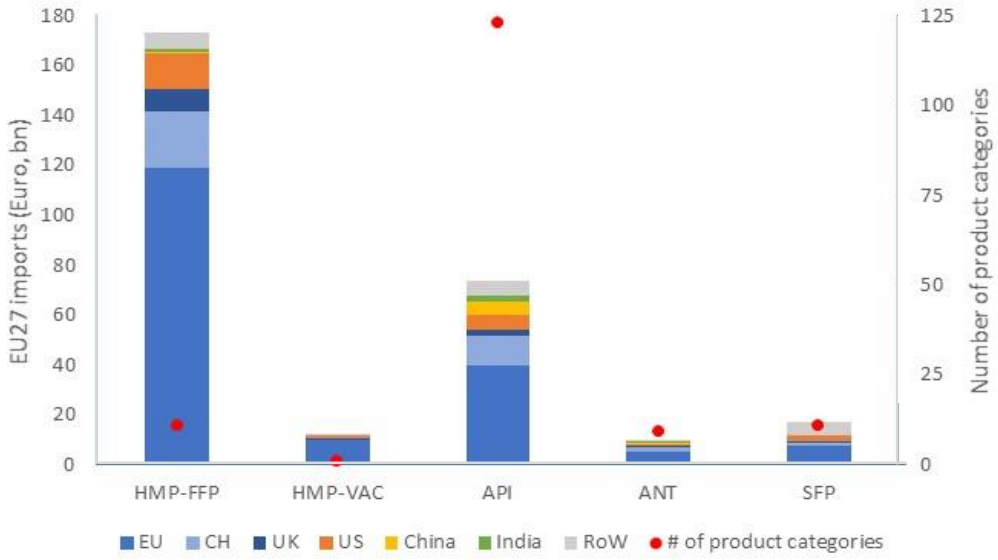
When looking at the *value* of imports for the different pharmaceutical categories (Figure 3.3) – splitting out APP into HMP-FPP, HMP-VAC, API, ANT - we see that the EU imports €185.7 bn in HMP (HMP-FFP + HMP-VAC), including €12.2 bn in vaccines, €78.7 bn in APIs, and €9.5 bn in antibiotics. This totals €286 bn. The largest number of product categories are in APIs.

We see that for HMP-FPP, the share of imports coming from Europe (EU27, UK, CH) is 86.7%, while the import share coming from the US is 8.5% and China 0.3%. This shows that for Human Medicinal Products, the EU is already very resilient. Regarding vaccines, the EU27 is the source of 84.0% of imports, followed by the US (11.2%) and UK (2.8%). This means that after the EU27, Switzerland is the most important source country for HMP in the EU (for FFP and Vaccine combined). For APIs the picture is a bit different. 53.4% of API imports originate from the EU27 itself (72.7% from Europe as a whole), followed by 8.4% from US, 7.2% from China and 3.4% from India.

[12] The 155 products turn to 151 entries, since 4 products were not reported as imported from any country (30034300, 30034900, 29395100 and 29396200).

[13] The total value of EU pharmaceutical imports by volume is not equal to the sum of the import volume of all pharmaceutical categories because some product codes belong to more than one category.

Figure 3.3. EU27 imports by source country and # of product categories (2019, €)

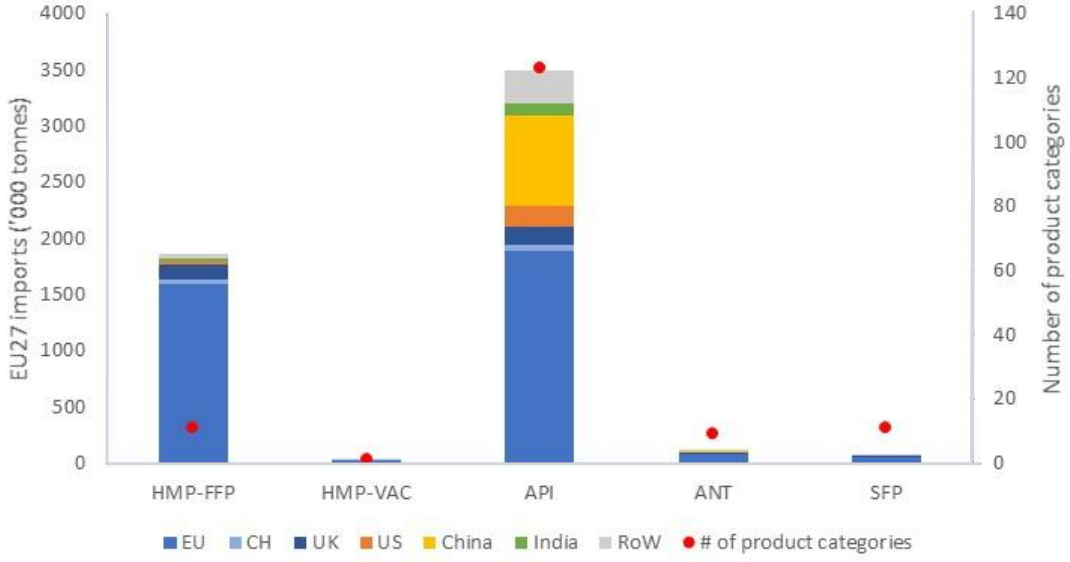


Source: Eurostat. Authors' calculations.

Imports in volume terms

When looking at imports in absolute quantities (in tonnes), we can do the same analysis. What is interesting to see, when comparing Figure 3.3 above (in value terms) with Figure 3.4 (in volume terms) is that the share of API is much higher in volume (62.8%) than in value (22.8%) terms, while the share of HMP (FPP) is much lower.

Figure 3.4. EU27 imports by source country and # of product categories (2019, volumes, tonnes)



Source: Eurostat. Authors' calculations.

While Europe (EU27, UK and CH) is still resilient regarding the imports for all the pharmaceutical categories in volume terms (95.3% of HMP and 58.6% of APIs), the import shares are higher in volume than in value terms, especially for APIs. The main source of APIs outside Europe is China (22.6%), followed by US (5.7%) and India (3.1%).

While the Chinese import share in APIs is 22.6%, which is significant, it is not close to the 75% or 80% as EFCG or other sources have claimed.[14] This analysis based on Eurostat data is confirmed by the EFPIA membership survey. For Human Medicinal Products, the European import share is 95%, followed by India (1.2%) and the US (1.1%).

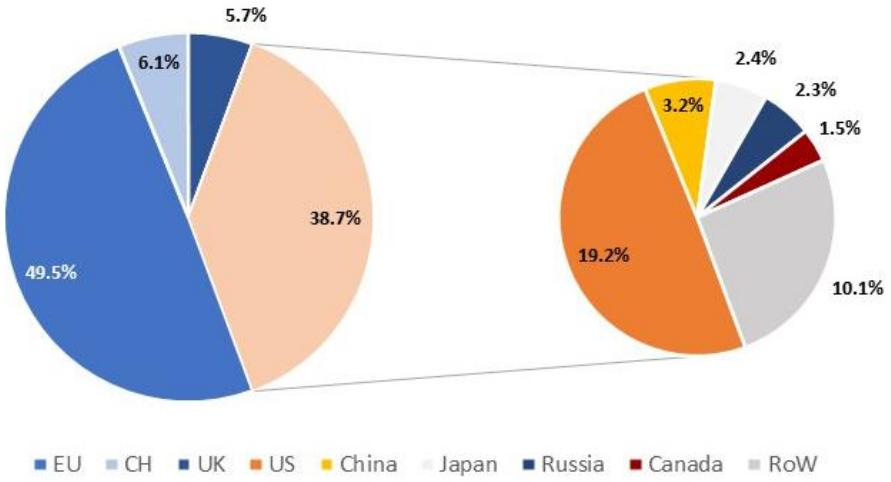
3.3 EXPORTS OF PHARMACEUTICAL PRODUCTS.

3.3.1 EU27 exports (value, volume terms) for All Pharmaceutical Products

Exports in value terms

If we analyse the destination of EU27 pharmaceutical products, i.e. EU27 exports of all pharmaceutical products (APP), the main export destination is the EU27 itself (49.5%), followed by the US (19.2% of exports). We find that exports seem to be more diversified than imports. This time, the "Rest of the World" (non-EU exports value destinations apart from the top export destinations) represents 10.1% of the total value in 2019. This is shown in Figure 3.5.

Figure 3.5. EU27 exports (values) of all pharmaceutical products (2019, %)



Source: Eurostat. Authors' calculations.

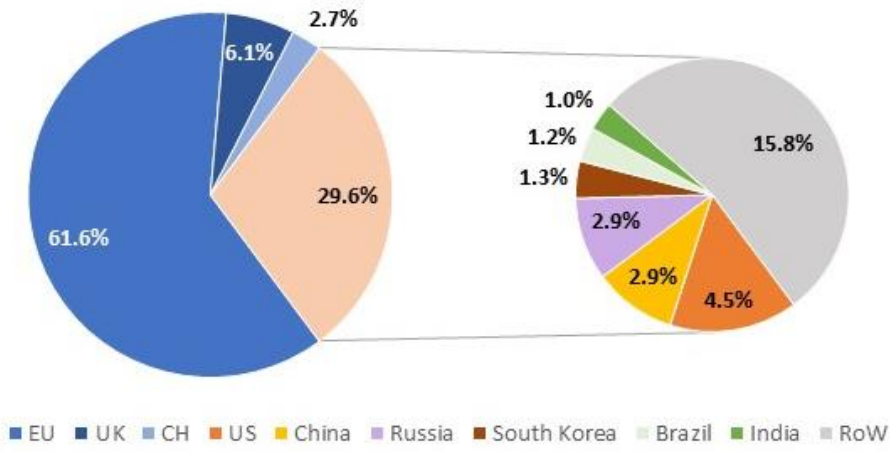
Exports in volume terms

If we analyse the destination of EU27 pharmaceutical products, i.e. EU27 exports of all products in terms of volumes, the overview of exports changes as non-EU destinations become even more diversified (see Figure 3.6).

Most exports go to Europe (EU27 61.6%, UK 6.1%, CH 2.7%), followed by exports to US (4.5%), Russia (2.9%) and China (2.9%) but the rest of the world represents now 13.0% of exports volume. United States goes to the third place as a destination with 4.5% of EU27 exports volume.

[14] EFCG (2020), "Building a resilient and sustainable EU Health Industry", December 2020. URL: https://efcg.cefic.org/mediaroom/building-a-resilient-and-sustainable-eu-health-industry/

Figure 3.6. EU27 exports (volumes) of all pharmaceutical products (2019, %)



Source: Eurostat. Authors' calculations.

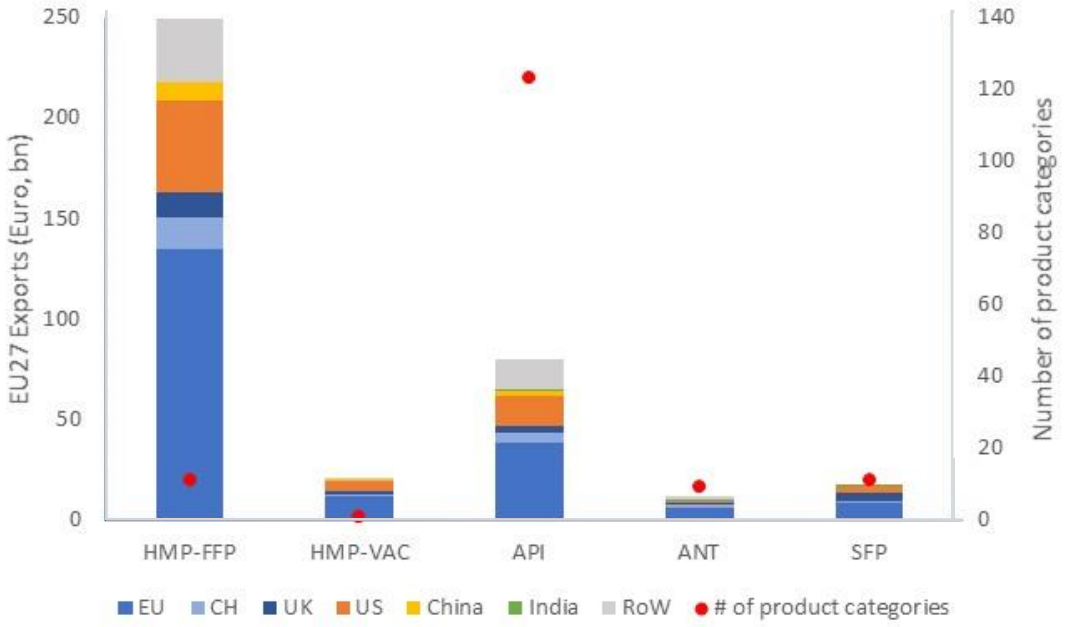
3.3.2 EU27 exports (value, volume terms) by pharmaceutical category

Exports in value terms

The total value of EU27 exports in 2019 was €366 bn. If we divide the pharmaceutical exports into the pharmaceutical categories, we find that the main export category in value terms is Human Medicinal Products (73.8% for FPP and VAC together) followed by Active Pharmaceutical Ingredient (API) exports (21.9%).

Most HMP go to Europe itself (65.6%), followed by 18.8% to the US and 3.5% to China. For APIs, the picture is a bit different. While most API exports still go to other EU27 Member States (47.8%), 19.4% goes to US and 2.7% goes to China. This is shown in Figure 3.7.

Figure 3.7. EU27 export shares for different pharmaceutical categories (2019, value %)

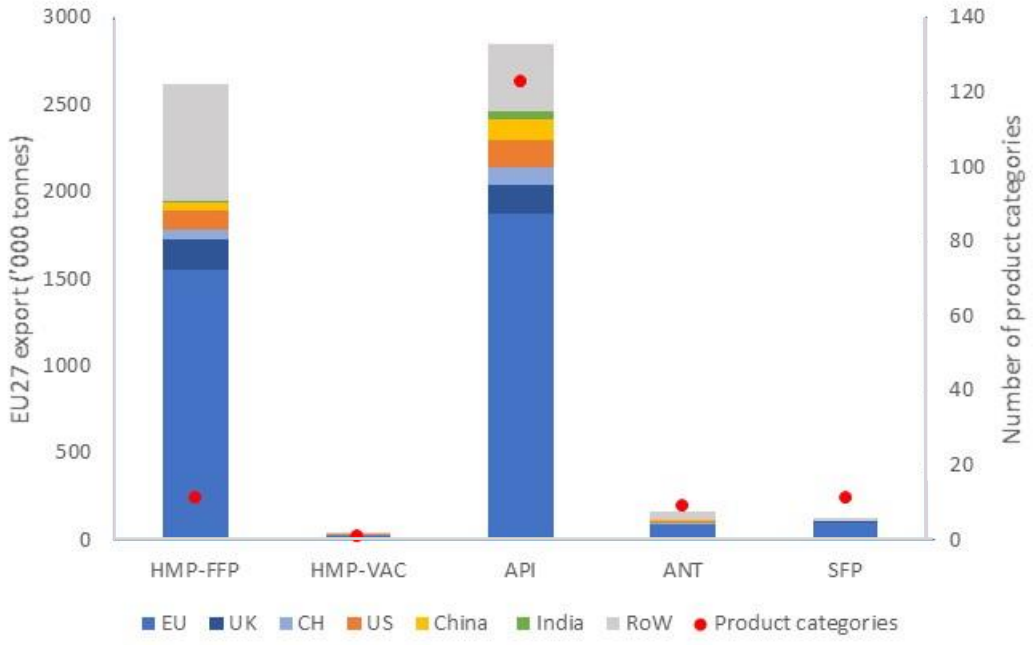


Source: Eurostat. Authors' calculations.

Exports in volume terms

The total volume of exports for the EU27 in 2019 was 5.65 million tonnes. As we did for imports, if we check the categories in terms of volumes, API exports now represent 50.4% of the EU27 export volumes, closely followed by exports in Human Medicinal Products with 47.0%. In general, we can say that the EU27 imports more APIs in volume terms than it exports, but – vice versa – exports more human medicinal products in volume terms than it imports. This makes sense, because we know that the EU uses APIs to produce final medicinal products, including for exports. If we look at the split out into destinations for EU exports (see Figure 3.8), we see that 59.0% is exported to the EU27 itself, 2.0% to Switzerland and 7.0% to the UK (totalling 68.0% to Europe). 4.0% is exported to the US and a significant 19.4% of all medicines goes to a wide range of partners that all have an export share of less than 1%. This is the Rest of World (RoW) category in Figure 3.8.

Figure 3.8. EU27 export shares for different pharmaceutical categories (2019, volumes, tonnes)



Source: Eurostat. Authors' calculations.

3.4 MAIN CHAPTER TAKEAWAYS

The main conclusions we can draw from this Chapter are:

- 64.2% of EU27 domestic consumption and exports for All Pharmaceutical Products is produced in the EU27 itself. 16.9% is imported from other European countries and 18.9% from outside Europe.
- 57.8% of EU27 domestic consumption and exports for APIs is produced in the EU27 itself. 17.5% is imported from Switzerland and the UK, and 24.7% from outside Europe, especially the US, China and India.
- Of all pharmaceutical product imports, in value terms, 81.0% comes from Europe (EU27 62.3%, CH 13.3% and UK 4.0%). 8.9% comes from the US, 2.5% from Singapore

and 2.4% from China. Looking at the volume of imports, 71.6% of all pharmaceutical products comes from Europe with 14.3% coming from China, 4.0% from the US and 2.4% from India. This points to a very high degree of resilience of the EU pharmaceutical industry (both innovative and generic) down to the 8-digit product level.

- Looking at imports of Active Pharmaceutical Ingredients (APIs), we find that APIs account for €78.7 bn in value terms and 3.5 million tons in volume terms. Import dependencies are higher for APIs and even higher in volume terms compared to the value of imports, but the EU economy still displays a significant degree of resilience.
- The EU has a very strong export performance for all pharmaceutical categories, especially finished Human Medicinal Products – with a trade surplus for this category alone of €85 bn in 2019. The EU is the main supplier of APIs for the US. While EU HMP exports are much larger than EU HMP imports, EU API imports are larger than EU API exports, especially in volume terms – though the largest supplier is the EU itself. The reason why EU API imports are larger than EU API exports is because the EU uses the bulk of the APIs to produce final Human Medicinal Products – as shown by the EU's export performance for that category. So the API imports are needed to fuel the EU's strong export performance.

This Chapter clearly shows that a high level of overall resilience for the EU27 in value and volume terms for all pharmaceutical categories (also APIs) exists. EU import dependencies are higher in volume than in value terms, especially for APIs. But even for APIs, including raw materials and intermediates for chemical APIs, that are included in the Eurostat statistics, dependency on China is a mere 22.6% and not 75% as other claim.

But while the EU27 may be resilient today, it is also important to look at how EU27 imports have evolved over time and whether the EU is resilient for all products, not just on average. The change of EU exports and imports is the focus of the next Chapter of our analysis, while in Chapter 5 we will look at individual product import dependencies and export vulnerabilities.

4. EU27 EXPORT AND IMPORT TRENDS IN PHARMACEUTICALS

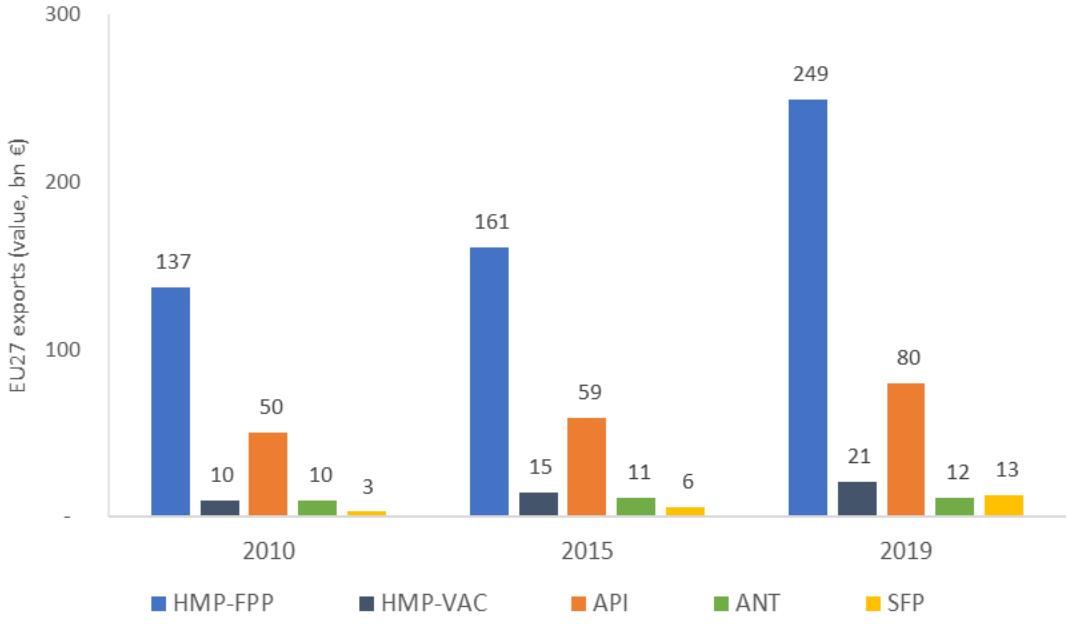
In the previous Chapter, we looked at and concluded that EU27 resilience in terms of value and volume imports of pharmaceuticals – split into different categories – is high overall for the year 2019. To avoid this being a snapshot for 2019 only, we compared values and volumes of imports and exports for the years 2010 and 2015 with our findings for 2019 – not only for export and import totals, but also splitting these out into source and destination countries.

4.1 EXPORT TRENDS 2010 - 2019

Exports in value terms

For total EU27 exports of pharmaceuticals, see Figure 4.1, we see a clear increase between 2010 and 2019 for HMP-FPP, HMP-VAC, APIs, ANT and SFP. As we saw in the previous export analysis, APIs are not the first group in terms of export value for the EU27. From 2010 until 2019, the export value of All Pharmaceutical Products (APP) has increased by 77.9% compared to 2010.

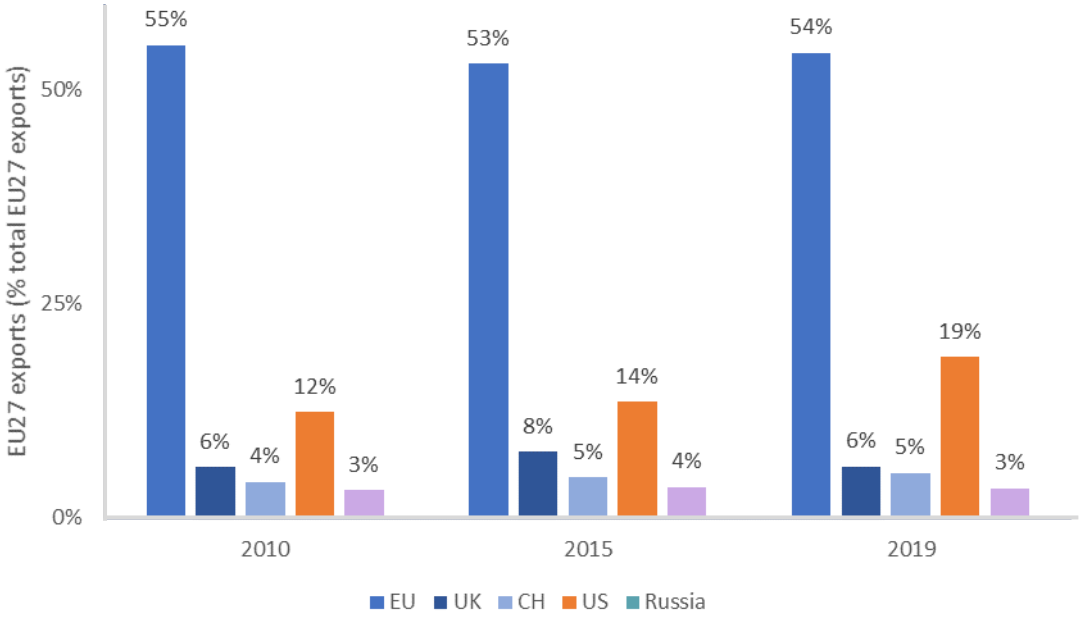
Figure 4.1. EU27 exports (value) of pharmaceutical categories (2010-2019)



Source: Eurostat. Authors' calculations.

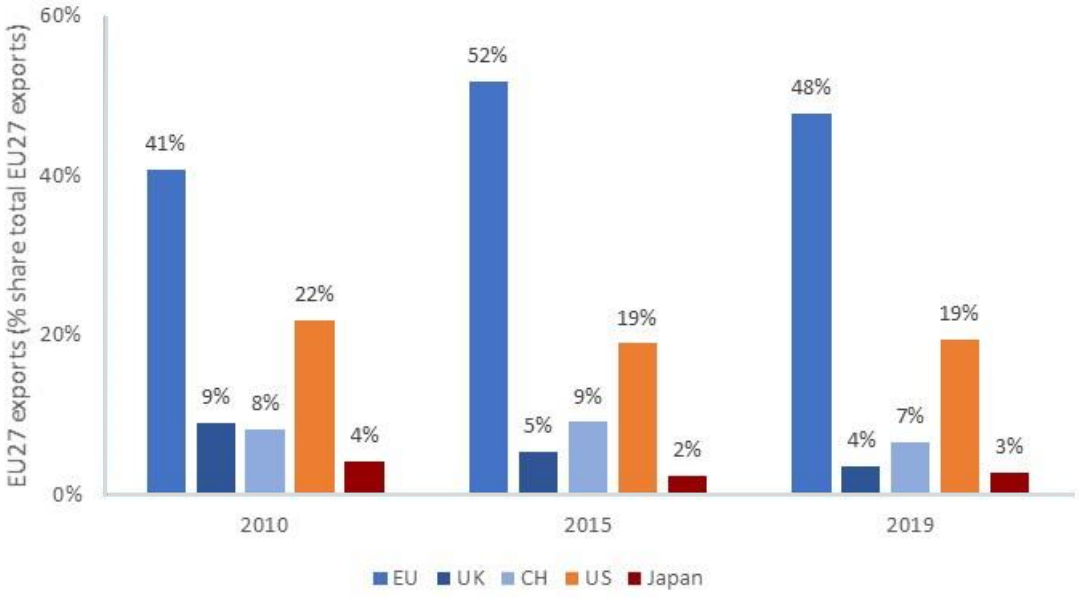
The main destination of EU27 exports is Europe itself. Figures 4.2 and 4.3 show that this holds in value and volume terms HMP but also for APIs. In terms of the value of exports, Figure 4.2 shows that the share of HMP exports from EU27 that goes to other EU27 countries has been relatively stable during the last ten years and the share going to the US has increased from 12.4% to 18.8%. Figure 4.3 shows that Europe is its own main export destination in terms of APIs with (47.8%) while the US remains the second largest destination with 19.4%. These numbers have been quite stable from 2010 onwards.

Figure 4.2. Top 5 Countries EU27 exports HMPs (2010-2019, value - %)



Source: Eurostat. Authors' calculations.

Figure 4.3. Top 5 Countries EU27 exports APIs (2010-2019, value - %)

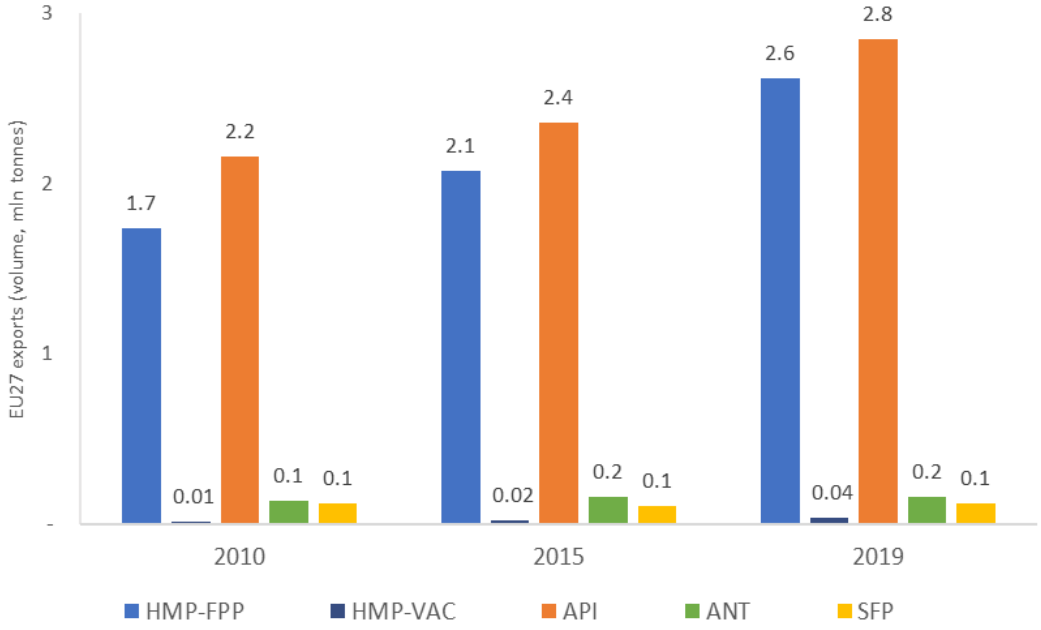


Source: Eurostat. Authors' calculations.

Exports in volume terms

Things change if we check exports in terms of volumes. This time the increase in all pharmaceutical products over these years has been 39.1%. The relative importance of APIs has decreased marginally over time, from a share of 51% in 2010, down to 48% in 2019. Whereas Human Medicinal Products have grown from 43% in 2010 to 47% of total export volumes for the EU27 in 2019. These two groups constitute more than 95% of exports for the EU27 in volume terms. This is shown in Figure 4.4.

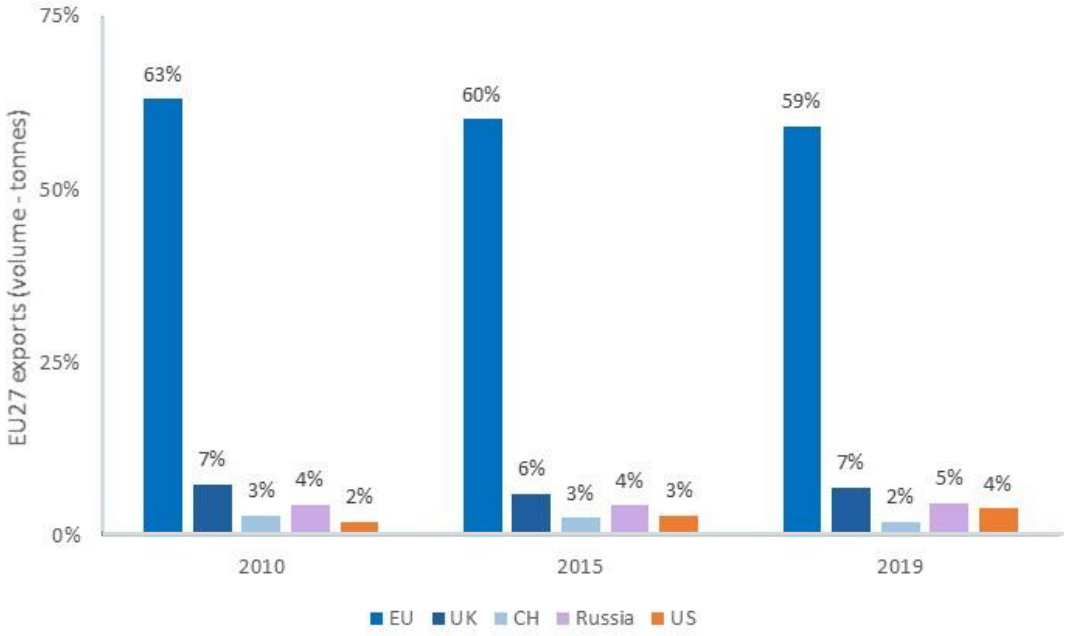
Figure 4.4. EU27 exports (volume) of different pharmaceutical categories (2010-2019, volume – tonnes)



Source: Eurostat. Authors' calculations.

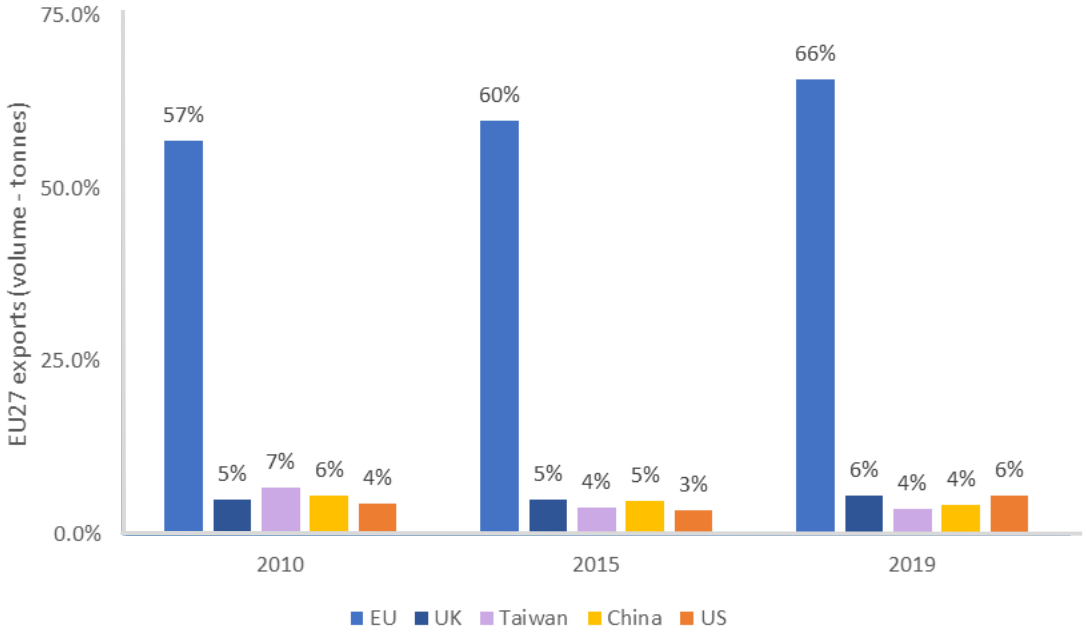
In terms of the destination of EU27 pharmaceutical products by volume for HMP and APIs, Europe remains the largest destination of EU27 exports. There is a slight fall in the percentage of EU27 exports of HMP to the EU27 that went from 63% in 2010 to 59% in 2019. Figure 4.5 also shows that Russia is one of the top 5 destinations of EU exports of HMP by volume. For APIs (Figure 4.6), Taiwan (5.3%), China (4.1%), and US (5.5%) are the three non-European destination and their shares have been relatively stable over the last 10 years.

Figure 4.5. Top 5 Countries EU27 export HMPs (2010-2019, volume – tonnes)



Source: Eurostat. Authors' calculations.

Figure 4.6. Top 5 Countries EU27 export APIs (2010-2019, volume – tonnes)



Source: Eurostat. Authors' calculations.

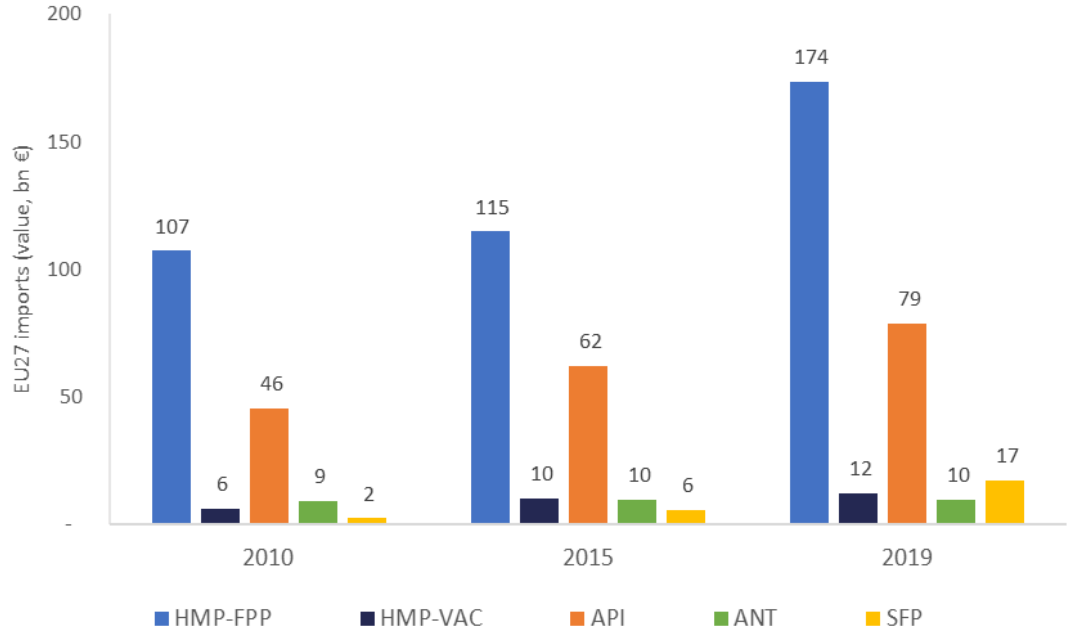
4.2 IMPORT TRENDS 2010 - 2019

Imports in value terms

The importance of imports is in part explained by the global value chain nature of the pharmaceutical industry: imports are needed to produce more Human Medicinal Products for EU27 exports. The value of imports increased steadily from 2010 to 2019, but at a lower rate than exports (see previous section). The fact that imports grow at a slower pace than exports, suggests that EU27 resilience has increased over the past decade. The only pharmaceutical category where we witness an absolute decline in imports from 2015 to 2019 is in antibiotics (see Figure 4.7). If we look at the two categories that constitute this group, imports of antibiotic FPPs imports have decreased constantly since 2010. For antibiotic APIs, there was an upturn in 2015, but the value decreased again between 2015 and 2019. Overall, the import value of antibiotics between 2015 and 2019 was reduced by just 2.2%.

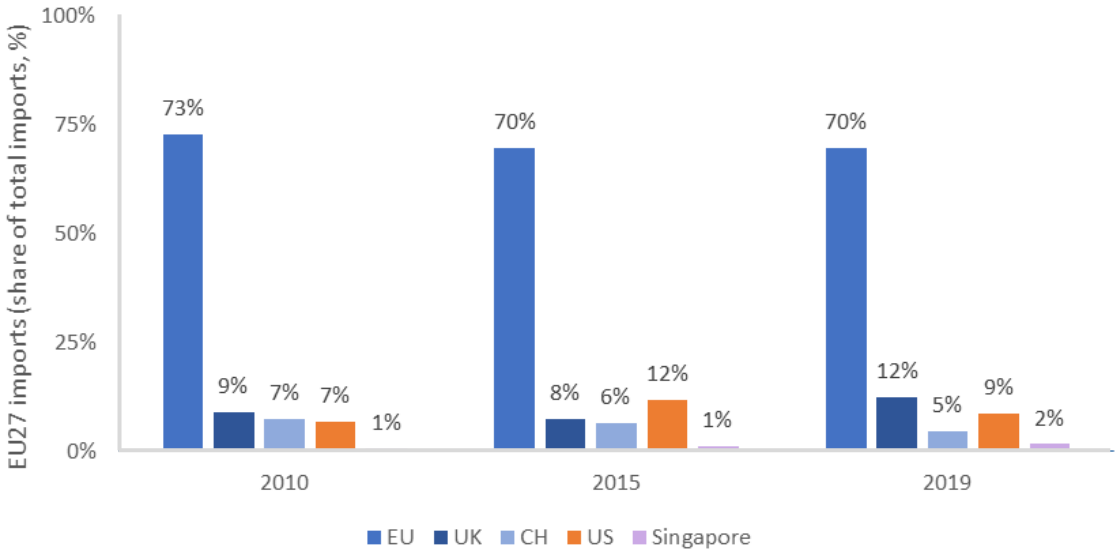
As explained in Chapter 3, the main source of EU27 imports is Europe itself (EU27, UK, and Switzerland). Figure 4.8 and Figure 4.9 show that the relevance of Europe as the source of imports for HMP and APIs has remained stable over the last decade. Even though Europe is a more important source of imports for HMP (86.7%) than for APIs, the share of EU27 total imports that come from Europe is still 72.7%.

Figure 4.7. EU27 imports (value) of different pharmaceutical categories (2010-2019)



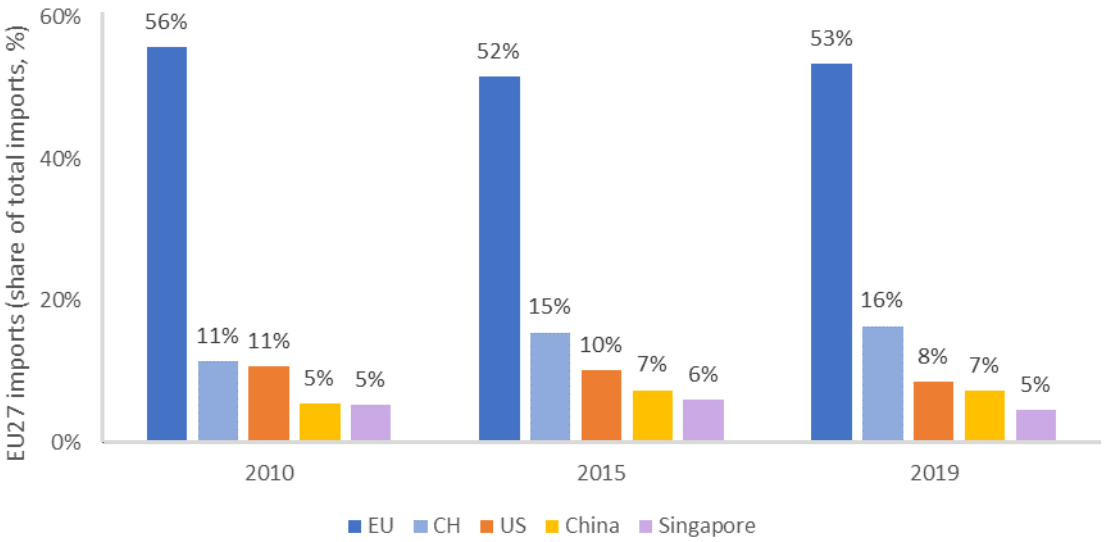
Source: Eurostat. Authors' calculations.

Figure 4.8. Top 5 Countries EU27 imports HMPs (2010-2019, value - %)



Source: Eurostat. Authors' calculations.

Figure 4.9. Top 5 Countries EU27 imports APIs (2010-2019, value - %)

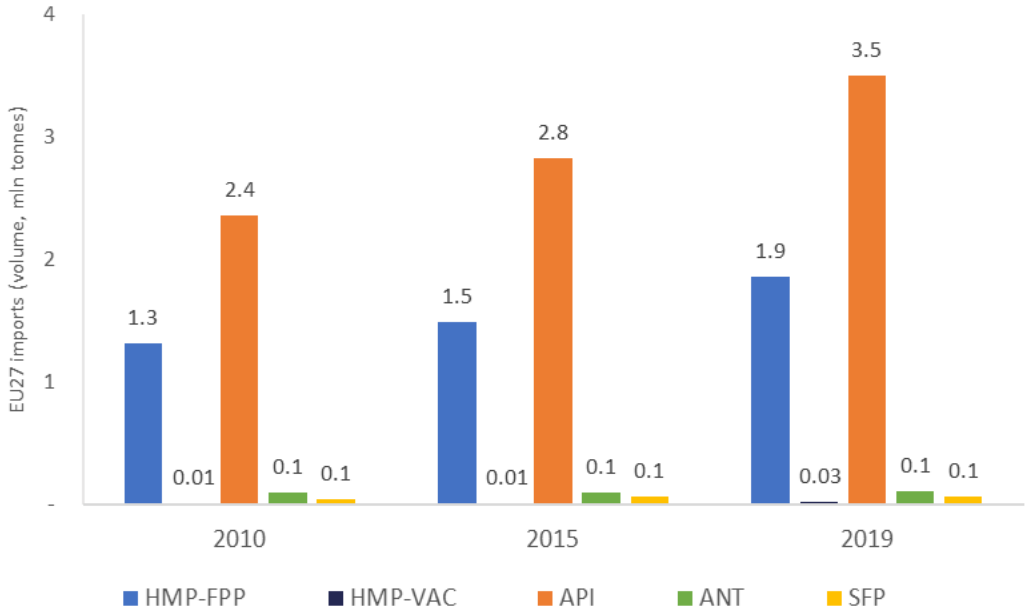


Source: Eurostat. Authors' calculations.

Imports in volume terms

If we do the same comparative analysis in terms of imports in volume terms, we find that imports for all pharmaceutical categories have increased between 2010 and 2019 (except for imports in the quantity of antibiotics for 2015). APIs are now the first group in volume terms and their share in total pharmaceutical imports has gone up marginally from 60,8% in 2010 to 62,3% in 2019 – as shown in Figure 4.10.

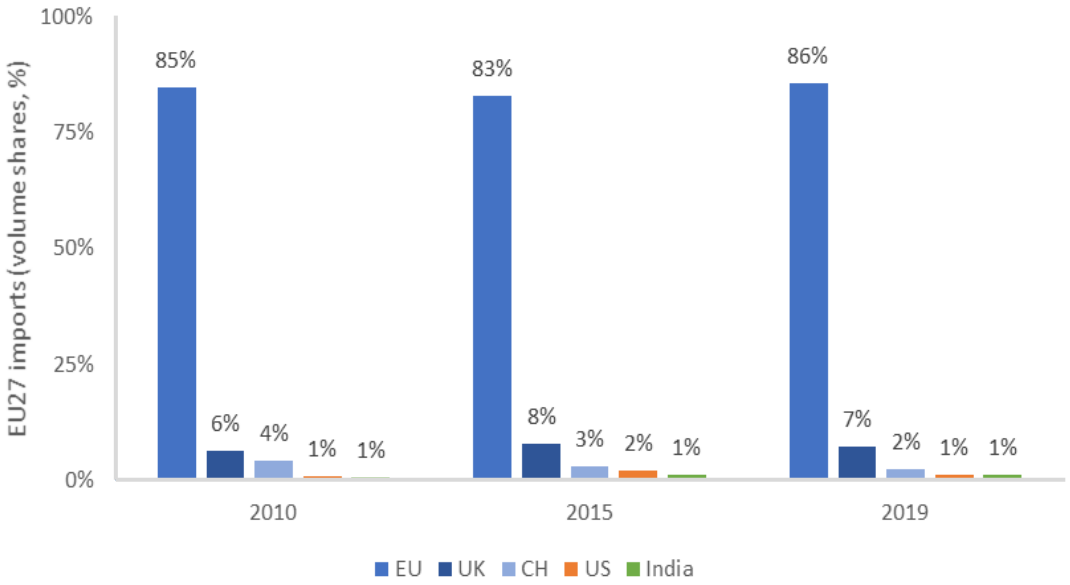
Figure 4.10. EU27 imports (volume) of different pharmaceutical categories (2010-2019, tonnes)



Source: Eurostat. Authors' calculations.

The majority of EU27 imports of HMP in volume terms come from the EU27, then the UK, then Switzerland. The EU27 share of HMP imports has remained stable at around 85% of all EU27 imports as Figure 4.11 shows.

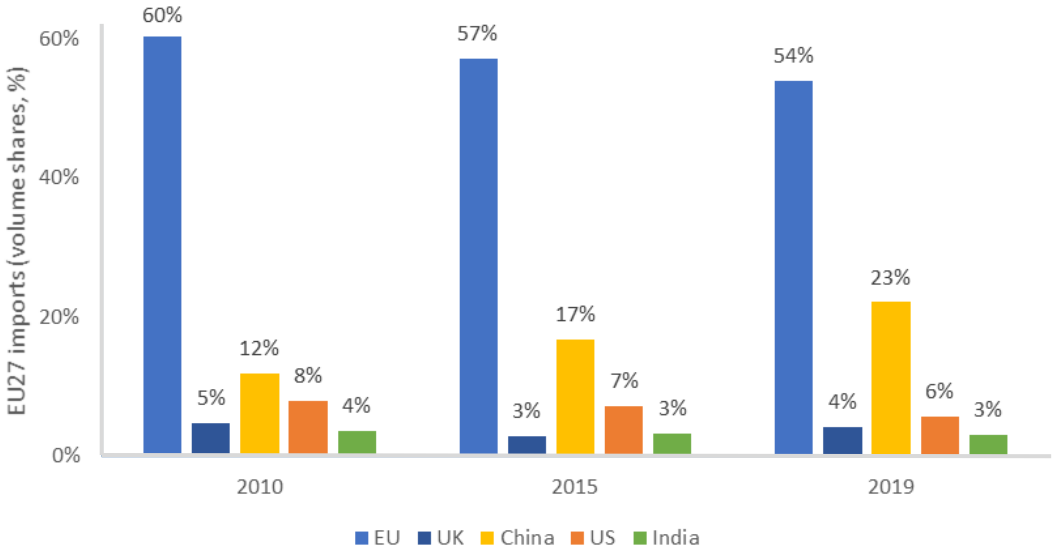
Figure 4.11. Top 5 Countries EU27 imports HMPs (2010-2019, volume - %)



Source: Eurostat. Authors' calculations.

However, for APIs the volume of imports from Europe has fallen over time from 66% in 2010, 61% in 2015, and 59% in 2019. This is significantly lower than for HMP but still above half of EU27 total imports of APIs by volume. Figure 4.12 shows that China is an increasingly important source of APIs rising from 12% in 2010 to 17% in 2015 and 23% in 2019 of total EU27 imports of APIs by volume. This is not close to the 75% number that some circulate, but it is a rising share, making China the most important non-EU27 source of supply of APIs for the EU.

Figure 4.12. Top 5 Countries EU27 imports APIs (2010-2019, volume - %)



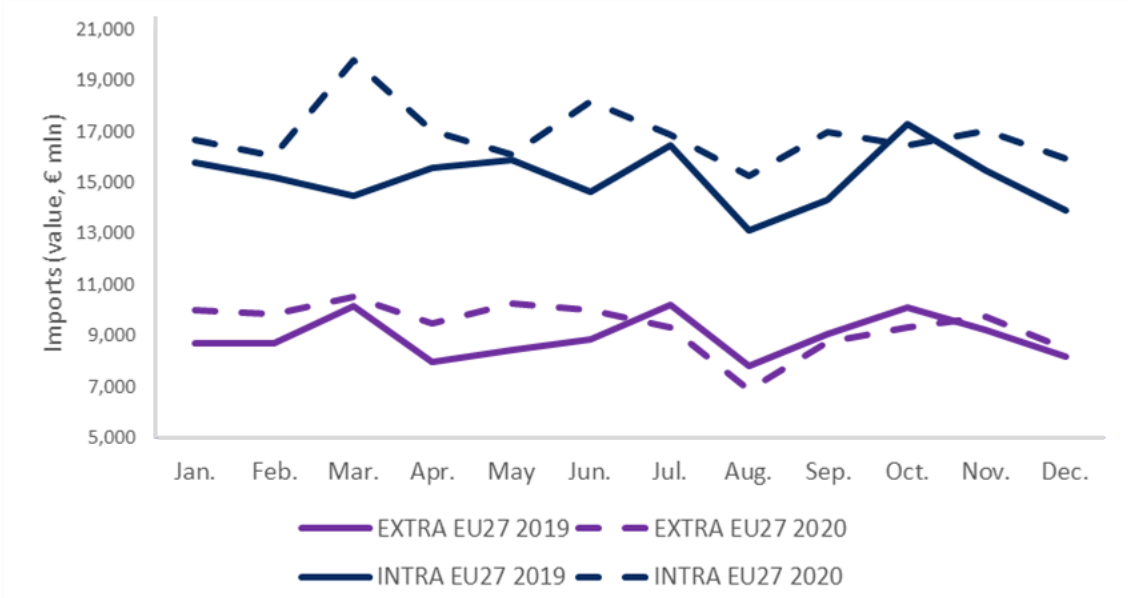
Source: Eurostat. Authors' calculations.

4.3 THE COVID-19 PANDEMIC SHOCK: COMPARING 2019 TO 2020

Imports in value terms

We can also see what happened with these key 155 pharmaceutical products during 2020, the year of the COVID-19 pandemic. If we compare the time trends for imports month-by-month, we can see that there was not a very large impact during the year 2020 when compared to 2019 in extra-EU27 flows. If there was an increase in EU27 imports (especially during key periods like March 2020), it came from intra-EU flows. Intra-EU trade in 2020 in pharmaceutical products was, however, consistently higher in 2020 in value terms (except for October 2020). Also, until July 2020, imports from outside the EU27 were marginally higher in value terms than in 2019, but from July onwards imports of pharmaceutical products seem to have returned to historically normal levels. This is shown in Figure 4.13.

Figure 4.13. EU27 imports of APP from within and outside the EU27 (2019/2020, value in Euro)



Source: Eurostat. Authors' calculations.

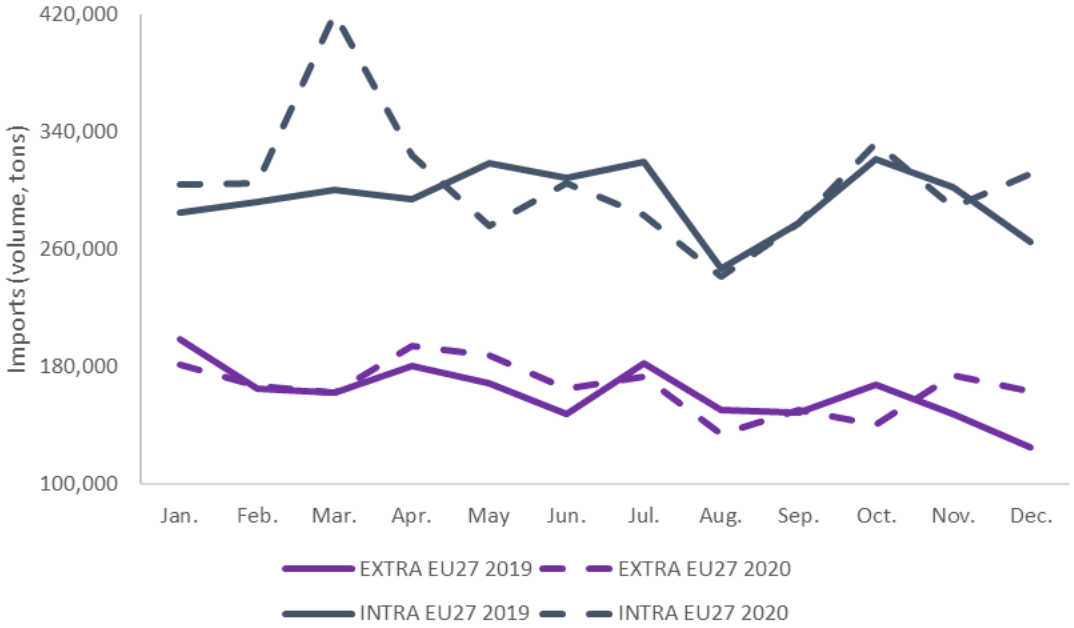
Imports in volume terms

When we look at the imports of pharmaceutical products in volume terms (Figure 4.14), we see that there was no significant difference in imports when comparing 2019 with 2020, except for the peak in March 2020, where intra-EU27 imports were significantly higher in 2020 than in 2019.

Exports in value terms

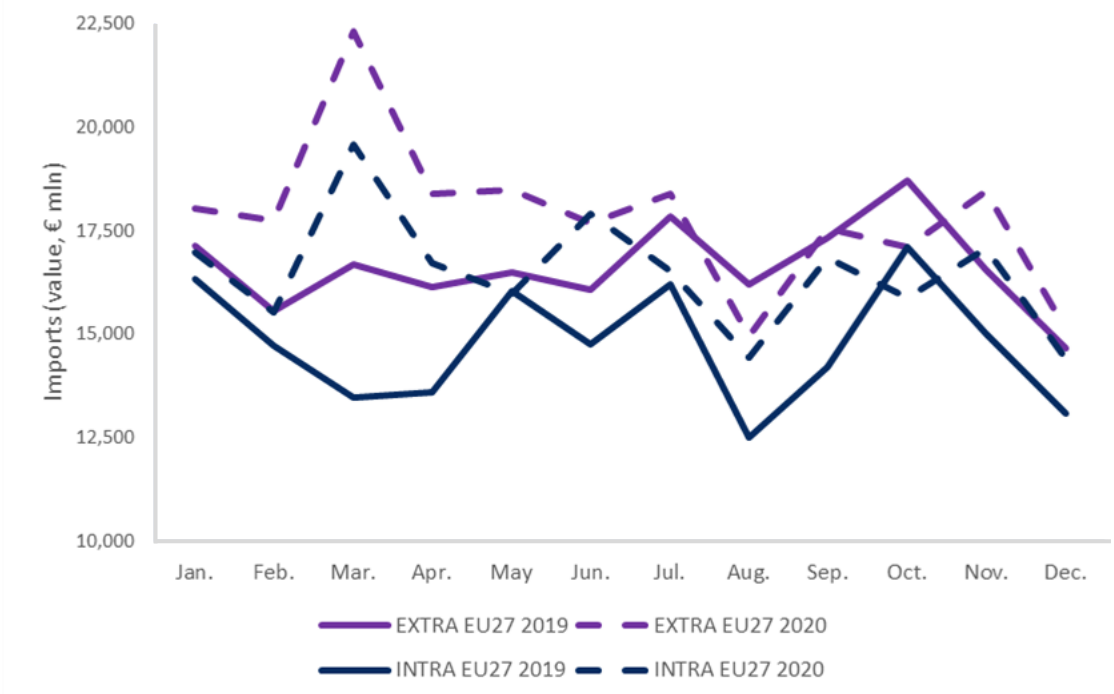
For exports, the pattern seems to be different, especially for exports in value terms – as illustrated in Figure 4.15. These were higher in 2020 than in 2019, both for intra- and extra-EU27 exports until July. Especially the export peak in March 2020 was higher than the import peak and also lasted longer. After July the situation normalised. Intra-EU trade in 2020 remained above 2019 levels, except for October.

Figure 4.14. EU27 imports of APP from within and outside the EU27 (2019/2020, volume in Euro)



Source: Eurostat. Authors' calculations.

Figure 4.15. EU27 exports of all pharmaceutical products from within and outside the EU27 (2019/2020, value in Euro)



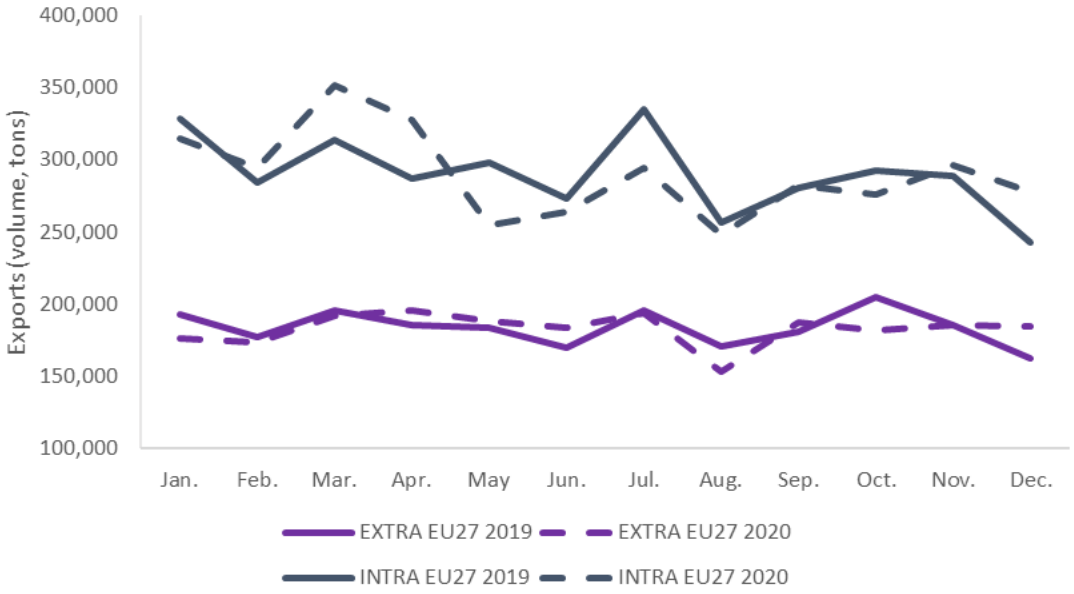
Source: Eurostat. Authors' calculations.

Exports in volume terms

Like for imports, with exports in volume terms, we cannot talk about a big shock during the months of the pandemic's first wave. Only the intra-EU27 export volume surpasses

its 2019 levels for the months of February, March, and April. For the rest both years were very comparable.

Figure 4.16. EU27 exports of APP from within and outside the EU27 (2019/2020, volume, tonnes)



Source: Eurostat. Authors' calculations.

4.4 MAIN CHAPTER TAKEAWAYS

The main conclusions we can draw from this Chapter based on our analysis are:

- Exports and imports of all pharmaceutical products have increased significantly between 2010 and 2019, but the increase in exports has been higher – leading to an increased trade surplus for the EU27 in pharmaceuticals.
- In value terms, the European import share for HMP and API has remained rather stable between 2010 and 2019. For HMP, EU27 imports from the EU were 72.8% in 2010; 69.6% in 2015 and 69.6% in 2019. Extra-EU27 imports in HMP show an interesting shift in the EU's main sources for imports: in 2010, the UK was the largest source for EU27 imports, but this share declined from 9.1% in 2010 to 7.6% in 2015 to 4.7% in 2019.
- For API this share was 55.9% in 2010, 51.6% in 2015 and 53.4% in 2019. Over the past decade the Swiss and Chinese shares of EU imports of APIs have marginally increased, while import shares from the US and Singapore declined.
- In volume terms the picture is slightly different: the EU27's import share in volume terms for HMP rose from 84.7% in 2010 to 85.7% in 2019. In terms of the volume of imports for APIs, the EU27 share in EU imports dropped from 60.4% in 2010 to 54.0% in 2019. The largest rise in imports of APIs in volume terms came from China. The Chinese import share rose from 11.8% in 2010 to 22.6% in 2019.
- When looking at the COVID-19 effect, by comparing imports and exports of pharmaceutical products between 2019 and 2020, we find that these flows have not

changed that much, with the exception of a peak in imports in March 2020 and an even larger peak in exports in that same month.

This chapter has shown that EU resilience has been remarkably steady between 2010 and 2019. The one aspect that has changed significantly, is the rise of China as a supplier (in volume terms) for the EU27 in APIs. The Chinese share was 11.8% in 2010 and rose to 22.6% in 2019, a 10%-point increase in 10 years. This rise has come at the expense of intra-EU27 trade and a relative decline in imports from the US and UK. But while the EU27 may be resilient regarding import levels on average and even over time, it may be the case that underneath this average level, for some product categories dependencies on imports do exist. This is the focus of the next Chapter of our analysis.

5. EU27 ECONOMIC DEPENDENCE AT PRODUCT LEVEL

One of the key policy discussions in the EU centres around 'Open Strategic Autonomy' and the issue of strategic resilience. While respecting open global supply chains and trade, the EU wants to increase its strategic resilience by reducing existing dependencies.

This means, we have to define what a 'dependency' is, which we do in this study along two dimensions:

- First, we look at the share of extra-EU27 imports of EU27 total imports of pharmaceutical products and ingredients. The higher the share, the more dependent the EU is on imports from outside the EU. For a share higher than 75% the EU is highly dependent. For a share below 50% the EU is not dependent.
- Second, we look at the diversification of imports into the EU27 and exports out of the EU27.
    - For imports, we do this by looking at the number of suppliers, but also their market shares, culminating in an analysis using the Herfindahl-Hirschman Index (HHI), an index more commonly used to measure market concentration, but applied in this case to go beyond the mere number of international suppliers of pharmaceutical products and intermediates to the EU, to also factor in their relative market shares in supplying the EU. The HHI thus measures – for all product categories at HS8 level – the degree of supplier concentration for the EU27. This is a good measure of supplier dependency at product level.
    - For exports, we do this by looking at the number of export destinations as well as the HHI – which measures the degree of export concentration to specific markets. This is a good measure of export vulnerability towards trading partner (import) policies.

The HHI for import concentration can be calculated as follows:

$$H = \sum_{i=1}^{N} s_i^2$$

where s_i is the import share of country *i* in all EU27 imports and *N* is the number of countries. For example, if the EU imports a pharmaceutical ingredient from two countries that each have a 50% import share, the HHI equals $0.5^2 + 0.5^2 = 0.5$. The HHI ranges from *1/N* to 1. The higher the HHI, the higher the degree of import concentration among one or a few pharmaceutical ingredient suppliers. We review each of the 155 products to see: 1) What the extra-EU27 import share is; and 2) What the HHI is for each of the products.

The HHI for export concentration can be calculated in the same way. s_i is then the export share of country *i* in all EU27 exports and *N* is the number of countries the EU27 exports to. For example, if the EU exports a pharmaceutical final product to five countries, where one country receives 80% of the exports and the other four countries each 5%, the HHI equals $0.8^2 + 0.05^2 + 0.05^2 + 0.05^2 + 0.05^2 = 0.65$. This is a highly concentrated export

market, despite there being five destination countries and EU27 exports depend highly on the country that receives 80% of EU27 exports. We review each of the 155 products to see: 1) What the extra-EU27 import share is; and 2) What the HHI is for each of the products.

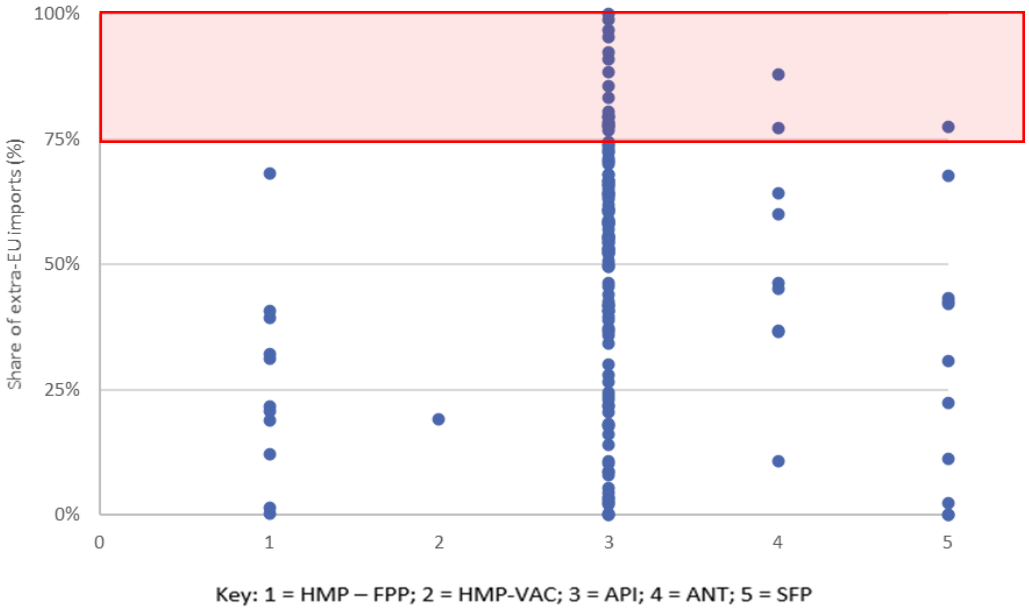
5.1 DIMENSION 1: EXTRA-EU27 IMPORT/EXPORT SHARES AT PRODUCT LEVEL

When we look at the share of extra-EU27 imports of EU27 total imports of pharmaceutical products and ingredients, we do so for each of the 155 product categories at HS8-digit level. The higher the share of extra-EU imports, the more dependent the EU is on imports from outside the EU. As before, we do so in value and in volume terms.

5.1.1 Imports in value terms

From the 155 entries, imports from 22 products passed a threshold of more than 75% of their value coming from outside the EU. In the scatter plot of Figure 5.1 we can see how many products passed this 75% barrier by product category (in red). As it can be seen, most of these 22 products – 19 of them – are APIs, which most of the time are basic components that are relatively easy to produce.

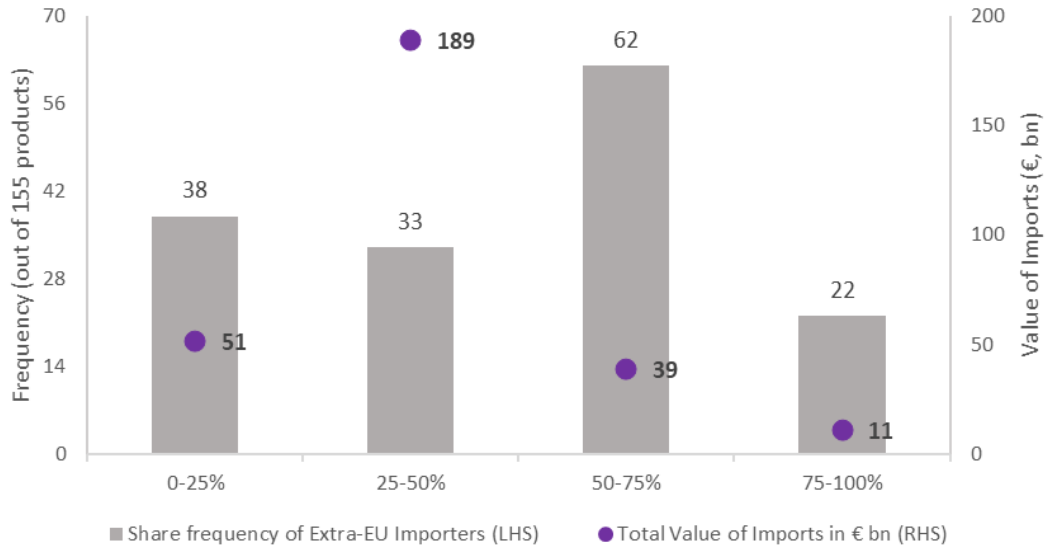
Figure 5.1. Extra-EU import share in total EU27 imports for each pharmaceutical category (2019, value)



Source: Eurostat. Authors' calculations.

14.2% (22 out of 155) of imported products into the EU27 fall into the '75% or higher' imports from outside the EU category. While this sounds like a significant share, when we look at the total import value of these 22 products, we find that they represent only 3.7% of all pharmaceutical product imports in value terms (coming into the EU27, intra-EU imports included). The EU27 imports most, in value terms, of pharmaceutical products where it has limited levels of dependencies (0-25% or 25-50%). This is shown in Figure 5.2 below.

Figure 5.2. Pharmaceutical products share of extra-EU imports and value of imports (2019)

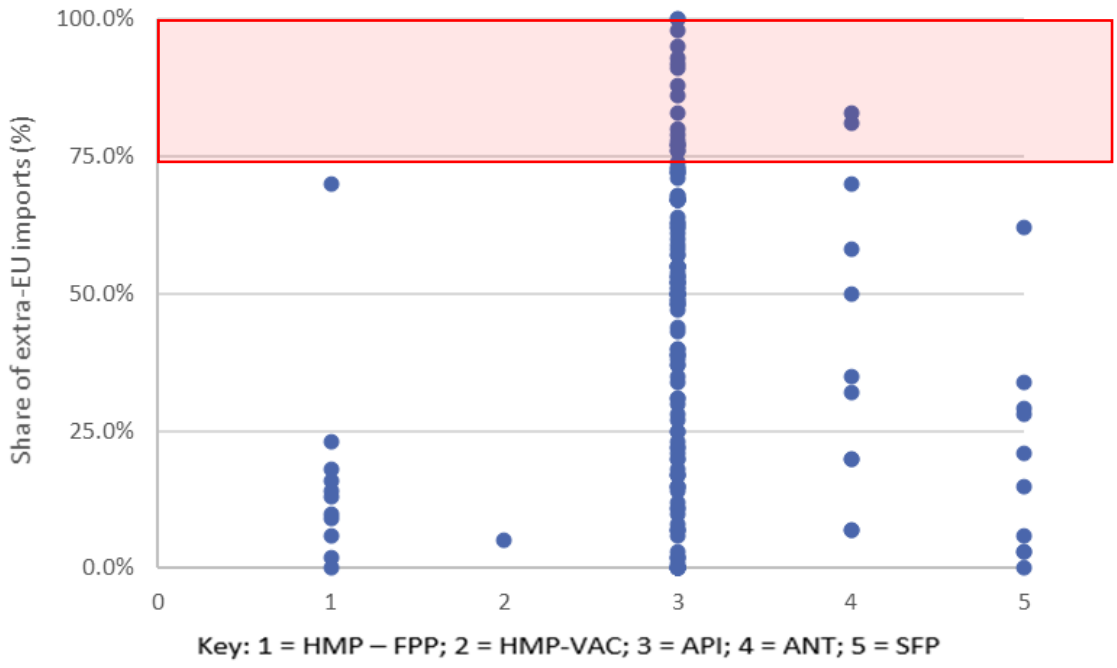


Source: Eurostat. Authors' calculations.

5.1.2 Imports in volume terms

The same analysis as before but in volume terms shows that 20 products passed the threshold of more than 75% of their value coming from outside the EU27. Similarly, to EU27 imports by value, most of these products (18) belong to APIs (Figure 5.3).

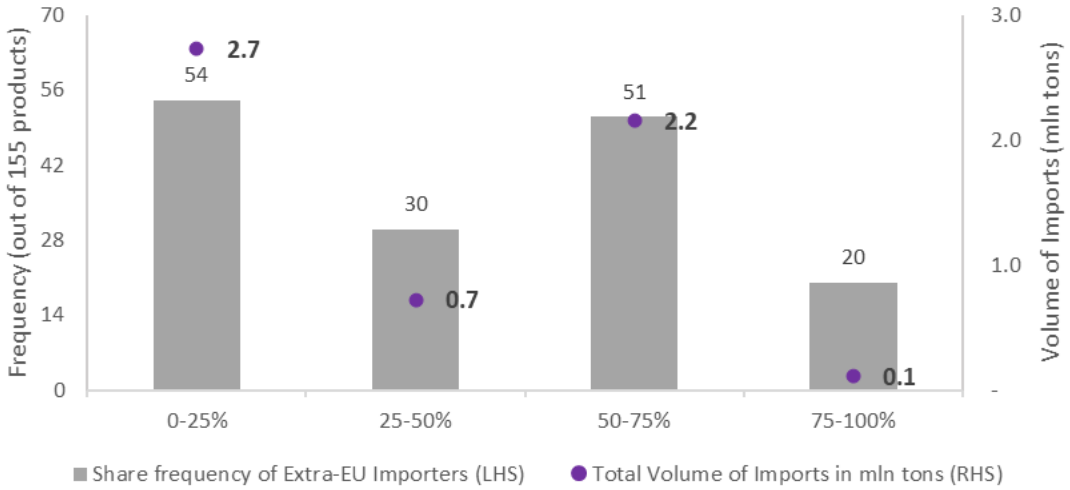
Figure 5.3. Extra-EU import share in total EU27 imports for each pharmaceutical category (2019, volume)



Source: Eurostat. Authors' calculations.

84 products have a share of extra-EU27 exports lower than 50%. The total volume of imports (including import volumes sourced from within and from outside the EU27) from the products belonging to the group 0-25% and 25-50% represent 60% of the total volume of EU27 imports of pharmaceutical products. The share of imports with a high EU27 dependency on extra-EU imports is 1.9% as is shown in Figure 5.4.

Figure 5.4. Pharmaceutical products share of extra-EU imports and volume of imports (2019)



Source: Eurostat. Authors' calculations.

5.1.3 Exports in value terms

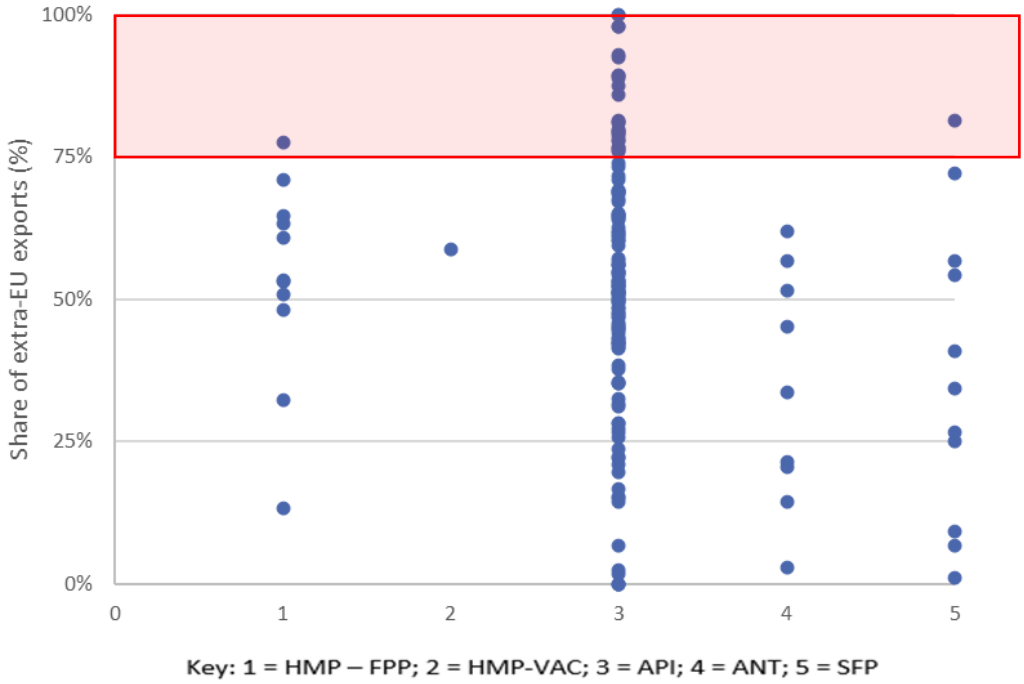
As we saw in Chapter 3 regarding the export destinations by country, exports of pharmaceutical products from the EU27 are highly diversified. Out of 155 products, 88 of them pass the 50% of their exports value going to extra-EU countries and 27 even the 75% threshold. As we can see in the scatter plot of Figure 5.5 below, all pharmaceutical categories have some products surpassing the 75% of extra-EU exports value threshold. As for imports, the API category has the highest share of products which exports are above the 75% threshold: 26 API products fall in this category.

While regarding the *number* of products, the pattern seems similar for imports and exports (22/155 imported products come for more than 75% from outside the EU27; while 27/155 exported products go for more than 75% to extra-EU27 destinations), in terms of values, the picture is quite different. When we look at the value of EU27 exports versus imports, a very different picture emerges. The 27 products surpassing the 75% share of extra-EU exports represent a very small share (0.8%) of intra and extra EU exports (Figure 5.6) but for the 88 products with over 50% of extra-EU exports, 89.4% of total value EU27 is involved.

From these data we can draw two important conclusions. First, that the EU's import dependence is 1/3 of the EU's export vulnerability. Second, that, while there is some import dependency (especially regarding specific products), other countries around the world are much more dependent on exports of the EU27 than vice versa. This matches

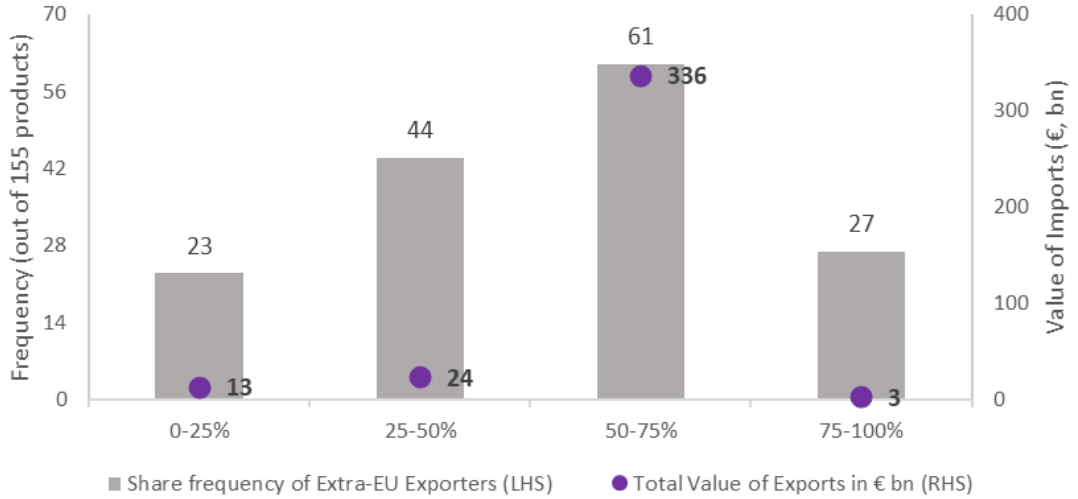
the trade statistic from the WTO that the EU27 is exporting 63.8% of all medicines in the world.[15]

Figure 5.5. Pharma products: extra-EU exports of EU27 total export value (2019)



Source: Eurostat. Authors' calculations.

Figure 5.6. Pharmaceutical products share of extra-EU exports and value of exports (2019)



Source: Eurostat. Authors' calculations.

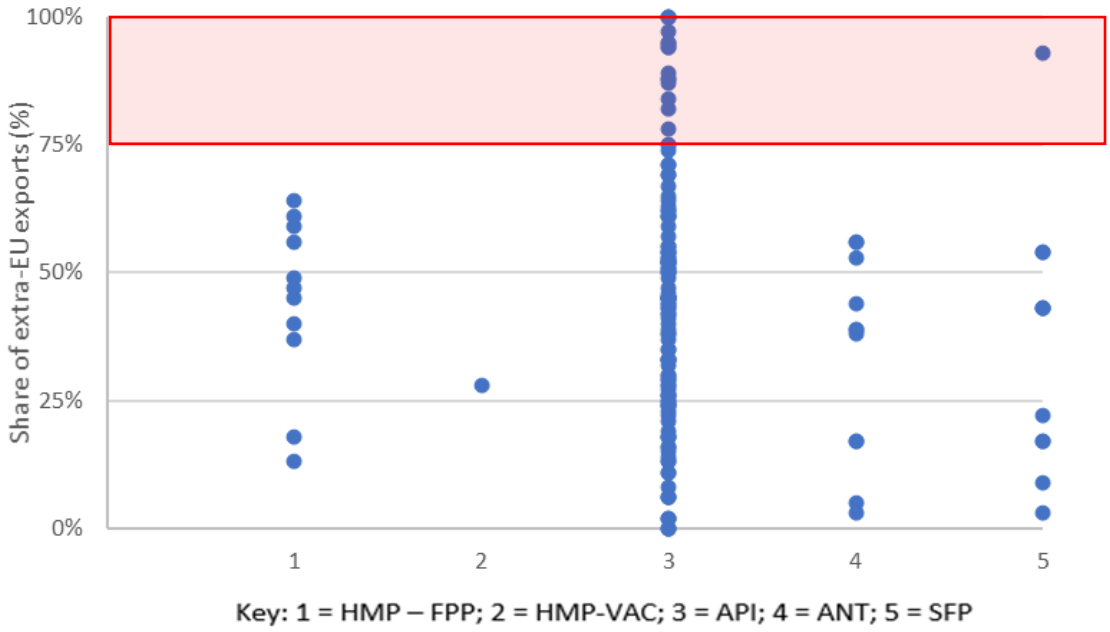
5.1.4 Exports in volume terms

From the 155 entries, imports from 19 products passed the threshold of more than 75% of their volumes being exported outside the EU. In Figure 5.7 we can see how

[15] WTO (2019) database.

many products passed this 75% barrier: we find that most of these 19 products – 18 of them – are APIs.

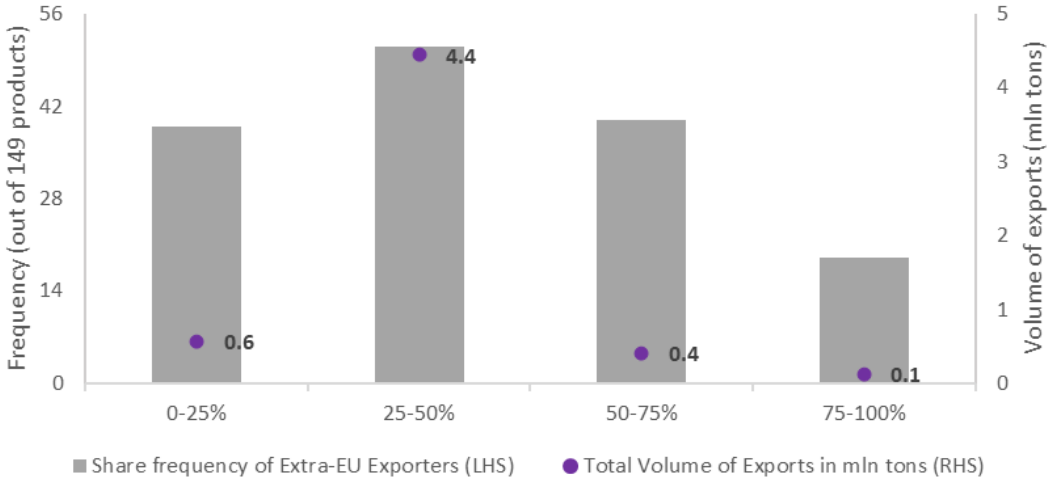
Figure 5.7. Pharma products: extra-EU exports of EU27 total export volume (2019)



Source: Eurostat. Authors' calculations.

26% of products (40 out of 155) fall in the group of 50-75% export share from outside the EU27. 12% (19 out of 155) of exported products by volume fall in to the 'over 75%' category. While this sounds like a relevant share, when we look at the total export volume of these 19 products, we find that they represent 2.1% of all pharmaceutical exports in volume terms (sold into the EU27 and outside the EU27). The EU27 exports most, in volume terms, of pharmaceutical products where it has limited levels of dependencies (0-25% or 25-50%). This is shown in Figure 5.8 below.

Figure 5.8. Pharmaceutical products share of extra-EU exports and volume of exports (2019)



Source: Eurostat. Authors' calculations.

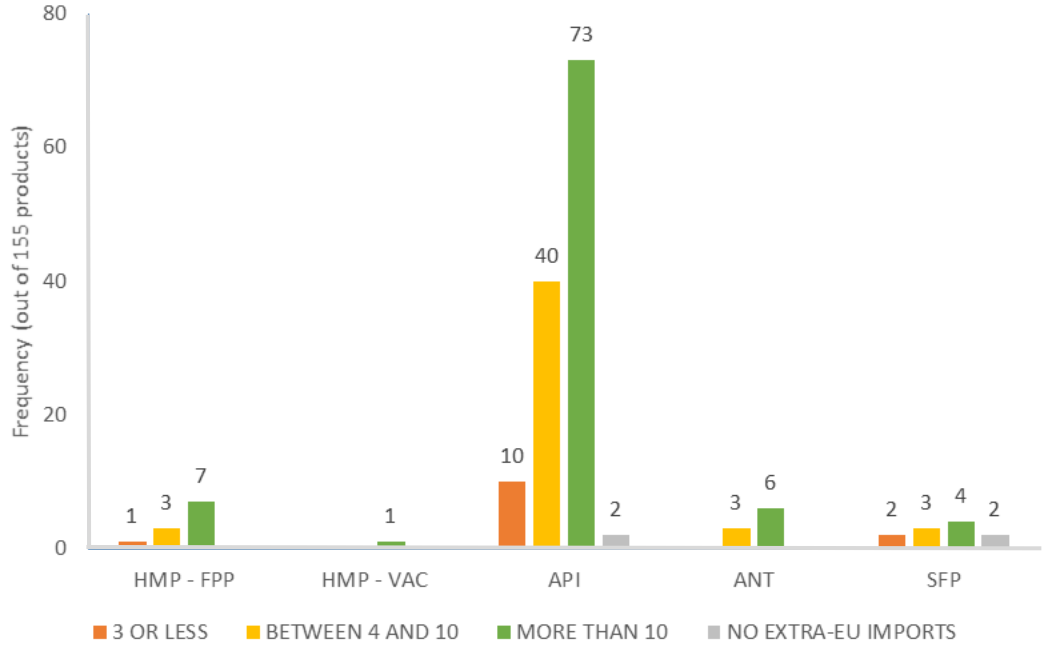
5.2 DIMENSION 2: DIVERSIFICATION OF SUPPLY AT PRODUCT LEVEL

5.2.1 Imports in value terms

Number of suppliers

Taking another step, we focus on products where the EU27 is challenged by a low level of imports diversification. Looking at import values, we identified 4 products where all the imports were intra-EU.[16] For the rest of the products (151), we divided them between products with a highly diversified origin (more than 10 non-EU importers), products with a moderately diversified origin (between 4 and 10 importers) and products that are only marginally diversified (and where the EU27 might face problems when there are supply disruptions), since they only have 3 or less non-EU suppliers. In this last category we found 13 products: 10 products in the API category, 1 product in the HMP-FPP category, and 2 products in the SFF category. This is shown in Figure 5.9.

Figure 5.9. Number of non-EU country suppliers of pharmaceutical products (value, 2019)



Source: Eurostat. Authors' calculations.

We can also look at the actual number of suppliers for the EU27 and search for those products where there is essentially one supplier only. We find that for APIs there were two products with one single supplier and another two which were only sourced from within the EU. For SFP there were two products that the EU27 only sourced from within the EU27 itself (i.e. there were no extra-EU imports).

Herfindahl-Hirschman index of supplier concentration

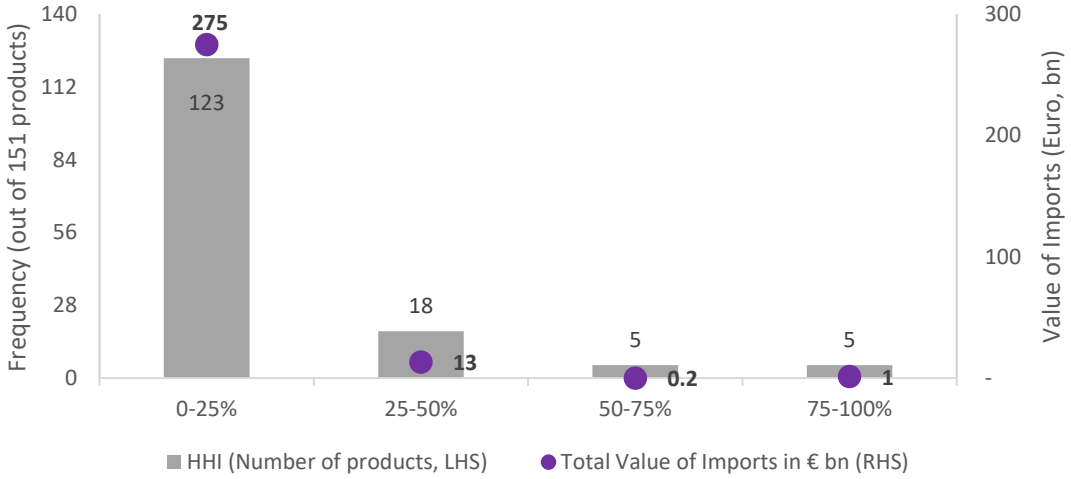
The number of suppliers is a useful measure to look at how diversified supply of imports for the EU27 is, and thus how high of low the actual dependence on limited sources of supply is. The more limited the number of suppliers the higher the dependency on a

[16] Products 29334100, 29396300, 30034200 and 30034300.

limited source. However, there may be products that have more than 3 importers, but one of them may take the bulk of the supplier share, effectively reducing those 3 importers to one. For example, for product 29242400, Ethinamate (INN), there are three suppliers to the EU27: the US, the UK and China that provide 99.97% of Ethinamate for the EU27. When studying the import market shares, it turns out that 99,93% of its imports' value (intra and extra EU) come from China, with the US and UK providing the other 0.04%. So, while there are three suppliers registered, effectively there is only one supplier for this product: China[17].

For this reason, we use the Herfindahl-Hirschman Index, the HHI, to come up with a measure that goes beyond the number of suppliers to the EU27, and that factors in the supplier shares of each of the suppliers, approximating supplier concentration. From Figure 30, we can see that 28 out of 155 products have an HHI value above 0.25 (which is classified as 'highly concentrated'). For these products, irrespective of the number of suppliers there is a degree of dependency that is high on the second dimension: in terms of non-diversified sources of supply. Similarly, for 81.4% of products (123 out of 151), the HHI is below 0.25. These products are not only the majority in terms of numbers but also in terms of the total value of imports that they represent. The Figure 5.10 shows that 94.9% of all the imports (intra and extra EU imports) belong to a product code for which HHI is below 0.25.

Figure 5.10. Pharmaceutical products by HHI level and value of imports (2019)



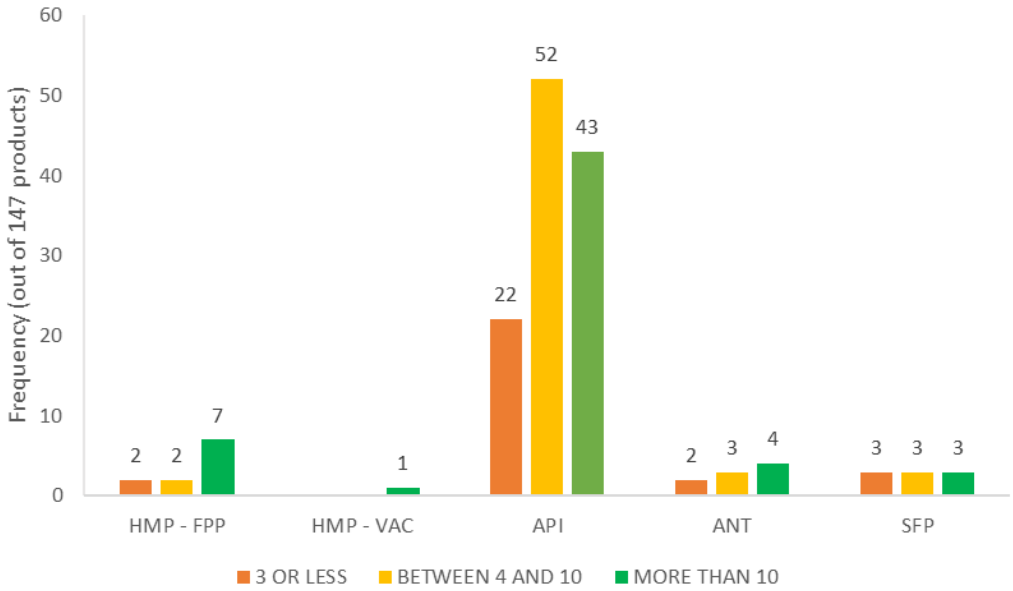
Source: Eurostat. Authors' calculations.

5.2.2 Imports in volume terms

The same analysis as before can be done for EU27 imports by volume. In 2019, there were 29 products – out of 147 products for which data on import volumes was available – with three or less suppliers. Figure 5.11 shows to which categories these products belong being API 22 of these 29 products. For 40.8% of the products, there were between 4 and 10 suppliers and for 39.5% of the products there were more than 10 suppliers.

[17] However, in this particular situation, the dependency is not a major issue, because the overall value for this product in 2019 is small. The reason for this is that Ethinamate has been replaced by other medicines and is in disuse.

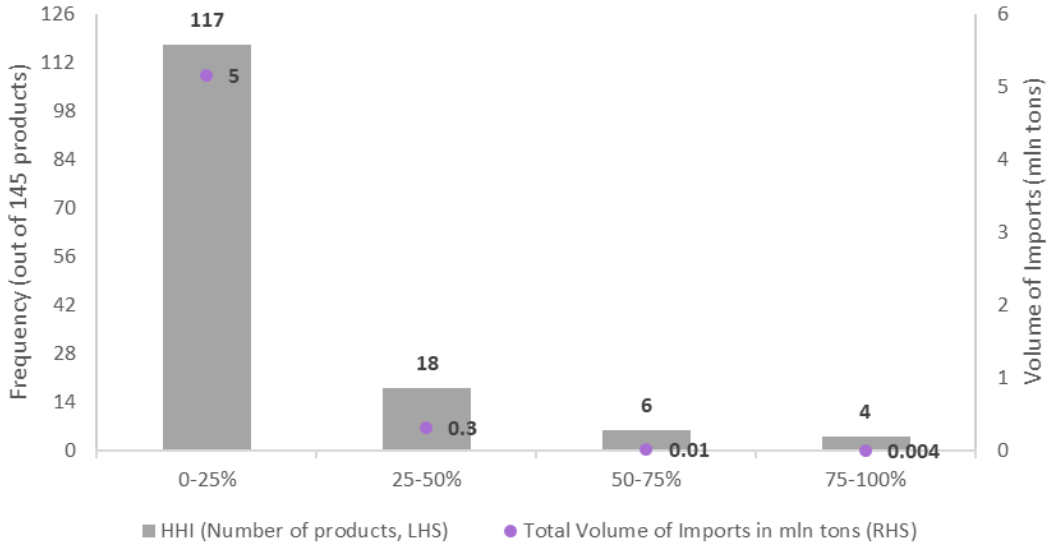
Figure 5.11. Number of non-EU country suppliers of pharmaceutical products (volume, 2019)



Source: Eurostat. Authors' calculations.

Figure 5.12 shows that the HHI index is below 25% for 117 products which indicates that these products are sourced from multiple locations relatively evenly or in other words that there is no concentration in the supply of these products in volume terms. There were, however, 28 products with an HHI higher than 25%. The total value of imports that these products represent is 6%.

Figure 5.12. Pharmaceutical products by HHI level and volume of imports (2019)



Source: Eurostat. Authors' calculations.

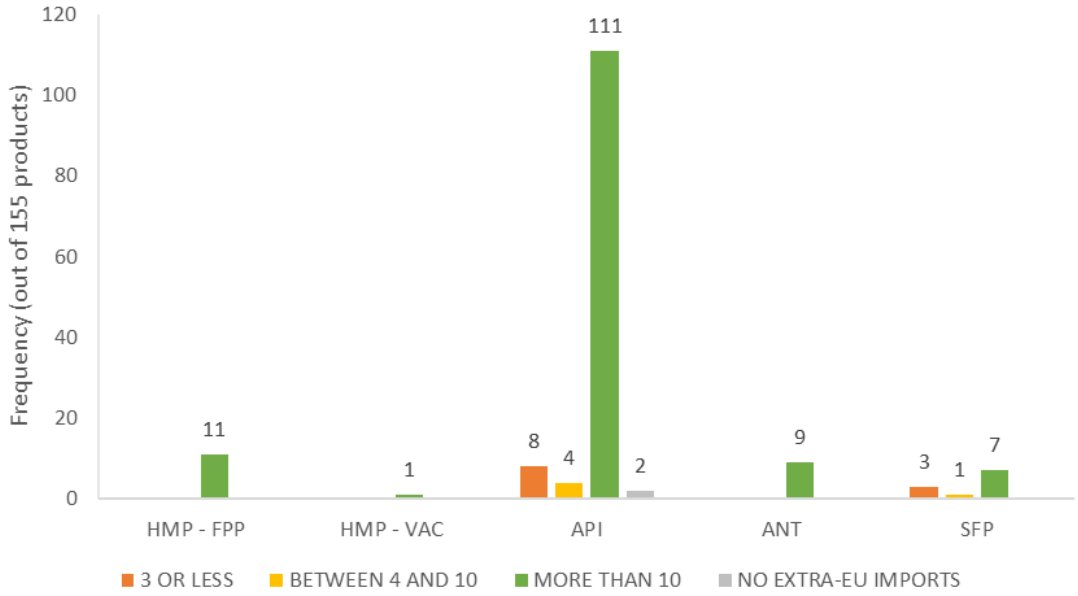
5.2.3 Exports in value terms

Number of destinations

If we analyse how many different extra-EU destinations the European pharmaceutical products have, the evidence points to a stronger diversification when compared to

imports. Most products go to more than 10 non-EU countries. We also have two products with no extra-EU exports. In terms of products whose share of exports value going to a single non-EU country is higher than 50%, we found 13 out of 155 products. For example, 96.7% of the export value of product 29224400 "Tilidine" in 2019 ended up in Serbia.

Figure 5.13. Number of non-EU countries receiving EU27 pharmaceutical products (value, 2019)



Source: Eurostat. Authors' calculations.

This means that – if we look from the trade partner perspective – the higher the exports of the EU27 to a specific country – the higher the dependency of that country on imports from the EU27. But it also means that the more limited the number of destinations, the higher the dependency of EU27 exports on import policies in those destination countries and thus the higher EU27 export vulnerability. For example, for product 29333945 (3,5-Dichloro-2,4,6-trifluoropyridine), over 99.7% of total EU27 exports are exported to the US. If the US government decides this is a critical medicine and wants to re-shore supply chains to produce this medicine inside the US, EU27 exports for 3,5-Dichloro-2,4,6-trifluoropyridine would be hit hard, and so would the (global) supply chains that input into the final production of this product.

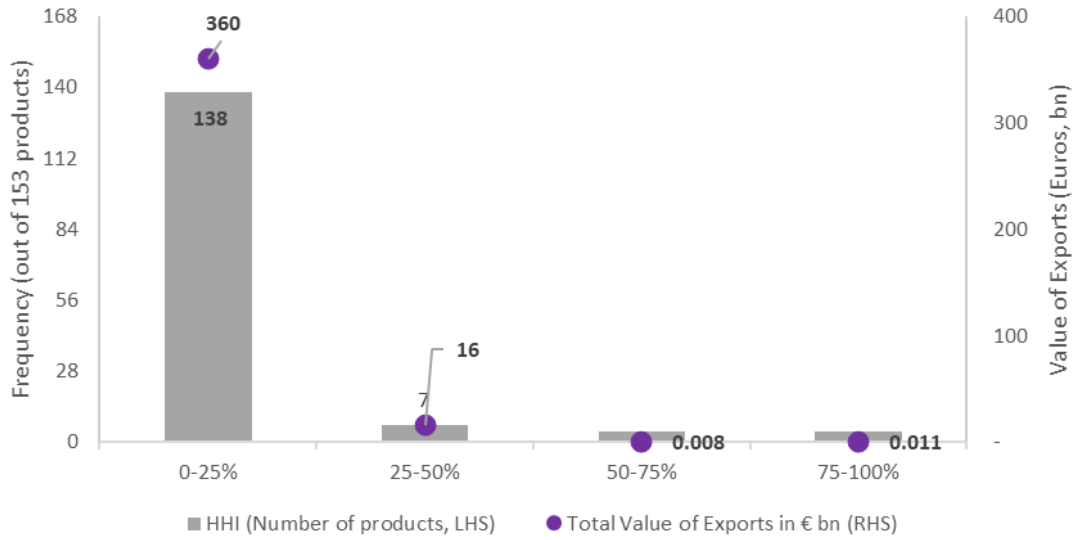
Herfindahl-Hirschman index of destination concentration

The number of destinations is a useful measure to look at export diversification, but as with imports, the export concentration index gives a better indication of the export shares of individual countries within that number of export destinations, and thus the vulnerability of EU27 exports. For example, for product 29394400 (Norephedrine and its salts), there are two EU27 export destinations outside the EU: US and South Africa that receive 93% of the EU27 exports while the rest is exported to other EU27 countries (France, Croatia, and Italy). When studying the export market shares, it turns out that 87% of the EU27's export value goes to South Africa, with the other countries receiving

the other 13%. So, while there are two non-EU and three EU destination registered, effectively there is only one significant destination for this product: South Africa.

From Figure 5.14, we can see that 15 out of 155 products have an HHI value above 0.25 (which is classified as 'highly concentrated'). For these products, irrespective of the number of destinations there is a degree of export vulnerability. However, it is important to understand the relative importance of these products as they represent only 4.2% of the total value of exports.

Figure 5.14. Pharmaceutical products by HHI level and value of exports (2019)



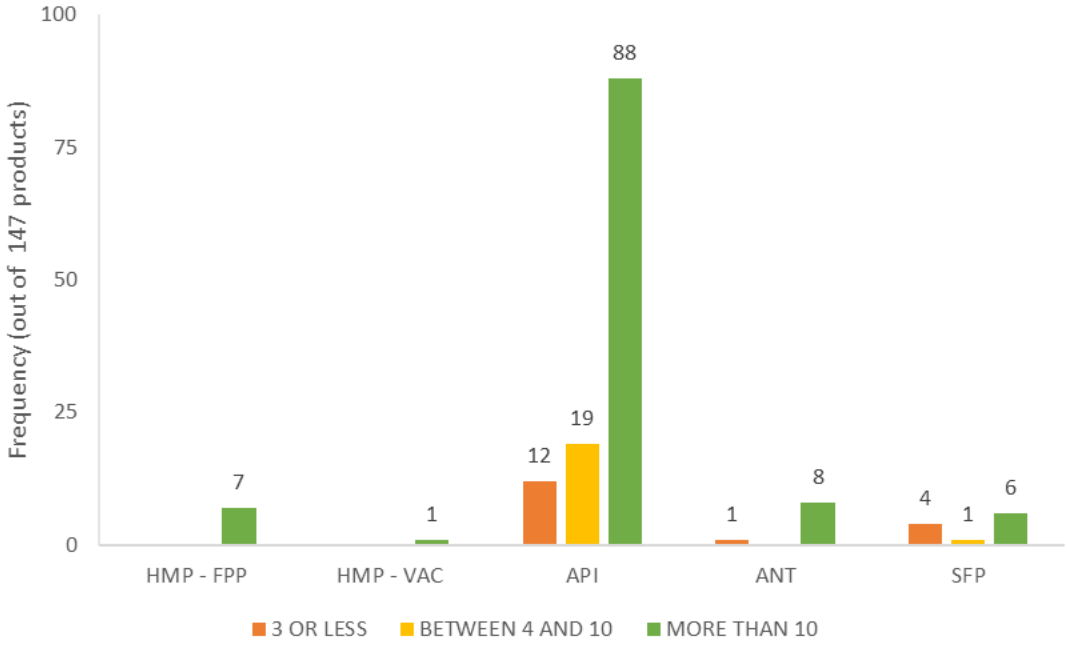
Source: Eurostat. Authors' calculations.

5.2.4 Exports in volume terms

In relation of the volume of exports, if we analyse the number of different extra-EU destination, we find a strong diversification, similar to the one we found when we looked at the value of exports. There were only 17 products with three or less suppliers and 12 of these products were APIs. 74.8% of products were exported to more than 10 different countries. Moreover, there are products under the "More than 10" label in each of the five pharmaceutical categories.

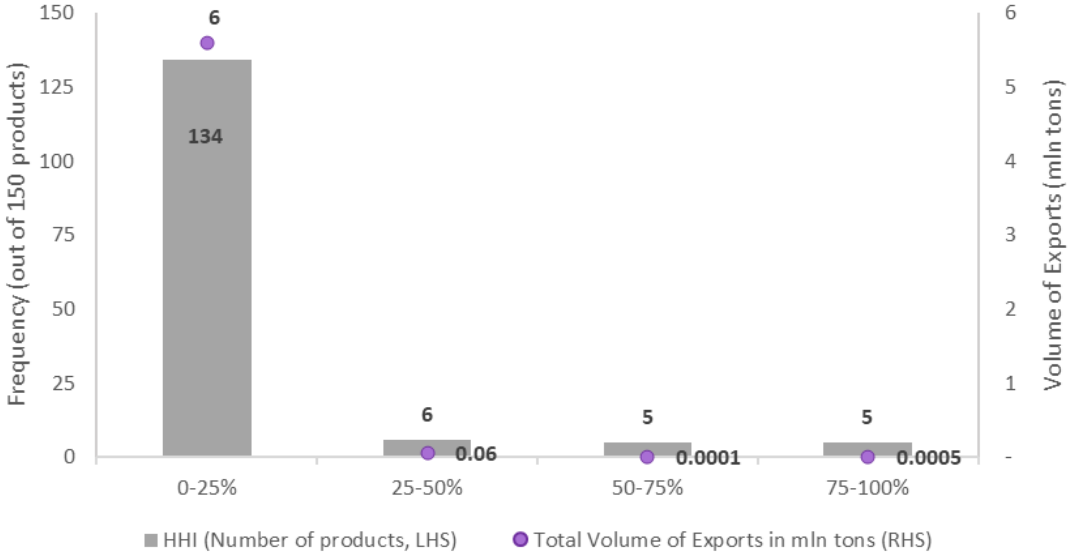
Figure 5.16 shows the HHI index for each of the four quartiles. There were 134 products for which the HHI was lower than 25% which indicates a lower level of concentration of exports in terms of volumes. In contrast, 16 products had a high concentration of exports as measured by the HHI index. However, the number of total exports from these 16 products is just 1% of EU total exports.

Figure 5.15. Number of non-EU countries receiving EU27 pharmaceutical products (volume, 2019)



Source: Eurostat. Authors' calculations.

Figure 5.16. Pharmaceutical products by HHI level and volume of exports (2019)



Source: Eurostat. Authors' calculations.

5.3 SYNTHESIS: EU27 IMPORT DEPENDENCIES AND EXPORT VULNERABILITIES

In the two previous sections we looked in detail at each of the two dimensions of dependency and vulnerability. We now combine the two dimensions of dependency:

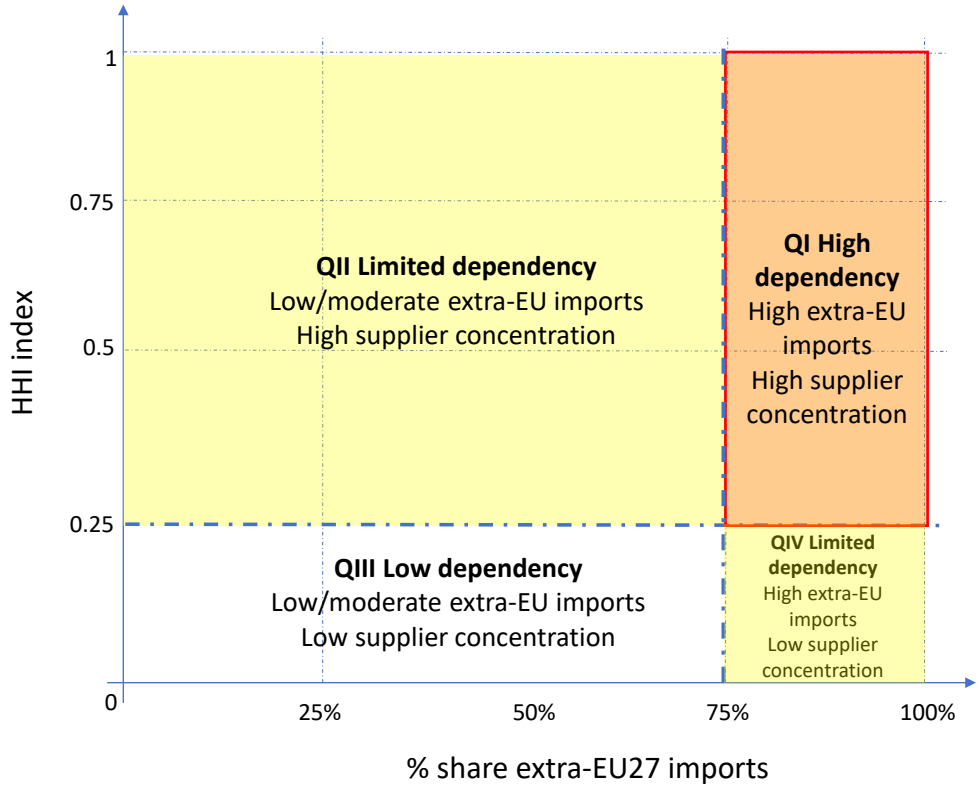
- **For imports:** Extra-EU27 imports as share of total EU27 imports (Dimension 1) with the degree of supplier concentration of those imports (Dimension 2).

- **For exports:** Extra-EU27 exports as share of total EU27 exports (Dimension 1) with the degree of export destination concentration of those exports (Dimension 2)

In doing so, we create an accurate picture – both in value and volume terms – regarding import dependencies and export vulnerabilities for each of the 155 products identified at HS8 digit level.

Figure 5.17 shows conceptually how the two-dimensional dependency definition works for import dependencies (the same can be done, but not depicted, for export vulnerabilities). On the horizontal axis, we plot Dimension 1 (extra-EU27 imports as share of total EU27 imports), and on the vertical axis the HHI index (measuring the degree of supplier concentration for EU27 imports). This allows us to divide EU27 levels of import dependencies into four quadrants.

Figure 5.17. Import dependency conceptual framework



In QIII, both extra-EU imports and supplier concentration are low, which leads to a low level of EU27 import dependency.

In QII and QIV there is a limited degree of dependency because only one of the two dimensions is high while the other one is not. In QII the supplier concentration is high (HHI > 0.25), but imports from outside the EU27 are below 75%, meaning 25% comes from the EU27 itself, providing the EU27 economy with domestic flexibilities. In QIV the supplier concentration is low (HHI < 0.25) but extra-EU27 imports are higher than 75%. This means that while there are significant imports, the EU27 supplier base is broad and thus the EU27 has a diversified base of supply for these imports.

The focus should be on QI where both the extra-EU27 import share and the supplier concentration are high. This is the quadrant where there is a higher degree of EU27 vulnerability in that the extra-EU imports are significant and there is a highly concentrated supplier base (i.e. a limited number of effective suppliers for the EU27). For example, for product 29394300, (Cathine "INN" and its salts), the extra-EU import share is 85.6% (which is higher than 75% and so there is a high degree of extra-EU import dependency). For this product, the EU27 relies on 3 importers outside the EU, the US, India and Switzerland, but the Indian share in EU27 total imports of this product is 84.0%, so the HHI is 0.71 (which is much higher than 0.25 and so there is a high degree of supplier concentration). This is therefore a product that falls into QI where the EU27 has a very high degree of dependency. Reassuring is that the import share of this product is only 0.00005% of total EU27 imports.

From an import dependency perspective, the EU27 would want to first develop strategies to ensure that for critical medicines, none is in QI, and then for QII and QIV that policies are developed to monitor and – if possible – also further reduce dependencies. We will turn to this in the final Chapter of this study.

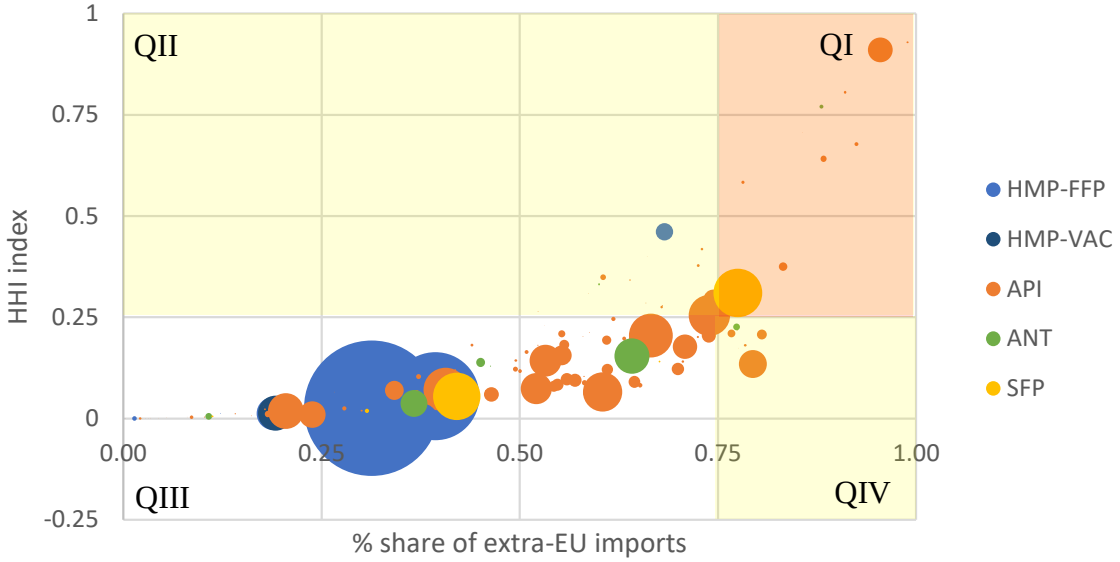
5.3.1 EU27 import dependencies (value terms)

When we look at EU27 import dependencies in value terms, Figure 5.18 shows for each of the products, the combination of extra-EU27 import shares and HHI index values. Each dot represents a product plotted in the two dimensions and the size of the dots represent the total value of the extra-EU27 import.

The Figure follows the conceptual framework presented in Figure 5.17. The horizontal axis displays the share of imports sourced from outside the EU and the vertical axis presents the HHI index that ranges between 0 and 1. The two cut-off points from the conceptual framework are at the 75% in the x-axis and 0.25 in the y-axis.

Figure 5.18 shows that 87.5% of the value of extra-EU imports belongs to the low dependency quadrant (QIII) while 6.1% of EU total imports are situated in QI. In that quadrant, there are 14 products and product 29371200 (insulin and its salts, used primarily as hormones) is the most important one with a total EU imports of €1,194 mln which represent 1.1% of EU total imports and belongs to APIs. From the 14 products in QI 12 were APIs.

Figure 5.18. EU27 import dependency (HHI, share of extra-EU imports, value, 2019)

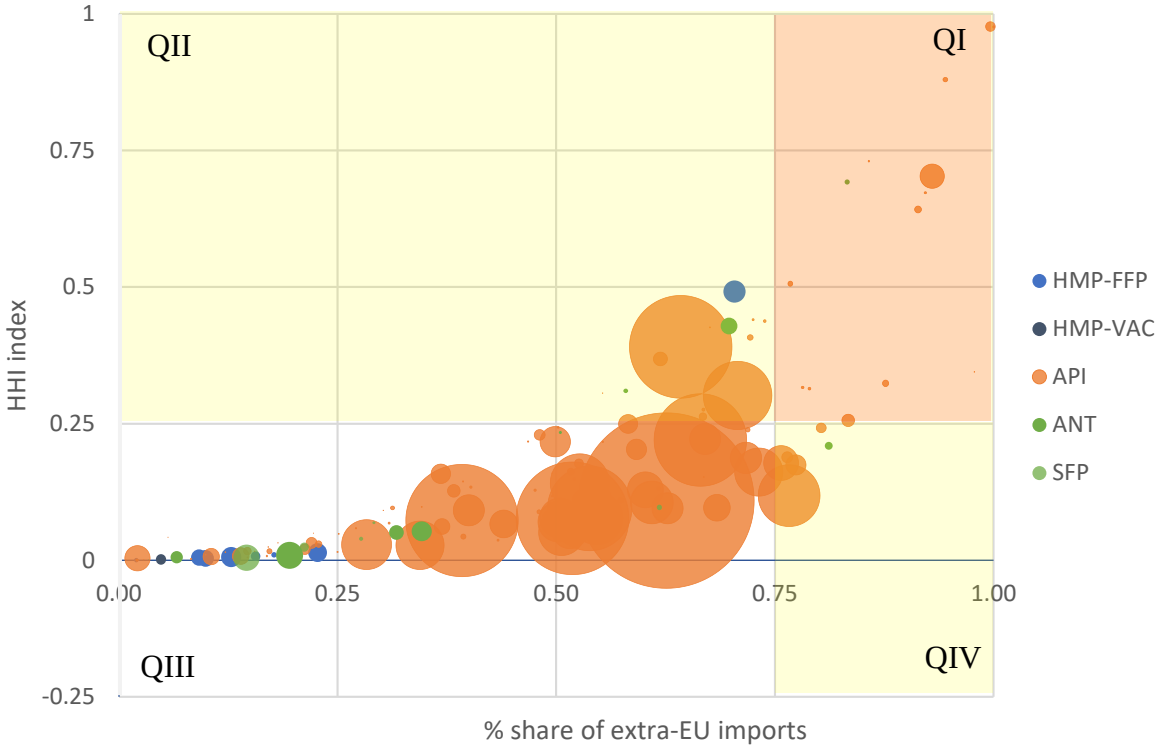


Source: Eurostat. Authors' calculations.

5.3.2 EU27 import dependencies (volume terms)

When we look at EU27 import dependencies in volume terms, Figure 5.19 shows for each of the products, the combination of extra-EU27 import shares and HHI index values. Each dot represents a product plotted in the two dimensions and the size of the dots represent the total volume of the extra-EU27 import.

Figure 5.19. EU27 import dependency (HHI, share of extra-EU imports, volume, 2019)



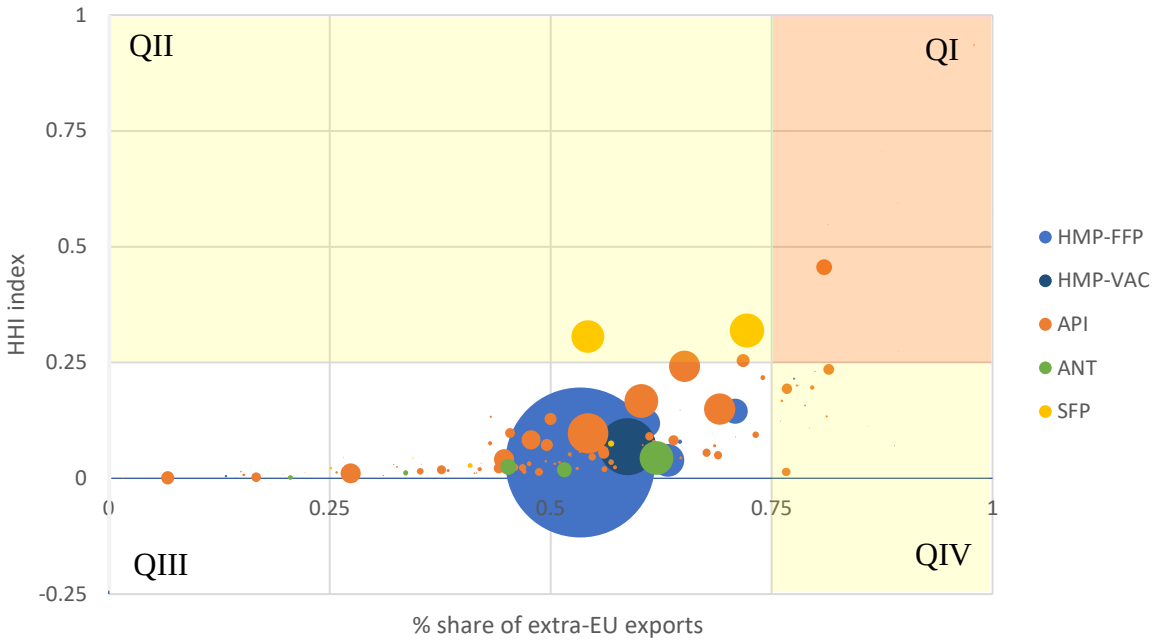
Source: Eurostat. Authors' calculations.

Figure 5.19 follows the same representation as Figure 5.17 but this time showing import *volumes* rather than values. The picture is similar from Figure 5.18 as the majority of the volume of imports (82.6%) belongs to the low dependency quadrant (QIII) with low extra-EU imports and low supplier concentration. The volume of imports that belongs to the high dependency quadrant is just 0.8% with product 29334990 (Heterocyclic compounds with nitrogen hetero-atoms only) being the most important one with more than 74,000 tonnes, representing 0.4% of EU total volume of imports from extra-EU sources.

5.3.3 EU27 export vulnerabilities (value terms)

When we look at EU27 export vulnerabilities in value terms, Figure 5.20 shows for each of the products, the combination of extra-EU27 export shares and HHI index values. Like with the import dependency graphs, each dot represents a product plotted in the two dimensions and the size of the dots represent the total value of the extra-EU27 exports.

Figure 5.20. EU27 export vulnerability (HHI, share of extra-EU exports, value, 2019)



Source: Eurostat. Authors' calculations.

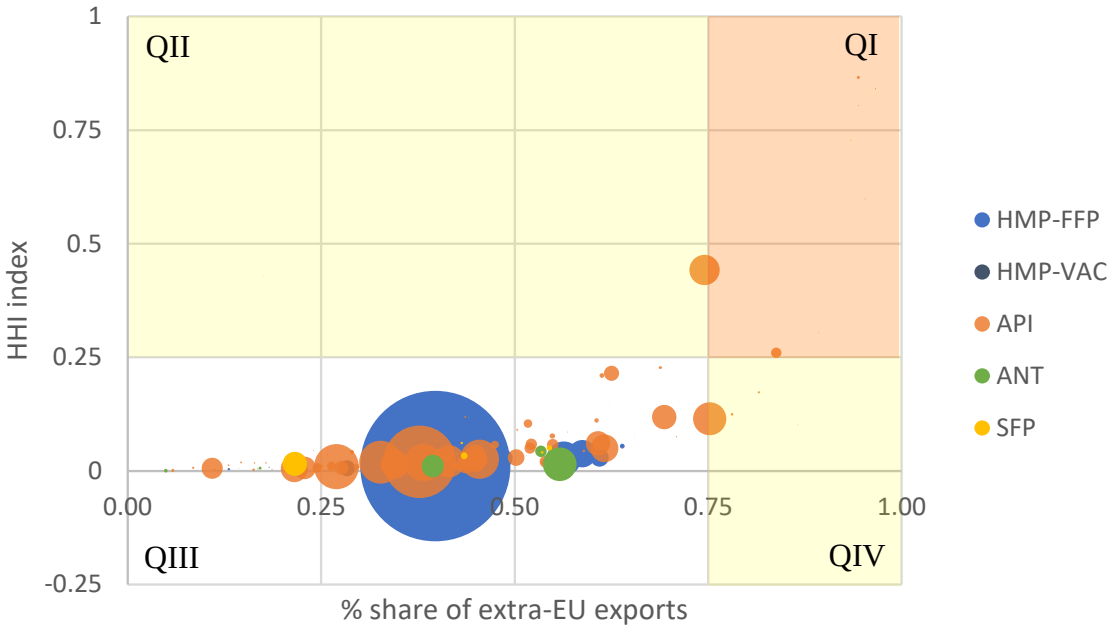
Figure 5.20 shows that 94.2% of exports are in QIII Low vulnerability (low extra-EU exports and low supplier concentration). QI represents just 0.5% of the value of extra-EU exports with only 11 products in this quadrant, from which 10 of them were APIs and 1 product belong to the category SFP.

5.3.4 EU27 export vulnerabilities (volume terms)

When we look at EU27 export vulnerabilities in volume terms, Figure 5.21 shows for each of the products, the combination of extra-EU27 export shares and HHI index values. Like with the import dependency graphs, each dot represents a product plotted in the two dimensions and the size of the dots represent the total value of the extra-EU27 exports.

Figure 5.21 shows that, when compared to EU exports in value terms, the centre of gravity of EU exports in volumes moves even more towards QIII Low vulnerability quadrant. In this case, QIII low vulnerability accounts for 99.7% of extra-EU exports. QI, the category of high vulnerability, includes 11 products which represents a mere 0.2% of EU exports outside the EU.

Figure 5.21. EU27 export vulnerability (HHI, share extra-EU exports, volume, 2019)



Source: Eurostat. Authors' calculations.

5.4 MAIN CHAPTER TAKEAWAYS

The main conclusions we can draw from this Chapter based on our analysis are:

- Our analysis shows that while the EU may be dependent on the rest of the world for some products, many more countries are dependent on the EU for their consumption of pharmaceutical products.
- There are a significant number of pharmaceutical products for which the EU imports or exports a large share from outside the EU. The relevance of these products in terms of their value or volume over the total EU27 imports is relatively small. The 22 products for which more than 75% of EU27 total imports come from outside the EU27 represent 3.7% of EU27 total imports. However, the same statistic for EU27 exports shows that the 27 products from which EU27 exports more than 75% outside the EU27 constitute 0.8% and the 89 products from which the EU27 exports more than half of EU27 total exports represent 89.4% of EU27 total value of exports.
- In general, EU27 imports of pharmaceutical products come from relatively large pool of countries and are exported to several destinations. Although our analysis shows that there are products which are sourced from and export to less than 3 countries.
- The actual value of imports and exports that belong to products with a high degree of import or export concentration is relatively small. However, imports of 14

products and exports of 11 products in value terms were classified as highly concentrated.

EU27 import dependencies

- For imports in value and volume terms, the share of imports that are demonstrating a low degree of dependency (low import shares and diversified base of suppliers) is 87.5% and 82.6% respectively. This constitutes the large majority of imports.
- For imports, the application of our analysis to the conceptual framework of the two dimensions of dependency shows that there is an issue of high dependency for 6.1% of extra-EU27 imports in value terms and 0.8% of extra-EU27 imports in volume terms. These products show both a high level of extra-EU27 imports (>75%) and concentration of suppliers. This is a very small share of imports however, and the very large majority of products, show no or very limited dependencies. For these products, the EU could look at diversifying the number of suppliers (e.g. via its trade strategy) and/or reduce the share of extra-EU imports by incentivising production of certain products in the EU itself and/or ensuring bilaterally and/or contractually that a part of global supply remains destined for the EU.
- For 4.5% of EU27 imports in value terms and 12.3% in volume terms, the import shares are such that a significant part (>25%) still comes from the EU (excluding the UK and Switzerland) but supplier concentration is high. A logical step to decrease this limited degree of dependency is to focus on import diversification, possibly via the EU's trade strategy and bilateral global trade network.[18]
- For 1.9% of EU27 imports in value terms and 4.3% in volume terms, the supplier concentration is low, but import shares are for more than 75% coming from non-EU sources of supply. This does not have to be a problem because the EU27 has many suppliers, but dependencies could be reduced through incentivising production in the EU27 and/or ensuring bilaterally and/or contractually that a part of global supply remains destined for the EU.

EU27 export vulnerabilities

- For exports, the majority of EU27 exports belong to the low vulnerability and limited vulnerability category (94.2% in value and 99.7% in volume terms).
- The share of extra EU27 exports that was classified as vulnerable was 0.5% and 0.2% in value and volume terms respectively. There is a clear link between attempts to reduce imports and export vulnerability, because the EU27's imports are another country's exports that the EU27 also exports back to. The more the EU27 will reduce its imports, the more its exports will face third country barriers and become more vulnerable. The EU could reduce this vulnerability through its trade strategy and via the WTO multi-lateral trading system, for example via the 'Trade in Healthcare Products' initiative'.

[18] European Commission (2021) "Open, sustainable and assertive EU trade policy", 18 February 2021. URL: https://ec.europa.eu/commission/presscorner/detail/en/ip_21_644 [accessed 1 May 2021].

6. CONCLUSIONS

The current discussions on EU27's dependency on foreign imports for pharmaceutical products must be based in solid evidence. The main goal of this report is to contribute to this discussion, analysing production and trade statistics that are publicly available.

Our report shows that the EU27 itself was (2010) and remains (2019) the major source of imports and export destination for the EU pharmaceutical industry. This is not just in the aggregate but also across all pharmaceutical categories including generic products like Active Pharmaceutical Ingredients (API) as well as more complex Human Medicinal Products (HMP).

Our analysis shows that the EU pharmaceutical sector is a successful industry with a significant trade surplus. The EU27 value-added in pharmaceutical products can be seen in the imports of APIs (€78.7 bn) and exports of HMP (€270 bn), and still, the EU27 exported more APIs than it imported in value terms, with exports of APIs equal to €80.1 bn in 2019. The relative importance of exports over imports indicates that while the EU27 is dependent on other countries for some pharmaceutical intermediates and raw materials, the rest of the world is more dependent on the EU27 for the consumption of pharmaceuticals. Therefore, policies that support reshoring of the production of pharmaceuticals, which may lead to retaliation from EU27 trade partners, carry the risk of damaging EU27 exports of pharmaceutical products. Even though EU27 exports of pharmaceuticals are relatively well-spread, with a significant number of products having more than four different export destinations, the importance of non-EU countries for EU27 exports of pharmaceutical is much larger (89%) than the EU27 dependency on imports from outside the EU27 (17%).

Our analysis shows that the EU27 buys a substantial amount (in volume and value terms) of pharmaceutical products from other countries. While over time, the share of EU27 imports from abroad has remained relatively stable, there has been a significant increase in the amount of APIs coming from China in volume terms, growing from 11.8% in 2010 to 22.6% in 2019. However, the same analysis in value terms shows that China only accounts for 7.2% of the total value of APIs that the EU27 buys from abroad while Europe (EU27, CH, UK) accounts for 59%.

The distinction between values and volumes is necessary but not sufficient to understand EU27 dependency on foreign suppliers. Our analysis looks at different dimensions of dependency by assessing the total number of suppliers, the share of extra-EU imports over EU27 total imports, and the market share of each EU supplier per product (the Herfindahl-Hirschman Index – HHI). Based on this analysis, the report presents import dependencies and export vulnerabilities within a conceptual framework. Our analysis suggests that while there is a dependency and vulnerability for some products, the vast majority of EU27 imports and exports of pharmaceuticals are under no risk of either dependency or vulnerability. This is summarised in Table 6.1.

Table 6.1: Summary of EU27 import dependencies and export vulnerabilities

Quadrant	Import dependencies / export vulnerabilities	Imports		Exports	
		(% value)	(% volume)	(% value)	(% volume)
QI: High dependency	High import dependency (export vulnerability) and high supplier (destination) concentration	6.1%	0.8%	0.5%	0.2%
QII: Limited dependency	Low import dependency (export vulnerability) and high supplier (destination) concentration	4.5%	12.3%	4.7%	0.001%
QIII: Low dependency	Low import dependency (export vulnerability) and low supplier (destination) concentration	87.5%	82.6%	94.2%	99.7%
QIV: Limited dependency	High import dependency (export vulnerability) and low supplier (destination) concentration	1.9%	4.3%	0.7%	0.02%

Policies aiming at lowering import dependency must be granular because this dependency and vulnerability happens in very specific products which, most of the time, represent small shares of EU27 imports and exports.

The relationship between import dependency and export vulnerability is important for policymakers as defensive trade and industrial policies can have a knock-on effect on the trade and industrial policies of EU trading partners. In other words, if the EU cuts it dependency on the rest of the world, the rest of the world could cut its dependency on the EU27. An EU strategic autonomy would be the wrong signal and lead to increased export vulnerabilities. Incidentally, this could lead to protectionist policies that would harm the EU27 economy and its pharmaceutical industry especially because of the strong export performance of the industry.

Policy proposals must be assessed against alternative policies, including the possibility of doing nothing. Our analysis shows that the EU pharmaceutical industry has been relatively resilient with no major change in the imports and exports of pharmaceuticals within and outside the EU27 between 2020 and 2019. If anything, there was a small increase in intra-EU imports of pharmaceuticals in March 2020 which indicates that there was an increase in trade within the EU27 when more medicines were needed. The positive performance of the EU pharmaceutical industry together with the product specific nature of EU27 import dependency and export vulnerability calls for surgical policy changes rather than a policy overhaul.

ANNEX I: METHODOLOGY

One of the objectives of the project was to gather production and trade statistics from Eurostat in order to undertake an analysis of the consumption of EU27 pharmaceutical products and to understand the relevance of imports on that consumption.

Production values are included in the Eurostat PRODCOM database. This database also includes exports and import data although it does not differentiate from which trade partners the imports are sourced and which markets EU27 products are exported to. Therefore, we use the Eurostat COMEXT database to gather data on exports and imports of pharmaceutical products by country.

The first action we took was to transform the list of Combined Nomenclature (CN) of six digits from which we started, into the eight digits that COMEXT uses. We also needed this step to map the concordance between the CNs in eight digits used in COMEXT for trade data with the PRODCOM nomenclature used with the production data. This transformation and matching process came with two setbacks.

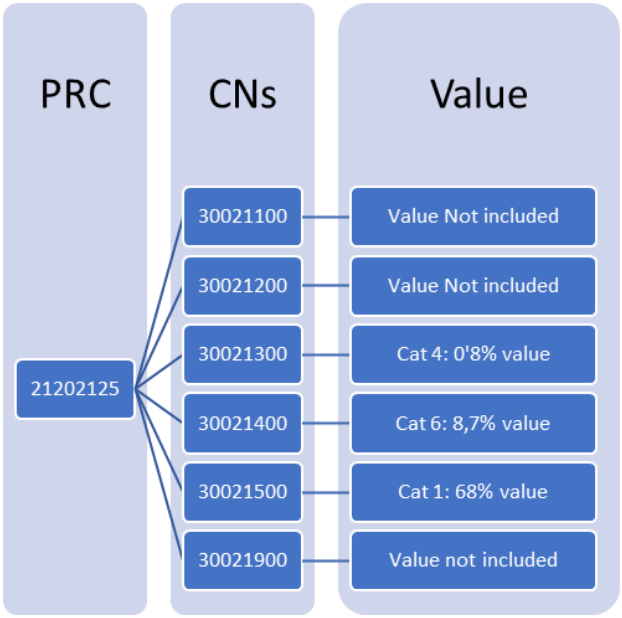
- First, we noticed that when increasing from CN6 to CN8, some of the products were not exactly used in the pharmaceutical industry. Some products headings can be broken down into different chemical components, and some of these may be (for example) used in the herbicide market but not for human medicine, despite belonging to the same product family in CN6. We started with 126 products in CN6, which is equivalent to 164 products in CN8. From these 164 products, we decided to remove 9 entries because there are not used in the human pharmaceutical industry products. At the end we have 155 CN8 products that were referenced in this report. However, for some calculations the number of products were reduced as not all products are traded across all countries.
- Second, once we had the CN8s, we used a concordance table that matches the Combined Nomenclature (CN) used in COMEXT for trade data with the PRODCOM Nomenclature (PRC) used with the production data. We found that the products in PRC nomenclature are more aggregated that in CN nomenclature which resulted in multiple CN matched to one PRODCOM code. The 155 products of reference equal to 51 PRC products. We also found that in some cases there PRODCOM codes were associated with CN codes that were not included in our original list of CN codes used in ECIPE (2020)[19].

Several CNs can be subsumed in the same PRC. But this aggregation is not perfect: Sometimes the PRCs include some CNs that were not in our original list used in COMEXT. This happens with several PRCs inside Category 4 and with one PRC in category 1. We calculated how much this new inclusion represent and for category 4 is almost 5% percent of all its PRCs value and for category 1 is almost imperceptible. These entries were therefore not adjusted, but we added in the next Annex a table with all the PRC and their equivalent CNs, stating which ones were not in original list.

[19] ECIPE (2020). Key Trade Data Points on the EU27 Pharmaceutical Supply Chain. Available at: https://ecipe.org/wp-content/uploads/2020/07/Pharmaceutical-data_July-2020.pdf

As showed above, product 21202125 *"Antisera, other immunological products which are directly involved in the regulation of immunological processes and other blood fractions"* was a special case. This product included 6 different CNs. It was the only PRC in the list where its CNs belonged to 3 different categories (1, 4 and 6). The other 3 CNs were also not included in our original list of CNs, but their value was more representative. Due to this, we decided to adjust for this based on the total value of these CNs' 2019 exports. Then we assigned their percentage to the final PRC 21202125 as it follows:

Figure I.1. Example of PRC to CN concordance



We have 51 product entries, which are listed in the Annex below. They are divided in categories as follows:

- 5 PRC products in category 1 "FPPs", and part of PRC 21202125.
- 2 PRC products in category 2 "Antibiotic FPPs".
- 1 PRC product in category 3 "Vaccines".
- 35 PRC products in category 4 "APIs", and part of PRC 21202125.
- 1 PRC product in category 5 "Antibiotic APIs".
- 6 PRC products in category 6 "Semi FPPs", and part of PRC 21202125.

The second action was to check that the import and exports figures in PRODCOM were equivalent to the figures reported in COMEXT. We performed several checks and the necessary adjustment to be confident that the PRODCOM exports and imports figures for 2019 were very similar to the exports and import figures published under COMEXT.

Third, we joined the PRODCOM production figure with the exports and imports figures from COMEXT for each PRODCOM product code. The advantage of using COMEXT data for exports and imports rather than PRODCOM data on exports and imports were that COMEXT data includes trade partners for exports and imports and the information on volumes is much more complete than in PRODCOM.
We compared the values of imports and exports from PRODCOM, after having adjusted these values, with the value of imports and exports reported by Eurostat in COMEXT

using CN codes. For imports, although it was not possible to produce the same figures in PRODCOM as in CN, the amounts were relatively similar. In general, PRODCOM figures for imports were higher than in CN: 2% higher for HMP – FPP, 1% higher for API, 4% higher for ANT, 1% higher for SFP and 25% higher for HMP -VAC. Whilst the relative difference for vaccines was significant in absolute numbers the difference was 488.4 million which is not relatively small when compared to the total amount of EU trade in pharmaceutical products. For exports, it was not possible either to produce the same figures in PRODCOM as in CN, but the amounts were also relatively similar. In general, PRODCOM figures for exports were higher than in CN: 2% higher for HMP – FPP, 2% higher for HMP – VAC, 4% higher for API, 1% higher for ANT, and the same figures for SFP.

Once we were confident that the product codes were correctly matched and adjusted, we proceeded with the analysis. However, we saw that for some product codes the amount of EU27 exports was higher than the amount of EU production. We found that Eurostat reports "The value of exports cannot always be compared directly with that of sold production. The latter is based on the ex-work selling price, whereas exports are evaluated at the time the goods cross the border. In addition, imported goods can be exported again with a different value, either without being modified or after industrial processing (e.g. textile finishing or surface treatment) which is not linked to external trade in Europroms."[20]

Therefore, any policy conclusion from analysing consumption needs to be done with caution. For that reason, it is better to look at production, imports, and exports separately. We analysed imports and exports data from COMEXT, and production data from PRODCOM.

We also need to highlight some analytical difficulties faced with COMEXT data. When gathering data for every country, we noticed that COMEXT skips some countries for certain products. At the same time, we saw in some products the presence of zeroes in imports and exports flows for some countries. We asked Eurostat and their clarification is that missing data means no trade from that country. On the other hand, 0 values can either mean very small trade (more than 3 decimals behind the comma) or that the member state did not have the correct value and at the same time was not able to estimate it or, depending on the code, confidential trade. Knowing this we decided to remove the zeroes and take them as missing value. The main reason is that value for COMEXT's imports and exports is given in Euros; hence it is difficult to understand how an import or export flow had more than 3 decimals behind a comma when speaking about currencies.

Another difficulty is how COMEXT reports volumes or quantities. COMEXT gives imports and exports flows for every EU or non-EU partner country with EU27 as the reporter. But it also gives information for "EU27_2020_EXTRA" and "EU27_2020_INTRA" as partners. These entries are supposed to sum all the trading flows from non-EU countries

[20] Eurostat. Europroms, PRODCOM Data. Available at: https://ec.europa.eu/eurostat/documents/120432/4433294/europroms-user-guide.pdf/e2a31644-e6a2-4357-8f78-5fa1d7a09556

(EXTRA) and EU countries (INTRA) into the EU27. We added all the indicators for all the non-EU countries, and this is supposed to match the “EU27_2020_EXTRA” entry and the imports and exports given by PRODCOM. The problem came when these figures do not match perfectly. At the end, we assume that this is normal and that some units may vary as we face very large quantities.

ANNEX II: CONCORDANCE OF CN AND PRODCOM CODES

Following ECIPE (2020)[21], we chose the list of the 163 pharmaceutical products of interest, at the 5th level (8 digits) with their Combined Nomenclature Code and their name (see Annex 2).

Then, we divided the products in the following 6 categories, with their respective PRODCOM's PCR code equivalent:

Table II.1. PRODCOM's PCR code equivalent

Category	Name	Group	CN (8 digits)	PCR
1	Finished Pharmaceutical Products (FPPs)	Human Medicinal Products (1)	30021500 30043100 30043200 30043900 30044100 30044200 30044300 30044900 30045000 30046000 30049000	21201260 21201270 21201340 21201360 21201380
2	Antibiotic FPPs	Antibiotics (2)	30041000 30042000	21201160 21201180
3	Vaccines for human medicine	Human Medicinal Products (1)	30022000	21202145
4	Active Pharmaceutical Ingredients (APIs)	Active Pharmaceutical Ingredients (3)	29146200 29146980 29163910 29182100 29182200 29182300 29189940 29214600 29214900 29221400 29221900 29222900 29223100 29224100 29224400 29224920 29225000 29232000 29241100 29242400 29242910 29251200 29252900 29263000 29319000 29322020 29331190 29331990 29332100	20143367 20143370 20143475 20144159 20144238 20144290 20144330 20144340 20144370 20145151 20145230 20145280 20145290 20146260 20146430 21101030 21101050 21101070 21102010 21102040 21102060 21102070 21103117 21103119 21103130 21103140 21103155 21103159 21103170

[21] ECIPE (2020). Key Trade Data Points on the EU27 Pharmaceutical Supply Chain. Available at: https://ecipe.org/wp-content/uploads/2020/07/Pharmaceutical-data_July-2020.pdf

Category	Name	Group	CN (8 digits)	PCR
			29332910	21103180
			29333100	21103200
			29333200	21105100
			29333300	21105200
			29333910	21105300
			29333945	21106040
			29333955	
			29334100	
			29334910	
			29335200	
			29335390	
			29335400	
			29335500	
			29335995	
			29336940	
			29337100	
			29337200	
			29337900	
			29339190	
			29339950	
			29341000	
			29343090	
			29349100	
			29349990	
			29359090	
			29362100	
			29362200	
			29362300	
			29362400	
			29362500	
			29362600	
			29362700	
			29362800	
			29362900	
			29369000	
			29371100	
			29371200	
			29371900	
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			29389030	
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			29391900	
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			29393000	
			29394100	
			29394200	
			29394300	
			29394400	
			29394900	
			29395100	
			29395900	
			29396100	
			29396200	
			29396300	
			29396900	
			29397100	

Category	Name	Group	CN (8 digits)	PCR
			29397990 29398000 29420000 30019098 30021300	
5	Antibiotic APIs	Antibiotics (2)	29411000 29412080 29413000 29414000 29415000 29419000	21105400
6	Semi-finished products (SFPs)	Semi-finished products (4)	30021400 30031000 30032000 30033100 30033900 30034100 30034200 30034300 30034900 30036000 30039000	21201130 21201150 21201230 21201250 21201310 21201320 21202125

Source: Eurostat.

To compile the dataset, we matched the data coming from COMEXT and PRODCOM.

We checked whether the import values from COMEXT and PRODCOM were similar. For example, PCR product code 21202145, category 3 "Vaccines" was matched to one CN product (30022000). We checked that the information from PRODCOM was the same as the one reported in COMEXT for the partner "EU27_2020_EXTRA". It needs to be noted that this product has a missing value for 2010 at PRODCOM but, for example, if we check the values for the years 2015 and 2019, we can see that both datasets report almost the same amount:

Table II.2. Example of matching value of PORDCOM (PRC) and COMEXT (CN)

reporter	partner	PRCCODE	CN product	category	years	Imports Value at COMEXT	Imports Value at PRODCOM
EU27_2020	EU27_2020_EXTRA	21202145	30022000	3	2019	2.427.905.113	2.425.928.650
EU27_2020	EU27_2020_EXTRA	21202145	30022000	3	2015	2.797.836.836	2.797.836.850

Source: Eurostat. Authors' calculations.

ANNEX III: CN PRODUCTS LIST

Table III.1. CN product list

CN8 CODE (no space)	NAME
29146200	Coenzyme Q10 "ubidecarenone "INN""
29146910	1,4-Naphthoquinone
29146980	Quinones (excl. anthraquinone, coenzyme Q10 "ubidecarenone "INN"" and 1,4-naphthoquinone)
29163910	Esters of phenylacetic acid
29163990	Aromatic monocarboxylic acids, their anhydrides, halides, peroxides, peroxyacids and their halogenated, sulphonated, nitrated or nitrosated derivatives (excl. benzoic acid, its salts and esters, benzoyl peroxide, benzoyl chloride, binapacryl [ISO], phenylacetic acid, its salts and esters, and inorganic or organic compounds of mercury whether or not chemically defined)
29182100	Salicylic acid and its salts (excl. inorganic or organic compounds of mercury)
29182200	o-Acetylsalicylic acid, its salts and esters
29182300	Esters of salicylic acid and their salts (excl. o-acetylsalicylic acid, its salts and esters)
29189940	2,6-Dimethoxybenzoic acid; dicamba (ISO); sodium phenoxyacetate
29189990	Carboxylic acids with additional oxygen function, their anhydrides, halides, peroxides and peroxyacids and their halogenated, sulphonated, nitrated or nitrosated derivatives (excl. only with alcohol, phenol, aldehyde or ketone function, and 2,6-dimethoxybenzoic acid, dicamba [ISO], sodium phenoxyacetate, and 2,4,5-T [ISO] [2,4,5-trichlorophenoxyacetic acid] and its salts and esters)
29214600	Amfetamine "INN", benzfetamine "INN", dexamfetamine "INN", etilamfetamine "INN", fencamfamine "INN", lefetamine "INN", levamfetamine "INN", mefenorex "INN" and phentermine "INN", and salts thereof
29214900	Aromatic monoamines and derivatives; salts thereof (excl. aniline, toluidines, diphenylamine, 1-naphthylamine "alpha-naphthylamine", 2-naphthylamine "beta-naphthylamine" and their derivatives, and salts thereof, and amfetamine "INN", benzfetamine "INN", dexamfetamine "INN", etilamfetamine "INN", fencamfamine "INN", lefetamine "INN", levamfetamine "INN", mefenorex "INN" and phentermine "INN", and salts thereof)
29221400	Dextropropoxyphene "INN" and its salts
29221900	Amino-alcohols, their ethers and esters; salts thereof (other than those containing > one kind of oxygen function and excl. monoethanolamine, diethanolamine, dextropropoxyphene "INN", their salts, triethanolamine, diethanolammonium perfluorooctane sulphonate, methyldiethanolamine, ethyldiethanolamine and 2-(N,N-Diisopropylamino)ethanol)
29222900	Amino-naphthols and other amino-phenols, their ethers and esters; salts thereof (excl. those containing > one kind of oxygen function; aminohydroxynaphthalenesulphonic acids and their salts)
29223100	Amfepramone "INN", methadone "INN" and normethadone "INN", and salts thereof
29224100	Lysine and its esters; salts thereof
29224400	Tilidine "INN" and its salts
29224920	beta-Alanine
29224985	Amino-acids and their esters; salts thereof (excl. those containing > one kind of oxygen function, lysine and its esters, and salts thereof, and glutamic acid, anthranilic acid, tilidine "INN" and their salts and beta-alanine)
29225000	Amino-alcohol-phenols, amino-acid-phenols and other amino-compounds with oxygen function (excl. amino-alcohols, amino-naphthols and other amino-phenols, their ethers and esters and salts thereof, amino-aldehydes, amino-ketones and amino-quinones, and salts thereof, amino-acids and their esters and salts thereof)
29232000	Lecithins and other phosphoaminolipids, whether or not chemically defined
29241100	Meprobamate "INN"
29242400	Ethinamate "INN"

CN8 CODE (no space)	NAME
29242910	Lidocaine "INN"
29242970	Cyclic amides, incl. cyclic carbamates, and their derivatives; salts thereof (excl. ureines and their derivatives, salts thereof, 2-acetamidobenzoic acid "N-acetylanthranilic acid" and its salts, ethinamate "INN", alachlor "ISO" and lidocaine "INN")
29251200	Glutethimide "INN"
29252900	Imines and their derivatives; salts thereof (excl. chlordimeform [ISO])
29263000	Fenproporex "INN" and its salts; methadone "INN"-intermediate "4-cyano-2-dimethylamino-4,4-diphenylbutane"
29319000	Separate chemically defined organo-inorganic compounds (excl. organo-sulphur, mercury, tetramethyl lead, tetraethyl lead and tributyltin compounds, and organo-phosphorous derivatives)
29322010	Phenolphthalein; 1-Hydroxy-4-[1-(4-hydroxy-3-methoxycarbonyl-1-naphthyl)-3-oxo-1H,3H-benzo[de]isochromen-1-yl]-6-octadecyloxy-2-naphthoic acid; 3'-Chloro-6'-cyclohexylaminospiro[isobenzofuran-1(3H),9'-xanthen]-3-one; 6'-(N-Ethyl-p-toluidino)-2'-methylspiro[isobenzofuran-1(3H),9'-xanthen]-3-one; Methyl-6-docosyloxy-1-hydroxy-4-[1-(4-hydroxy-3-methyl-1-phenanthryl)-3-oxo-1H,3H-naphtho[1,8-cd]pyran-1-yl]naphthalene-2-carboxylate
29322020	gamma-Butyrolactone
29322090	Lactones (excl. gamma-Butyrolactone; Phenolphthalein; 1-Hydroxy-4-[1-(4-hydroxy-3-methoxycarbonyl-1-naphthyl)-3-oxo-1H,3H-benzo[de]isochromen-1-yl]-6-octadecyloxy-2-naphthoic acid; 3'-Chloro-6'-cyclohexylaminospiro[isobenzofuran-1(3H),9'-xanthen]-3-one; 6'-(N-Ethyl-p-toluidino)-2'-methylspiro[isobenzofuran-1(3H),9'-xanthen]-3-one; Methyl-6-docosyloxy-1-hydroxy-4-[1-(4-hydroxy-3-methyl-1-phenanthryl)-3-oxo-1H,3H-naphtho[1,8-cd]pyran-1-yl]naphthalene-2-carboxylate)
29331110	Propyphenazone
29331190	Phenazone "antipyrin" and its derivatives (excl. propyphenazone "INN")
29331990	Heterocyclic compounds with nitrogen hetero-atom[s] only, containing an unfused pyrazole ring, whether or not hydrogenated, in the structure (excl. phenazone "antipyrin" and its derivatives and phenylbutazone "INN")
29332100	Hydantoin and its derivatives
29332910	Naphazoline hydrochloride "INNM" and naphazoline nitrate "INNM"; phentolamine "INN"; tolazoline hydrochloride "INNM"
29332990	Heterocyclic compounds with nitrogen hetero-atom[s] only, containing an unfused imidazole ring, whether or not hydrogenated, in the structure (excl. hydantoin and its derivatives, naphazoline hydrochloride "INNM", naphazoline nitrate "INNM", phentolamine "INN" and tolazoline hydrochloride "INNM")
29333100	Pyridine and its salts
29333200	Piperidine and its salts
29333300	Alfentanil "INN", anileridine "INN", bezitramide "INN", bromazepam "INN", difenoxin "INN", diphenoxylate "INN", dipipanone "INN", fentanyl "INN", ketobemidone "INN", methylphenidate "INN", pentazocine "INN", pethidine "INN", pethidine "INN" intermediate A, phencyclidine "INN" "PCP", phenoperidine "INN", pipradol "INN", piritramide "INN", propiram "INN" and trimeperidine "INN", and salts thereof
29333910	Iproniazid "INN"; ketobemidone hydrochloride "INNM"; pyrodostigmine bromide "INN"
29333945	3,5-Dichloro-2,4,6-trifluoropyridine
29333955	4-Methylpyridine
29333999	Heterocyclic compounds with nitrogen hetero-atom[s] only, containing an unfused pyridine ring, whether or not hydrogenated, in the structure (excl. pyridine, piperidine, alfentanil "INN", anileridine "INN", bezitramide "INN", bromazepam "INN", difenoxin "INN", diphenoxylate "INN", dipipanone "INN", fentanyl "INN", ketobemidone "INN", methylphenidate "INN", pentazocine "INN", pethidine "INN", pethidine "INN" intermediate A, phencyclidine "INN" "PCP", phenoperidine "INN", pipradol "INN", piritramide "INN", propiram "INN", trimeperidine "INN", and their salts, and iproniazid "INN", ketobemidone hydrochloride "INNM",

CN8 CODE (no space)	NAME
	pyridostigmine bromide "INN", 2,3,5,6-tetrachloropyridine, 3,6-dichloropyridine-2-carboxylic acid, 2-hydroxyethylammonium-3,6-dichloropyridine-2-carboxylate, 2-butoxyethyl"3,5,6-trichloro-2-pyridyloxy"acetate, 3,5-dichloro-2,4,6-trifluoropyridine, fluroxypyr "ISO" methyl ester, 4-methylpyridine, and inorganic or organic compounds of mercury)
29334100	Levorphanol "INN" and its salts
29334910	Halogen derivatives of quinoline; quinolinecarboxylic acid derivatives
29334930	Dextromethorphan "INN" and its salts
29334990	Heterocyclic compounds with nitrogen hetero-atom[s] only, containing in the structure a quinoline or isoquinoline ring-system, whether or not hydrogenated, but not further fused (excl. levorphanol "INN", dextromethorphan "INN", and their salts, halogen derivatives of quinoline, quinolinecarboxylic acid derivatives, and inorganic or organic compounds of mercury)
29335200	Malonylurea "barbituric acid" and its salts
29335310	Phenobarbital "INN", barbital "INN", and salts thereof
29335390	Allobarbital "INN", amobarbital "INN", butalbital "INN", butobarbital "INN", cyclobarbital "INN", methylphenobarbital "INN", pentobarbital "INN", secbutabarbital "INN", secobarbital "INN" and vinylbital "INN", and salts thereof
29335400	Derivatives of malonylurea "barbituric acid" and salts thereof (excl. salts of malonylurea)
29335500	Loprazolam "INN", mecloqualone "INN", methaqualone "INN" and zipeprol "INN", and salts thereof
29335920	1,4-Diazabicyclo[2.2.2]octane "triethylenediamine"
29335995	Heterocyclic compounds with nitrogen hetero-atom"s" only, containing a pyrimidine ring, whether or not hydrogenated, or piperazine ring in the structure (excl. malonylurea "barbituric acid" and its derivatives, allobarbital "INN", amobarbital "INN", barbital "INN", butalbital "INN", butobarbital "INN", cyclobarbital "INN", methylphenobarbital "INN", pentobarbital "INN", phenobarbital "INN", secbutabarbital "INN", secobarbital "INN", vinylbital "INN", loprazolam "INN", mecloqualone "INN", methaqualone "INN" and zipeprol "INN", and salts thereof, and diazinon "ISO" and 1,4-diazabicyclo[2.2.2]octane "triethylenediamine")
29336940	Methenamine (INN) (hexamethylenetetramine); 2,6-Di-tert-butyl-4-[4,6-bis(octylthio)-1,3,5-triazine-2-ylamino]phenol
29336980	Heterocyclic compounds with nitrogen hetero-atom[s] only, containing an unfused triazine ring, whether or not hydrogenated, in the structure (excl. melamine, atrazine "ISO", propazine "ISO", simazine "ISO", hexahydro-1,3,5-trinitro-1,3,5-triazine "hexogen, trimethylenetrinitramine", methenamine [INN] "hexamethylenetetramine" and 2,6-di-tert-butyl-4-[4,6-bis"octylthio"-1,3,5-triazine-2-ylamino]phenol)
29337100	6-Hexanelactam "epsilon-caprolactam"
29337200	Clobazam "INN" and methyprylon "INN"
29337900	Lactams (excl. 6-hexanelactam "epsilon-caprolactam", clobazam "INN", methyprylon "INN", and inorganic or organic compounds of mercury)
29339110	Chlorodiazepoxide "INN"
29339190	Alprazolam "INN", camazepam "INN", clonazepam "INN", clorazepate, delorazepam "INN", diazepam "INN", estazolam "INN", ethyl loflazepate "INN", fludiazepam "INN", flunitrazepam "INN", flurazepam "INN", halazepam "INN", lorazepam "INN", lormetazepam "INN", mazindol "INN", medazepam "INN", midazolam "INN", nimetazepam "INN", nitrazepam "INN", nordazepam "INN", oxazepam "INN", pinazepam "INN", prazepam "INN", pyrovalerone "INN", temazepam "INN", tetrazepam "INN" and triazolam "INN", salts thereof, and salts of chlordiazepoxide "INN"
29339920	Indole, 3-methylindole "skatole", 6-allyl-6,7-dihydro-5H-dibenz"c,e"azepine "azapetine", phenindamine "INN" and their salts; imipramine hydrochloride "INNM"
29339950	2,4-Di-tert-butyl-6-"5-chlorobenzotriazol-2-yl"phenol
29339980	Heterocyclic compounds with nitrogen hetero-atom[s] only (excl. those containing an unfused pyrazole, imidazole, pyridine or triazine ring, whether or not hydrogenated, a quinoline or isoquinoline ring-system, not further fused, whether or not hydrogenated, a pyrimidine ring, whether or not hydrogenated, or piperazine ring in the structure, lactams, alprazolam "INN", camazepam "INN", chlordiazepoxide "INN", clonazepam "INN", clorazepate, delorazepam "INN", diazepam "INN", estazolam "INN", ethyl loflazepate "INN", fludiazepam "INN", flunitrazepam "INN", flurazepam "INN", halazepam "INN", lorazepam "INN", lormetazepam

CN8 CODE (no space)	NAME
	"INN", mazindol "INN", medazepam "INN", midazolam "INN", nimetazepam "INN", nitrazepam "INN", nordazepam "INN", oxazepam "INN", pinazepam "INN", prazepam "INN", pyrovalerone "INN", temazepam "INN", tetrazepam "INN", triazolam "INN", salts thereof, indole, 3-methylindole "skatole", 6-allyl-6,7-dihydro-5H-dibenz"c,e"azepine "azapetine", phenindamine "INN" and their salts, imipramine hydrochloride "INNM", 2,4-di-tert-butyl-6-"5-chlorobenzotriazol-2-yl"phenol and azinphos-methyl "ISO")
29341000	Heterocyclic compounds containing an unfused thiazole ring, whether or not hydrogenated, in the structure
29342080	Heterocyclic compounds containing in the structure a benzothiazole ring-system, whether or not hydrogenated, but not further fused (excl. di"benzothiazol-2-yl"disulphide; benzothiazole-2-thiol "mercaptobenzothiazole" and its salts, and inorganic or organic compounds of mercury)
29343010	Thiethylperazine "INN"; thioridazine "INN" and its salts
29343090	Heterocyclic compounds containing in the structure a phenothiazine ring-system, whether or not hydrogenated, but not further fused (excl. thiethylperazine "INN", and thioridazine "INN" and its salts)
29349100	Aminorex "INN", brotizolam "INN", clotiazepam "INN", cloxazolam "INN", dextromoramide "INN", haloxazolam "INN", ketazolam "INN", mesocarb "INN", oxazolam "INN", pemoline "INN", phendimetrazine "INN", phenmetrazine "INN" and sufentanil "INN", and salts thereof
29349960	Chlorprothixene (INN); thenalidine (INN) and its tartrates and maleates; furazolidone (INN); 7-aminocephalosporanic acid; salts and esters of (6R,7R)-3-acetoxymethyl-7-[(R)-2-formyloxy-2-phenylacetamido]-8- oxo-5-thia-1-azabicyclo[4.2.0]oct-2-ene-2-carboxylic acid; 1-[2-(1,3-Dioxan-2-yl)ethyl]-2-methylpyridinium bromide
29349990	Nucleic acids and their salts, whether or not chemically defined; heterocyclic compounds (excl. those with oxygen or nitrogen hetero-atom"s" only, compounds containing in the structure an unfused thiazole ring or a benzothiazole or phenothiazine ring-system or further fused, aminorex "INN", brotizolam "INN", clotiazepam "INN", cloxazolam "INN", dextromoramide "INN", haloxazolam "INN", ketazolam "INN", mesocarb "INN", oxazolam "INN", pemoline "INN", phendimetrazine "INN", phenmetrazine "INN", sufentanil "INN", salts thereof, chlorpothixene "INN", thenalidine "INN" and its tartrates and maleates, furazolidone "INN", 7-aminocephalosporanic acid, salts and esters of "6R, 7R"-3-acetoxymethyl-7-["R"-2-formyloxy-2-phenylacetamido]-8-oxo-5-thia-1-azabicyclo[4.2.0]oct-2-ene-2-carboxylic acid, 1-[2-"1,3-dioxan-2-yl"ethyl]-2-methylpyridinium bromide, and inorganic or organic compounds of mercury)
29359030	3-{1-[7-(Hexadecylsulphonylamino)-1H-indole-3-yl]-3-oxo-1H,3H-naphtho[1,8-cd]pyran-1-yl}-N,N-dimethyl-1H-indole-7-sulphonamide; metosulam "ISO"
29359090	Sulphonamides (excl. perfluorooctane sulphonamides, 3-{1-[7-"hexadecylsulphonylamino"-1H-indole-3-yl]-3-oxo-1H, 3H-naphtho[1,8-cd]pyran-1-yl}-N,N-dimethyl-1H-indole-7-sulphonamide and metosulam "ISO")
29362100	Vitamins A and their derivatives, used primarily as vitamins
29362200	Vitamin B1 and its derivatives, used primarily as vitamins
29362300	Vitamin B2 and its derivatives, used primarily as vitamins
29362400	D-Pantothenic or DL-pantothenic acid "Vitamin B3 or B5" and their derivatives, used primarily as vitamins
29362500	Vitamin B6 and its derivatives, used primarily as vitamins
29362600	Vitamin B12 and its derivatives, used primarily as vitamins
29362700	Vitamin C and its derivatives, used primarily as vitamins
29362800	Vitamin E and its derivatives, used primarily as vitamins
29362900	Vitamins and their derivatives, used primarily as vitamins, unmixed (excl. vitamins A, B1, B2, B3, B5, B6, B12, C, E and their derivatives)
29369000	Provitamins and mixtures of vitamins, of provitamins or of concentrates, whether or not in any solvent, and natural concentrates
29371100	Somatropin, its derivatives and structural analogues, used primarily as hormones
29371200	Insulin and its salts, used primarily as hormones
29371900	Polypeptide hormones, protein hormones and glycoprotein hormones, their derivatives and structural analogues, used primarily as hormones (excl. somatropin, its derivatives and structural analogues, and insulin and its salts)
29372100	Cortisone, hydrocortisone, prednisone "dehydrocortisone" and prednisolone "dehydrohydrocortisone"

CN8 CODE (no space)	NAME
29372200	Halogenated derivatives of corticosteroidal hormones
29372300	Oestrogens and progestogens
29372900	Steroidal hormones, their derivatives and structural analogues, used primarily as hormones (excl. cortisone, hydrocortisone, prednisone "dehydrocortisone", prednisolone "dehydrohydrocortisone", halogenated derivatives of corticosteroidal hormones, oestrogens and progestogens)
29375000	Prostaglandins, thromboxanes and leukotrienes, their derivatives and structural analogues, used primarily as hormones
29379000	Hormones, natural or reproduced by synthesis; derivatives and structural analogues thereof, used primarily as hormones (excl. polypeptide hormones, protein hormones, glycoprotein hormones, steroidal hormones, catecholamine hormones, prostaglandins, thromboxanes and leukotrienes, their derivatives and structural analogues, and amino-acid derivatives, and products of 3002 10)
29381000	Rutoside "rutin" and its derivatives
29389010	Digitalis glycosides
29389030	Glycyrrhizic acid and glycyrrhizates
29389090	Glycosides, natural or reproduced by synthesis, and their salts, ethers, esters and other derivatives (excl. rutoside "rutin" and its derivatives, digitalis glycosides, glycyrhizic acid and glycyrrhizates)
29391100	Concentrates of poppy straw; buprenorphine "INN", codeine, dihydrocodeine "INN", ethylmorphine, etorphine "INN", heroin, hydrocodone "INN", hydromorphone "INN", morphine, nicomorphine "INN", oxycodone "INN", oxymorphone "INN", pholcodine "INN", thebacon "INN" and thebaine, and salts thereof
29391900	Alkaloids of opium and their derivatives, and salts thereof (excl. concentrates of poppy straw; buprenorphine "INN", codeine, dihydrocodeine "INN", ethylmorphine, etorphine "INN", heroin, hydrocodone "INN", hydromorphone "INN", morphine, nicomorphine "INN", oxycodone "INN", oxymorphone "INN", pholcodine "INN", thebacon "INN" and thebaine, and salts thereof)
29392000	Alkaloids of cinchona and their derivatives; salts thereof
29393000	Caffeine and its salts
29394100	Ephedrine and its salts
29394200	Pseudoephedrine "INN" and its salts
29394300	Cathine "INN" and its salts
29394400	Norephedrine and its salts
29394900	Ephedrines and their salts (excl. ephedrine, pseudoephedrine "INN", cathine "INN", norephedrine, and their salts)
29395100	Fenetylline "INN" and its salts
29395900	Theophylline and aminophylline "theophylline-ethylenediamine" and their derivatives, and salts thereof (excl. fenetylline "INN" and its salts)
29396100	Ergometrine "INN" and its salts
29396200	Ergotamine "INN" and its salts
29396300	Lysergic acid and its salts
29396900	Alkaloids of rye ergot and their derivatives; salts thereof (excl. lysergic acid, ergotamine and ergometrine, and their salts)
29397100	Cocaine, ecgonine, levometamfetamine, metamfetamine "INN", metamfetamine racemate, and salts, esters and other derivatives thereof
29397910	Nicotine and its salts, ethers, esters and other derivatives thereof
29397990	Vegetal alkaloids, natural or reproduced by synthesis, and their salts, ethers, esters and other derivatives (excl. alkaloids of opium, alkaloids of cinchons, theophylline, aminophylline "theophylline-ethylenediamine" alkaloids of rye ergot and their salts and derivatives, cocaine, ecgonine, levometamfetamine, metamfetamine "INN", metamfetamine racemate, and salts, esters and other derivatives thereof, caffeine and ephedrines, and their salts, nicotine and its salts, ethers, esters and other derivatives thereof)
29398000	Non-vegetal alkaloids, natural or reproduced by synthesis, and their salts, ethers, esters and other derivatives

CN8 CODE (no space)	NAME
29411000	Penicillins and their derivatives with a penicillanic acid structure; salts thereof
29412030	Dihydrostreptomycin, its salts, esters and hydrates
29412080	Streptomycins and their derivatives; salts thereof (excl. dihydrostreptomycin and its salts, esters and hydrates)
29413000	Tetracyclines and their derivatives; salts thereof
29414000	Chloramphenicol and its derivatives; salts thereof
29415000	Erythromycin and its derivatives; salts thereof
29419000	Antibiotics (excl. penicillins and their derivatives with a penicillanic acid structure, salts thereof, streptomycins, tetracyclines, chloramphenicol and erythromycin, their derivatives and salts thereof)
29420000	Separate chemically defined organic compounds, n.e.s.
30019020	Dried glands and other organs for organo-therapeutic uses, whether or not powdered, and other substances of human origin prepared for therapeutic or prophylactic uses, n.e.s.
30019091	Heparin and its salts
30019098	Dried glands and other organs for organo-therapeutic uses, whether or not powdered, and other substances of animal origin prepared for therapeutic or prophylactic uses, n.e.s. (excl. heparin and its salts)
30021300	Immunological products, unmixed, not put up in measured doses or in forms or packings for retail sale
30021400	Immunological products, mixed, not put up in measured doses or in forms or packings for retail sale
30021500	Immunological products, put up in measured doses or in forms or packings for retail sale
30022000	Vaccines for human medicine
30031000	Medicaments containing penicillins or derivatives thereof with a penicillanic acid structure, or streptomycins or derivatives thereof, not in measured doses or put up for retail sale
30032000	Medicaments containing antibiotics, not in measured doses or put up for retail sale (excl. medicaments containing penicillins or derivatives thereof with a penicillanic acid structure, or streptomycins or derivatives thereof)
30033100	Medicaments containing insulin, not in measured doses or put up for retail sale
30033900	Medicaments containing hormones or steroids used as hormones, not containing antibiotics, not in measured doses or put up for retail sale (excl. those containing insulin)
30034100	Medicaments containing ephedrine or its salts, not containing hormones, steroids used as hormones or antibiotics, not in measured doses or put up for retail sale
30034200	Medicaments containing pseudoephedrine "INN" or its salts, not containing hormones, steroids used as hormones or antibiotics, not in measured doses or put up for retail sale
30034300	Medicaments containing norephedrine or its salts, not containing hormones, steroids used as hormones or antibiotics, not in measured doses or put up for retail sale
30034900	Medicaments containing alkaloids or derivatives thereof, not containing hormones, steroids used as hormones or antibiotics, not in measured doses or put up for retail sale (excl. containing ephedrine, pseudoephedrine "INN", norephedrine or their salts)
30036000	Medicaments containing any of the following antimalarial active principles: artemisinin "INN" for oral ingestion combined with other pharmaceutical active ingredients, or amodiaquine "INN"; artelinic acid or its salts; artenimol "INN"; artemotil "INN"; artemether "INN"; artesunate "INN"; chloroquine "INN"; dihydroartemisinin "INN"; lumefantrine "INN"; mefloquine "INN"; piperaquine "INN"; pyrimethamine "INN" or sulfadoxine "INN", not containing hormones, steroids used as hormones or antibiotics, not in measured doses or put up for retail sale
30039000	Medicaments consisting of two or more constituents mixed together for therapeutic or prophylactic uses, not in measured doses or put up for retail sale (excl. antibiotics containing hormones or steroids used as hormones, but not containing antibiotics, alkaloids or derivatives thereof, hormones, antibiotics, antimalarial active principles or goods of heading 3002, 3005 or 3006)
30041000	Medicaments containing penicillins or derivatives thereof with a penicillanic acid structure, or streptomycins or derivatives thereof, put up in measured doses "incl. those for transdermal administration" or in forms or packings for retail sale
30042000	Medicaments containing antibiotics, put up in measured doses "incl. those for transdermal administration" or in forms or packings for retail sale (excl. medicaments containing penicillins or derivatives thereof with a penicillanic structure, or streptomycines or derivatives thereof)

CN8 CODE (no space)	NAME
30043100	Medicaments containing insulin but not antibiotics, put up in measured doses "incl. those for transdermal administration" or in forms or packings for retail sale
30043200	Medicaments containing corticosteroid hormones, their derivatives or structural analogues but not antibiotics, put up in measured doses "incl. those for transdermal administration" or in forms or packings for retail sale
30043900	Medicaments containing hormones or steroids used as hormones but not antibiotics, put up in measured doses "incl. those for transdermal administration" or in forms or packings for retail sale (excl. medicaments containing insulin or corticosteroid hormones, their derivatives or structural analogues)
30044100	Medicaments containing ephedrine or its salts, not containing hormones, steroids used as hormones or antibiotics, put up in measured doses "incl. those for transdermal administration" or in forms or packings for retail sale
30044200	Medicaments containing pseudoephedrine "INN" or its salts, not containing hormones, steroids used as hormones or antibiotics, put up in measured doses "incl. those for transdermal administration" or in forms or packings for retail sale
30044300	Medicaments containing norephedrine or its salts, not containing hormones, steroids used as hormones or antibiotics, put up in measured doses "incl. those for transdermal administration" or in forms or packings for retail sale
30044900	Medicaments containing alkaloids or derivatives thereof, not containing hormones, steroids used as hormones or antibiotics, put up in measured doses "incl. those for transdermal administration" or in forms or packings for retail sale (excl. containing ephedrine, pseudoephedrine "INN", norephedrine or their salts)
30045000	Medicaments containing provitamins, vitamins, incl. natural concentrates and derivatives thereof used primarily as vitamins, put up in measured doses "incl. those for transdermal administration" or in forms or packings for retail sale (excl. containing antibiotics, hormones, alkaloids, or their derivatives)
30046000	Medicaments containing any of the following antimalarial active principles: artemisinin "INN" for oral ingestion combined with other pharmaceutical active ingredients, or amodiaquine "INN"; artelinic acid or its salts; artenimol "INN"; artemotil "INN"; artemether "INN"; artesunate "INN"; chloroquine "INN"; dihydroartemisinin "INN"; lumefantrine "INN"; mefloquine "INN"; piperaquine "INN"; pyrimethamine "INN" or sulfadoxine "INN", put up in measured doses "incl. those for transdermal administration" or in forms or packings for retail sale (excl. containing antibiotics, hormones, alkaloids, provitamins, vitamins, or their derivatives)
30049000	Medicaments consisting of mixed or unmixed products for therapeutic or prophylactic purposes, put up in measured doses "incl. those for transdermal administration" or in forms or packings for retail sale (excl. containing antibiotics, hormones or steroids used as hormones, alkaloids, provitamins, vitamins, their derivatives or antimalarial active principles)

Source: Eurostat.

ANNEX IV: PRODCOM PRODUCTS LIST

Table IV.1. Prodcom product list

PRODCOM Code	PRODCOM Product Description
20143367	20143367 Phenylacetic acid; its salts and esters
20143370	20143370 Aromatic monocarboxylic acids, (anhydrides), halides, peroxides, peroxyacids, derivatives excluding benzoic acid, phenylacetic acids their salts/esters, benzoyl peroxide, benzoyl chloride
20143475	20143475 Carboxylic acid with alcohol, phenol, aldehyde or ketone functions
20144159	20144159 Other aromatic monoamines and their derivatives; salts thereof
20144238	20144238 Amino-alcohols, their ethers and esters with only 1 oxygen function and their salts (excluding monoethanolamine and its salts, diethanolamine and its salts)
20144290	20144290 Oxygen-function amino-compounds (excluding amino-alcohols, their esters and ethers and salts thereof, lysine and its salts and esters, glutamic acid its salts and esters)
20144330	20144330 Imides and their derivatives, and salts thereof (excluding saccharin and its salts)
20144340	20144340 Imines and their derivatives; and salts thereof
20144370	20144370 Nitrile-function compounds (excluding acrylonitrile, 1-cyanoguanidine (dicyandiamide))
20145151	20145151 Organo-inorganic compounds (excluding organo-sulphur compounds)
20145230	20145230 Heterocyclic compounds with nitrogen only hetero-atom(s); containing an unfused imidazole ring (excluding hydantoin and its derivatives)
20145280	20145280 Compounds containing in the structure an unfused pyridine ring or a quinoline or isoquinoline ring-system, not further fused; lactames; other heterocyclic compounds with nitrogen hetero-atom(s) only (excluding compounds containing in the structure an unfused pyrazole ring, an unfused imidazole ring,
20145290	20145290 Nucleic acids and other heterocyclic compounds - thiazole, benzothiazole, other cycles
20146260	20146260 Quinones
20146430	20146430 Other organic compounds, n.e.c.
21101030	21101030 Salicylic acid and its salts
21101050	21101050 O-acetylsalicylic acid; its salts and esters
21101070	21101070 Esters of salicylic acid and their salts (excluding of O-acetylsalicylic acid)
21102010	21102010 Lysine and its esters, and salts thereof
21102040	21102040 Quaternary ammonium salts and hydroxides; lecithins and other phosphoaminolipids, whether or not chemically defined
21102060	21102060 Acyclic amides and their derivatives, and salts thereof (including acyclic carbamates)
21102070	21102070 Cyclic amides and their derivatives, and salts thereof (including cyclic carbamates) (excluding ureines and their derivatives, and salts thereof)
21103117	21103117 Phenolphthalein; 1-Hydroxy-4-[1-(4-hydroxy-3-methoxycarbonyl-1-naphthyl)-3-oxo-1H,3H-benzo[de]isochromen-1-yl]-6-octadecyloxy-2-naphthoic acid; 3'-Chloro-6'-cyclohexylaminospiro[isobenzofuran-1(3H),9'-xanthen]-3-one; 6'-(N-Ethyl-p-toluidino)-2'-methylspiro[isobenzofuran-1(3H),9'-xanthen]-3-one; Meth
21103119	21103119 Lactones (excluding phenolphthalein; 1-Hydroxy-4-[1-(4-hydroxy-3-methoxycarbonyl-1-naphthyl)-3-oxo-1H,3H-benzo[de]isochromen-1-yl]-6-octadecyloxy-2-naphthoic acid; 3’-Chloro-6’-cyclohexylaminospiro[isobenzofuran-1(3H),9’-xanthen]-3-one; 6’-(N-Ethyl-p-toluidino)-2’-methylspiro[isobenzofuran-1(3H),9’-
21103130	21103130 Compounds containing an unfused pyrazole ring (whether or not hydrogenated) in the structure
21103140	21103140 Hydantoin and its derivatives
21103155	21103155 Malonylurea (barbituric acid) and its derivatives, and salts thereof
21103159	21103159 Compounds containing a pyrimidine ring (whether or not hydrogenated) or piperazine ring in the structure (excluding malonylurea (barbituric acid) and its derivatives)
21103170	21103170 Compounds containing an unfused triazine ring (whether or not hydrogenated) in the structure (excluding melamine)

21103180	21103180 Compounds containing a phenothiazine ring-system (whether or not hydrogenated); not further fused
21103200	21103200 Sulphonamides
21105100	21105100 Provitamins and vitamins, natural or reproduced by synthesis (including natural concentrates), derivatives thereof used primarily as vitamins, and intermixtures of the foregoing, whether or not in any solvent
21105200	21105200 Hormones, prostaglandins, thromboxanes and leukotrienes, natural or reproduced by synthesis; derivatives and structural analogues thereof, including chain modified polypeptides, used primarily as hormones
21105300	21105300 Glycosides and vegetable alkaloids, natural or reproduced by synthesis, and their salts, ethers, esters and other derivatives
21105400	21105400 Antibiotics
21106040	21106040 Glands and other organs or substances for therapeutic or prophylactic use, n.e.c. (excluding blood and extracts of glands or other organs)
21201130	21201130 Medicaments containing penicillins or derivatives thereof, with a penicillanic acid structure, or streptomycins or their derivatives, for therapeutic or prophylactic uses, n.p.r.s.
21201150	21201150 Medicaments of other antibiotics, n.p.r.s.
21201160	21201160 Medicaments of penicillins, streptomycins or derivatives thereof, in doses or p.r.s.
21201180	21201180 Medicaments of other antibiotics, p.r.s.
21201230	21201230 Medicaments containing insulin but not antibiotics, for therapeutic or prophylactic uses, not put up in measured doses or for retail sale
21201250	21201250 Medicaments containing hormones but not antibiotics, for therapeutic or prophylactic uses, not put up in measured doses or for retail sale (excluding insulin)
21201260	21201260 Medicaments containing insulin but not antibiotics, for therapeutic or prophylactic uses, put up in measured doses or for retail sale
21201270	21201270 Medicaments containing corticosteroid hormones, their derivatives and structural analogues, put up in measured doses or for retail sale
21201310	21201310 Medicaments of alkaloids or derivatives thereof, n.p.r.s.
21201320	21201320 Other medicaments for therapeutic or prophylactic uses, of HS 3003, n.p.r.s.
21201340	21201340 Medicaments of alkaloids or derivatives thereof, p.r.s.
21201360	21201360 Medicaments containing vitamins, provitamins, derivatives and intermixtures thereof, for therapeutic or prophylactic uses, put up in measured doses or for retail sale
21201380	21201380 Other medicaments of mixed or unmixed products, p.r.s., n.e.c.
21202125	21202125 Antisera, other immunological products which are directly involved in the regulation of immunological processes and other blood fractions
21202145	21202145 Vaccines for human medicine

Source: Eurostat.

ANNEX V: PRC PRODUCTS WITH ALL THEIR MATCHING CNS

Table V.1. PRC, CN and category

PRC PRODUCT	CN PRODUCT	INCLUDED	CATEGORY
20143367	29163400	0	4
	29163910	1	4
20143370	29163990	1	4
20143475	29181100	0	4
	29181200	0	4
	29181300	0	4
	29181700	0	4
	29181800	0	4
	29181930	0	4
	29181940	0	4
	29181998	0	4
	29182900	0	4
	29183000	0	4
	29189100	0	4
	29189940	1	4
	29189990	1	4
	29181600	0	4
20144159	29214300	0	4
	29214400	0	4
	29214500	0	4
	29214600	1	4
	29214900	1	4
20144238	29221400	1	4
	29221500	0	4
	29221600	0	4
	29221700	0	4
	29221800	0	4
	29221900	1	4
20144290	29222100	0	4
	29222900	1	4
	29223100	1	4
	29223900	0	4
	29224300	0	4
	29224400	1	4
	29224920	1	4
	29224985	1	4
	29225000	1	4
20144330	29251200	1	4

PRC PRODUCT	CN PRODUCT	INCLUDED	CATEGORY
	29251920	0	4
	29251995	0	4
20144340	29252100	0	4
	29252900	1	4
20144370	29263000	1	4
	29264000	0	4
	29269020	0	4
	29269070	0	4
20145151	29311000	0	4
	29312000	0	4
	29313100	0	4
	29313200	0	4
	29313300	0	4
	29313400	0	4
	29313500	0	4
	29313600	0	4
	29313700	0	4
	29313800	0	4
	29313920	0	4
	29313930	0	4
	29313950	0	4
	29313960	0	4
	29313990	0	4
	29319000	1	4
20145230	29332910	1	4
	29332990	1	4
20145280	29333100	1	4
	29333200	1	4
	29333300	1	4
	29333910	1	4
	29333920	0	4
	29333925	0	4
	29333935	0	4
	29333940	0	4
	29333945	1	4
	29333950	0	4
	29333955	1	4
	29333999	1	4
	29334100	1	4
	29334910	1	4
	29334930	1	4

PRC PRODUCT	CN PRODUCT	INCLUDED	CATEGORY
	29334990	1	4
	29337100	1	4
	29337200	1	4
	29337900	1	4
	29339110	1	4
	29339190	1	4
	29339200	0	4
	29339920	1	4
	29339950	1	4
	29339980	1	4
20145290	29341000	1	4
	29342020	0	4
	29342080	1	4
	29349100	1	4
	29349960	1	4
	29349990	1	4
	29398000	1	4
20146260	29146200	1	4
	29146910	1	4
	29146980	1	4
	29146100	0	4
20146430	29420000	1	4
21101030	29182100	1	4
21101050	29182200	1	4
21101070	29182300	1	4
21102010	29224100	1	4
21102040	29232000	1	4
	29231000	0	4
	29233000	0	4
	29234000	0	4
	29239000	0	4
21102060	29241100	1	4
	29241200	0	4
	29241900	0	4
21102070	29242300	0	4
	29242400	1	4
	29242500	0	4
	29242910	1	4
	29242970	1	4
21103117	29322010	1	4
	29322020	1	4

PRC PRODUCT	CN PRODUCT	INCLUDED	CATEGORY
21103119	29322090	1	4
21103130	29331110	1	4
	29331190	1	4
	29331910	0	4
	29331990	1	4
21103140	29332100	1	4
21103155	29335200	1	4
	29335310	1	4
	29335400	1	4
	29335390	1	4
21103159	29335500	1	4
	29335910	0	4
	29335920	1	4
	29335995	1	4
21103170	29336910	0	4
	29336940	1	4
	29336980	1	4
21103180	29343010	1	4
	29343090	1	4
21103200	29351000	0	4
	29352000	0	4
	29353000	0	4
	29354000	0	4
	29355000	0	4
	29359030	1	4
	29359090	1	4
21105100	29362100	1	4
	29362200	1	4
	29362300	1	4
	29362400	1	4
	29362500	1	4
	29362600	1	4
	29362700	1	4
	29362800	1	4
	29362900	1	4
	29369000	1	4
21105200	29371100	1	4
	29371200	1	4
	29371900	1	4
	29372100	1	4
	29372200	1	4

PRC PRODUCT	CN PRODUCT	INCLUDED	CATEGORY
	29372300	1	4
	29372900	1	4
	29375000	1	4
	29379000	1	4
21105300	29381000	1	4
	29389010	1	4
	29389030	1	4
	29389090	1	4
	29391100	1	4
	29391900	1	4
	29392000	1	4
	29393000	1	4
	29394100	1	4
	29394200	1	4
	29394300	1	4
	29394400	1	4
	29394900	1	4
	29395100	1	4
	29395900	1	4
	29396100	1	4
	29396200	1	4
	29396300	1	4
	29396900	1	4
	29397100	1	4
	29397910	1	4
	29397990	1	4
21106040	30019020	1	4
	30019091	1	4
	30019098	1	4
21202125	30021100	0	?
	30021200	0	?
	30021300	1	4
	30021400	1	6
	30021500	1	1
	30021900	0	?
21201260	30043100	1	1
21201270	30043200	1	1
	30043900	1	1
21201340	30044100	1	1
	30044200	1	1
	30044300	1	1

PRC PRODUCT	CN PRODUCT	INCLUDED	CATEGORY
	30044900	1	1
21201360	30045000	1	1
21201380	30046000	1	1
	30049000	1	1
	38249958	0	1
21201160	30041000	1	2
21201180	30042000	1	2
21202145	30022000	1	3
21105400	29411000	1	5
	29412030	1	5
	29412080	1	5
	29413000	1	5
	29414000	1	5
	29415000	1	5
	29419000	1	5
21201130	30031000	1	6
21201150	30032000	1	6
21201230	30033100	1	6
21201250	30033900	1	6
21201310	30034100	1	6
	30034200	1	6
	30034300	1	6
	30034900	1	6
21201320	30036000	1	6
	30039000	1	6

Source: Eurostat.

ANNEX VI: CN6 TO CN8. ERASED NON-PHARMA PRODUCTS

Table VI.1. CN6, CN8, and erased codes

CN6	CN8 DIGITS (no spaces)	ERASED
291462	29146200	
291469	29146980	
291469	29146910	
291639	29163910	
291639	29163990	
291821	29182100	
291822	29182200	
291823	29182300	
291899	29189940	
291899	29189990	
292146	29214600	
292149	29214900	
292214	29221400	
292219	29221900	
292229	29222900	
292231	29223100	
292241	29224100	
292244	29224400	
292249	29224985	
292249	29224920	
292250	29225000	
292320	29232000	
292411	29241100	
292424	29242400	
292429	29242910	
292429	29242970	
292512	29251200	
292529	29252900	
292630	29263000	
293190	29319000	
293220	29322010	
293220	29322020	
293220	29322090	
293311	29331110	
293311	29331190	
293319	29331990	
293319	29331910	POSSIBLE VETERINARIAN USE ONLY Phenylbutazone, INN
293321	29332100	
293329	29332910	
293329	29332990	

CN6	CN8 DIGITS (no spaces)	ERASED
293331	29333100	
293332	29333200	
293333	29333300	
293339	29333910	
293339	29333950	POSSIBLE HERBICIDE Fluroxypyr "ISO" methyl ester
293339	29333935	POSSIBLE HERBICIDE 2-Hydroxyethylammonium-3,6-dichloropyridine-2-carboxylate
293339	29333920	POSSIBLE HERBICIDE 2,3,5,6-Tetrachloropyridine
293339	29333955	
293339	29333940	POSSIBLE HERBICIDE 2-Butoxyethyl"3,5,6-trichloro-2-pyridyloxy"acetate
293339	29333925	POSSIBLE HERBICIDE 3,6-Dichloropyridine-2-carboxylic acid
293339	29333999	
293339	29333945	
293341	29334100	
293349	29334930	
293349	29334910	
293349	29334990	
293352	29335200	
293353	29335390	
293353	29335310	
293354	29335400	
293355	29335500	
293359	29335920	
293359	29335910	POSSIBLE INSECTICIDE Diazinon "ISO"
293359	29335995	
293369	29336980	
293369	29336940	
293369	29336910	POSSIBLE HERBICIDE Atrazine "ISO"; propazine "ISO"; simazine "ISO"; hexahydro-1,3,5-trinitro-1,3,5-triazine "hexogen, trimethylenetrinitramine"
293371	29337100	
293372	29337200	
293379	29337900	
293391	29339190	
293391	29339110	
293399	29339950	
293399	29339980	
293399	29339920	
293410	29341000	
293420	29342080	
293420	29342020	POSSIBLE VETERINARIAN USE ONLY Di"benzothiazol-2-yl"disulphide; benzothiazol-2-thiol "mercaptobenzothiazole" and its salts

CN6	CN8 DIGITS (no spaces)	ERASED
293430	29343010	
293430	29343090	
293491	29349100	
293499	29349960	
293499	29349990	
293590	29359090	
293590	29359030	
293621	29362100	
293622	29362200	
293623	29362300	
293624	29362400	
293625	29362500	
293626	29362600	
293627	29362700	
293628	29362800	
293629	29362900	
293690	29369000	
293711	29371100	
293712	29371200	
293719	29371900	
293721	29372100	
293722	29372200	
293723	29372300	
293729	29372900	
293750	29375000	
293790	29379000	
293810	29381000	
293890	29389090	
293890	29389010	
293890	29389030	
293911	29391100	
293919	29391900	
293920	29392000	
293930	29393000	
293941	29394100	
293942	29394200	
293943	29394300	
293944	29394400	
293949	29394900	
293951	29395100	
293959	29395900	
293961	29396100	
293962	29396200	
293963	29396300	

CN6	CN8 DIGITS (no spaces)	ERASED
293969	29396900	
293971	29397100	
293979	29397990	
293979	29397910	
293980	29398000	
294110	29411000	
294120	29412030	
294120	29412080	
294130	29413000	
294140	29414000	
294150	29415000	
294190	29419000	
294200	29420000	
300190	30019020	
300190	30019091	
300190	30019098	
300213	30021300	
300214	30021400	
300215	30021500	
300220	30022000	
300310	30031000	
300320	30032000	
300331	30033100	
300339	30033900	
300341	30034100	
300342	30034200	
300343	30034300	
300349	30034900	
300360	30036000	
300390	30039000	
300410	30041000	
300420	30042000	
300431	30043100	
300432	30043200	
300439	30043900	
300441	30044100	
300442	30044200	
300443	30044300	
300449	30044900	
300450	30045000	
300460	30046000	
300490	30049000	

Source: Eurostat.