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Economic Commission for Africa

# UNLOCKING THE POTENTIAL OF REGIONAL VALUE CHAINS IN NORTH AFRICA

focus on the  
pharmaceutical  
industries



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*December 2021*

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The Economic Commission for Africa is proud to present its research and findings on the potential for promoting regional value chains in North Africa: focus on the pharmaceutical industries. The timing of the study is ideal in that it takes advantage of the African Continental Free Trade Area and the increase in demand for pharmaceuticals stimulated by the coronavirus disease (COVID-19) pandemic.

Despite having a combined population of more than 250 million inhabitants, linguistic and cultural affinities, continuity of physical space, and adequate infrastructure, trade in the subregion is below potential. In 2019, intraregional trade represented only 5 per cent of total North African trade, well below the continental average of 16 per cent, owing to the fragmented nature of North African economies.

To attain structural transformation and move the economic structure of North African economies away from producing commodities with little value addition to economies driven by industry and by-products with greater value addition, it is essential to move towards producing manufacturing products to warrant the economic take-off desired for the subregion. In line with the mission of the Economic Commission for Africa to propose ideas and actions that would engender a self-reliant and transformed Africa within the framework of the 2030 Agenda for Sustainable Development and Agenda 2063: The Africa We Want, of the African Union, the study contains an analysis of what has been found to be a promising sector – the pharmaceutical sector and its growth potential.

The COVID-19 pandemic has revealed that the pharmaceutical industries are one of the new sectoral trends that could emerge following the COVID-19 period and that they have the potential to integrate North African countries by making use of existing economic complementarities. Owing to disruptions experienced in the global value chain as a result of the pandemic, the development of innovative and solid pharmaceutical industries is ever more timely in the post-COVID-19 period. This is especially true when the trend towards the regionalization of sources of supply, the potential relocations of some production segments, the reconfiguration of value chains and the shortening of distribution cycles are taken into account.

Despite already being well positioned in the medicines sector, the emerging pharmaceutical sector has the potential for real comparative advantage that can stimulate economic integration. This means that there is an opportunity to develop the sector post-pandemic by putting strategies in place to address structural difficulties through better spending and investments in the health sector and industrial innovation. The creation of regional value chains is also timely since markets for medicines in the subregion carry primarily generic medicines and the development of production chains for original medicines is still highly dependent on new capacities in research and development.

The study contains a detailed mapping of the pharmaceutical sector of the North African subregion and a comprehensive analysis of the potential for the development of regional value chains. The research has uncovered weaknesses and strengths in the sector and the study contains proposals for regional policies to address the weaknesses, enhance the strengths and expand regional value chains to attain the desired structural transformation and growth.

**Zuzana Schwidrowski**

Director of the Subregional Office for North Africa  
of the Economic Commission for Africa



## VI Acknowledgements

The present “Study on the potential for promoting regional value chains in North Africa: focus on the pharmaceutical industries” was commissioned by the Subregional Office for North Africa of the Economic Commission for Africa. It was prepared by Patricia Augier, Professor of Economics, Aix-Marseille University, Aix-Marseille School of Economics, France, as a consultant of the Subregional Office for North Africa, and coordinated by Aziz Jaid, Economic Affairs Officer at the Subregional Office, with inputs from Amal Nagah Elbeshbishi, Chief of the Employment and Skills Section, under the guidance of Zuzana Schwidrowski, Director of the Subregional Office. The publication has benefited from the debates, conclusions and recommendations of the expert group meeting on the same theme as the study, which was organized by the Subregional Office and was held in a hybrid format in Marrakech, Morocco, on 24 and 25 November 2021.



# I. Introduction

Upgrading in global value chains is largely driven by the development of regional value chains. Building regional value chains is vital to promote subregional integration. In addition to the non-exploitation of the natural assets that North Africa possesses for subregional integration, in particular in certain sectors – agrifood and fisheries, energy and chemicals (natural gas, crude oil, mineral products, phosphates, etc.), mechanical engineering and electronic components – the crisis caused by the coronavirus disease (COVID-19) pandemic has shown that, thanks to their resilience, the pharmaceutical industries could become one of the emerging sectors in the post-pandemic era. The sector also has great potential to drive integration and could utilize economic complementarities that already exist in the subregion. Given how the crisis has damaged global value chains, it will become all the more urgent to implement new strategies to develop an innovative and solid pharmaceutical industry in the subregion after COVID-19, since certain production segments are likely to be relocated, multinationals will reconfigure value chains, distribution channels will be streamlined and supplies will increasingly be sourced from the subregion.

This emerging sector has the potential to give North African countries high revealed comparative advantages that can accelerate economic integration (complementarity of trade, specialization, technological content, sophistication of exports, complexity levels, etc.) and, most importantly, accelerate upgrading in global value chains and the construction of regional value chains. These strong developments will be boosted by the subregion's strong position in the drugs and pharmaceuticals sector, which give it a clear opportunity to develop the sector after COVID-19. To do so, the subregion must address its structural difficulties by raising health spending and boosting investment in the health sector and industrial innovation.

This opportunity to build a regional value chain has come at just the right time for North Africa, since the subregional market still uses locally produced, mainly generic drugs, while the development of more complex, brand-name drugs remains dependent on new research and development capacities.

It is in this context that the current study is taking place, the aim of which is to map out the North African pharmaceutical sector and analyse the potential to develop a subregional value chain for the sector.

There are two chapters in the study. The first chapter is an analysis of the pharmaceutical industries in North African countries. The analysis looks at developments in global and subregional trade to target the competitiveness profiles of products and identify the sectors in which there is potential for subregional integration. The second chapter seeks to find avenues for building a regional value chain in the pharmaceutical sector. It looks at the context of trade among North African countries and their trade with the rest of the world. Potential avenues for accelerating the subregional integration process in the current context are also explored. The global fight against COVID-19, the concern of contractors to secure supply chains, in particular in the health sector, and the recent implementation of the African Continental Free Trade Area provide opportunities for the development of regional value chains in North Africa.

## II. Mapping the pharmaceutical sector in North African countries

The purpose of this mapping is to provide an analysis of exports and imports of pharmaceutical goods among North African countries and between them and the rest of the world.<sup>1</sup>

### II.I. Global trade in pharmaceuticals

#### II.I.I. EXPORTS IN THE SECTOR

##### a. Total exports and trends

In the pharmaceutical sector, the value of exports by Libya, Mauritania and the Sudan is very small and data are available only for a few years.<sup>2</sup> Figure I therefore shows the changes in the value of exports only for Algeria, Egypt, Morocco and Tunisia. All four countries have increased the value of their pharmaceutical exports over the past 10 years. Egypt is the leading exporter of pharmaceuticals. Its exports increased from around \$169.6 million in 2008 to almost \$271.8 million in 2019, peaking at 352.6 million in 2014. Moroccan pharmaceutical exports increased from around \$58.8 million in 2008 to \$117.1 million in 2019. Similarly, Tunisian exports in the sector grew from \$24.3 million to \$75.8 million during the same period. Algerian exports were very low for the entire period (\$1.7 million in 2008; \$5.2 million in 2017, the latest year for which there are data for Algeria), but in relative terms the sector showed strong growth, having increased by a factor of 3.0. By contrast, between 2008 and 2019, Tunisia increased its exports by a factor of 3.1, Morocco by a factor of 2.0 and Egypt by a factor of 1.6.

Furthermore, the pharmaceutical sector's share of total exports has grown in all the countries (see figure II). In Egypt, pharmaceuticals accounted for 0.89 per cent of exports in 2019, which is higher than the 0.66 per cent share recorded in countries with similar income levels, but well below the 5.14 per cent share recorded in the countries that are members of the Organization for Economic Cooperation and Development and the 5.03 per cent share recorded by India. The Tunisian and Moroccan pharmaceutical sectors have slightly higher shares of exports (0.51 per cent and 0.40 per cent, respectively) than the Chinese sector (0.37 per cent). The

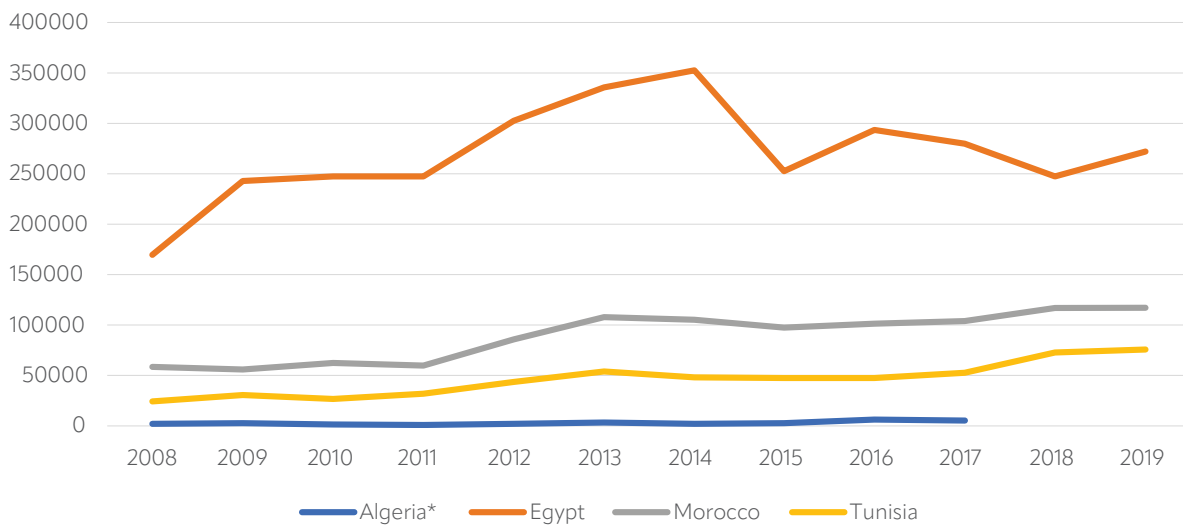
1 This trade analysis is based on official data collected by the United Nations Conference on Trade and Development. The authors of this study are unable to take any informal trade in pharmaceuticals into account, especially among countries within the subregion. Apart from estimates of possible informal bilateral trade flows between some countries, the authors do not have any hard data on informal trade.

2 The years used for pharmaceutical exports in the United Nations Commodity Trade Statistics Database are 2016 and 2017 for Libya; 2010, 2016, 2018 and 2019 for Mauritania; and the years 2014–2018 for the Sudan. Pharmaceutical exports by Algeria (the smallest exporter of pharmaceuticals among the four North African countries) represented 0.07 per cent of total exports in 2019, those by Mauritania represented 0.7 per cent and those by the Sudan 20 per cent. These figures are confirmed if exports are calculated using figures for imports for all other countries (known as "mirror data").

pharmaceutical sectors of the Sudan (0.03 per cent) and Algeria (0.01 per cent) account for a tiny share of total exports from those countries.

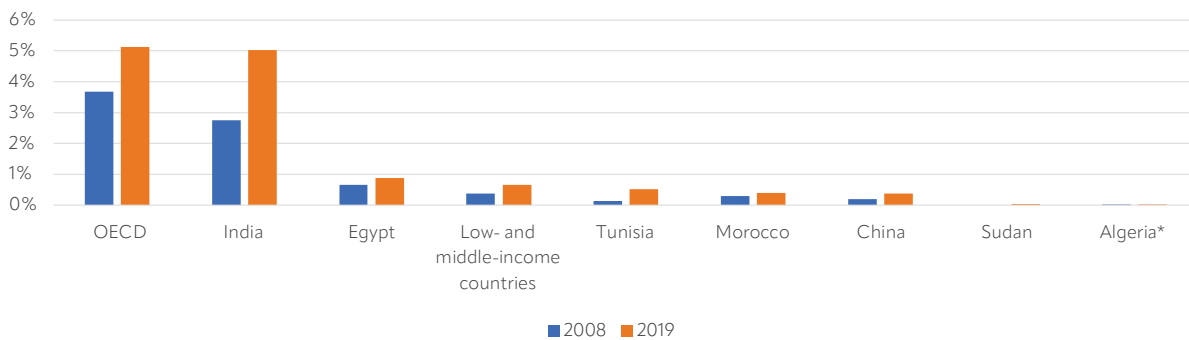
The pharmaceutical industry's share of total exports for all the countries in North Africa is 0.60 per cent, which is close to the figure of 0.66 per cent for low- and middle-income countries, but well below the industry's 3.29 per cent share of total world trade (see figure III). It would therefore be reasonable to assume that, as a result of the catch-up effect, North African countries might further grow their pharmaceutical exports.

**Figure I** Pharmaceutical exports by year (Thousands of United States dollars)



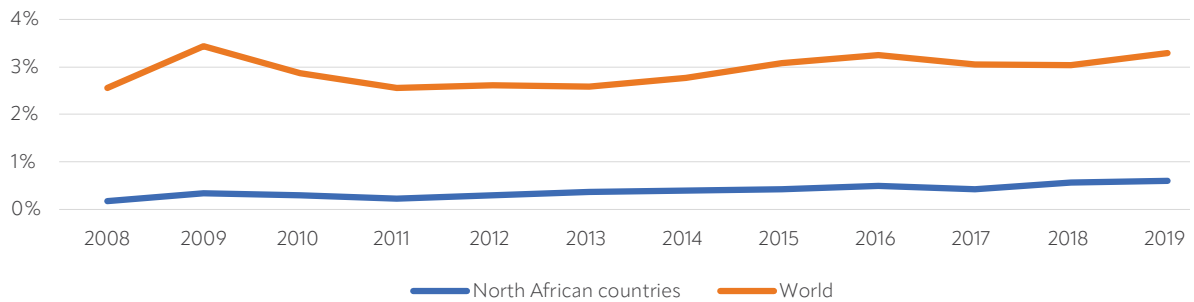
**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.  
 a For Algeria, data on pharmaceutical exports are available only until 2017.

**Figure II** Pharmaceutical goods as a share of total exports for North African countries and comparator countries, 2008 and 2019



**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.  
 a 2017 for Algeria; 2018 for the Sudan.

**Figure III** Pharmaceutical goods as a share of total exports by North African countries and as a share of total global trade, 2008 and 2019



**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

### b. Main export destinations for the pharmaceutical sector

Figure IV shows the share of pharmaceuticals that each country exports to several major export destinations, namely, the European Union, the North African Mediterranean countries (Algeria, Egypt, Morocco and Tunisia), the other countries in the Middle East and North Africa, and the rest of the world. These shares were calculated for 2008 and 2019 (2017 for Algeria). In terms of the developments between 2008 and 2019:

- All countries except Egypt increased their share of pharmaceutical exports to the European Union.
- The share of exports to the North African Mediterranean countries was stable for Algeria and Egypt but fell considerably for Morocco and Tunisia.
- The share of exports to the other Middle East and North Africa countries declined for Algeria, remained stable for Egypt and increased for Morocco and Tunisia.
- The share of exports to the rest of the world was relatively stable for Algeria, Egypt and Morocco and declined slightly for Tunisia.

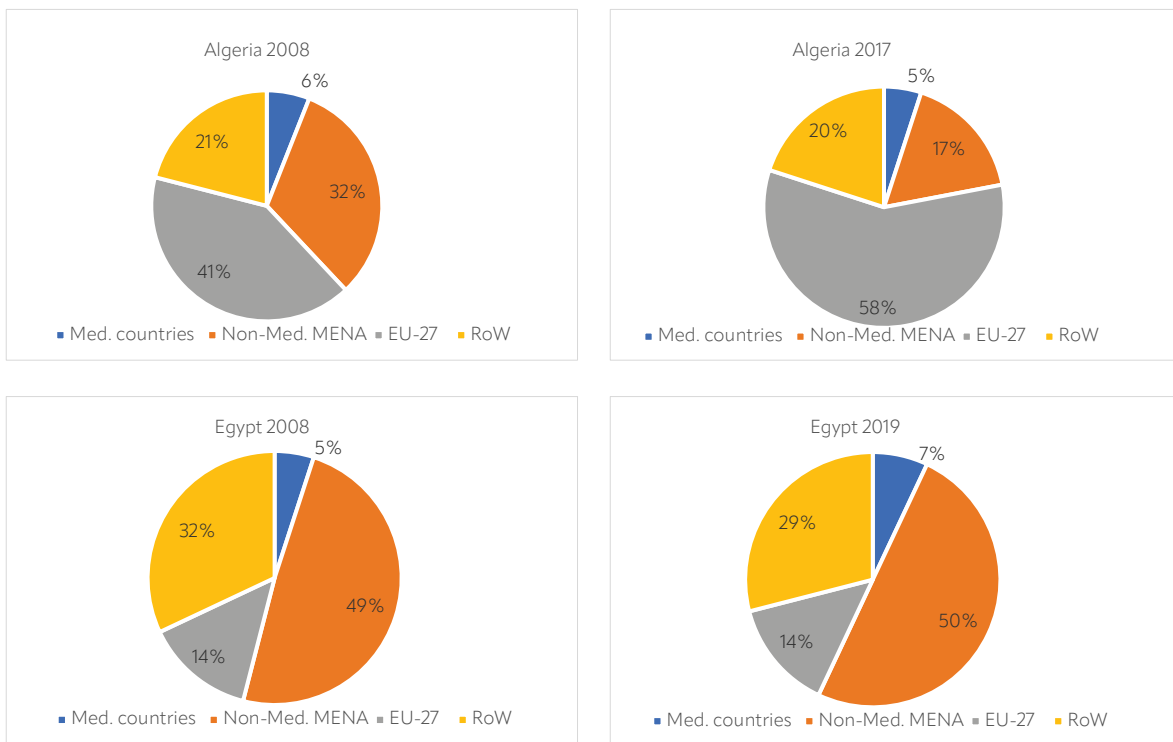
According to the latest data, for 2019:

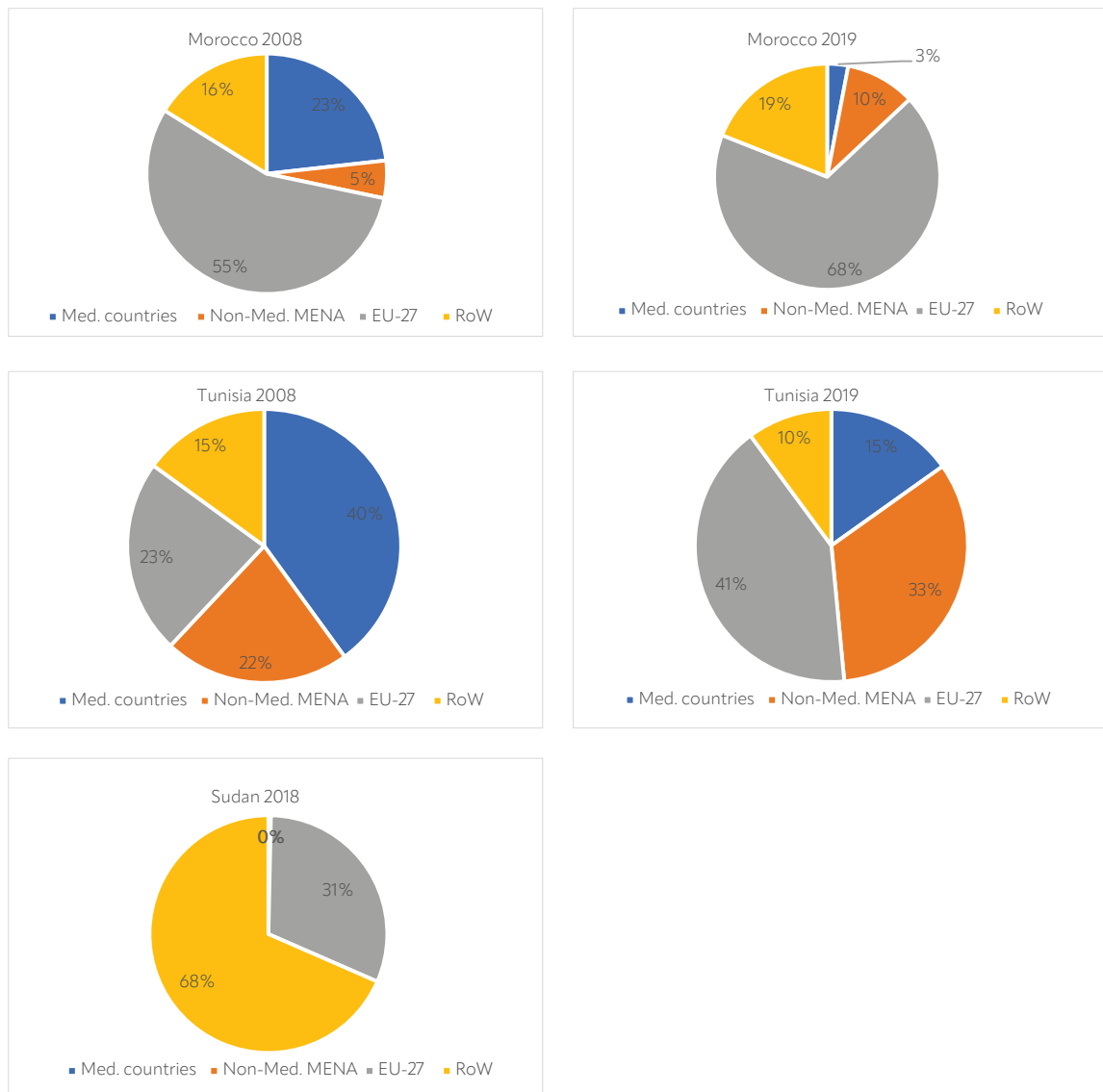
- The main destination of Algerian pharmaceutical exports is the European Union (58 per cent), followed by the rest of the world (20 per cent), the other Middle East and North Africa countries (17 per cent) and the Mediterranean North African countries (5 per cent).
- Egypt exports half (50 per cent) of its pharmaceutical exports to the other Middle East and North Africa countries, 29 per cent to the rest of the world, 14 per cent to the European Union and 7 per cent to the Mediterranean North African countries.

- The main destination of Moroccan pharmaceutical exports is the European Union (68 per cent), followed by the rest of the world (19 per cent), the other Middle East and North Africa countries (10 per cent) and the Mediterranean North African countries (3 per cent).
- The main destination of Tunisian pharmaceutical exports is the European Union (41 per cent), followed by the other Middle East and North Africa countries (33 per cent), the Mediterranean North African countries (15 per cent) and the rest of the world (10 per cent).
- The few pharmaceutical goods exported by the Sudan are sold to the rest of the world (68 per cent) and the European Union (31 per cent). Pharmaceutical exports to the Middle East and North Africa countries are negligible.

The European Union is therefore the main destination for Algerian and especially Moroccan pharmaceutical exports. It is interesting to note that, considered as a single area, the entire Middle East and North Africa receives 57 per cent of Egyptian and 48 per cent of Tunisian pharmaceutical exports, making it the main destination of pharmaceutical exports from those two countries. By contrast, Algeria sends only 22 per cent of its pharmaceuticals to the Middle East and North Africa, Morocco only 13 per cent and the Sudan less than 1 per cent.

**Figure IV** Share of pharmaceutical goods by destination, 2008 and 2019





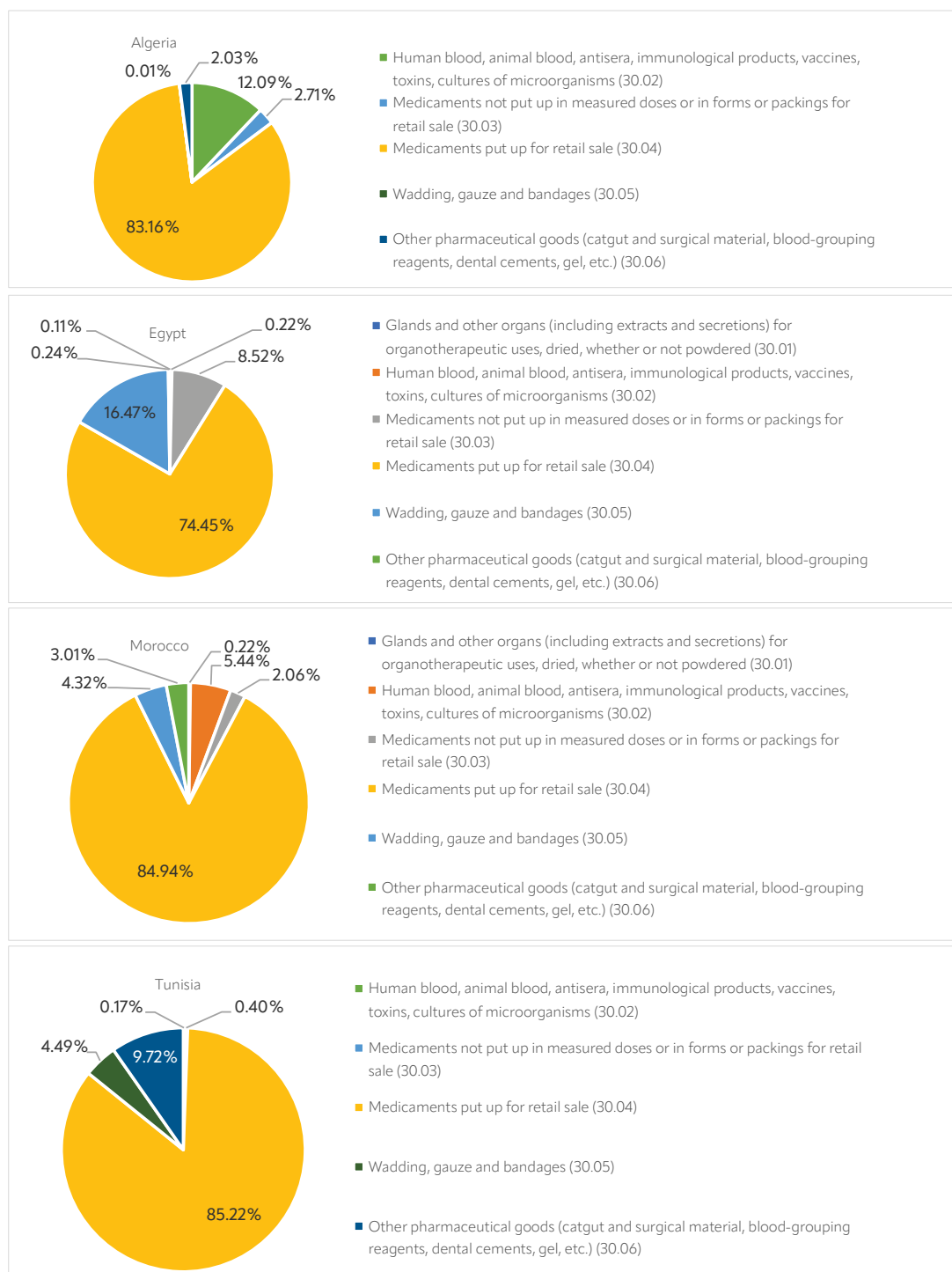
**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

### c. Main pharmaceutical exports

Figure V shows that the top four exporting countries in North Africa export mostly medicaments put up for retail sale (4-digit tariff heading 30.04 in the Harmonized Commodity Description and Coding System). This family of products accounts for 85 per cent of exports by the pharmaceutical industry in Morocco and Tunisia, 83 per cent in Algeria and 75 per cent in Egypt. For Algeria, this category is followed by human blood, animal blood, antisera, immunological products, vaccines, toxins and cultures of microorganisms (tariff heading 30.02, accounting for 12 per cent of pharmaceutical exports) and wadding, gauze and bandages (heading 30.05, 16.5 per cent). For Egypt, the next largest category of pharmaceutical exports is medicaments not put up in measured doses or in forms or packings for retail sale (30.03, 8.5 per cent). For Morocco, it is human blood, animal blood, antisera, immunological products, vaccines, toxins and cultures of microorganisms (30.02, 5.5 per cent) and wadding, gauze and bandages (30.05, 4.3 per cent). For Tunisia, it is other pharmaceutical goods (catgut and surgical material, blood-

grouping reagents, dental cements, gel, etc.) (30.06, 9.7 per cent) and wadding, gauze and bandages (30.05, 4.3 per cent).

**Figure V** Products exported in the pharmaceutical industry (4-digit tariff headings, for the most recent period, as a percentage of the total for the sector)

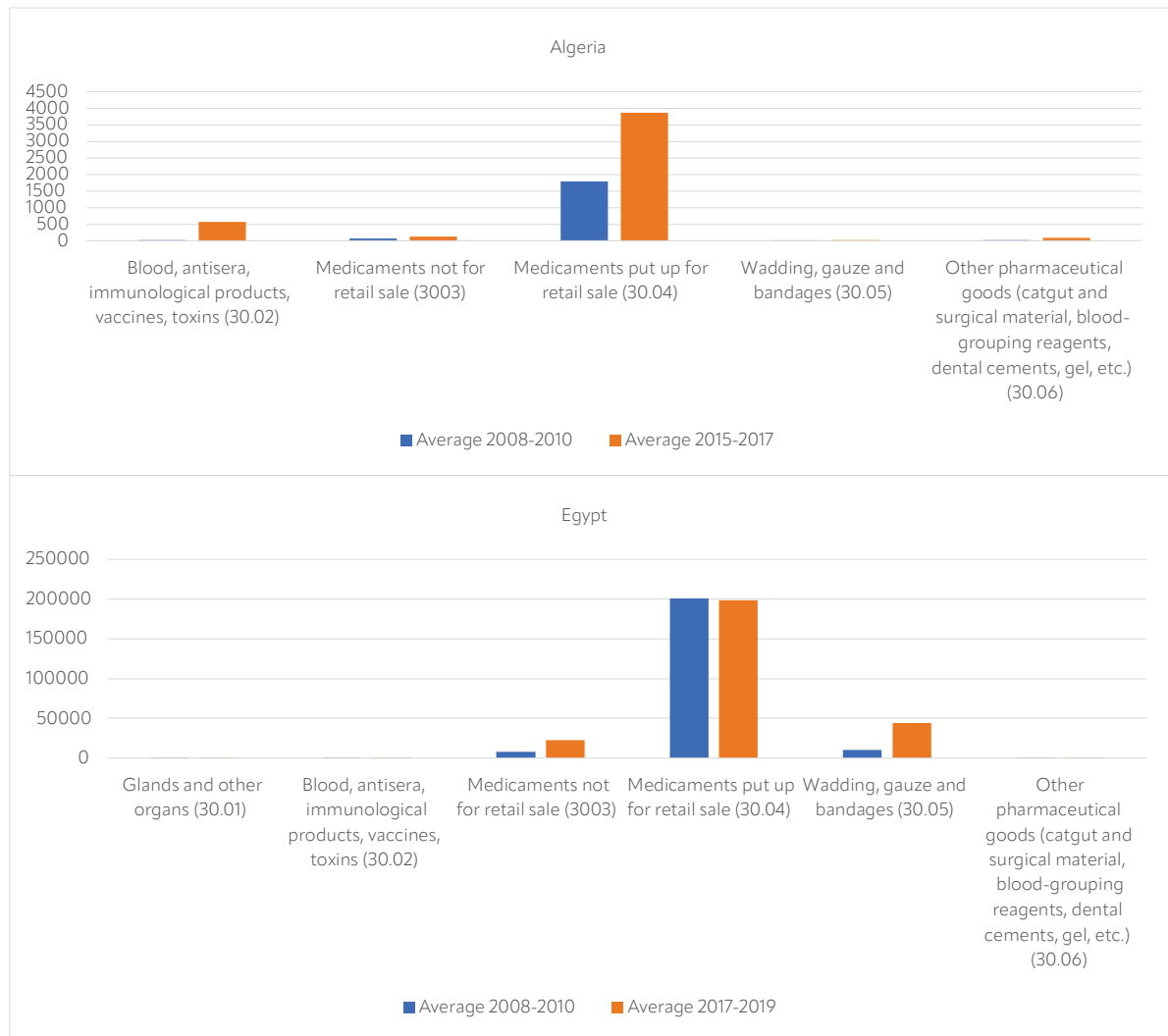


**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

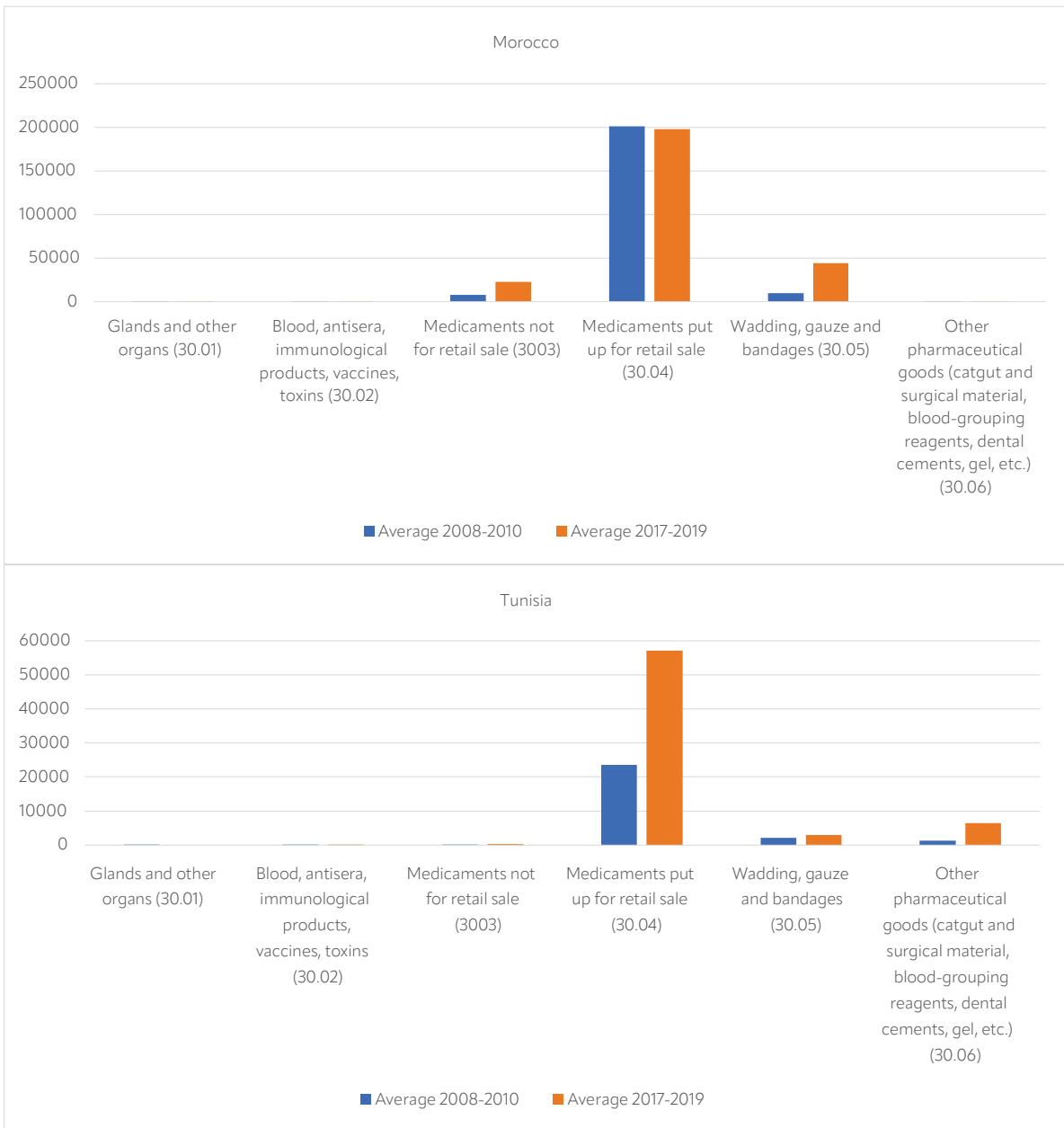
**Note:** Average of the last three years (2015–2017 for Algeria; 2017–2019 for all other countries).

The products exported by the pharmaceutical industry changed little in these North African countries during the periods shown in figure VI. For Algeria, Morocco and Tunisia, the increase in the volume exported by this industry comes mainly from medicaments put up for retail sale (30.04). For Egypt, the volume of this family of products remained constant, while exports of wadding, gauze and bandages (30.05) and of medicaments not for retail sale (30.03) increased. During the same period, there was also an increase in the exported volumes of human blood, animal blood, antisera, immunological products, vaccines, toxins and cultures of microorganisms (30.02) by Algeria; wadding, gauze and bandages (30.05, 16.5 per cent) and medicaments not put up for retail sale (30.03) by Morocco; and other pharmaceutical goods (catgut and surgical material, blood-grouping reagents, dental cements, gel, etc.) (30.06) for Tunisia.

**Figure VI** Change in products exported by the pharmaceutical industry during the period indicated (4-digit tariff headings, in thousands of dollars)

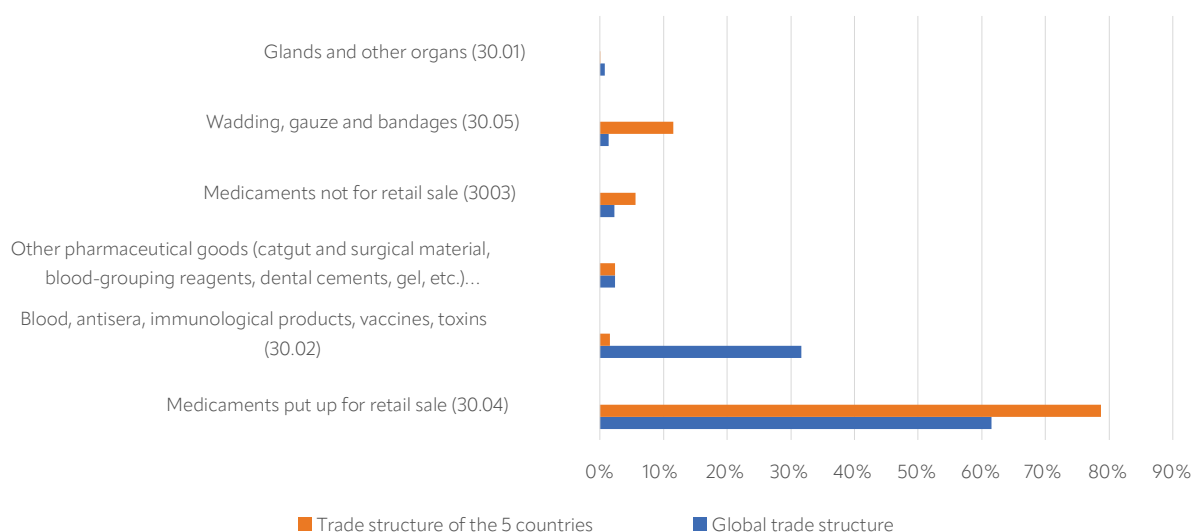






**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

Comparing the structure of pharmaceutical exports in North African countries with the structure of global trade in pharmaceutical goods (see figure VII) shows that medicaments put up for retail sale (30.04) are overrepresented in North Africa (78.7 per cent, versus 61.5 per cent in global trade) and that human blood, animal blood, antisera, immunological products, vaccines and toxins (30.02) are underrepresented (1.6 per cent, versus 31.6 per cent in global trade). There is also a considerable gap for wadding, gauze and bandages (11.5 per cent, versus 1.4 per cent in international trade).

**Figure VII** Structure of pharmaceutical exports in North African countries and structure of global pharmaceutical trade (4-digit tariff headings)

**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

**Note:** These structures were calculated based on the average values of exports for the three-year period from 2017 to 2019.

The breakdown of medicament by-products put up for retail sale exported by North African countries (see table 1) shows that these drugs contain almost no penicillin, insulin or corticosteroid hormones. Algeria and Morocco, on the other hand, export other antibiotics, which may include, for instance, tetracyclines, cephalosporins, bacitracins and vancomycins, etc. (9.9 per cent of drugs exported by Algeria and 6.5 per cent of those exported by Morocco). Tunisia exports hormonal drugs such as epinephrines, oestrogens and progestins (27.0 per cent of total exported drugs) and drugs containing alkaloids (6.9 per cent). For these North African countries, most of the medicaments put up for retail sale that are exported are from the category "other" (3004.90), which covers a wide range of products, including analgesics, antidepressants, antihypertensives, antihistamines, anaesthetics, diuretics, ophthalmological preparations, dermatological preparations, dextrose and levulose solutions, liver extracts, etc.

**Table 1** Medicament by-products put up for retail sale exported by North African countries (Percentage)

Medicaments put up for retail sale	Algeria	Egypt	Morocco	Tunisia
Containing penicillins or derivatives thereof (3004.10)	0.60	0.28	1.20	0.00
Containing other antibiotics (3004.20)	9.87	0.19	6.47	1.81
Containing insulin (3004.31)	0.00	0.04	0.35	0.00
Containing corticosteroid hormones (3004.32)	1.23	0.00	1.51	0.00
Other (epinephrines, oestrogens, etc.) (3004.39)	0.70	0.05	0.11	26.98
Containing alkaloids or derivatives thereof (3004.40)	0.08	0.00	0.10	6.93
Other medicaments containing vitamins (3004.50)	1.33	0.91	1.09	0.08
Other (analgesics, antidepressants, etc.) (3004.90)	86.17	98.48	89.17	62.56

**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

**Note:** Calculations based on average flows for the final three years for which data are available.

Products exported by country at the most detailed (6-digit) level in the United Nations Commodity Trade Statistics Database; the entire pharmaceutical sector is contained in chapter 30 of the Harmonized System classification.

Each country exports only a small number of different products (between 15 and 20) and, as discussed above, the exports are highly concentrated. The “other” category (3004.90) for medicaments put up for retail sale – used, as mentioned above, for a wide range of products, including analgesics, antidepressants and ophthalmological preparations – accounts for 71.66 per cent of pharmaceutical exports from Algeria, 73.32 per cent of those from Egypt, 75.74 per cent of those from Morocco and 53.31 per cent of those from Tunisia. For each of these countries, the “other” subheading and only one or two additional products account for more than 90 per cent of medicaments put up for retail sale. For Egypt, for instance, three product categories alone make up 97 per cent of pharmaceutical exports of medicaments put up for retail sale.

The main pharmaceutical goods exported by North African countries in addition to those under the “other” tariff subheading (3004.90) are medicaments containing antibiotics (3004.20) (8.21 per cent of pharmaceutical exports for retail sale for Algeria and 5.5 per cent for Morocco); vaccines for human medicine (3002.20) (6.2 per cent for Algeria); vaccines for veterinary medicine (3002.30) (4.43 per cent for Morocco); adhesive dressings (3005.10) (15.85 per cent for Egypt); soybean oil emulsions; dextrose solutions, etc. (3003.90) (8.26 per cent for Egypt); epinephrine-type hormones, etc. (3004.39) (23 per cent for Tunisia); first-aid boxes and kits (3006.50) (9.3 per cent for Tunisia); medicaments containing alkaloids (3004.40) (5.91 per cent for Tunisia); wadding, gauze, bandages and similar articles (3005.90) (4.28 per cent for Morocco); and toxins, antitoxins, viruses, bacteriophages, etc. (3002.90) (3.19 per cent for Algeria). All other pharmaceutical goods exported by North African countries collectively account for less than 3 per cent of pharmaceutical exports.

## II.1.2. IMPORTS IN THE SECTOR

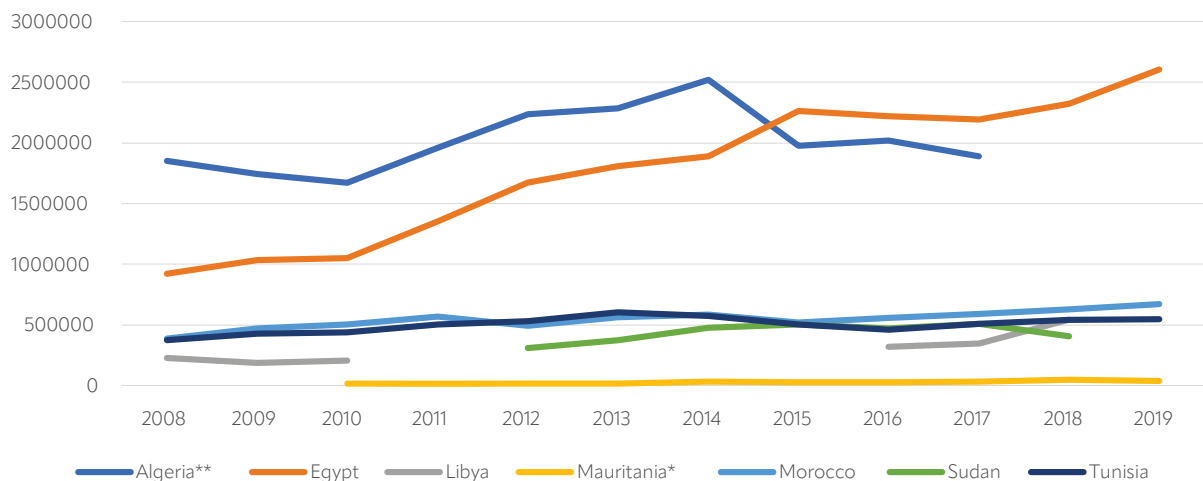
### a. Total imports and trends

Pharmaceutical imports grew in all North African countries except Algeria during the periods shown in figure VIII. The increase was most pronounced for Egypt, whose imports almost tripled from \$921.1 million in 2008 to \$2.6 billion in 2019. Libya and Mauritania more than doubled their imports. This improvement is not visible in figure VIII for Mauritania because the value of those imports is too small: Mauritania imported \$16.2 million of pharmaceuticals in 2010 (57 times fewer than Egypt) and \$37.0 million in 2019 (70 times fewer than Egypt). Libya imported \$226.8 million of pharmaceuticals in 2008, but, thanks to a 58 per cent jump between 2017 and 2018, it caught up with Tunisia, importing \$542.7 million in 2018. Moroccan pharmaceutical imports increased by a factor of 1.7, from \$386.6 million in 2008 to \$670.8 million in 2019. The sector in Tunisia followed a similar trend, albeit from a lower base. Its pharmaceutical imports increased from \$373.7 million in 2008 to \$544.0 million in 2019. This period included a peak of \$603.3 million in 2013 followed by a downturn that bottomed out at \$459.8 million in 2016 before imports recovered again. The trend for Algeria was even more

erratic. Its pharmaceutical imports were the highest of all the countries in 2008, at \$1.8 billion. They then declined slightly in 2009 and 2010 before rebounding strongly, reaching \$2.5 billion in 2014 then declining again. By 2017 (the most recent year for which data are available for Algeria), the country's pharmaceutical imports were at virtually the same level as in 2008, at around \$1.9 billion, placing Algeria just behind Egypt. Sudanese data are available only from 2012, when the country imported \$308.5 million of pharmaceuticals. By 2018, this figure had grown to \$406.9 million.

Based on three-year averages for the most recent three-year period for which data are available, Egypt is the largest importer of these countries, followed by Algeria, Morocco, Tunisia, the Sudan, Libya and Mauritania. In terms of total value, Mauritania imports 10 times less in pharmaceuticals than Libya, 12 times less than the Sudan and 62 times less than Egypt; Libya imports 6 times less than Egypt, the Sudan 5 times less and Morocco and Tunisia 4 times less. By contrast, the value of Algerian pharmaceutical imports is relatively close to that of Egyptian pharmaceutical imports.

**Figure VIII** Pharmaceutical imports by year (Thousands of United States dollars)



**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

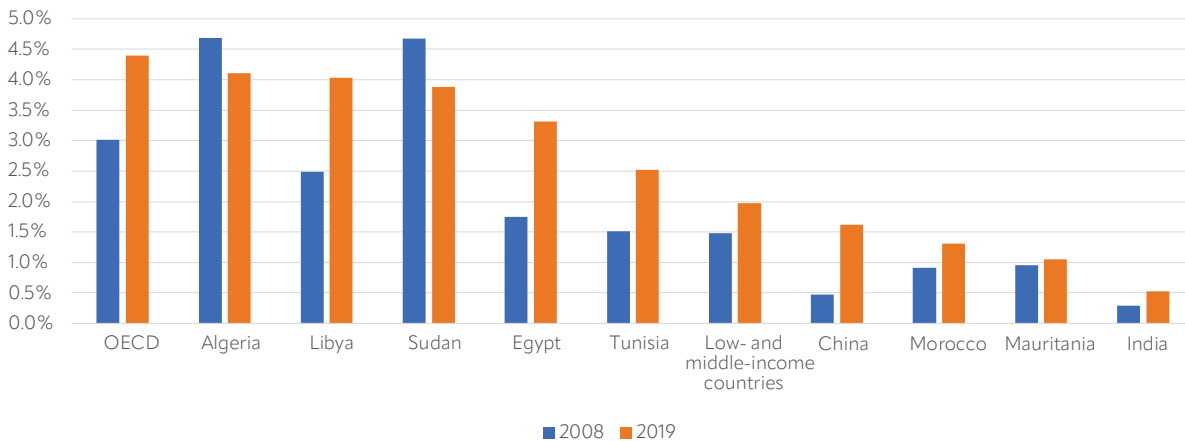
<sup>a</sup> For Mauritania, data on pharmaceutical exports are available only from 2010.

<sup>b</sup> For Algeria, the data are available only until 2017.

Over a period of around 10 years, the share of pharmaceuticals in total imports increased in Egypt, Libya, Morocco and Tunisia and remained relatively stable in Mauritania. The share decreased in Algeria and the Sudan, although Algeria still had the highest share of all the countries mentioned, at 4.1 per cent according to the most recent data, just below the 4.4 per cent average among the member States of the Organization for Economic Cooperation and Development (see figure IX). The country with the next highest share is Libya (4.0 per cent), followed by the Sudan (3.9 per cent), Egypt (3.3 per cent) and Tunisia (2.5 per cent), the latter being the final country whose share is above the average of low- and middle-income countries (2.0 per cent) and above the share of China (1.6 per cent). Morocco (1.3 per cent), Mauritania (1.0 per cent) and India (0.5 per cent) all have a lower share than China. In the North African

countries, the latest data available show that pharmaceutical goods account for a higher share of imports than they do of exports, the latter ranging from 0.01 per cent (Algeria) to 0.9 per cent (Egypt), as seen earlier. North African countries import more pharmaceuticals than they export in terms of the relative shares. As discussed later, the same is true for the absolute values.

**Figure IX** Pharmaceuticals as a share of total imports for North African countries and comparator countries, 2008 and 2019



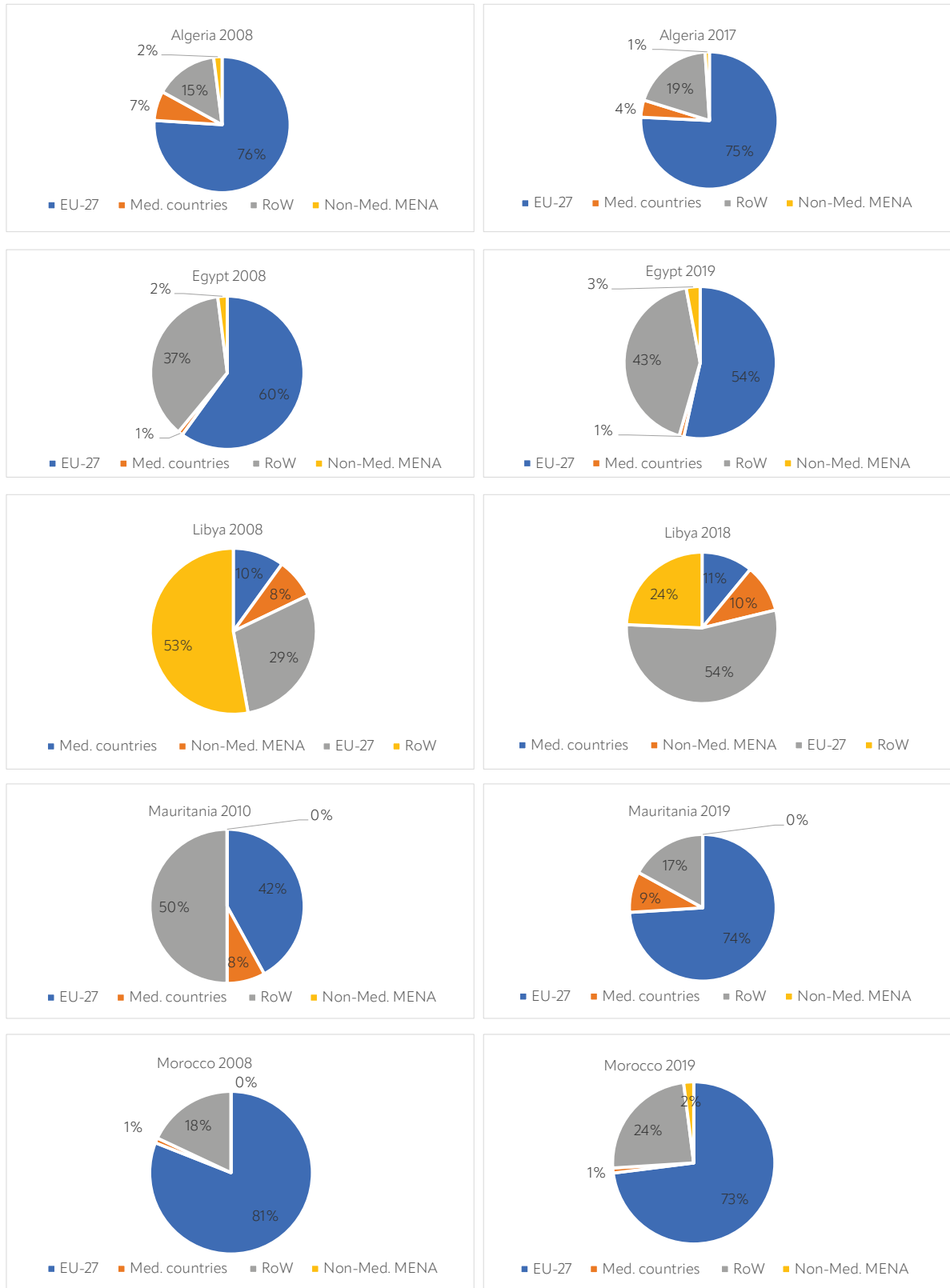
**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

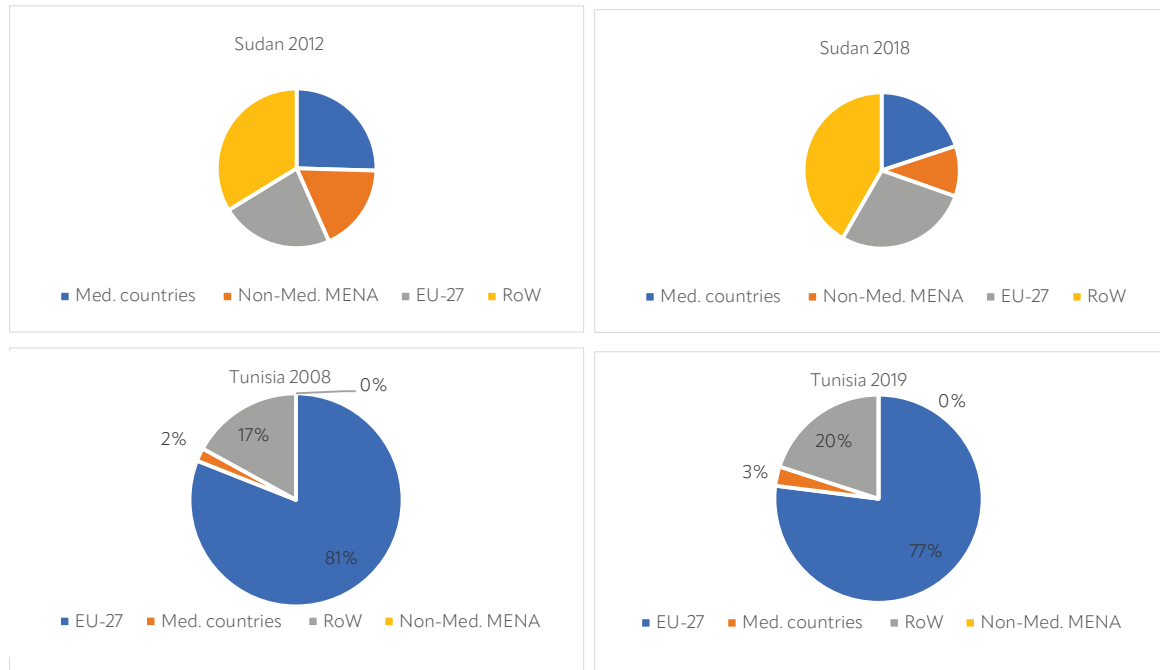
<sup>a</sup> No data are available after 2017 for Algeria or after 2018 for the Sudan; no data are available before 2010 for Mauritania or before 2012 for the Sudan.

## b. Main origins of pharmaceutical imports

The main origin of pharmaceutical imports is the European Union. The proportion of pharmaceutical imports from the European Union has remained relatively stable for Algeria (76 per cent in 2008 versus 75 per cent in 2017) and Tunisia (81 per cent in 2008 versus 77 per cent in 2019); has declined slightly for Egypt (60 per cent in 2006 versus 54 per cent in 2019) and Morocco (81 per cent in 2008 versus 73 per cent in 2019); and has increased markedly for Libya (29 per cent in 2008 versus 54 per cent in 2018), Mauritania (42 per cent in 2010 versus 74 per cent in 2019) and the Sudan (23 per cent in 2012 versus 28 per cent in 2018). The share of such imports from non-European Mediterranean origins (Algeria, Egypt, Jordan, Lebanon, Morocco, Tunisia and the State of Palestine) is very small (11 per cent for Libya, 9 per cent for Mauritania, 4 per cent for Algeria, 3 per cent for Tunisia and 1 per cent for Egypt and Morocco according to the most recent data), though the figure for the Sudan in 2018 was 20 per cent, the highest of all the countries under consideration. The share of such imports from the other countries in the Middle East and North Africa is even smaller (3 per cent for Egypt, 2 per cent for Morocco, 1 per cent for Algeria and less than 0.01 per cent for Mauritania and Tunisia in 2019), though it was 10 per cent for Libya and the Sudan in 2018. For all the countries except Libya and Mauritania, pharmaceutical imports from the rest of the world as a share of the total have increased, reaching 43 per cent for Egypt, 42 per cent for the Sudan, 24 per cent for Morocco, 20 per cent for Tunisia, 19 per cent for Algeria and 17 per cent for Mauritania according to the latest data available (see figure X).

**Figure X** Share of pharmaceutical imports by origin, 2008 and 2019



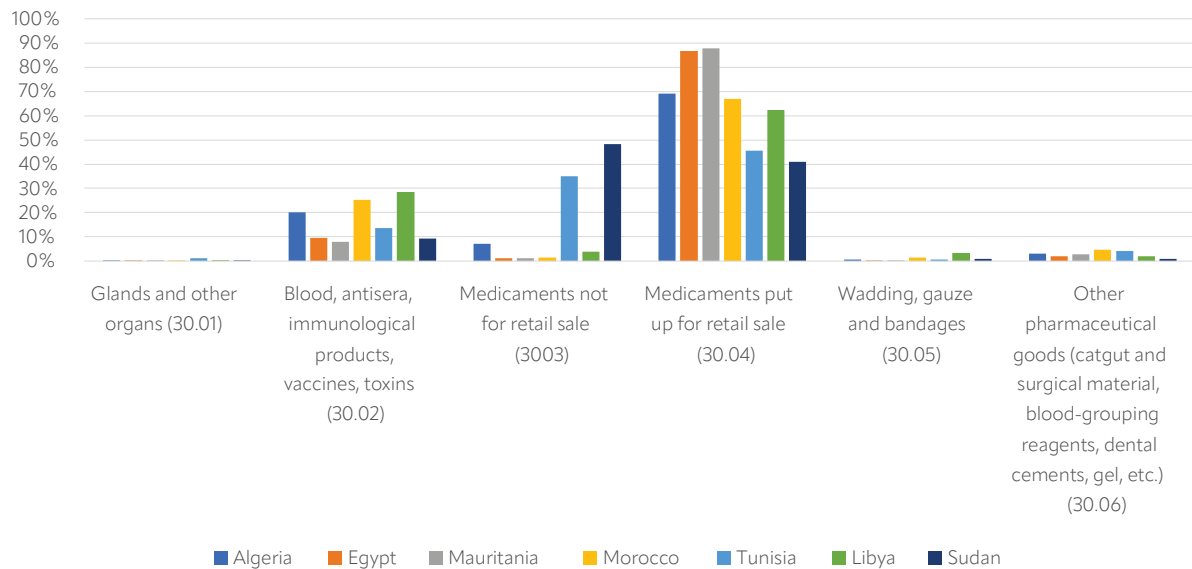


**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

### c. Main products imported by North African countries

North African countries import and export mainly the same category of goods: medicaments put up for retail sale (30.04) (see figure XI). Over a recent three-year period, this category made up, on average, 88 per cent of pharmaceutical imports in Mauritania, 87 per cent in Egypt, 69 per cent in Algeria, 67 per cent in Morocco, 62 per cent in Libya and 45 per cent in Tunisia. Only the Sudan imported a larger share (48 per cent) of medicaments not for retail sale (30.03), although Tunisia also imported a substantial share (35 per cent). Human blood, animal blood, antisera, immunological products, vaccines and toxins (30.02) constituted a non-negligible share of pharmaceutical imports: 28 per cent for Libya, 25 per cent for Morocco, 20 per cent for Algeria, 14 per cent for Tunisia, 10 per cent for Egypt, 9 per cent for the Sudan and 8 per cent for Mauritania.

**Figure XI** Products imported in the pharmaceutical industry (4-digit tariff headings, for the most recent period, as a percentage of the total for the sector)



**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

**Note:** Average of the last three years for which data are available (2017–2019 for Egypt, Mauritania, Morocco and Tunisia; 2016–2018 for Libya and the Sudan; 2015–2017 for Algeria).

The breakdown of imported medicaments put up for retail sale (30.04) into by-products at the six-digit tariff subheading level (see table 2) shows many similarities with the structure of exports. Most of the medicaments belong to the category “other” (3004.90), which, as explained above, covers a wide range of products, including analgesics, antidepressants, antihypertensives, antihistamines, anaesthetics, diuretics, ophthalmological preparations, dermatological preparations, dextrose and levulose solutions, liver extracts, etc. In the most recent three-year period for which data are available for each country, only Algeria imported other by-products amounting to more than 10 per cent of total imports of medicaments put up for retail sale, namely insulin (17.4 per cent) and antibiotics other than penicillins (11.5 per cent). Just below this 10 per cent level, Libyan imports of the latter constituted 9 per cent of the country’s total imports of medicaments put up for retail sale, while Moroccan imports of medicaments other than corticosteroids constituted slightly less than 9 per cent. For these five North African countries – the main importers of medicaments put up for retail sale (30.04) – no other by-product made up more than 8 per cent of total imports of medicaments put up for retail sale.

Imports of medicaments put up for retail sale by Mauritania and the Sudan (which are not included in table 2) are almost entirely from the category “other” (3004.90), which is used for analgesics, antidepressants, etc.



**Table 2** Medicament by-products put up for retail sale imported by North African countries (Percentage)

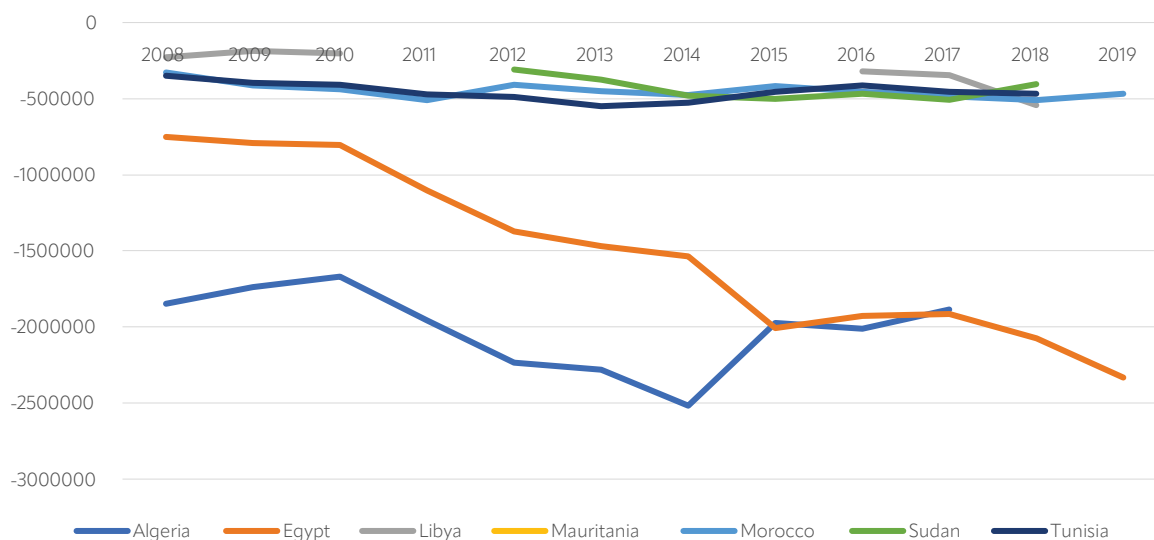
Medicaments put up for retail sale	Algeria	Egypt	Libya	Morocco	Tunisia
Containing penicillins or derivatives thereof (3004.10)	0.49	2.62	5.44	1.60	0.03
Containing other antibiotics (3004.20)	11.51	5.11	9.07	6.75	2.96
Containing insulin (3004.31)	17.38	0.59	2.02	3.30	6.79
Containing corticosteroid hormones or derivatives thereof (3004.32)	5.09	0.66	0.70	4.36	0.25
Other hormones (epinephrines, oestrogens, etc.) (3004.39)	7.17	0.81	5.27	8.87	3.21
Containing alkaloids or derivatives thereof (3004.40)	0.64	3.89	1.95	1.12	0.00
Other medicaments containing vitamins (3004.50)	3.68	0.44	2.31	1.99	0.52
Other (analgesics, antidepressants, etc.) (3004.90)	54.05	85.87	73.24	72.02	86.25

**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

**Note:** Calculations based on average flows for the final three years for which data are available.

### II.1.3. TRADE BALANCE FOR PHARMACEUTICAL GOODS

For the countries in the subregion, the value of pharmaceutical imports was greater than that of exports throughout the period. Nevertheless, the trade balance deteriorated for all countries. Most notably, the trade deficit of Egypt widened from \$751 million in 2008 to \$2.3 billion in 2019 (see figure XII). In 2008, imports were around five times higher than exports; by 2019 they were almost 10 times higher. For Algeria, and even more so for Libya, Mauritania and the Sudan, which have very low exports, the trade balance followed the same trend as imports. The Algerian trade deficit deteriorated mainly between 2010, when it stood at \$1.7 billion, and 2014, when it reached \$2.5 billion. By 2017, it had narrowed again to \$1.9 billion. In Libya, the trade deficit widened from \$226.8 million in 2008 to \$542.7 million in 2018. The Sudan had a very similar trade balance to Libya during the period. Its deficit widened from \$308.5 million in 2012 to \$501.7 million in 2015 before narrowing again to \$405.8 million in 2018. Mauritania had the smallest deficit during the period, not because the country exports, but because it imports less than the other North African countries. The country's trade deficit widened from \$16.1 million in 2010 to \$47.0 million in 2019. The trade balances of Morocco (\$327.9 million in 2008 and \$509.6 million in 2019) and Tunisia (\$349.4 million in 2008 and \$468.2 million in 2018) followed almost identical trends during the period.

**Figure XII** Trade balance for pharmaceutical goods in North African countries, 2008–2019 (Thousands of United States dollars)

**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

**a** Trade balances shown for Mauritania should be treated with caution, as they were calculated by extrapolating export figures from mirror data.

## II.2. Competitiveness profiles

### II.2.1. NORTH AFRICAN TRADE IN THE PHARMACEUTICAL SECTOR

In 2010, total pharmaceutical exports and imports in North African countries constituted 0.32 per cent of global trade. By 2018, this figure had increased only slightly and remained small, at 0.55 per cent. This slight increase by 0.2 percentage points was linked to the increase in pharmaceutical imports and, to a lesser extent, the increase in pharmaceutical exports. The latter increased by 31 per cent, from \$337.8 million in 2010 to \$443.0 in 2018. As mentioned above, imports are much higher than exports in 2010, the countries in the area imported pharmaceuticals worth \$4.1 billion, around 12 times the value of exports. The most recent data show imports worth \$6.4 billion, which represents a 56 per cent increase in eight years. As of 2018, imports by these countries were 14 times larger than their exports.

**Table 3** Total pharmaceutical exports and imports by North African countries, 2010 and 2018 (Thousands of United States dollars)

	2010	2018	Variation	Percentage change
Total exports	337,791.71	443,075.25	105,283.54	31
Total imports	4,088,111.05	6,377,121.71	2,289,010.66	56
Import/export ratio	12.1	14.4	-	-

**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

**Note:** The years 2010 and 2018 were selected as they are the years for which the best data are available, in particular for imports.

## II.2.2. COMPETITIVENESS OF PHARMACEUTICAL GOODS EXPORTED BY NORTH AFRICAN COUNTRIES

To calculate the competitiveness of products exported by North African countries, the revealed comparative advantage was calculated for the most detailed product categories (six-digit tariff subheadings in the data available on trade flows). The revealed comparative advantage is based on the Balassa index. It refers to the ratio between the share of product  $j$  in the exports of country  $i$  and the share of the same product in global exports. The indicator is used to compare one country's export structure with that of all countries. It is calculated as follows:

$$ACR_j^i = \frac{X_j^i / X^i}{X_j / X}$$

Where  $X_j^i$  refers to exports of product  $j$  by country  $i$  (Algeria, Egypt, Morocco or Tunisia),  $X^i$  to total exports by country  $i$ ,  $X_j$  to global exports of product  $j$  and  $X$  to total global exports.

The index was then normalized to make it symmetrical and bound between  $-1$  and  $+1$ , as follows:

$$ACRN_j^i = \frac{ACR_j^i - 1}{ACR_j^i + 1}$$

The normalized revealed comparative advantage is interpreted as follows: (a) if the share of a product in a given country's exports is equal to the share of that product or industry in global exports, its normalized revealed comparative advantage will be 0; (b) if a product constitutes a larger share of a given country's exports than it does of global exports, its normalized revealed comparative advantage will be positive (and bounded by 1); (c) if, on the other hand, the product constitutes a smaller share of a given country's exports than it does of global exports, its normalized revealed comparative advantage will be negative (and bounded by  $-1$ ).

Tables 4–7 show that very few pharmaceutical goods exported by North African countries are competitive on international markets. In 2017, Egypt, Morocco and Tunisia had only two pharmaceutical goods each that had a comparative advantage.

For Egypt, these products were adhesive dressings (which made up 15.8 per cent of pharmaceutical exports) and medicaments consisting of constituents mixed together for therapeutic or prophylactic uses, not put up for retail sale, such as dextrose and levulose solutions, soybean oil emulsions, etc. (8.3 per cent of the sector's exports). The two products for which Morocco had a comparative advantage were vaccines for veterinary medicine (4.4 per cent of pharmaceutical exports) and medicaments not put up for retail sale containing penicillins or derivatives thereof (1.5 per cent). Tunisia had a comparative advantage for first-aid boxes and kits (9.3 per cent of pharmaceutical exports) and medicaments put up for retail sale containing alkaloids or derivatives thereof (5.9 per cent). Algeria did not have a comparative advantage for any pharmaceutical goods.

**Table 4** Competitiveness of pharmaceutical goods exported by Algeria

Harmonized System code	Product names	Share in the pharmaceutical sector (percentage)	Normalized revealed comparative advantage, 2017
3004.90	Medicaments for retail sale, other (analgesics, antidepressants, etc.)	71.66	-1.000
3004.20	Medicaments for retail sale (containing antibiotics)	8.21	-1.000
3002.20	Vaccines for human medicine	6.18	-0.968
3002.90	Toxins, cultures of microorganisms (excluding yeasts)	3.19	-0.998
3002.10	Antisera and modified immunological products	2.72	-0.997
3003.20	Medicaments not for retail sale (containing antibiotics)	2.70	-0.650
3004.50	Medicaments for retail sale (containing vitamins)	1.11	-0.991
3006.10	Sterile suture materials	1.05	-0.891
3004.32	Medicaments for retail sale (containing corticosteroid hormones)	1.02	-0.996
3006.50	First-aid boxes and kits	0.99	-1.000
3004.39	Medicaments for retail sale containing other hormones (epinephrines, oestrogens, etc.)	0.59	-0.999
3004.10	Medicaments for retail sale (containing penicillins)	0.50	-0.928
3004.40	Medicaments for retail sale (containing alkaloids)	0.07	-0.988
3003.90	Medicaments not for retail sale (soybean oil emulsions, dextrose solutions, etc.)	0.01	-0.991
3005.90	Wadding, gauze, bandages, others (impregnated dressings, surgical dressings, etc.)	-	-0.983
3004.31	Medicaments for retail sale (containing insulin)	-	-0.999
3003.31	Medicaments not for retail sale (containing insulin)	-	-0.996
3005.10	Adhesive dressings	-	-1.000
3002.30	Vaccines for veterinary medicine	-	-1.000
3003.40	Medicaments not for retail sale (containing alkaloids)	-	-1.000
3003.39	Medicaments not for retail sale (epinephrine and solutions thereof)	-	-1.000

**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

**Table 5** Competitiveness of pharmaceutical goods exported by Egypt

Harmonized System code	Product names	Share in the pharmaceutical sector (percentage)	Normalized revealed comparative advantage, 2017
3004.90	Medicaments for retail sale (analgesics, antidepressants, etc.)	73.32	-0.418
3005.10	Adhesive dressings	15.85	0.716
3003.90	Medicaments not for retail sale (soybean oil emulsions, dextrose solutions, etc.)	8.26	0.013
3004.50	Medicaments for retail sale (containing vitamins)	0.68	-0.441
3005.90	Wadding, gauze, bandages, others (impregnated dressings, surgical dressings, etc.)	0.62	-0.561
3003.39	Medicaments not for retail sale (epinephrine and solutions thereof)	0.26	-0.173
3004.10	Medicaments for retail sale (containing penicillins)	0.21	-0.881
3002.30	Vaccines for veterinary medicine	0.14	-0.777
3004.20	Medicaments for retail sale (containing antibiotics)	0.14	-0.937
3006.10	Sterile suture materials	0.13	-0.902
3001.90	Human or animal substances other than glands and other organs	0.11	-0.830
3006.20	Blood-grouping reagents	0.08	-0.533
3002.10	Antisera and modified immunological products	0.07	-1.000
3004.39	Medicaments for retail sale containing other hormones (epinephrines, oestrogens, etc.)	0.03	-0.992
3004.31	Medicaments for retail sale (containing insulin)	0.03	-0.959
3006.70	Gel preparations	0.02	-0.904
3002.90	Toxins and cultures of microorganisms (excluding yeasts)	0.01	-0.998
3003.20	Medicaments not for retail sale (containing antibiotics)	–	-0.998
3006.40	Dental cements and other dental fillings	–	-0.993
3002.20	Vaccines for human medicine	–	-0.999

**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

**Table 6** Competitiveness of pharmaceutical goods exported by Morocco

Harmonized System code	Product names	Share in the pharmaceutical sector (percentage)	Normalized revealed comparative advantage, 2017
3004.90	Medicaments for retail sale, other (analgesics, antidepressants, etc.)	75.74	-0.691
3004.20	Medicaments for retail sale (containing antibiotics)	5.50	-0.734
3002.30	Vaccines for veterinary medicine	4.43	0.145
3005.90	Wadding, gauze, bandages, others (impregnated dressings, surgical dressings, etc.)	4.28	-0.097
3006.70	Gel preparations	2.41	-0.974
3003.10	Medicaments not for retail sale (containing penicillins)	1.48	0.235
3004.32	Medicaments for retail sale (containing corticosteroid hormones)	1.28	-0.793
3004.10	Medicaments for retail sale (containing penicillins)	1.02	-0.348
3004.50	Medicaments for retail sale (containing vitamins)	0.93	-0.662
3002.90	Toxins and cultures of microorganisms (excluding yeasts)	0.91	-0.936
3003.20	Medicaments not for retail sale (containing antibiotics)	0.52	-0.080
3004.31	Medicaments for retail sale (containing insulin)	0.30	-0.937
3006.50	First-aid boxes and kits	0.29	-0.879
3006.40	Dental cements and other dental fillings	0.24	-0.812
3001.90	Human or animal substances other than glands and other organs	0.22	-0.811
3002.20	Vaccines for human medicine	0.11	-0.986
3004.39	Medicaments for retail sale containing other hormones (epinephrines, oestrogens, etc.)	0.10	-0.990
3004.40	Medicaments for retail sale (containing alkaloids)	0.09	-0.946
3006.10	Sterile suture materials	0.08	-0.991
3003.90	Medicaments not for retail sale (epinephrine and solutions thereof)	0.07	-0.985
3005.10	Adhesive dressings	0.04	-0.976
3003.39	Medicaments not for retail sale (epinephrine and solutions thereof)	–	-1.000
3002.10	Antisera and modified immunological products	–	-0.990

**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

**Table 7** Competitiveness of pharmaceutical goods exported by Tunisia

Harmonized System code	Product names	Share in the pharmaceutical sector (percentage)	Normalized revealed comparative advantage, 2017
3004.90	Medicaments for retail sale (analgesics, antidepressants, etc.)	53.31	-0.718
3004.39	Medicaments for retail sale containing other hormones (epinephrines, oestrogens, etc.)	23.00	-0.128
3006.50	First-aid boxes and kits	9.30	0.912
3004.40	Medicaments for retail sale (containing alkaloids)	5.91	0.213
3005.10	Adhesive dressings	2.35	-0.340
3005.90	Wadding, gauze, bandages, others (impregnated dressings, surgical dressings, etc.)	2.13	-0.465
3004.20	Medicaments for retail sale (containing antibiotics)	1.55	-0.733
3006.10	Sterile suture materials	0.41	-0.890
3003.10	Medicaments not for retail sale (containing penicillins)	0.19	-0.372
3003.20	Medicaments not for retail sale (containing antibiotics)	0.12	-0.883
3003.90	Medicaments not for retail sale (soybean oil emulsions, dextrose solutions, etc.)	0.10	-0.983
3004.50	Medicaments for retail sale (containing vitamins)	0.07	-0.933
3002.20	Vaccines for human medicine	0.01	-0.998
3006.40	Dental cements and other dental fillings	0.01	-0.996
3006.70	Gel preparations	0.01	-0.976
3002.10	Antisera and modified immunological products	0.00	-1.000

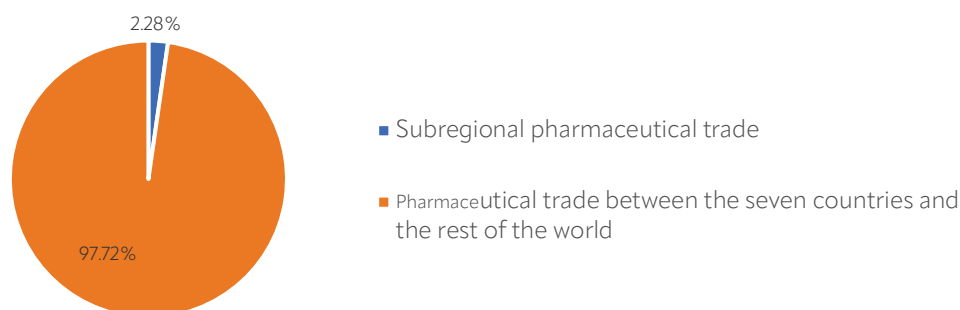
**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

### II.3. Subregional trade by the pharmaceutical sector

As shown in figure XIII, only a small fraction (2.3 per cent between 2016 and 2018, the three most recent years for which there are data) of pharmaceutical trade by North African countries is with other countries in the subregion. This weak subregional integration in pharmaceutical trade is linked to the fact that, for all these countries, almost all imports by the pharmaceutical sector come from the rest of the world, and these imports make up a substantial fraction of total imports. The share of subregional trade in pharmaceutical imports is therefore even smaller than the share in total trade (1.20 per cent during the same period (see figure XV)). Exports to the subregional market constituted 15.74 per cent of total exports (see figure XIV).

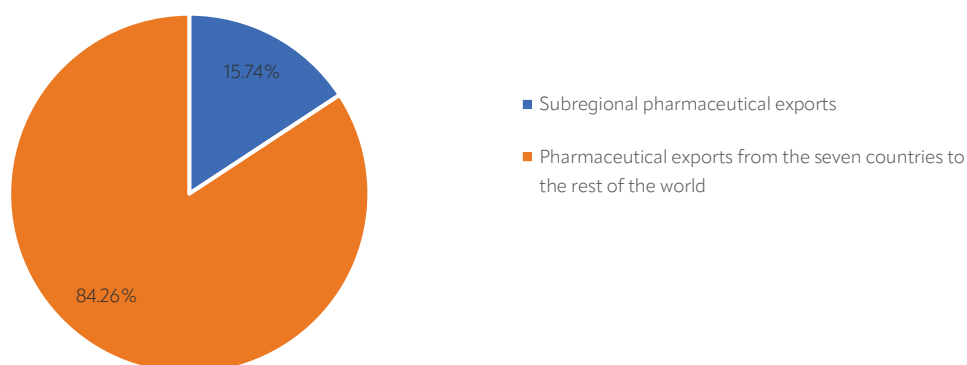
Figure XVI shows the changes in total subregional trade and in total trade with the rest of the world between 2008 and 2017. Total subregional trade in pharmaceutical goods increased from around \$80 million to around \$140 million. Total trade with the rest of the world grew from \$3.9 billion to \$6.4 billion and consisted almost entirely of imports.

**Figure XIII** Subregional trade in pharmaceuticals as a share of total trade in the sector in North African countries, 2016–2018



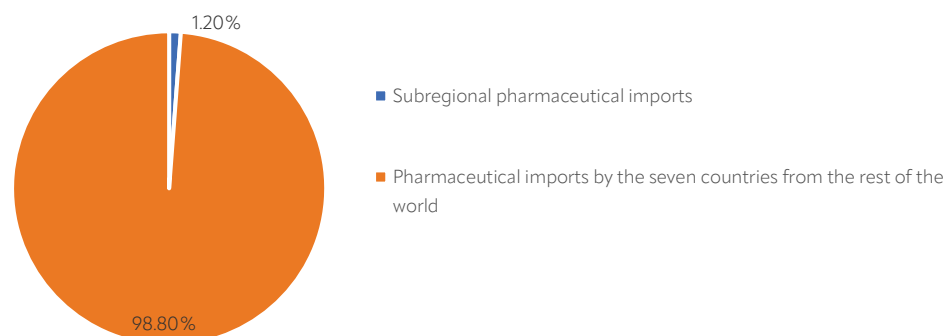
**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

**Figure XIV** Subregional pharmaceutical exports as a share of total exports in the sector in North African countries, 2016–2018



**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

**Figure XV** Subregional pharmaceutical imports as a share of total imports in the sector in North African countries, 2016–2018



**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.



**Figure XVI** Pharmaceutical trade by year within the subregion and with the rest of the world (Thousands of United States dollars)



Source: United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

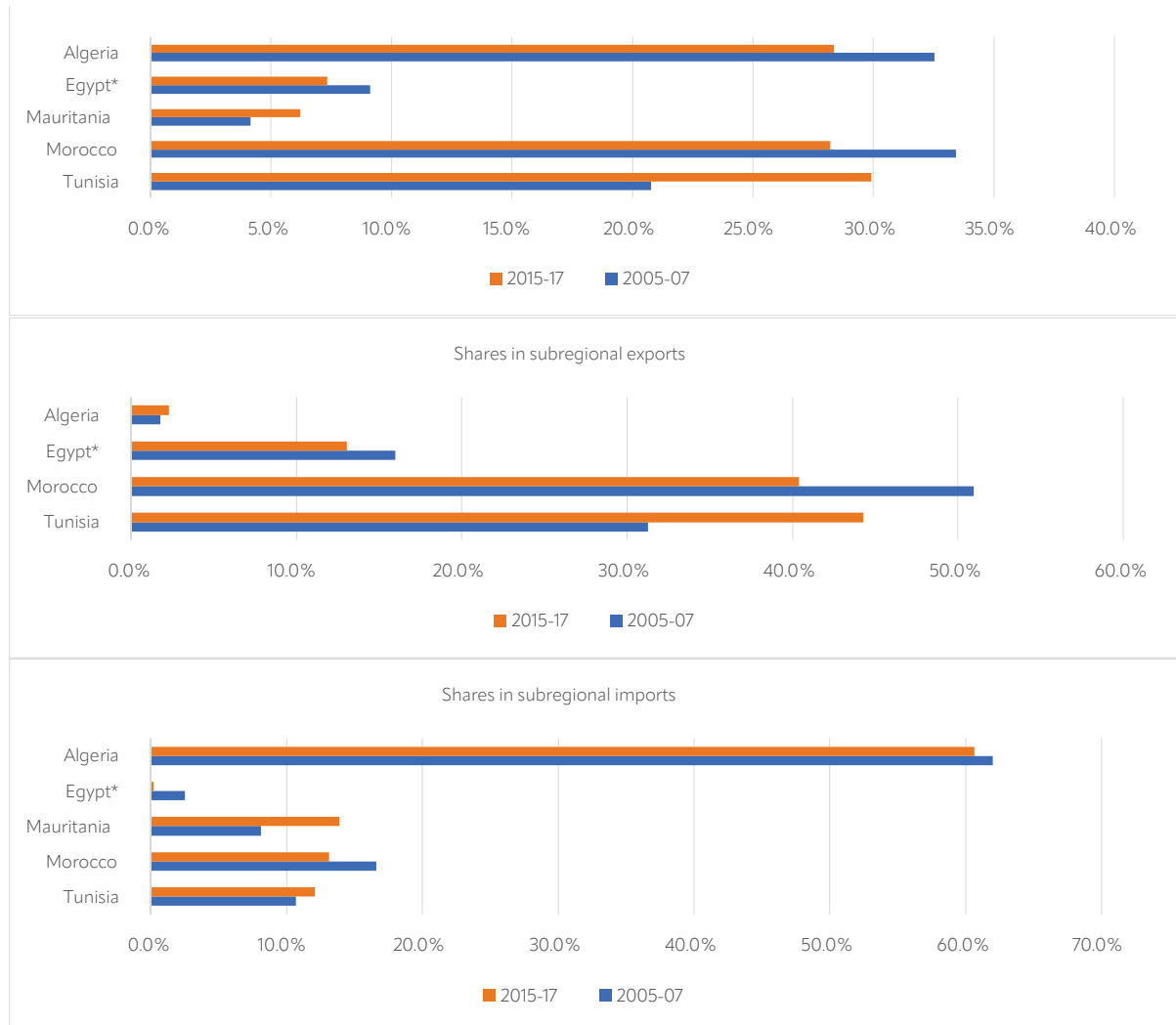
### II.3.1. CONTRIBUTION OF EACH COUNTRY TO SUBREGIONAL TRADE IN PHARMACEUTICAL GOODS

The following analysis looks at five North African countries: Algeria, Egypt, Mauritania, Morocco and Tunisia. In the period from 2015 to 2017, three countries – Algeria, Morocco and Tunisia – contributed around 30 per cent each to subregional trade in the pharmaceutical sector. Egypt and Mauritania made much smaller contributions (7.3 per cent and 6.2 per cent respectively) (see figure XVII). For Mauritania, data are available only for imports, but all indications suggest that Mauritanian exports of pharmaceuticals are very low, so the figure of 6.2 per cent for the country's contribution to subregional trade is likely to be very close to the actual amount.

Most subregional exports during the same period were by Tunisia (44.3 per cent) and Morocco (40.4 per cent), followed by Egypt (13.0 per cent) and Algeria (2.3 per cent). While Algeria contributed very little to subregional exports of pharmaceuticals, it purchased 60.7 per cent of subregional imports. Mauritania, Morocco and Tunisia all contributed 12–14 per cent to

subregional imports of pharmaceuticals. Egyptian purchases of pharmaceuticals from the other North African countries were negligible (0.2 per cent).

**Figure XVII** Contribution of each country to subregional trade (Percentage)



**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

**Note:** The ratios of subregional exports and imports for each country are calculated on total subregional trade. The ratios are broken down by retaining only exports (in the numerator and in the denominator), then only imports.

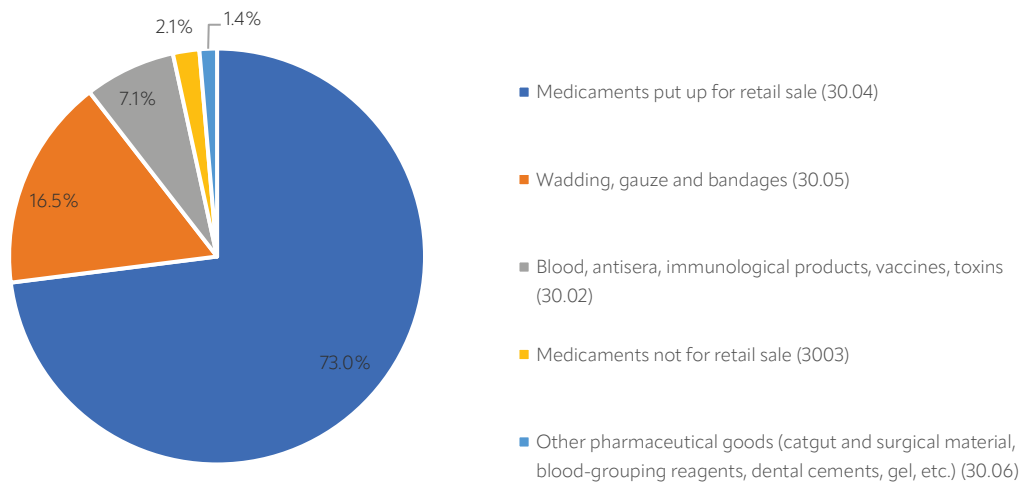
<sup>a</sup> **Data** available only from 2008.

<sup>b</sup> **Data** for imports available only from 2010; no data available for exports. It was not possible to reconstruct the Mauritanian export data based on all other North African countries' imports from Mauritania because the data were not available.

### II.3.2. PHARMACEUTICAL GOODS TRADED REGIONALLY

Medicaments put up for retail sale (4-digit tariff heading 30.04) are the main pharmaceutical goods traded among North African countries (73.0 per cent of the total), followed by wadding, gauze and bandages (30.05, 16.5 per cent); blood, antisera, immunological products, vaccines, etc. (30.02, 7.1 per cent); medicaments not for retail sale (30.03, 2.1 per cent); and products in the category for other pharmaceutical goods (catgut and surgical material, dental cements, gel, etc.) (30.06, 1.4 per cent).

**Figure XVIII** Pharmaceutical goods traded among North African countries



**Source:**  
United Nations

Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

**Note:** Shares calculated for the final three years for which data are available.

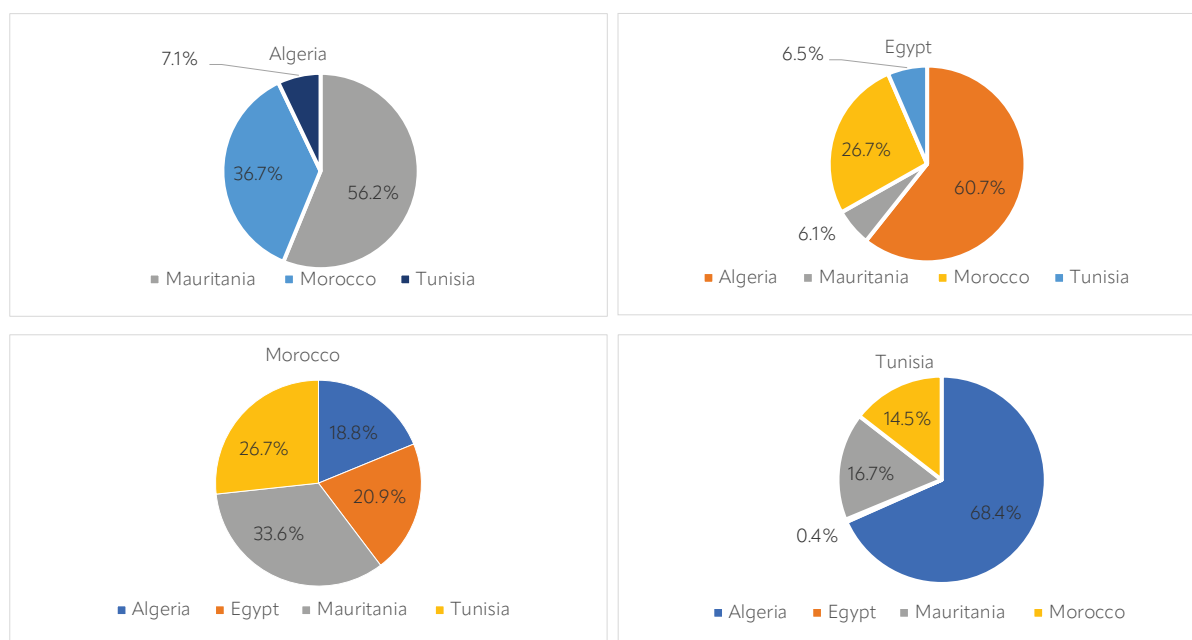
### III. Analysis of avenues open for building a regional value chain

To analyse avenues for building a regional value chain, export destinations and import origins in subregional trade were identified, then the products traded were traced.

#### III.I. Subregional export destinations and import origins

Algeria sells 56.2 per cent of its subregional pharmaceuticals exports to Mauritania, 36.7 per cent to Morocco, 7.1 per cent to Tunisia and none to Egypt. Egypt exports 61 per cent to Algeria, 27 per cent to Morocco, 7 per cent to Mauritania and 6 per cent to Tunisia. Tunisia exports an even greater proportion of its subregional trade in pharmaceuticals to Algeria (68.4 per cent), its largest client. It also exports to Mauritania (16.7 per cent), Morocco (14.5 per cent) and, to a much smaller degree, Egypt (0.4 per cent). Finally, Morocco sells 34 per cent of its subregional exports to Mauritania, almost 27 per cent to Tunisia, 21 per cent to Egypt and 19 per cent to Algeria (see figure XIX). The two main clients for subregional pharmaceutical exports are therefore Algeria and Mauritania, in that order.

**Figure XIX** Subregional export destinations



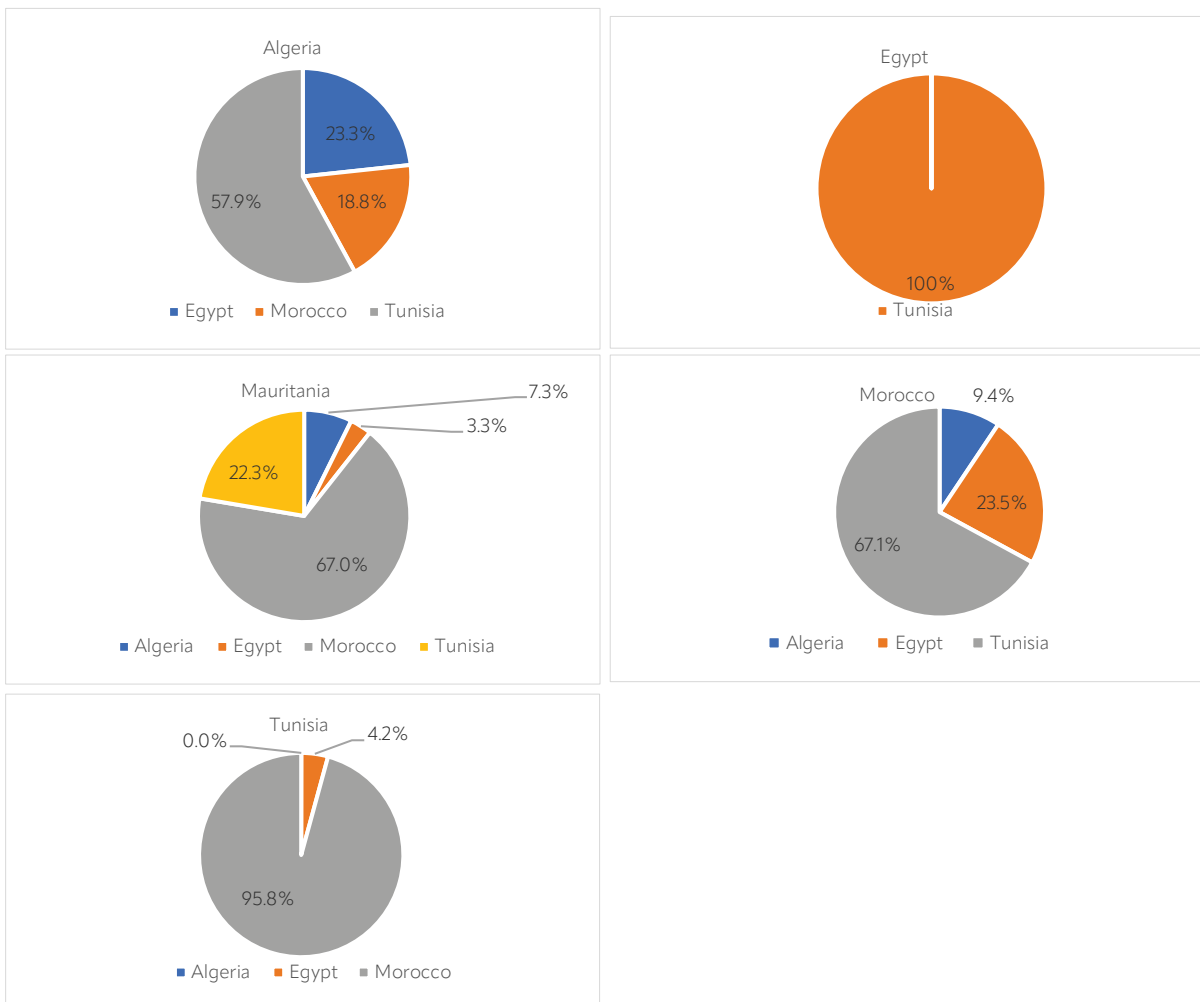
**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

**Note:** Shares calculated for the final three years for which data are available.

**Export** data are not available for Mauritania.

In terms of subregional imports, Algeria imports from Tunisia (58 per cent), Egypt (23 per cent) and Morocco (19 per cent). As discussed above, Egypt imports very few pharmaceuticals from its North African neighbours, but it imports some from Morocco and a very small proportion from Tunisia. Imports from Morocco, however, do not appear in the trade data, which only indicate the negligible imports from Tunisia. Subregional imports by Egypt are therefore slightly underestimated. Mauritania imports mainly from Morocco (67.0 per cent) and Tunisia (22.3 per cent). Its other subregional imports are from Algeria (7.3 per cent) and Egypt (3.3 per cent). Subregional imports by Morocco are from Tunisia (67.1 per cent), Egypt (23.5 per cent) and Algeria (9.4 per cent). Tunisia buys almost all of its subregional pharmaceutical imports from Morocco (96 per cent). It imports only 4 per cent from Egypt (see figure XX). The two largest subregional suppliers of pharmaceuticals, therefore, are Morocco and Tunisia. No country imports pharmaceuticals from Mauritania, which means that Mauritania does not export any to the other North African countries.

**Figure XX** Subregional imports by origin



**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

**Note:** Shares calculated for the final three years for which data are available.

**Subregional imports by Egypt** are incorrect because they do not show imports from Morocco (even though Morocco sells 21 per cent of its subregional exports to Egypt).

### III.2. Identifying the pharmaceutical goods traded among North African countries

The above mapping shows which pharmaceutical products each country exports to a great level of detail and the share of each type of product in the country's total pharmaceutical exports. This section contains an analysis of pharmaceutical goods traded among North African countries. The share exported to each country in the subregion and to the rest of the world is indicated in tables 8–11. The final column shows the total subregional share.

When broken down into detailed categories, the number of pharmaceutical goods exported within the subregion varies greatly from one country to another. Tunisia is the largest contributor to subregional exports. Although it exports only eight pharmaceutical goods to the subregion, quite a substantial proportion of its exports of those products remain in the subregion: 83.1 per cent for adhesive dressings (3005.10), 28.7 per cent for sterile suture materials (3006.10), 19.2 per cent for medicaments not put up for retail sale containing antibiotics (3003.20), 17.4 per cent for medicaments put up for retail sale containing alkaloids (3004.40) and 11.2 per cent for medicaments put up for retail sale containing oestrogen and other hormones (3004.39). Two other products are sold in one of the countries of the subregion in much smaller proportions (first-aid boxes and kits, and wadding, gauze and bandages). Of these eight products exported in the subregion, seven are sold to Mauritania, six to Algeria, five to Morocco and only one – and only a very small proportion – to Egypt.

Morocco exports only slightly less than Tunisia to the other countries in the subregion, but it exports a wider range of products – 17 in total. The main subregional exports by Morocco are medicaments put up for retail sale containing insulin (3004.31, of which 26.1 per cent of its exports are to the subregion), medicaments put up for retail sale containing vitamins (3004.50, 25.9 per cent to the subregion), vaccines for veterinary medicine (3002.30, 20.7 per cent to the subregion), adhesive dressings (3005.10, 12.4 per cent to the subregion) and medicaments put up for retail sale containing penicillins (3004.10, 10.1 per cent). For the other products, the proportion of exports to the subregion is much smaller. Of the 17 exported products, 16 are sold to Mauritania, 4 to Algeria and Tunisia and 1 to Egypt.

Algeria exports seven pharmaceutical goods to the subregion: 100 per cent of its exports of medicaments put up for retail sale containing alkaloids (3004.40); 42.1 per cent of its exports of sterile suture materials (3006.10); 25.1 per cent of its exports of blood, antisera and other; 10.1 per cent of its exports of medicaments put up for retail sale, such as analgesics and antidepressants (3004.90); 5.6 per cent of its exports of medicaments put up for retail sale containing corticosteroid hormones (3004.32); and 0.4 per cent of its exports of medicaments put up for retail sale containing antibiotics (3004.20). All these products are sold in the Mauritanian market, two in the Tunisian market, one in Morocco and none in Egypt.

Although Egypt also exports seven products to the subregion, for most of them, a much larger proportion is exported outside the subregion. The one exception is dental cements (3006.40), which are not exported at all outside the subregion. The other six products are vaccines for veterinary medicine (3002.30, 8.8 per cent to the subregion); antisera and modified immunological products (3002.10, 6.8 per cent); wadding, gauze and bandages (3005.90,

6.5 per cent); adhesive dressings (3005.10, 4.3 per cent); and medicaments not put up for retail sale in the form of soybean oil emulsions, dextrose solutions, etc. (3003.90, 0.9 per cent) and medicaments put for retail sale in the form of analgesics, antidepressants, etc. (3004.90, 0.6 per cent). Five of these products are sold to Algeria, four to Morocco and Tunisia and three to Mauritania.

**Table 8** Destinations of products exported by Algeria (Percentage)

6-digit Harmonized System code	Product names	Rest of the world	North Africa subregion				Total
			Egypt	Mauritania	Morocco	Tunisia	
3004.90	Medicaments for retail sale, other (analgesics, antidepressants, etc.)	89.9	–	4.5	4.7	0.9	10.1
3004.20	Medicaments for retail sale (containing antibiotics)	99.6	–	0.4	–	–	0.4
3002.20	Vaccines for human medicine	100	–	–	–	–	–
3002.90	Toxins and cultures of microorganisms (excluding yeasts)	74.9	–	25.1	–	–	25.1
3002.10	Antisera and modified immunological products	82.3	–	17.7	–	–	17.7
3003.20	Medicaments not for retail sale (containing antibiotics)	100	–	–	–	–	–
3004.50	Medicaments for retail sale (containing vitamins)	100	–	–	–	–	–
3006.10	Sterile suture materials	57.9	–	41.3	–	0.8	42.1
3004.32	Medicaments for retail sale (containing corticosteroid hormones)	94.4	–	5.6	–	–	5.6
3006.50	First-aid boxes and kits	100	–	–	–	–	–
3004.39	Medicaments for retail sale containing other hormones (epinephrines, oestrogens, etc.)	100	–	–	–	–	–
3004.10	Medicaments for retail sale (containing penicillins)	100	–	–	–	–	–
3004.40	Medicaments for retail sale (containing alkaloids)	–	–	100	–	–	100
3003.90	Medicaments not for retail sale (soybean oil emulsions, dextrose solutions, etc.)	100	–	–	–	–	–
3005.90	Wadding, gauze, bandages, others (impregnated dressings, surgical dressings, etc.)	100	–	–	–	–	–
3004.31	Medicaments for retail sale (containing insulin)	100	–	–	–	–	–
3003.31	Medicaments not for retail sale (containing insulin)	100	–	–	–	–	–

**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

**Note:** Shares calculated for the final three years for which data are available (2015–2017).

**Table 9** Destinations of products exported by Egypt(Percentage)

6-digit Harmonized System code	Product names	Rest of the world	North Africa subregion				Total
			Algeria	Mauritania	Morocco	Tunisia	
3004.90	Medicaments for retail sale, other (analgesics, antidepressants, etc.)	99.37	0.42	0.07	0.06	0.08	0.63
3005.10	Adhesive dressings	95.7	2.9	1.2	–	0.2	4.3
3003.90	Medicaments not for retail sale (soybean oil emulsions, dextrose solutions, etc.)	99.12	0.52	0.36	0.00	–	0.88
3004.50	Medicaments for retail sale (containing vitamins)	100	–	–	–	–	–
3005.90	Wadding, gauze, bandages, others (impregnated dressings, surgical dressings, etc.)	93.5	3.7	–	0.9	1.9	6.5
3003.39	Medicaments not for retail sale (epinephrine and solutions thereof)	100	–	–	–	–	–
3004.10	Medicaments for retail sale (containing penicillins)	100	–	–	–	–	–
3002.30	Vaccines for veterinary medicine	91.2	–	–	8.8	–	8.8
3004.20	Medicaments for retail sale (containing antibiotics)	100	–	–	–	–	–
3006.10	Sterile suture materials	100	–	–	–	–	–
3001.90	Human or animal substances other than glands and other organs	100	–	–	–	–	–
3006.20	Blood-grouping reagents	100	–	–	–	–	–
3002.10	Antisera and modified immunological products	93.2	6.8	–	–	–	6.8
3004.39	Medicaments for retail sale containing other hormones (epinephrines, oestrogens, etc.)	100	–	–	–	–	–
3004.31	Medicaments for retail sale (containing insulin)	100	–	–	–	–	–
3006.70	Gel preparations	100	–	–	–	–	–
3002.90	Toxins and cultures of microorganisms (excluding yeasts)	100	–	–	–	–	–
3003.20	Medicaments not for retail sale (containing antibiotics)	100	–	–	–	–	–
3006.40	Dental cements and other dental fillings	0	–	–	–	100	100

**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

**Note:** Shares calculated for the final three years for which data are available (2017–2019).



**Table 10** Destinations of products exported by Morocco(Percentage)

		North Africa subregion					
6-digit Harmonized System code	Product names	Rest of the world	Algeria	Egypt	Mauritania	Tunisia	Total
3004.90	Medicaments for retail sale, other (analgesics, antidepressants, etc.)	94.2	1.0	–	3.4	1.4	5.80
3004.20	Medicaments for retail sale (containing antibiotics)	99.7	–	–	0.3	–	0.3
3002.30	Vaccines for veterinary medicine	79.3	–	0.6	4.3	15.8	20.70
3005.90	Wadding, gauze, bandages, others (impregnated dressings, surgical dressings, etc.)	99.73	–	–	0.04	0.24	0.28
3006.70	Gel preparations	99.97	–	–	0.03	–	0.03
3003.10	Medicaments not for retail sale (containing penicillins)	100	–	–	–	–	–
3004.32	Medicaments for retail sale (containing corticosteroid hormones)	99.6	–	–	0.4	–	0.4
3004.10	Medicaments for retail sale (containing penicillins)	89.9	–	–	10.1	–	10.1
3004.50	Medicaments for retail sale (containing vitamins)	74.1	10.8	–	15.1	–	25.9
3002.90	Toxins and cultures of microorganisms (excluding yeasts)	95.4	–	–	4.6	–	4.6
3003.20	Medicaments not for retail sale (antibiotics)	98.87	1.11	–	0.02	–	1.13
3004.31	Medicaments for retail sale (containing insulin)	73.9	–	–	26.1	–	26.1
3006.50	First-aid boxes and kits	99.94	–	–	0.06	–	0.06
3006.40	Dental cements and other dental fillings	96.5	–	–	–	3.5	3.5
3001.90	Human or animal substances other than glands and other organs	100	–	–	–	–	–
3002.20	Vaccines for human medicine	100	–	–	–	–	–
3004.39	Medicaments for retail sale containing other hormones (epinephrines, oestrogens, etc.)	100	–	–	–	–	–
3004.40	Medicaments for retail sale (containing alkaloids)	95.0	–	–	5.0	–	5.0
3006.10	Sterile suture materials	99.1	–	–	0.9	–	0.9
3003.90	Medicaments not for retail sale (epinephrine and solutions thereof)	99.9	–	–	0.1	–	0.1
3005.10	Adhesive dressings	87.6	0.3	–	12.1	–	12.4
3003.39	Medicaments not for retail sale (epinephrine and solutions thereof)	100	–	–	–	–	–

**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

**Note:** Shares calculated for the final three years for which data are available (2017–2019).

**Table 11** Destinations of products exported by Tunisia (Percentage)

6-digit Harmonized System code	Product names	North Africa subregion					Total
		Rest of the world	Algeria	Egypt	Mauritania	Morocco	
3004.90	Medicaments for retail sale, other (analgesics, antidepressants, etc.)	87.3	6.8	0.0	3.8	2.0	12.7
3004.39	Medicaments for retail sale containing other hormones (epinephrines, oestrogens, etc.)	88.8	11.2	–	–	–	11.2
3006.50	First-aid boxes and kits	99.7	0.0	–	0.3	–	0.3
3004.40	Medicaments for retail sale (containing alkaloids)	82.6	–	–	0.1	17.3	17.40
3005.10	Adhesive dressings	16.9	75.3	–	1.4	6.3	83.1
3005.90	Wadding, gauze, bandages, others (impregnated dressings, surgical dressings, etc.)	96.6	1.6	–	1.4	0.4	3.4
3004.20	Medicaments for retail sale (containing antibiotics)	100	–	–	–	–	–
3006.10	Sterile suture materials	71.3	15.9	–	8.1	4.6	28.7
3003.10	Medicaments not for retail sale (containing penicillins)	100	–	–	–	–	–
3003.20	Medicaments not for retail sale (containing antibiotics)	80.8	–	–	19.2	–	19.2
3003.90	Medicaments not for retail sale (soybean oil emulsions, dextrose solutions, etc.)	100	–	–	–	–	–
3004.50	Medicaments for retail sale (containing vitamins)	100	–	–	–	–	–
3002.20	Vaccines for human medicine	100	–	–	–	–	–
3006.40	Dental cements and other dental fillings	100	–	–	–	–	–
3006.70	Gel preparations	100	–	–	–	–	–

**Source:** United Nations Commodity Trade Statistics Database and United Nations Conference on Trade and Development.

**Note:** Shares calculated for the final three years for which data are available (2017–2019).

The figures show that items for retail sale dominate subregional trade. These items include drugs and material such as first-aid kits, dressings, bandages and dental cements. It can be deduced from the results that few regional value chains have been created.

Nevertheless, comparing subregional trade within North Africa and between North Africa and the rest of the world shows that there is real potential to grow trade flows as part of a regional value chain. This is particularly true for certain intermediate goods intended to be processed in another country and then exported again, a sector that is currently small but could be further

developed. Such goods include certain medicaments not put up for retail sale and products in the blood, antisera and “other” category (toxins, antitoxins, viruses and bacteriophages).

The categories of products in this sector offer real potential for the development of a regional value chain, especially given that some of the countries studied export these products to the rest of the world but do not trade them in the subregion. The products are also imported from the rest of the world by at least one other country in the subregion and are exported by at least one other. Algeria, for instance, imports 14 product categories only from the rest of the world (3001.90, 3002.20, 3002.30, 3002.90, 3003.10, 3003.39, 3004.10, 3004.20, 3004.31, 3004.32, 3004.40, 3006.20, 3006.40 and 3006.70) that are also exported by at least one North African country.<sup>3</sup>

Finally, not all the products for which a country has a revealed comparative advantage are traded, and of those that are, the shares and volumes traded in the subregion are small. In other words, stronger subregional cooperation in the pharmaceutical industries should pave the way not only for more trade, but also for regional value chains to be formed.

### III.3. Prerequisites and future strategies for the development of a regional value chain

The above analysis has shown that a regional value chain could be developed for drugs. For now, the chain would be for generic drugs, but it could eventually be transformed to cover brand-name drugs as part of a move to reshape global value chains and as part of future trends for the relocation of value chains after the COVID-19 crisis in the form of short distribution circuits.

The potential for subregional trade in generic drugs is more viable locally thanks to the availability of patents on active ingredients, knowledge of manufacturing processes and formulas and, most importantly, the efforts made by countries in the subregion that have adopted strategies to develop the pharmaceutical sector. The countries have made the sector a priority for two reasons: because it helps to satisfy the essential needs of the population, which will become ever more numerous and complex owing to demographic growth, urbanization and the epidemiological transition in the subregion, and because the sector has a high value added and provides important opportunities for industrialization, job creation and human capital development.

Although the majority of brand-name drugs are still imported, some countries in the subregion (Egypt, Morocco and Tunisia) recently sought to develop new research and development capacities in the sector (Augier and others, forthcoming; Mouley and Verdier, 2019).

For now, efforts to tackle the COVID-19 pandemic could result in North African countries developing capacities to produce vaccines, the components used to produce vaccines, and

<sup>3</sup> To obtain this list of 14 product categories, a list was initially drawn up of the 30 six-digit categories imported by Algeria from the rest of the world during the three most recent years for which data are available. It was then shown that at least 10 of those 30 categories were imported from a country in the subregion and 20 were imported only from the rest of the world. Next, it was shown that 14 of the 20 product categories that Algeria imported only from the rest of the world were also exported by a country in the subregion.

tests and drugs to treat the virus. Knowledge Ecology International has drawn up a list of sites around the world where vaccine production capacities already exist or could be mobilized.<sup>4</sup> One of the manufacturers on the list that currently produces COVID-19 vaccines is Sidal, a company based in Constantine, Algeria, that is preparing to develop the Russian vaccine Sputnik.<sup>5</sup> Another is Vacsera, a company based in Giza, Egypt, that is producing the Chinese vaccine Sinovac. Knowledge Ecology International has also published a list of facilities that have the potential to contribute to the manufacture of COVID-19 vaccines. The Egyptian company Pharco Pharmaceuticals is on the list, as is the Institut Pasteur in Tunis. These current and potential production sites identified by Knowledge Ecology International are consistent with the above mapping, as vaccines for human medicine are part of the list of exported products, which are sold only to the rest of the world, not to the rest of the subregion. Knowledge Ecology International did not identify any production capacities in Morocco, which is surprising and raises questions concerning the visibility of production capacities in each country. Every country in the subregion should generally be investing more efforts in developing production capacities, given the global needs for pharmaceutical goods to tackle the virus. There are two main factors holding back this development. The first is the constraint posed by intellectual property rights. The procedures in the Agreement on Trade-Related Aspects of Intellectual Property Rights that give countries certain flexibilities for public health and safety reasons are insufficient to overcome this constraint. The only solution is the temporary waiver of intellectual property rights for all products and technologies linked to the battle against COVID-19. With the support of around 100 countries, India and South Africa submitted such a request to the World Trade Organization on 2 October 2020 (see the box, which explains why this proposal must be supported as part of the battle against the pandemic). After a year of discussions, and despite support from civil society (scientists, intellectuals, former political leaders, non-governmental organizations, etc.) around the world,<sup>6</sup> the proposal has not been implemented owing to opposition from certain countries, notably as a result of pressure from pharmaceutical companies that are firmly opposed to this temporary suspension of intellectual property rights. The second factor holding back the development of production capacities is that pharmaceutical companies are not cooperating, even though they alone have the patents, expertise and technologies needed to fight against the pandemic. They are opposed to knowledge-sharing (they refuse to take part in internationally coordinated initiatives) and have implemented few to no partnerships (such as co-production agreements) that would make it possible to ramp up production capacities around the world.

If sites in North Africa that already produce vaccines were supported by the pharmaceutical companies that hold the patents and by international financial institutions, they could receive financial, technical, logistical and other forms of support to help them increase how many vaccines and how many different types of vaccines they produce. Similarly, if pharmaceutical companies in developed countries shared technologies and expertise, helped to train employees and established manufacturing partnerships, with the support of the wider international community, they could help to improve or create production capacities in North Africa not only for COVID-19 vaccines but also for the components of those vaccines and for drugs and tests used in the fight against COVID-19. Such production capacities could allow new regional value chains to emerge.

4 This information is available at [www.keionline.org/covid-19-vaccine-manufacturing-capacity](http://www.keionline.org/covid-19-vaccine-manufacturing-capacity).

5 Production was due to start in September 2021.

6 "Civil society letter supporting proposal by India and South Africa on waiver from certain provisions of the TRIPS Agreement for the prevention, containment and treatment of COVID-19", [www.wto.org/english/tratop\\_e/covid19\\_e/cso\\_letter\\_e.pdf](http://www.wto.org/english/tratop_e/covid19_e/cso_letter_e.pdf) — World Trade Organization.

### Box 1 Why should the proposal by India and South Africa to temporarily suspend intellectual property rights be supported as part of the fight against COVID-19?

In the fight against HIV, the main barrier preventing access to treatment in developing and emerging countries was cost. Today, access to COVID-19 vaccines is determined primarily by supply: the few manufacturers are unable to achieve the production levels that the world needs to tackle the virus effectively. It is estimated that 70 per cent of the global population needs to be vaccinated to achieve herd immunity. At two doses per person, that means around 11 billion doses are required, yet, as of the end of August 2021, global production was only around 6 billion doses. This figure was expected to reach 12 billion by the end of 2021<sup>7</sup>. In addition to the mismatch between supply and demand is the vast inequality in global vaccine distribution. According to Oxfam France<sup>8</sup>, high-income countries account for 13 per cent of the global population but have already reserved around 6 billion vaccines – half the potential global supply. At the time of writing, 75 per cent of doses had been administered in around 10 countries (the United States of America, some European Union countries, the United Kingdom of Great Britain and Northern Ireland, China and Israel).

The main initiative put in place by the World Health Organization to correct these imbalances is the Access to COVID-19 Tools Accelerator. An important pillar of the Accelerator is COVID-19 Vaccines Global, an initiative introduced in April 2020 to facilitate cooperation on vaccine supplies by purchasing doses and distributing them equitably among all participating countries (98 high-revenue countries and 92 low- and middle-income countries). Even if the stated objective of distributing at least 2 billion doses by the end of 2021 (including 1.3 billion doses to low-income countries)<sup>9</sup> is achieved, the initiative is not enough to control the pandemic in the long term, as it remains limited by weak production capacities<sup>10</sup>. To strengthen production capacities, the Access to COVID-19 Tools Accelerator also includes a technology access pool (initially proposed by Costa Rica) that allows the pooling of patents and rights to data, knowledge and technology that are useful to prevent, detect and treat COVID-19. The pharmaceutical industry's rejection of the initiative limits its effectiveness.

What the HIV crisis and the COVID-19 crisis have in common is that the pharmaceutical companies alone determine how many doses to produce, how much to charge, how many are sent to different parts of the world and what collaborations and technology transfers will take place, even though the companies have received substantial public funding<sup>11</sup>. In the case of HIV, developing and emerging countries finally managed to obtain access to antiretroviral treatments because some of them began producing the treatments under the compulsory licensing system envisaged by flexibilities under the Agreement on Trade-Related Aspects of Intellectual Property Rights<sup>12</sup>. The compulsory licensing system, however, is not appropriate for COVID-19 vaccines because, unlike antiretroviral production, which was based on only one or two patents, the RNA messenger, for instance, requires a myriad of patents. According to Kilic and Fukuda-Parr (2021), "one company doesn't necessarily own all the patents on its own technology, but needs sublicenses from other companies"<sup>13</sup>. In the current fight against the COVID-19 pandemic, intellectual property therefore constitutes a major obstacle to increasing production capacities and improving access to vaccines for people in developing and emerging countries. It is therefore entirely justified that India and South Africa submitted a proposal to the World Trade Organization in October 2020, backed by over 100 countries, requesting a temporary suspension of intellectual property rights on the development, manufacture and distribution of vaccines and essential material in the fight against COVID-19<sup>14</sup>. The proposal would undoubtedly increase vaccine production capacities. Moreover, in addition to global vaccine production capacities falling short of what is needed, there are also shortages of certain components used to produce the vaccines, such as nucleotides, enzymes and lipids. The few companies that make these products do not make enough to supply the entire world, and they have still not awarded enough licences for other companies to produce the components. Temporarily suspending patents would also help to reduce these shortages by giving more companies the opportunity to manufacture these components.

7 Source: Airfinity ([www.airfinity.com](http://www.airfinity.com)).

8 [www.oxfamfrance.org/financement-du-developpement/vaccins-contre-le-covid-19-quels-enjeux-en-2021/](http://www.oxfamfrance.org/financement-du-developpement/vaccins-contre-le-covid-19-quels-enjeux-en-2021/) According to an Amnesty International report published at the end of September 2021, of the almost 6 billion doses that had been manufactured at the time, only 0.3 per cent had gone to the 82 low-income countries ([www.amnesty.org.uk/press-releases/covid-19-big-pharma-fuelling-unprecedented-human-rights-crisis-new-report](http://www.amnesty.org.uk/press-releases/covid-19-big-pharma-fuelling-unprecedented-human-rights-crisis-new-report)).

9 According to Oxfam, barely 100 million doses had been distributed by mid-September 2021.

10 Another limit of the COVID-19 Vaccines Global Access initiative is that, for high-income countries, it involves Governments procuring vaccines from pharmaceutical companies that are already on the market, rather than encouraging local capacity-building in developing and emerging countries.

11 According to data from Airfinity, 35 per cent of the financing needs for vaccine research by nine pharmaceutical groups – AstraZeneca, Pfizer/BioNTech, Moderna, Novavax, SinoVac, Curevac, Johnson and Johnson, Sanofi/GlaxoSmithKline and Sanofi/Translate Bio – were covered by public funding and 8 per cent by non-governmental organizations.

12 The flexibilities under the Agreement on Trade-Related Aspects of Intellectual Property Right are applicable for public health and safety reasons. The awarding of a compulsory licence by a Government allows the production of a patented product to be authorized without the consent of the patent holder. The patent holder is paid compensation.

13 B. Kilic and S. Fukuda-Parr (2021), *Conversations on the Frontline: Thinking Long Term and Building Local Capacity*, [www.indiachinainstitute.org/2021/05/14/conversations-on-the-frontline-thinking-long-term-and-building-local-capacity](http://www.indiachinainstitute.org/2021/05/14/conversations-on-the-frontline-thinking-long-term-and-building-local-capacity).

14 The suspension would end once the pandemic has been brought under control.

### **III.3.1. POTENTIAL OF THE REGIONAL VALUE CHAIN IN THE EVENT OF DISRUPTIONS TO THE GLOBAL PHARMACEUTICAL SUPPLY CHAIN**

The COVID-19 crisis has highlighted the vulnerability of global pharmaceutical supply chains owing to the strong dependence on China and India (Institut Amadeus, 2020). The supply issues encountered during the pandemic, including for products needed to fight against COVID-19, could make private-sector (and public-sector) operators in Europe and Africa reconfigure their supply chains outside China and India. North African countries with large internal markets, especially Algeria and Egypt, could benefit most from this realigning of pharmaceutical supply chains (Augier and others, forthcoming). A regional value chain, however, would allow all countries in the subregion could benefit from partnerships being established with pharmaceutical companies and other foreign firms, especially in Europe. Such partnerships could take the form of contracts for the supply of inputs, contracts for the establishment of industrial units, and joint production agreements (Joumard, Dhaoui and Morgavi, 2018). Reconfiguring global value chains to make them more regional while exploiting the potential for more effective linkages in those value chains should open up promising avenues for the domestic development of the pharmaceutical industries in these countries and should act as vectors to reinvigorate regional integration after COVID-19 (Moreno-Dodson, 2020; World Bank, 2020).

### **III.3.2. BEYOND SUBREGIONAL TRADE POTENTIAL: PREREQUISITE STRUCTURAL TRANSFORMATION FOR A STRONG AND INNOVATIVE REGIONAL VALUE CHAIN**

In building regional value chains in the subregional pharmaceutical industry, North African countries face two main challenges: to compete with the big international groups in the basic drugs market and to move upmarket to produce more complex drugs that are better adapted to the subregion's changing health needs. To take on these challenges, countries will need to draw up national pharmaceutical innovation strategies that foster partnerships between research institutions and the private sector to strengthen capacities for discovering truly innovative drugs (Augier and others, forthcoming). In this regard, building a subregional innovation space driven by cooperation among research centres, pharmaceutical companies, innovative start-ups and industrialists in projects focused on common health challenges would make the subregion more attractive to the rest of the world.

For this to happen, it is essential for the pharmaceutical industry to be immersed in the national innovation system. Morocco and Tunisia are among the most innovative countries. Generally, however, additional efforts are still needed so that national innovation systems accelerate the pace of scientific activity and research and the adoption of technologies and knowledge inflows; make research and development financing less dependent on public subsidies; and increase companies' capacity to absorb pillars of expertise and knowledge (see table 12).

**Table 12** Subregional comparison of innovation indices

Scores/Pillars	Algeria	Egypt	Morocco	Tunisia
Global Innovation Index 2020 rank	113 (+8)	96 (-4)	75 (-1)	65 (+5)
Global Innovation Index 2019 rank	121	92	74	70
Institutions	52.2 (104)	48.6 (115)	60.8 (77)	61.1 (75)
Human capital and research of which:	28.4 (74)	21.5 (90)	25.9 (81)	40.7 (38)
Research and development	5.1 (76)	11 (55)	6.7 (71)	8.3 (64)
Infrastructure of which:	31.5 (100)	31.5 (99)	39.3 (71)	38.2 (74)
Information and communication technologies	37.3 (114)	50.3 (96)	63.2 (75)	67.5 (65)
Market sophistication	24.6 (130)	39.3 (106)	43.3 (88)	37.0 (112)
Business sophistication of which:	15.6 (126)	18.7 (103)	18.4 (107)	18.0 (110)
Innovation linkages	15.1 (111)	19.3 (74)	14 (117)	13.7 (118)
Knowledge and technology outputs	8.1 (125)	19.7 (65)	21.9 (60)	25.8 (52)
Creative outputs	8.9 (118)	13.4 (101)	19 (75)	21.1 (63)

**Source:** *Global Innovation Index (2020)*.

### III.4. Potential subregional integration under the Agreement Establishing the African Continental Free Trade Area

The Agreement Establishing the African Continental Free Trade Area offers real opportunities to consolidate the potential for subregional integration among the North African countries, especially in the Maghreb (Mouley, 2021). Like other African countries, the North African countries embarked on a continental regional integration programme that included: (a) the Action Plan for Boosting Intra-African Trade adopted in 2012 by the African Union Conference and a road map for establishing the African Continental Free Trade Area, for which negotiations began in 2015; (b) Agenda 2063: The Africa We Want, of the African Union, which was adopted in Dakar in 2015 and for which the Area is a flagship project; and (c) the 2030 Agenda for Sustainable Development. Following these strategic negotiation stages, the Agreement Establishing the African Continental Free Trade Area was concluded, with 54 signatories, and entered into force in May 2019.

Thanks to the Agreement, trade liberalization agreements were reached for goods and services; and progress was made in establishing an appropriate dispute settlement mechanism. During the initial start-up phase, preferential trade liberalization and the gains expected from the establishment of the Area will be conditioned by other necessary and expected steps forward in trade facilitation.

The negotiations already under way should therefore generate further details on: (a) the requirement to simplify the rules of origin, which should take into account the productive capacity levels and the structural asymmetries of all countries to take advantage of preferential treatment; (b) the gradual removal of non-tariff barriers; and (c) the establishment of

appropriate technical and regulatory frameworks for additional policy measures (free trade zones, capacity-building and cooperation).

All the North African countries have signed and ratified the Agreement, but only Egypt, Mauritania and Tunisia have deposited their instruments of ratification. The ratification of the Agreement by the countries in the subregion will therefore provide an opportunity for multilateral discussions among African countries on how to remove bilateral trade constraints and other market access barriers and how to reduce, or even gradually eliminate, tariff and non-tariff protections so that the process improves access to new markets and fosters integration into regional and international value chains.

These new directions are part of a complimentary multilateral vision and are in line with the Trade Facilitation Agreement adopted by the World Trade Organization. According to the African Development Bank (2019), the Agreement Establishing the African Continental Free Trade Area should reduce transaction costs from 18 per cent to 14 per cent and increase global trade by 0.5 per cent. By applying the Trade Facilitation Agreement, the African countries that are signatories to the Agreement Establishing the African Continental Free Trade Area could generate an additional \$31 billion, or 4.5 per cent of African gross domestic product, bringing their total gains to \$134 billion. Although each regional economic community in Africa has a different economic configuration, they would benefit in two ways from using the opportunities that the Agreement offers. The more industrialized countries are well placed to take advantage of the opportunities offered by manufactured goods, while the less industrialized countries could benefit by joining regional value chains, which will be facilitated by the Agreement and will reduce trade costs and promote investment. The Area will allow agricultural countries to meet the growing food-security needs in Africa.

The Area is expected to give North African countries an opportunity to reinvigorate trade within the subregion and the wider African region, to diversify their economies, to transform them structurally and to achieve major economic integration goals. The average share of intra-African trade in the foreign trade of African countries is only 15 per cent (African Export-Import Bank, 2020) and remains weaker than the levels of intracontinental trade in other parts of the world (around 47 per cent in the Americas, 61 per cent in Asia and 67 per cent in Europe). Although African trade in global exports is concentrated in primary, agricultural and agrifood products, with little diversification of trade in manufacturing goods and average complexity, intraregional trade has good indicators for specialization and sophistication. Manufactured goods make up 41.9 per cent of intraregional exports and have more than doubled in value from \$50.9 billion to \$106.2 billion over the past decade.

Implementation of the African Continental Free Trade Area should make it possible to gradually make African trade less concentrated in extractive resources such as oil and minerals, which currently represent more than 75 per cent of exports outside Africa. This will give Africa a more sustainable and competitive export base with strong potential for integration. The Agreement should also allow Africa to strengthen and consolidate the dynamism of its intraregional integration. These perspectives are all the more promising given that the Area covers a market with a population that currently stands at 1.2 billion and is projected to rise to



2.5 billion by 2050, or 26 per cent of the global population of working age (World Bank, 2019), with a potential GDP of \$2.5 billion and a highly dynamic market (Mouley, 2021).

According to the United Nations Conference on Trade and Development (2019), implementing the African Continental Free Trade Area could increase most countries' GDP by 1–3 per cent and lead to a 33 per cent rise in intra-African trade once customs duties have been abolished. These developments should attract new intra-African investments and create opportunities that will boost industrialization in Africa thanks to the development of regional value chains. The Economic Commission for Africa (United Nations, Economic Commission for Africa, 2019) estimates that the African Continental Free Trade Area could lead to a 52.3 per cent increase in intra-African trade. The Area offers real opportunities to consolidate regional integration, with the triggers and drivers of that integration supported by the following transmission channels:

- Eliminating tariff and non-tariff barriers and removing other non-technical and procedural barriers to cross-border trade and investment should improve access to the region's markets for competitive companies, improve competition, grow demand for work and optimize opportunities to create jobs. Before these things happen, as productive structures converge and cross-border trade and investment are harmonized it will become easier for companies to work together and create an intraregional pool of local jobs.
- It is extremely urgent for North African countries to ease other major economic constraints and obstacles to market access so that they can streamline their crisis-exit strategies as part of a new dynamic of subregional integration. Some of these constraints and obstacles are regulatory (banking regulations, exchange controls, trade and investment regimes, etc.), but others are inherent to business practice and the business environment in general and related to logistical trade and investment transaction costs.

A World Bank (2020) report confirms the benefits that this trade agreement is expected to have on growth, trade, poverty and employment.

Furthermore, although there are not yet, strictly speaking, any specific studies on the impact of the African Continental Free Trade Area on the pharmaceutical sector, there is every indication that the Area will boost the creation of regional value chains and the development of production capacities in North African countries that already have technology and expertise in the pharmaceutical sector.

## IV. Conclusion and recommendations

North African countries have increased their exports of pharmaceuticals, both in absolute terms and in terms of the share of total exports. Except in Egypt, the share of the sector in total exports is slightly lower than that of countries with similar levels of income, but far lower than the share of the sector in global trade. Egypt is by far the subregion's largest exporter, followed by Morocco and Tunisia. Exports from Algeria, Libya and the Sudan are very low and those from Mauritania are even lower. The main export market for Egypt and Tunisia is the Middle East and North Africa; for Algeria and Morocco, it is the European Union. The export structure in each country is highly concentrated and is dominated by medicaments for retail sale. More specifically, they export a wide range of products, including analgesics, antidepressants, antihistamines, anaesthetics, diuretics, ophthalmological preparations and dermatological preparations. Comparing the structure of pharmaceutical exports in North African countries against the structure of global trade in pharmaceuticals shows that medicaments put up for retail sale are generally overrepresented and blood, antisera, immunological products, vaccines and toxins are underrepresented. Finally, a very small number of pharmaceutical goods exported by North African countries are competitive in international markets.

North African countries import far more pharmaceuticals than they export. Egypt is the largest importer in the subregion, followed by Algeria, Morocco, Tunisia, the Sudan, Libya and Mauritania. With the exception of Algeria, pharmaceutical imports have grown rapidly in all these countries, causing their trade balances for those products to deteriorate drastically. Most of these imports are from the European Union, and the products imported are very similar in structure to those exported.

North African countries trade around 2.3 per cent of their total pharmaceutical exports among themselves. For imports, this figure goes down to only 1.2 per cent. The share of pharmaceutical exports sold to the subregional market is 15.7 per cent. What stands out in terms of the structure of trade by the pharmaceutical sector in North Africa is that imports make up such a large portion of total trade (14 times the value of exports) and that 98.8 per cent of imports come from the rest of the world.

When the pharmaceutical goods traded in the subregion are broken down further, it becomes apparent that they are dominated by goods for retail sale – drugs, as well as material such as first-aid kits, dressings, bandages and dental cements. There seem to be few intermediate products destined for processing in another country before being exported again, apart from certain medicaments not put up for retail sale and products in the blood, antisera and "other" category (toxins, antitoxins, viruses and bacteriophages). It can be deduced from the results that few regional value chains have been created. By contrast, there are signs that subregional

trade flows will grow, which would create opportunities to develop regional value chains in North Africa.

Comparing subregional trade within North Africa and between North Africa and the rest of the world shows that there is real potential to grow trade flows among North African countries, which could take place as part of a regional value chain. This is particularly true for certain intermediate goods intended to be processed in another country and then exported again, a sector that is currently small. Such goods include certain medicaments not put up for retail sale and products in the blood, antisera and "other" category (toxins, antitoxins, viruses and bacteriophages). These potentialities for strengthening subregional trade and creating value chains are made all the more evident by the fact that some of the countries studied in this document export pharmaceuticals to the rest of the world but do not trade them with the subregion. Further evidence of these potentialities is the fact that some of the products are imported from the rest of the world by at least one country in the subregion and exported by at least one other. It is also noteworthy that not all the products for which a country has a revealed comparative advantage are traded, and of those that are, the shares and volumes traded in the subregion are small. In other words, stronger subregional cooperation in the pharmaceutical industries creates the potential not only for more trade, but also for regional value chains to be formed.

The above analysis has shown that a regional value chain could be developed for drugs. For now, the chain would be for generic drugs, but it could eventually be transformed to cover brand-name drugs as part of a move to reshape global value chains and as part of future trends for the relocation of value chains after COVID-19 in the form of short distribution circuits. In the short term, the temporary waiver of intellectual property rights for all products and technologies linked to the battle against COVID-19 would accelerate the development of brand-name drugs, which would help North African countries to move upmarket and could lead to subregional collaboration. The implementation of the Agreement on the African Continental Free Trade Area is undoubtedly another factor that helps the development of regional value chains. However, beyond the potential it would create for subregional trade, a strong, innovative regional value chain will greatly contribute to creating the prerequisite structural transformation.

The main recommendations are as follows:

- Within the World Trade Organization and in their relations with the entire international community, North African countries should firmly back the proposed temporary waiver of customs duties on all products and technologies linked to the battle against COVID-19.
- Each country should make its production capacities, its technology and its expertise more visible.
- North African countries should work to reduce trade barriers that are specific to this sector (tariff and non-tariff barriers, rules of origin and cumulation, regulatory constraints, etc.).

- Other economic-policy actions should aim to improve national innovation systems, investment frameworks and the business environment for companies.
- Each country in the subregion should promote subregional foreign direct investment. When foreign direct investment comes from third countries, it is very important for political leaders to obtain guarantees on the transfer of technology and expertise that could benefit the recipient countries.
- Because the pharmaceutical sector usually generates high value added and provides excellent opportunities for industrialization, job creation and human capital development, it should remain a priority sector for the countries in the subregion, which should support it and do all they can to foster its development.
- Finally, to draw up measures that are more operational, it would be very useful to continue this study by analysing why subregional trade is so low. In particular, it would be useful to look at cases where one North African country exports a product category to the rest of the world and another, imports the same product category from the rest of the world and to understand why no subregional trade at all exists for such products.

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