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8 DECEMBER 2022

EXECUTIVE SUMMARY

Observatorium voor de farmaceutische industrie

Talent in the Biopharma sector

Revised final report

Introduction

The background of the research report on the current and future landscape of Biopharma talent in Belgium

Who is OFI?

OFI, '**Observatorium voor de Farmaceutische Industrie**', is a **national institution** consisting of 16 select members appointed by the Minister of Economy. The members represent amongst others the **pharmaceutical industry, federal government, and academic institutions**.

OFI was founded in 2018 by royal decree, to continuously supervise and evaluate the competitive position Belgium holds in the worldwide Biopharma industry, and to maintain and strengthen this position.

What has already been done?

The **Belgian Prime Minister** launched an **exercise** in 2021 to assess how **Belgium** could **strengthen its Biopharma ecosystem**. Regarding talent the consultant had identified the following high-level recommendations:

1. Create a national promotion campaign to attract talent and investors
2. Create an international promotion campaign to attract talent and investors
3. Create promotion campaigns at universities, student fairs and job fairs

Following this work by the Federal Government, the **R&D Bioplatform** was relaunched end of 2021, followed by the start of a **new cycle in OFI**.

Why research the talent challenge in Biopharma?

The Biopharma industry is a fast-growing, innovating and crucial sector in **Belgium**, and can be considered as **one of the most prominent Biopharma hubs in Europe**. To ensure the future of the leading role the Belgian Biopharma industry plays in Europe and worldwide, it is important to **understand the current and future landscape** of **Biopharma talent** and the role of STEM (science, technology, engineering and math) herein.

The industry has therefore commissioned Deloitte to research these topics and provide a more thorough analysis and recommendations around the topic of talent for the Belgian Biopharma industry. Deloitte will bring this study to OFI. Comparing Belgium to the countries we compete most with for Biopharma investments, i.e., Germany, France, United Kingdom, the Netherlands, Switzerland, Ireland and Denmark.

Answering 3 pressing questions:

1. **How to strengthen and retain local STEM talent**
2. **How to attract international STEM talent**
3. **How to reskill and upskill local STEM talent**

Understanding the talent challenge for the Biopharma industry

State the talent problem for the Biopharma industry, learn from other Biopharma hotspots in Europe and come to clear recommendations for Belgium

Context

The Belgian Biopharma industry envisions to maintain its leading position, by setting out ambitious goals to attract more talent. However, an analysis of the educational and labour context is necessary: the shortage of STEM-profiles and the war for talent is a challenge which may affect the growth of the Biopharma business.

This study will elaborate on the policy measures that the Belgian federal government, as well as the Flemish and the Walloon governments are encouraged to take urgently in the fields of education and labour market.

Research questions

1. **Strengthen and retain local STEM talent**
2. **Attract international STEM talent**
3. **Reskill and upskill local STEM talent**

Methodology

Desk research
Qualitative

- *Deloitte internal research*
- *Pharma.be*
- *Biowin*
- *Essenscia*
- *INSEAD*
- *STEM agenda 2030*
- *Wetenschaps-barometer*
- *EU STEM Coalition*
- *European Commission*
- *World Economic Forum*
- *BCG*
- *Foreign governments*
- *OECD reports*

Desk research
Quantitative

- *Deloitte internal data*
- *OECD*
- *Eurostat*
- *Statista*
- *Jobbarometer*
- *STEM Monitor 2021*
- *Hoger Onderwijs in Cijfers*
- *Académie de recherche et d'enseignement supérieur*

Interviews
Qualitative

- *2 x EU STEM coalition (NL & DE)*
- *6 x Regional government actors (education & labour market)*
- *9 x Academic actors*
- *3 x Employment platforms*
- *4 x Industry representatives*
- *15 x Deloitte national & international experts*

Belgium can reinforce itself as the Biopharma valley of Europe

The Belgian Biopharma industry is a net-plus contributor to the Belgian economy and is a front-runner in Europe, demonstrating strong continued growth during the COVID-19 crisis

Belgium, the Health and Biotech Valley of Tomorrow

be at heart
Biopharma Hive Belgium

.be

The Biopharma industry has a profound impact in the Belgian economy

The **total economic impact** of the life sciences ecosystem exceeded **30 billion euro** in recent years which is **nearly 7%** of Belgian GDP and almost **25%** of the R&D intensive industries.

Next to the digital sector, the Belgian pharmaceutical industry is outperforming other industries with a **growth of more than 10% yearly** between 2011 and 2018**.**

The **COVID-19 crisis has been an accelerator for the Biopharma industry** as Belgium's Biopharma export grew exponentially to €85 billion from €56 billion in 2020.

For Belgium, this means the Biopharma export is responsible for a fifth of the country's total export.

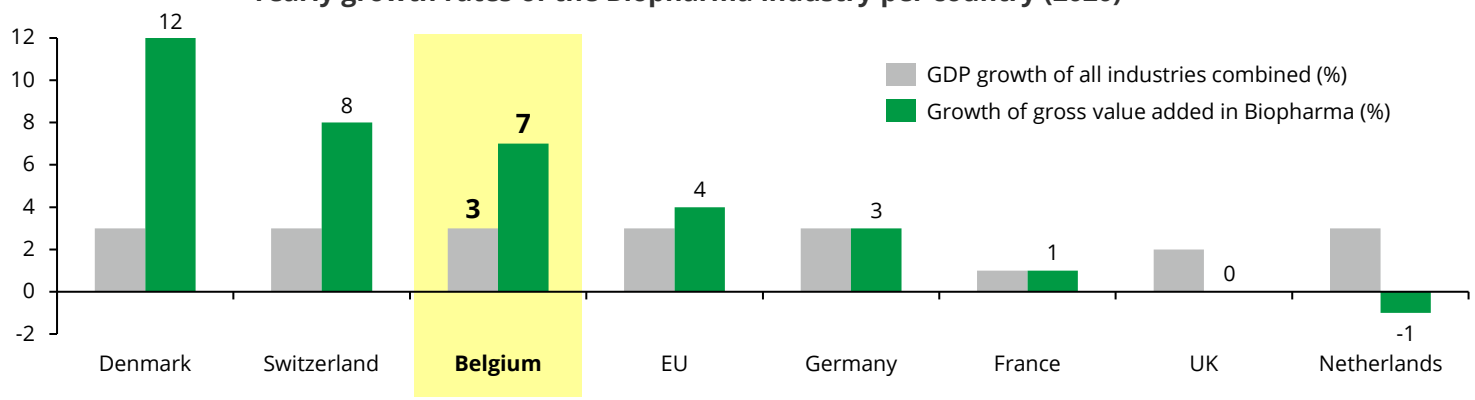
Belgium, a European Biopharma stronghold

Belgian Biopharma industry grows at almost twice the rate of the European average (e.g., 2020).

In our dataset, Switzerland, Denmark and Belgium have the highest growth of added value in Biopharma. On average, the biopharma industry has known a faster growth compared to the average GDP, for Belgium this is more than twice as much.

Evidencing the need to increase the talent pool in Belgium, to sustain and continue to grow as a center for the Biopharma industry in Europe.

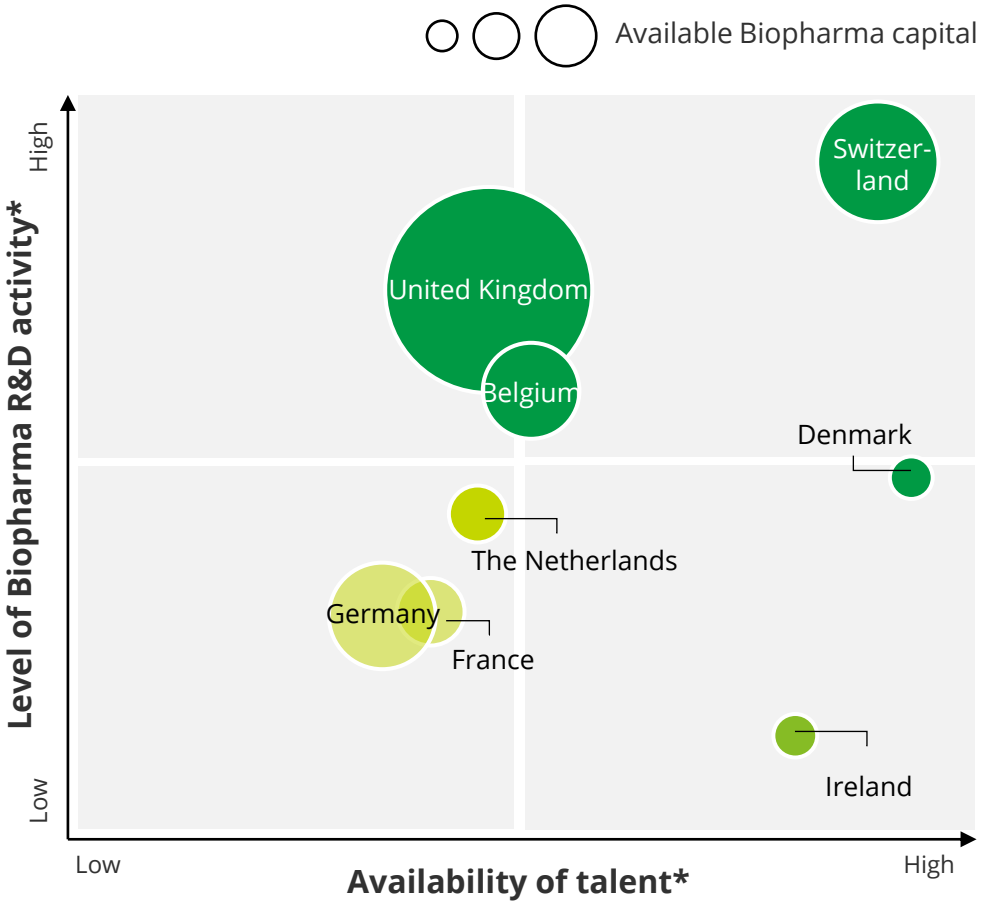
Yearly growth rates of the Biopharma industry per country (2020)



Source: Deloitte internal research, pharma.be, Statista, Eurostat (growth GVA Biopharma), OECD (GDP growth data)

.. but we cannot afford to be complacent

Availability of skilled talent and talent attractiveness will be key differentiators for Belgium to really consolidate its place as Biopharma valley in continental Europe



- Belgium has a **long and successful history of Biopharma**, making it one of the **top 5 regions** in the world **for R&D expenditure** (0,5% of GDP, i.e. over €2,5 Billion) and **Biopharmaceutical exports** (over €50 Billion).
- Enormous **boost for Biopharma exports** through Covid (+50% to around €80 Billion).
- Considering the concentration of Biopharma in the Benelux, **Belgium** is part of an **ecosystem that can rival with other EU clusters** like 'Mediconvalley' (DK), 'Bioalps' (CH) and, even the 'Golden Triangle' (UK).
  - Belgium has undertaken many successful steps in **attracting investments** in its life science industry, such as Legend Biotech (Flanders) and Catalent (Wallonia).
  - Continuous **expansion investments** of Belgian-based biopharma companies are also fortifying the ecosystem, such as UCB building a gene therapy and clinical manufacturing facility in Wallonia (2022) and Sanofi investing another €120mio in its biotech plant in Flanders (2022).
- However,
  - The **UK** benefits from its **prominent research centers** and, as part of its **life science strategy (2020),** is investing substantially (more than €1 billion) in **research infrastructure and programs.**
  - **In terms of investments Belgium is outcompeted** by UK, Switzerland and Germany.
  - Despite our strong footprint, **Belgium** is **gradually losing its position on clinical trials** to countries, like Denmark, that are investing more centrally in networks, infrastructure and talent.
- Recent developments, like Brexit, Covid-19 and the (r)evolution in advanced therapies (e.g., mRNA, CAR-T, radiopharmaceuticals) provide the **opportunity for Belgium** to claim a unique position **as R&D** and **Biomanufacturing hotspot** in continental Europe.

* More details on the scoring can be found on slide 54

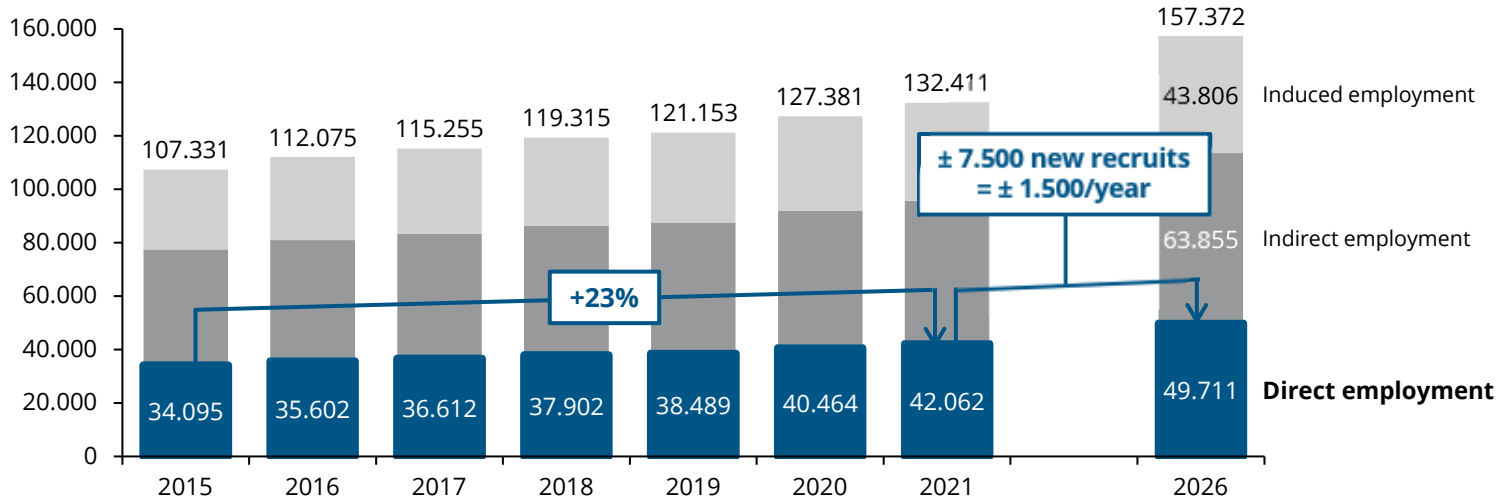
Monitor Deloitte 2022

Source: Deloitte analysis, The value story of the innovation levers for life sciences in Belgium – Deloitte (2021)

The need for talent is growing rapidly

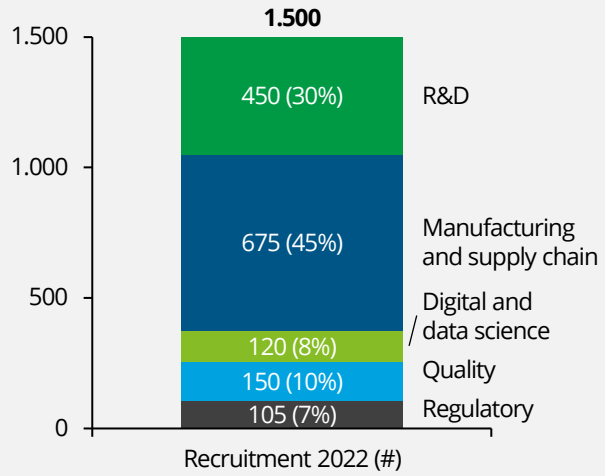
In order to fuel its growth ambitions, the Biopharma industry needs 1500 direct and 3000 indirect new recruits each year. Moreover, these recruits need to be highly educated STEM graduates with multidisciplinary competencies to 1) fill in the open job functions and 2) foster innovation and new technologies

Direct employment evolution in the Belgian Biopharma industry



Sources graph: Statista, Pharma.be

Estimation of recruitments per area*



Key takeaways for the demand

- **The Biopharma industry is a critical industry** for Belgium **with a clear need** in numbers and in capabilities in the coming years.
- In the next 3 to 5 years, there will be an estimated added need of 7.500 direct employees. Also considering indirect and induced employment this would be **an additional 18.000 additional new jobs** in the next 3 to 5 years thanks to the Biopharma sector.
- Figures above are considered conservative as they exclude the **expected outflow** for Biopharma. Expected to be between 2.000 and 2.500 in the next 4 years (2021 – 2025), and even double in the next 9 years (2021-2030).*

* Sources: Calculations were made based on 2022 data provided by the jobbarometer, and input from several Biopharma companies (representing over 50% of total Biopharma employment)

Source: pharma.be, Statista

* More details on the outflow can be found on slide 26

Current and future profiles and skills needed in Biopharma

The current Biopharma sector requires (highly) educated and technically skilled profiles in STEM, in the future 'skills-based organization' there will be a growing emphasis on multidisciplinary competencies

Current high-demand Biopharma talent

The industry requires both white- and blue-collar employees with a relevant STEM degree, from **secondary graduates to post-doctorates**

R&D	Manufacturing and supply chain	Digital and data science	Quality	Regulatory
Clinical research manager *Coordinating, supervising and overseeing the clinical trials*	**Production manager** *Coordination of manufacturing and packaging in compliance with GMP*	**Biostatistician** *Develop, implement and apply statistical methods in the field of medical research*	**Medical director/advisor** *Disseminates medical information*	**Regulatory affairs officer** *Ensure compliance of company and government regulations*
R&D scientist/researcher *Conducting of scientific studies and experiments*	**Automation engineer** *Designs and develops systems of automation and process control*	**Bioinformatician** *Apply data science to medical research to gather, analyze and interpret pharmaceutical data*	**Quality assurance manager** *Ensure the manufacturing process meets the quality requirements*	**Intellectual property manager** *Ensure IP obligations are met and secure patents*
Medical therapeutical area lead *Oversees all strategic medical affairs in the assigned therapeutic area*	**Operators – Operation technician** *Operates, monitors and executes pharmaceutical production machinery*	**Data science engineers** *Build systems that transform raw data into data science products for scientists to use*	**Environmental health and safety manager** *Monitor the environment, machines and processes to ensure safety regulations*	**Market access & health economics manager** *Facilitate market entry by optimizing pricing, launch time and region strategies*
Laboratory technician *Assist researchers in product or technology development*	**Maintenance** *Maintaining and regularly inspecting production equipment and instruments*		**QA/QC analysist** *Checks and tests the product to ensure quality and safety standards*	

Transversal skills of the workforce of the future

Rather than focusing on profiles or degrees, talent in the future will be valued for complementary competencies such as digital and data science, having MDM competencies, and being able to work in a flexible and adaptable environment. The lifetime of a skill is about 5 years, making the shift from formal education degrees to **(nonformal) acquired skills and competencies** inevitable.

Digital- and data science skills will be part of any future job as processes are increasingly digitized, and data has become the fuel for innovation	Breakthrough innovations require non-siloed **multidisciplinary competencies** (e.g., biology + technology)	As well as an **end-to-end understanding of operations**	An **adaptive and flexible mindset**, combining delivery excellence with innovation	And **continuous on-the-job learning**

Sources: Deloitte internal research, industry KOL interviews, Biowin etude stratégique: développement de talents en Wallonie 2020

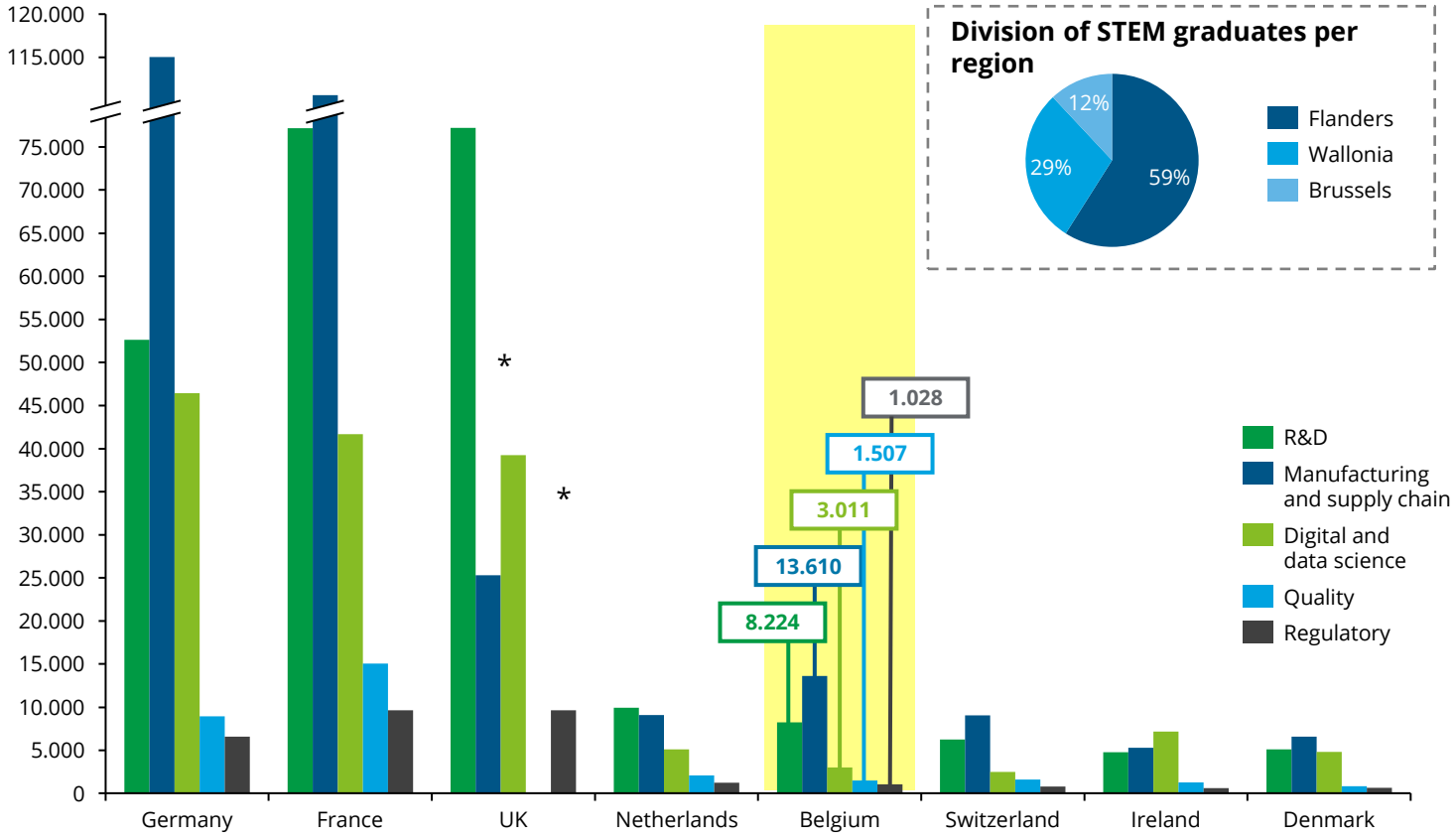
On graduates Belgium cannot rival some other regions in size

In absolute numbers Belgium holds a modest supply of new inflow of talent but is compensated by the concentration of talent in the Benelux region. Considering the size of the talent pool we see Belgium especially underperforming when it comes to digital and data science profiles

Key takeaways for the supply

- We are in competition with all 7 EU countries taken in scope. Depending on the specific graduates, **Belgium showed comparatively lower scores, except for manufacturing and supply chain graduates**. Overall, it appears the other countries are outperforming us in generating new required talents to keep their industries growing.
- It is important to note that **some countries have (successfully) increased their focus in the past years** on a specific target group, such as digital and data science or manufacturing and supply chain. The reasoning is that the Biopharma industry in those countries is mainly operational in a specific section of the value chain, and hence choose to focus on stimulating the growth.
- **Belgium is quite unique** because as **a small country it houses the entire value chain** from start to finish, which in turn also makes it more challenging in addressing the supply of new graduates and talents for it.
- Looking towards the Belgian talent pipeline in the higher education (and secondary vocational for manufacturing and supply chain profiles) **we are not seeing sufficient growth in STEM graduates** to change course in the coming 10 years.

Relevant graduates with higher educations per Biopharma job profile bucket per country in 2019



Sources: Eurostat, industry KOL interviews

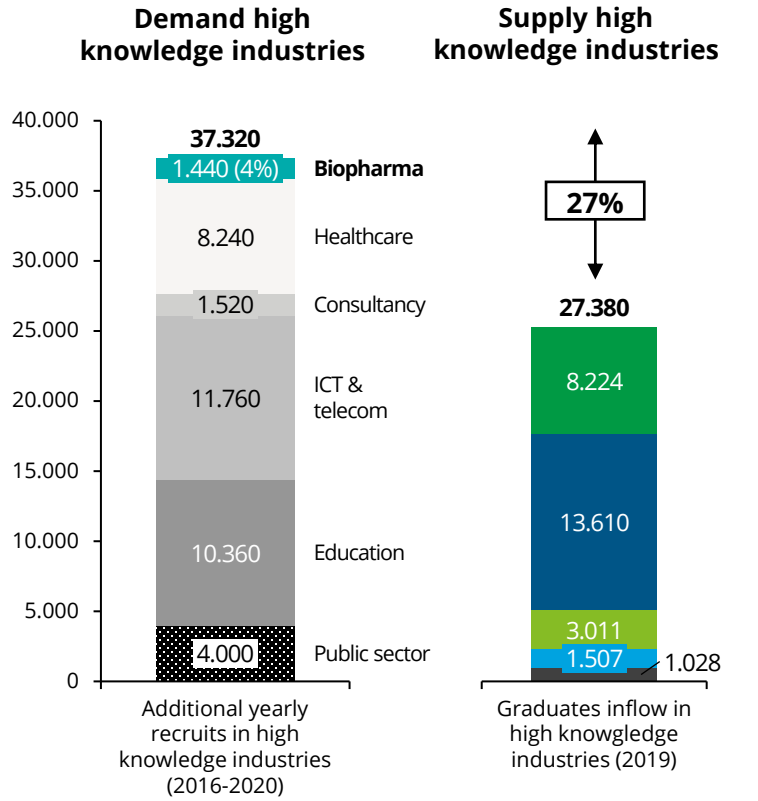
Belgium has a Biopharma talent gap of 27%

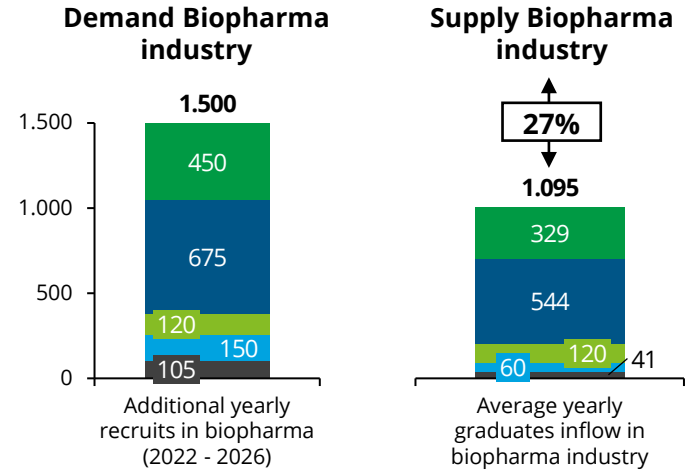
We see a gap of approximately 400 profiles each year, mainly in R&D and manufacturing and supply chain, however given the fast-growing digitalization, we expect to see a growing need/gap for data scientists in the near future

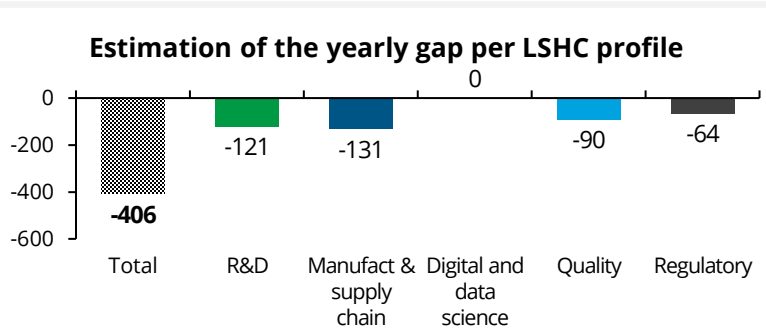
Key takeaways for the gap analysis

- **The needs of the industry continues to grow** faster in number of talents required, as well as in the required (multidisciplinary) competencies.
- The **inflow of new relevant graduates is insufficient** to close this gap for all high knowledge industries, including that of the Biopharma, who recruits ca. 4% out of the entire talent pool.
- This **gap is expected to grow even larger in the next 5 to 10 years** if considering also the indirect and induced employment, as well as the outflow.
- Overall, our gap analysis shows that **for the Biopharma industry there will be a 27% gap** between demand and supply, which currently is being filled by recruiting international talents.
- The limited gap for digital and data science profiles is deceiving given **the fast-growing digitalization** of the Biopharma industry and the exponential need for **multidisciplinary competencies.**

Gap analysis between yearly required recruits and outflowing graduates*







* More details on the calculation of the gap analysis can be found on slide 31

Sources: Deloitte internal research, Eurostat, Statista, Jobbarometer farmasector 2022

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The underlying challenges for Belgium

In order to solve the talent-gap we will need to successfully turn the tide on the challenges that map with our underlying research questions

Strengthen and retain local STEM talent

- Important progress by **creating awareness for STEM** and multitude of **initiatives in both regions.** However, **initiatives are fragmented,** and **outcomes unclear.** Overall, still **too little students opt for STEM**, especially in minority and female population.
- Biggest threat to the talent supply is the increasing **shortage of STEM teachers** in secondary education and the **lack of attention paid to STEM in the teacher training** for the primary education. The **dual teaching** project are promising but hard to scale.
- **Education** institutions insufficiently **connect and collaborate with industry**. As such, there are missed opportunities to **innovate curricula**, offer **impactful internships, and** create opportunities for future talent to get a **view on jobs in the ecosystem** and what it takes to work in **multidisciplinary** teams.
- **Biomedical scientists** play a vital role in R&D and delivery of next gen therapies, but they are **not a recognized health profession**, as such they operate in a legal vacuum.

Attract international STEM talent

- **Fragmentated implementation** of the federal, regional and local processes behinds single permit is **reducing the speed and efficiency of the process** (i.e., 4 to 9 months).
- **No system** where companies can act as **trusted parties** to speed-up the permitting process.
- **30% tax exemption** on social contribution and taxes for the employer is capped at € 90.000 and outside 150 km radius, making it **less useful to respectively attract leadership positions and talent from neighboring countries** like The Netherlands and Germany.
- **Language barriers** hinder to attract and keep foreign students and lectors in our high education.
- **Less after-care to keep international student connected with Belgium** (e.g., no international alumni network).
- The **capacity and costs of international schools** remains a challenge.
- **No full recognition of non-EU obtained degrees** for bottleneck professions.

Reskill and upskill local STEM talent

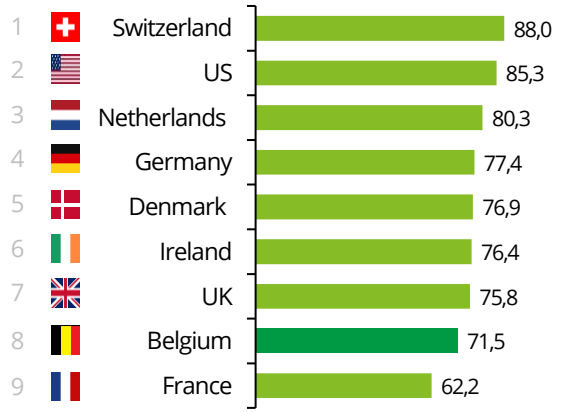
- Despite several good government initiatives in reskilling and upskilling (vouchers, the educational leave, programs for different target audiences) Belgium still **lacks an adult education culture for the workforce**. We urgently need **more trainings in transferable skills and new technologies.**
- Projects **driven by industry** are successful, but should be **implemented at a larger scale**, creating thus more visibility for the biotech ecosystem (EU Biotech Campus, ViTalent and aptaskil).
- Overall, Belgium public institutions (in education and government) lack the reflex and a **culture to collaborate more closely with the industry**. Too many administrative hurdles for regular collaboration between industry and universities.
- Belgium and the regions have a **fragmented and complex** learning & labour market policy.
- **No uniformization of certifications**.

Belgium is punching above its weight, but needs to step-up

Other EU countries have implemented some successful measures in tackling the three topics on STEM. While important to learn from their best practices, it is also crucial to distinguish which can feasibly be implemented in the Belgian context

Strengthen and retain local STEM talent

INSEAD ranking for all industries

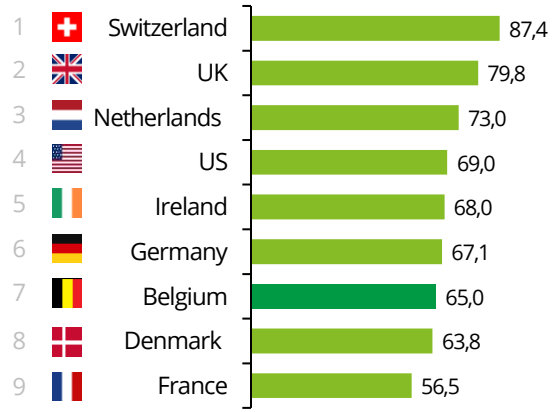


*The 5 selected INSEAD GTCI indicators are: Ease of finding skilled employees; Brain retention; Relevance of education system to the economy; Tertiary education expenditure; and Reading, maths and science

Best in class characteristics

- Access to **high quality, paid and diverse apprenticeships** during secondary and higher education taking place over 1 or **several years while not extending the standard number of school years.**
- Existence of a strong **cooperation between industry and academia** to offer innovative and multidisciplinary courses at the pace that is demanded by the market.

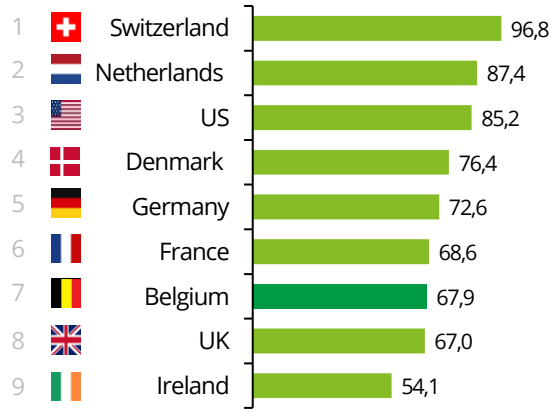
Attract international STEM talent



**The 2 selected INSEAD GTCI indicators are: International students; and Brain Gain

- **Fast administrative process** in obtaining a work and residence permit.
- Availability of national **programs for internationalization** for young graduates and professionals.
- Advantageous **tax exemptions** to attract expats
- High **prevalence of English** language in higher education and in governmental institutions.

Reskill and upskill local STEM talent



***The 2 selected INSEAD GTCI indicators are: Employee development; and Formal and non-formal studies

- Companies' and government's **investment in employees' training** leading to a high participation rate of adults in **lifelong learning programs** that offer the necessary flexibility and financial incentives.
- Strong **cooperation between industry and academia** to be able to provide futureproof and other basic necessary courses for working professionals.
- **Centralized platform** of reskilling and upskilling opportunities.

Sources: OECD, 2019-2022 ; INSEAD, 2021; Deloitte Analysis, 2022

What can we learn from other countries

Public-private collaboration, regulatory simplification and dedicated programs can make a huge difference in developing, attracting and keeping the right talent

Strengthen and retain local STEM talent

To strengthen STEM talent, the responsibilities lie with:

1) **Federal and regional governments**: Provide the legal framework to allow for cooperation between academia and industry, ensure the quality of the curricula, and promote STEM.
2) **Upper secondary and higher education**: Incorporate apprenticeships in the curricula for at least a year depending on the chosen academic or professional track, combined with career coaching along the way.
3) **The industry**: Creating apprenticeship positions and running their own training centers.

Best in class practices

- Provide career counselling linked to a wide variety of apprenticeships to choose from later on
- Remunerate students for apprenticeships and invest in the state-of-the art teaching and technologies
- Set up platforms and initiatives for industry and educational sector to connect and collaborate

Attract international STEM talent

To attract international talent, the most important avenues to focus on are:

1) **International professionals**: Have an efficient and fast procedure to relocate talents to Belgium, i.e. residency and work permits.
2) **International students**: Attract foreign students by offering English curricula and an extended stay after graduation to find employment. As for local students, offer international exchange and work programs.
3) **International network and acknowledgements**: Establish expat centers, international alumni network as well as actively promoting Belgian excellence through marketing or international events.

Best in class practices

- Faster visa approval (+/- 4 weeks) for employees from companies with a trusted employer/'referent' status
- Extended stay of 2 years for non-EU master and PhD graduates to find employment
- International promotion of Swiss vocational education through global organizations (WEF, OECD, Expo, etc.)

Reskill and upskill local STEM talent

To engrain lifelong learning in the routine of working professionals, the actors involved are:

1) **Federal and regional governments**: Provide (financial) incentives for companies (small and large) and for workers, that are grouped together on one platform, are transparent and easy to navigate.
2) **The industry**: Does the ground-work and provide the information on the futureproof skills and competences required in the industry.
3) **Higher education and training centers**: With the help of the government and the industry, provide trained teachers and space to up- and reskill professionals.

Best in class practices

- Macarrièredanslapharma.org groups re- and upskilling activities and more on 1 platform
- Companies determine with partners which skills are needed and receive funding and teachers from the government (e.g., Nationale LLO Katalysator)
- Similar to Belgium, Switzerland provides different training locations as well as teachers and instructors

Recommendations for Belgium | Short-term

While federal and regional governments are undeniable catalysts for closing the talent gap, also Biopharma and educational sectors should find each other

Strengthen and retain local STEM talent

- **Measure the impact of STEM initiatives through KPIs** to fuel a more effective, less fragmented and **coherent STEM-policy** incorporated in **regional STEM centers** combined with all topics related to STEM, i.e., teachers support, collaboration with the industry, STEM research, best practices, etc. – *role: regional government*
- **Increase digital infrastructures and capabilities** in secondary and higher education curricula – *role: regional government*
- Loosen the local **language proficiency requirements** for higher education professors for English courses/trajectories – *role: regional government*
- **Hire based on competencies and acquired skills** instead of degrees – *role: industry*
- **Promote 'Baekeland mandaten'** (Flanders) **and 'Win4Doc'** (Wallonia) to PhD students – *role: industry & educational sector*
- **Recognize Biomedical Sciences** as a health profession – *role: federal government*

Attract international STEM talent

- **Invest in a national Biopharma talent promotion and expat centre** (i.e., single point of contact for international talent) and an **international Biopharma alumni network** – *role: industry*
- Strengthen the Belgian ecosystem through **international promotion of the industry** – *role: federal and regional government*
- Create pilot projects to test a more **flexible language regulation** for select university degrees in close **collaboration with the Biopharma industry** – *role: regional government, educational sector and industry*
- Accept **legal contracts and social documents in English**, to speed up the relocation of expats to Belgium – *role: federal government*
- **Loosen the restriction of 30% tax exemption** for international recruits regarding the 150km and €90k cap – *role: federal government*
- **Extend the visas for international graduates to 2 years** to increase their chances in finding suitable employment in Belgium, similar to the recent new legislation (Oct 2022) by State Secretary Nicole de Moor to allow an extended stay of 1 year for researchers from non-EU countries – *role: federal government*
- Ensure attractiveness and salary competitiveness of Belgium to attract best in class researchers by **maintaining and reinforcing the 80% tax exemption for researchers** – *role: federal government*
- **Reinstate bilateral agreements with NL, FR and DE for cross-border employees** (only applicable during Covid times), where flexible teleworking was allowed versus the mandatory 4 days/week on a Belgian site – *role: federal government*

Reskill and upskill local STEM talent

- Centralizing reskilling, upskilling, job opportunities and apprenticeships in **one platform** – *role: regional government and industry*
- Have an open line of communication between the **industry and the education sector**, about the competencies needed in the future, e.g. re-evaluating the profiles in a Biopharma production environment who will also require (additional) higher education and/or re- and upskilling in the future – *role: industry & educational sector*
- Strengthen **strategic partnerships between job platforms** (VDAB, Forem, Actiris), **biopharma industry, and re- and up-skilling institutions** (EU Biotech Campus, ViTalent and aptaskil), and allow for **interregional cooperation** – *role: industry and regional government*

*The full list of recommendations and more details can be found in the annex

Recommendations for Belgium | Medium-term

While federal and regional governments are undeniable catalysts for closing the talent gap, also Biopharma and educational sectors should find each other

Strengthen and retain local STEM talent

- **Create awareness and showcase the relevance of STEM in real life** and incorporate in orientation of students – *role: industry & educational sector*
- Provide **career counselling and introduction to STEM at an early age (elementary school)**, linked to a **wide variety of apprenticeships** to choose from – *role: regional government & educational sector*
- **Provide legal framework** for the exchange of professionals between education and industry and **remuneration** for **student apprenticeships** and **researcher programs** – *role: regional government*
- Support the higher education institutions financially for **offering innovative and multidisciplinary programs at the pace required by the market** – *role: regional government*

Attract international STEM talent

- **Allow for companies to receive a government approved status** to accelerate the application process – *role: federal government*
- Speed up the administrative process for single permits by having **1 government authority responsible to coordinate** for both the **work permit** and **residential permit,** similar to the recent new legislation (Oct 2022) by State Secretary Nicole de Moor where non-EU researchers can go through a fast-track procedure - *role: federal government*
- Strengthen the Belgian ecosystem by **promoting inter-regional mobility** between the regions (e.g., international internship program in FR) and extend access to regional programs (e.g., Baekeland-mandaat or Win4Doc)
- **Create an international internship program for EU students and companies under the Belgian law** who wish to expand their activities abroad. This will allow Belgian companies expand internationally, give Belgian students/graduates the opportunity to acquire international work experience, tie EU students/graduates to Belgian companies, and promote Belgium globally – *role: federal government*
- **Create capabilities to quickly recognize and accept relevant competencies and degrees obtained outside EU**, to allow qualified talent to be employed in the Biopharma industry – *role: federal government*

Reskill and upskill local STEM talent

- **Expand on reskilling and upskilling initiatives** like EU Biotech Campus, ViTalent and aptaskil – by specialising in higher technical qualifications and apprenticeships using state-of-the-art facilities and equipment – *role: industry and regional government*
- **Make data science and digital skills a mandatory part** of the education, for students and (existing) teachers – *role: regional government & educational sector*
- **Stimulate knowledge exchange between generations, or peer-to-peer learning**, where the industry needs to push for (reverse) mentoring – *role: industry and/ or regional government*
- **Provide more flexibility to promote life-long learning**, i.e., increased public and private investments and an incentive-based system for upskilling & reskilling – *role: regional government and industry*

*The full list of recommendations and more details can be found in the annex

Moving the needle

In order to remain a leading Biopharma country in Europe, Belgium ultimately needs more STEM talent, international talent and trained professionals

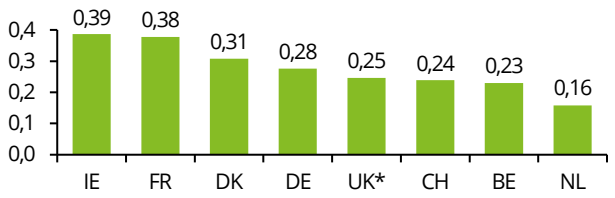
Strengthen and retain local STEM talent

Primarily, the focus should be on **supporting our teacher population**, ensuring that a significant number of primary school and secondary school teachers feels comfortable to integrate new technologies and STEM.

An **increased number of internships in Biopharma**, from apprenticeships in vocational schools to programs for PhD and postdoctoral researchers. Ensuring an opportunity to familiarize themselves with working in the Biopharma sector.

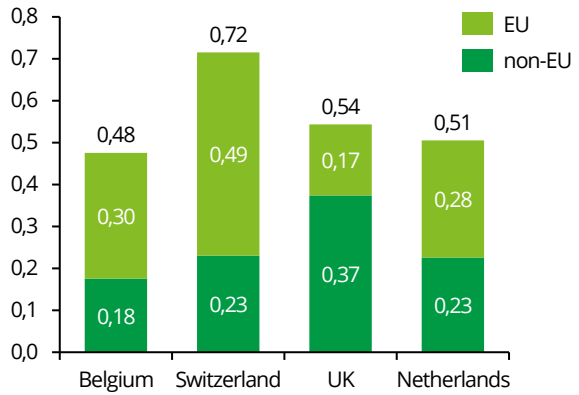
Ultimately, the goal is to **increase the number of students that opt for STEM education**. If we aim to be in the middle of the EU pack (e.g., Germany 0,28%), we could increase the Belgian STEM graduates with 5.000 on top of the 27.000 graduates in 2019.

Percentage of relevant STEM graduates per country capita in 2019



Attract international STEM talent

Percentage of migrants (25-64 yo) relative to country's population, with a tertiary degree from other EU and non-EU countries in 2019



These recommendations should allow Belgium to rival at least the Netherlands for Biopharma talent. This would mean between 100 to 200** **additional high-skilled migrants to be added to the workforce in the Biopharma industry** every year if Belgium reaches 0,51% (NL).

Reskill and upskill local STEM talent

Reskilling our Biopharma workforce will be crucial as the industry is transforming. Impacting both blue collar (e.g., increased automation) and white collar (e.g., required multi-disciplinary skills) employees. A dedicated program or institute through collaboration between government and industry, could potentially double the number of re- or up-skilled employees a year (see UK Institutes of Technologies).

Moreover, we are witnessing a **steady shift from formal education to skills and competencies obtained through lifelong learning** re- and up-skilling courses, matching the fast-paced ecosystem that is inherent to Biopharma.

Sources: Deloitte internal research, Eurostat, INSEAD

* Number of 'quality' graduates in the UK in 2019 was unavailable, the average of the preceding years (2015-2018) was taken as an estimate

** More details on the calculation of the high skilled migrants can be found on slide 76

Deloitte.