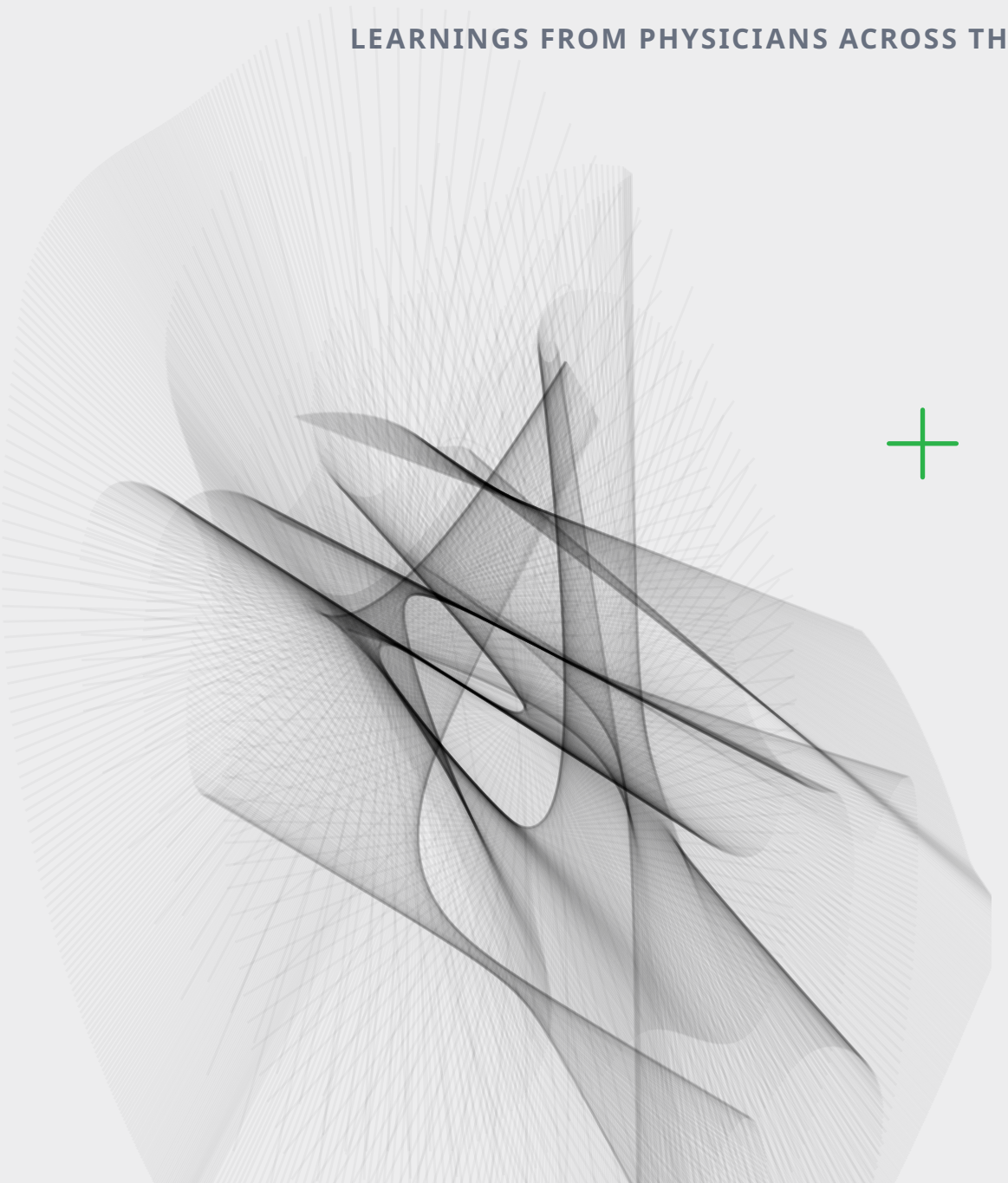
IQVIA INSTITUTE FOR HUMAN DATA SCIENCE

Unlocking Biosimilar Potential

LEARNINGS FROM PHYSICIANS ACROSS THERAPY AREAS



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Introduction

Physician experiences with biosimilars have increased substantially in Europe over the past few years, driven by an increased policy focus, greater comfort, and regulatory guidance. These biosimilars have also provided savings for the overall health system and have played a crucial role in enhancing sustainability of this system. Several new biosimilars are expected to launch over the next five years, and ensuring their optimal use will be important.

Understanding physician perspectives on biosimilars is an important part of developing a sustainable competitive market, as these perspectives drive the overall use. This report aims to understand the experience of physicians that have been utilizing biosimilars and the perspectives of physicians that will be using them for the first time in the near future. These insights were gathered through physician surveys in select European countries, and they hold lessons for stakeholders across the healthcare system on how to optimize the use of biosimilars and overcome physician concerns.

This report has been developed independently by the IQVIA Institute for Human Data Science, drawing on IQVIA proprietary data, IQVIA survey of physicians, and published literature across selected European countries. Funding for this research and report has been provided by Sandoz.

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MURRAY AITKEN
Executive Director
IQVIA Institute for Human Data Science

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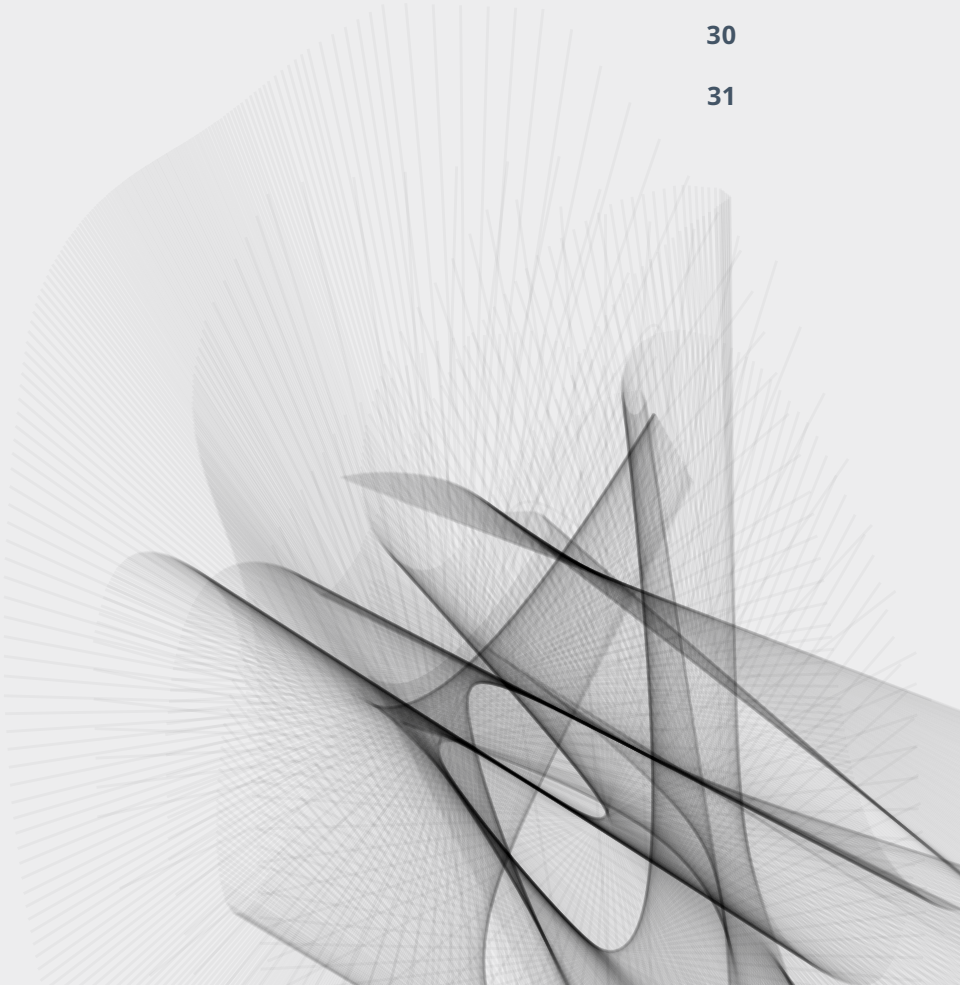


Overview

Biologic drugs have revolutionized treatment of patients over the past two decades. Biologics are products derived from living organisms or their components and can treat several conditions such as diabetes, cancer, and immune disorders. Biologics also constitute some of the most expensive drugs on the market and are a growing share of the overall drug expenditure. Biosimilars — which are biological medicines highly similar to another already approved biological medicine (the 'reference medicine') after its exclusivity has expired — can provide access to biologic treatments in a cost-efficient manner and create competitive pressure on reference biologic medicines. This can help generate savings for the health system and broaden access to biologics. Biosimilars also offer a new business model for manufacturers and contribute to sustainable biologics innovation and competition. Ensuring a healthy level of competition in the biologics market is important for achieving the benefits associated with biosimilars.

The entry of biosimilars has already had a large impact on EU healthcare systems in terms of savings generation and broader access to biologics; however, biosimilar use and rate of uptake has varied by country and molecule, even within Europe. Past research has identified several factors for variable uptake of biosimilars, ranging from country level policies to key stakeholder perceptions. Meta studies of physicians' awareness, perception, and preference for biosimilars from 2014 to 2018 have highlighted a high degree of variability on these dimensions, which can impact the optimal use of biosimilars.

Understanding physician perspectives on biosimilars is an important part of developing a sustainable competitive market, as these perspectives drive overall use. In next five years, at least 30 more biologics will lose protection than in the past five years. Physicians representing different specialties will have a biosimilar option for the first time; for example, neurologists are expected to have a biosimilar of natalizumab to treat multiple sclerosis (MS) available for the first time in 2023. These physicians can benefit from the experiences of oncologists and immunologists that have used biosimilars for multiple years. Assessing what drove physicians to adopt biosimilars, sharing best practices around use in different situations, and identifying the most appropriate approaches to sharing information will be helpful in optimizing biosimilar use. The experiences of physicians that have utilized biosimilars will also allow health systems to anticipate issues that may arise in relation to new biosimilars and ensure the development of a sustainable competitive market.

To understand the perception of physicians that are treating conditions where biosimilars are available, IQVIA conducted a survey of 63 oncologists and immunologists across multiple European countries. More than three quarters of the physicians surveyed reported that they were moderately or very aware of biosimilars, and the main sources of information were treatment guidelines, followed by medical journals and colleagues. In addition, 63% of physicians reported that their perceptions of biosimilars had evolved over time and the perception has become more positive. Also, 83% of physicians surveyed had a positive or very positive perception of biosimilars after they had gained experience with biosimilar use. Greater experience and acceptance of bio-comparability along with lower cost are key drivers of use of biosimilars.

Biosimilars are witnessing substantial use by immunologists and oncologists, with 63% of physicians stating that they start over 50% of their new patients on biosimilars. Most physicians reported there was an increase in number of patients treated with the biologic molecule driven by the entry of the biosimilar, one year after biosimilar launch. The increase largely ranges from 15–20% in total patients. The reason for this increase was not discussed in detail in the survey but physicians state that cost savings and access related benefits are a key driver of biosimilar prescribing. Out of the physicians that had to switch the route of administration when transitioning to the biosimilar, 50% of immunologists and 39% of oncologists viewed it as smooth and easy. The remaining physicians largely viewed it as difficult but manageable.

For physicians that have no experience with biosimilars, oncologists and immunologists recommend several approaches to enhancing education, from medical

associations and treatment guidelines to discussions with other physicians who have vast experience.

IQVIA also conducted a survey of 61 neurologists across Spain, the UK, Italy, Germany, France, Finland, Denmark, and Sweden to understand their perception of biosimilars ahead of the expected launch of the natalizumab biosimilar in 2023. The results showed that 54% of neurologists stated they were moderately or very informed about biosimilars in general and about biosimilar use in other specialty areas, with 70% reporting a positive or very positive perception of biosimilars (irrespective of whether they have had direct experience with them). Neurologists also appear to be anticipating the launch of the biosimilars with a moderately high degree of awareness of the MS biosimilar pipeline.

Neurologists expect to utilize biosimilars when available; 48% of them expect to use them for over 50% of their patients. Reasons for prescribing biosimilars were mainly cost and access related. When asked about the main concerns which would limit their prescribing of biosimilars in the first year of availability, physicians stated efficacy, safety, bio-comparability, and the need to gather more information as the main factors. While these concerns were stated by neurologists, it is important to note that in 2022, the European Medicines Agency (EMA) stated that "EMA has approved 86 biosimilar medicines since 2006. These medicines have been thoroughly reviewed and monitored over the past 15 years and the experience from clinical practice has shown that in terms of efficacy, safety and immunogenicity they are comparable to their reference products and are therefore interchangeable."

As biosimilars for multiple sclerosis (MS) become available, neurologists will face a situation where the reference medicine is available in sub-cutaneous (SC) form, but the biosimilar is available as an intravenous (IV) administration. Many neurologists do expect to switch patients from SC reference molecule to IV biosimilar due to the cost benefits but note that the process may be difficult (albeit manageable) and patient preference will be a factor. To achieve a competitive market, stakeholders across the health systems will need to consider such situations and ensure there is a balance between physician/patient preferences and autonomy, competitive space for multiple players, and optimal financial sustainability. Knowledge sharing among peers, nurses and patient education programs can help facilitate this process, and sharing of best practices across specialties and through physician associations will be important.

Overall, these surveys show that physician concerns around bio-comparability of biosimilars with reference medicines have reduced as they have gained more experience with biosimilar use. Although personal experience with biosimilars is important for physicians, many of them stated that peer-to-peer learning can help with increasing confidence in biosimilar use. In fact, most neurologists also stated that learning best practices from other specialties through physician associations as well as from other countries would be beneficial for them as biosimilars become an option. A health system will need to consider these approaches to enhance physician education, as this will be a crucial component of ensuring a sustainable market for biosimilars.

A sustainable market can improve patient access and a physician's prescription choice of safe and high-quality biologic medicines in a manner that considers the needs of all stakeholders while providing a means to manage existing healthcare budgets and safeguarding a healthy level of competition and supply. As more physician specialties gain experience with biosimilars, health systems have opportunities to learn from their experiences to unlock optimal savings in a timely manner. For example, key generics and biosimilars expected to launch over the next five years for MS are estimated to present an opportunity for €4.5–5.5Bn between 2023 and 2028 in savings in France, Germany, Italy, Spain and the UK. These savings can be reinvested into improving access to existing biologics and enhancing the ability to fund newer treatments. If the savings are shared with hospitals or clinical departments, they can be used for more nurse support, infrastructure, digital capabilities, and related needs. Continued understanding of physician perceptions, increased education of physicians, and sharing of best practices will be important for ensuring a sustainable competitive market.

Evolving Biosimilar Landscape

+ **Biologic drugs have revolutionized treatment of patients over the past two decades. They have also constituted some of the most expensive drugs on the market and are a growing share of the overall drug expenditure.**
+ **Biosimilars can provide potentially earlier and broader access to biologic treatments in a cost-efficient manner and lead to competitive pressure on reference biologic medicines. This can help generate savings for the health system and lead to broader access to biologics and enhanced patient care.**
+ **Biosimilars also offer a new business model for manufacturers and contribute to sustainable biologics innovation and competition.**
+ **The entry of biosimilars has already had a large impact on EU healthcare systems in terms of patient access and savings generation, with more than €30Bn in savings realized across Europe; however, biosimilar use and rate of uptake has varied by country and molecule, even within Europe.**
+ **Past research has identified several factors for variable uptake of biosimilars, ranging from country level policies to key stakeholder perceptions.**
+ **Previous meta-analyses of physicians' awareness, perception, and preference of biosimilars from 2014 to 2018 have highlighted a high degree of variability in these aspects, which can impact the optimal use of biosimilars; however, in Europe alone, biosimilars have provided nearly 4.5 billion treatment days.**

Biosimilars and generics can support the overall sustainability of the health system and biosimilars, in particular, provide a unique value proposition for various stakeholders

Biosimilars and generics play a key role in the sustainability of the overall healthcare system.[1,2] A biosimilar is a biological medicine highly similar to another already approved biological medicine (the 'reference medicine') while a generic drug is a pharmaceutical drug that contains the same chemical substance as a drug that was originally protected by chemical patents.[3] The past three decades have witnessed the launch of several biosimilars and generics as many biologics and small molecules have lost exclusivity. In Europe, more than 85 biosimilars have been approved over the past 15 years since the approval of the first biosimilar, Omnitrope®.[4]
Biologic drugs — which are products derived from living organisms or their components and can treat a number of conditions such as diabetes, cancer, and immune disorders — have revolutionized treatment of patients over the past two decades. They have also constituted some of the most expensive drugs on the market and are a growing share of the overall drug expenditure.[5]

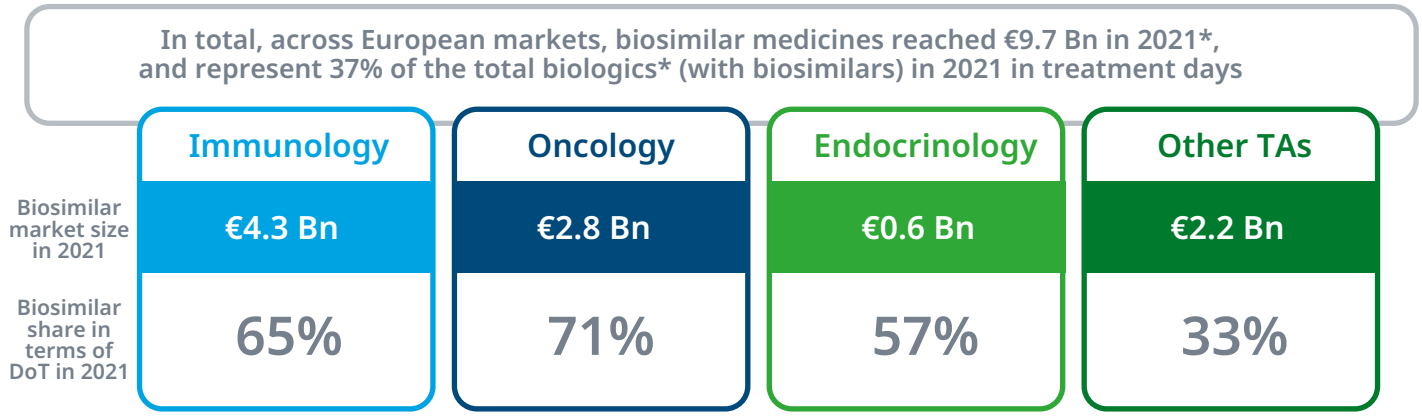
Biologic drugs have revolutionized treatment of patients over the past two decades. They have also constituted some of the most expensive drugs on the market and are a growing share of the overall drug expenditure.

Given this backdrop, biosimilars provide a unique value proposition for multiple stakeholders in the healthcare system. First, they can provide timely access to important medicines to patients, especially in markets where reference medicines were inaccessible due to restricted guidelines or reimbursement, or because reference medicines were not viewed as cost efficient in some patient populations. Second, biosimilars can provide savings by their reduced cost and due to increased competitive pressure on reference medicine. This can allow payers to optimize spending and budgets to liberate resources that can be used to improve and fund further patient care. Third, biosimilars offer a new business model for manufacturers and allow sustainable innovation and competition. Ensuring a healthy level of competition and a space for multiple players has an impact on price, increases the security of supply, improves patient access to biologic therapies, and has additional system-wide benefits if it is leveraged effectively.[1,2,5]

The entry of biosimilars has already had a large impact on EU healthcare systems in terms of patient access and savings generation. Biosimilars have provided nearly 4.5 billion patient treatment days to European patients and continue to grow year-on-year (Exhibits 1 and 2).

Biosimilars provide a unique value proposition for multiple stakeholders in the healthcare system.

Exhibit 1: Total biosimilar market and biosimilar share by therapy area

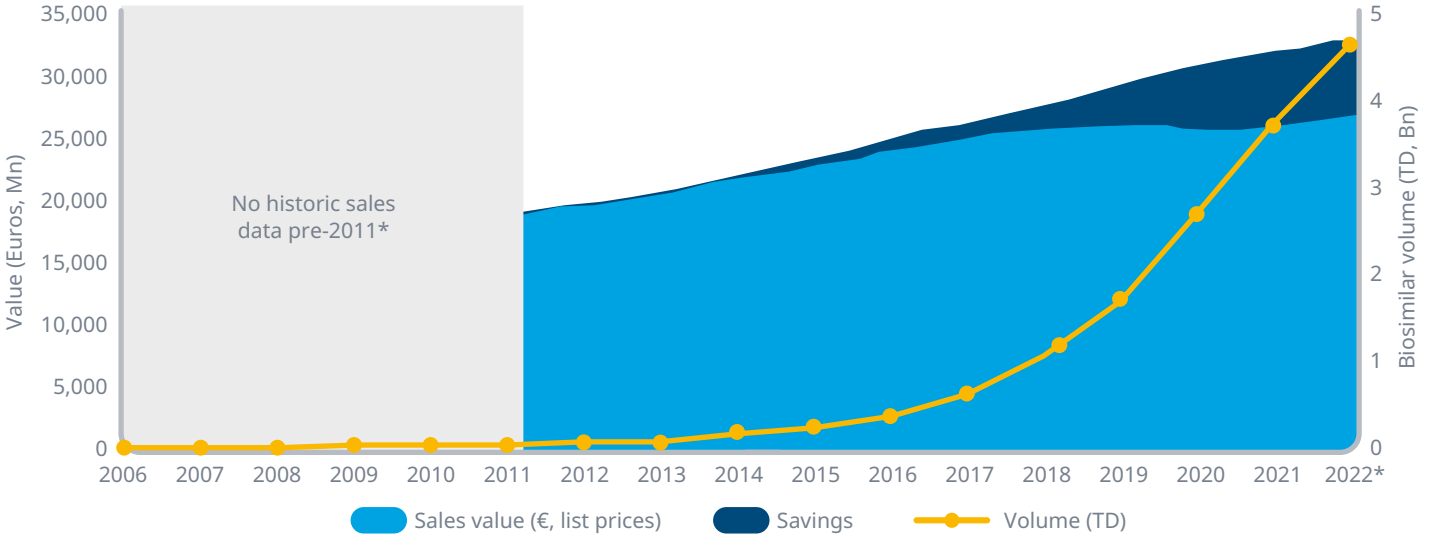


Source: IQVIA MIDAS™ data 2021.

Notes: Footnotes: * Accumulated biosimilar sales for immunology biologics (adalimumab, etanercept, and infliximab), endocrinology biologic (somatropin), oncology biologics (bevacizumab, rituximab, trastuzumab, filgrastim, and pegfilgrastim), and other TAs biologics (enoxaparin sodium, epoetin alfa, follitropin alfa, insulin glargine, and insulin lispro) in 2021 from Jan to December based on ex-MNF price (list price). Biosimilar annual sales include following countries AT, BE, BG, HR, CZ, EE, FI, FR, DE, GR, HU, IE, IT, LV, LT, LU, PO, PT, RO, SK, SI, ES, SE, UK; bubble size represent biosimilar market size in 2021 Abbreviations: TA: Therapeutic Area; DoT: Days of Treatment.

As of 2022, the cumulative savings at list prices from the impact of biosimilar competition in Europe reached over €30 Bn (Exhibit 2).

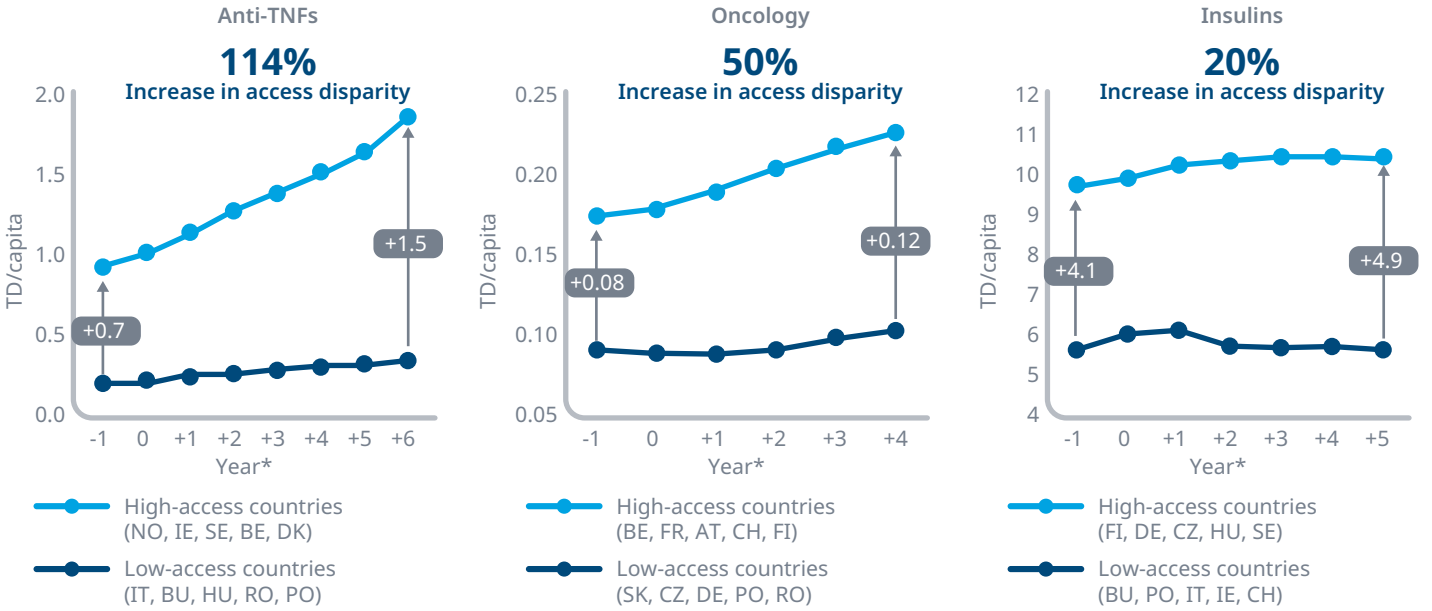
Exhibit 2: Savings from the impact of biosimilar competition at list prices



Source: IQVIA MIDAS June 2022 MAT. IQVIA MIDAS™ data from 2006–2022, using Euros at constant exchange rates.
Notes: Value includes all originator products with approved biosimilars from 2006–2022, covering the full European Economic Area (33 CTYs), calculated volumn is in treatment days determined by WHO-DDD and where values are unavailable via Oncology Dynamics Physician Survey (2017) DDD estimates. Volume is solely biosimilar treatment days. This figure is not equivalent to all savings. And is therefore an under-estimate. The data does not include the impact or discounts, which may have been present prior to the introduction of biosimilars in small quantities, and are highly significant post-biosimilar entry as it is based on publicly available list price.

However, biosimilar use and rate of uptake has varied by country and molecule, even within Europe (Exhibit 3).[5]

Exhibit 3: Variability in biosimilar use across Europe



Source: IQVIA MIDAS™ data 2021.
Notes: Includes Treatment Days (TD) for all market segments (Non-accessible, Non-referenced, Referenced, Biosimilars); All countries are ranked based on TD/Capita at +6 years and the top-5 and bottom-5 countries includes in this analysis.
*Normalised to the year of first recorded biosimilar sales in each county, to account for markets that are delayed in using biosimilars after loss of patent protection.

Past research has identified several factors for variable uptake of biosimilars, ranging from country level policies to key stakeholder perceptions. For example, policies such as gainsharing and quotas (or government biosimilar targets), along with a generally favorable environment for biosimilars, has led to increases in biosimilar use in several countries.[6,7] Previous meta studies of physicians' awareness, perception, and preference of biosimilars from 2014 to 2018 have highlighted a high degree of variability. One meta study concludes that physicians were approaching "biosimilar medicines with caution, citing limited biosimilar knowledge, low prescribing comfort, and safety and efficacy concerns as main deterrents for biosimilar use."[8] While another meta study finds that "physicians' knowledge of and attitudes toward biosimilars vary. Although physicians had positive attitudes towards biosimilars, prescribing was limited, especially for patients already being treated with biologic medicines."[9] Both studies highlight the need for greater physician education to address gaps in physician knowledge and to increase biosimilar use. However, it should be noted that the studies represent a timeframe up to 2018 and in 2022, the European Medicines Agency (EMA) stated *"EMA has approved 86 biosimilar medicines since 2006. These medicines have been thoroughly reviewed and monitored over the past 15 years and the experience from clinical practice has shown that in terms of efficacy, safety and immunogenicity they are comparable to their reference products and are therefore interchangeable."*[4]

Ensuring a sustainable market for biosimilars with a healthy level of competition that can ensure optimal benefits for the health system requires a thorough understanding of physician perspectives. How physicians and payers view biosimilars and how they handle situations that arise from the entry of biosimilars is a driver of optimal biosimilar use. Physicians who have experience with biosimilars can provide several best practices for specific situations and can also help educate other physicians based on their experiences with biosimilars. These physicians can also help health systems identify any issues that may be impact the uptake of biosimilars. Finally, understanding the perspective of physicians who do not have experience with biosimilars is crucial as well as this can help identify areas of concern that can be addressed with education along with issues that may require multi-stakeholder discussions. A comprehensive understanding of physician perspective can help optimize the use of biosimilars in a sustainable manner.

In next five years, at least 30 more biologics will lose protection than in the past five years.[5] There will be a new set of stakeholders who will have the option of utilizing biosimilars for the first time.v For example, in the case of MS, neurologists will consider new biosimilar and generic options.[10] Previous studies have highlighted the importance of physician education, particularly from physician associations. In a survey conducted by IQVIA (discussed in the next two chapters), many neurologists expressed a desire to learn from the experiences of physicians from other specialties. Therefore, to ensure the sustainability of the biosimilar market and to optimize uptake, lessons from physician behavior with previous biosimilars will need to be understood as this can serve as a learning platform for neurologists as well as other stakeholders to utilize biosimilars optimally. Such sharing of best practices and learnings can help ensure that the opportunity offered by biosimilars is not missed.

Biosimilar experience: Oncologists and immunologists

+ **Over three quarters of the physicians surveyed reported that they were moderately or very aware of biosimilars and the main sources of information were treatment guidelines, followed by medical journals and colleagues.**

+ **In addition, 63% of physicians reported that their perceptions of biosimilars had evolved over time and the perception has become more positive. Also, 83% of physicians surveyed had a positive or very positive perception of biosimilars after they had gained experience with biosimilar use.**

+ **Greater experience and acceptance of bio-comparability along with lower cost are key drivers of use of biosimilars.**

+ **Biosimilars are seeing substantial use by immunologists and oncologists with 63% of physicians stating that they start over 50% of their new patients on biosimilars.**

+ **Most physicians reported there was an increase in the number of patients treated with the biologic molecule, driven by the entry of the biosimilar after one year. The increase largely ranges from 15–20% in total patients.**

+ **Out of the physicians who had to switch the route of administration when transitioning to the biosimilar, 50% of immunologists and 39% of oncologists viewed it as smooth and easy; the remaining physicians largely viewed it as difficult but manageable.**

+ **For physicians who have no experience with biosimilars, oncologists and immunologists recommend several different approaches to enhancing education, from medical associations and treatment guidelines to discussions with other physicians who have vast experience.**

In September 2022, IQVIA conducted a survey of 63 oncologists and immunologists across Denmark, Finland, France, Germany, Italy, Spain, Sweden and the UK. The objective of this survey was to understand the experience of oncologists and immunologists regarding biosimilars. Details on sample and countries can be found in the appendix.

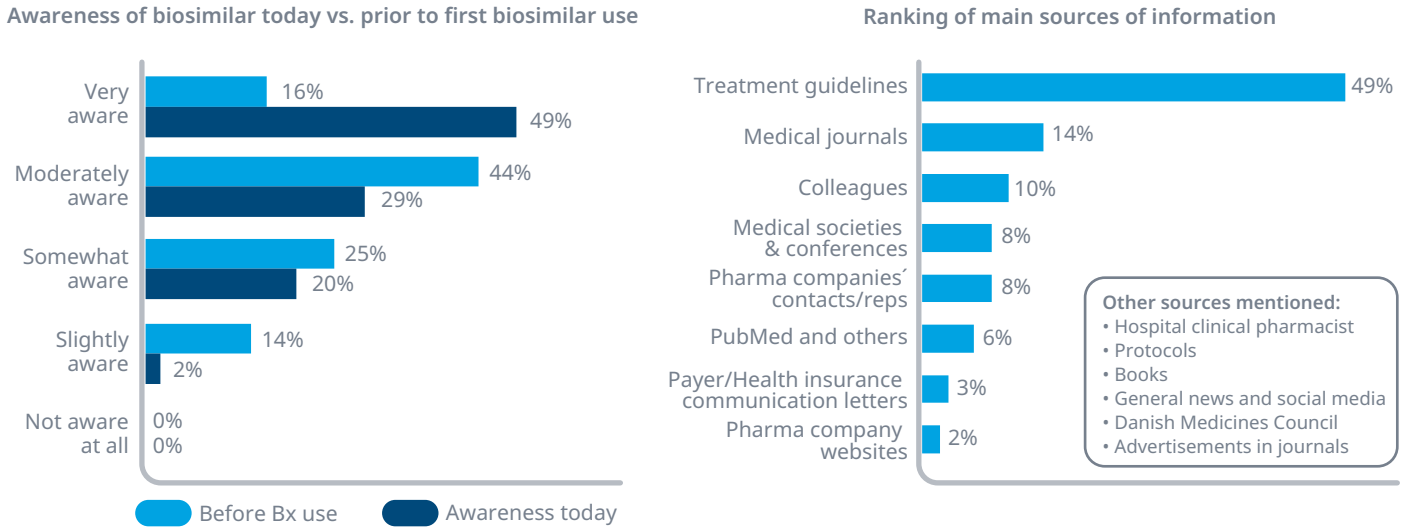
AWARENESS AND PERCEPTION

Based on the survey conducted, the overall awareness of healthcare practitioners has increased since the first year that they used biosimilars, with over three quarters of the physicians surveyed reporting that they were moderately or very aware of biosimilars (Exhibit 4). The main sources of information that helped the physicians were treatment guidelines followed by medical journals and colleagues. Similar sources of information have been identified in earlier studies as well with a meta study finding that, "Self-study and peer-reviewed journals/ professional guidelines were the two primarily trusted sources of biosimilar information in both the U.S. and Europe. Discussion with physician and pharmacist colleagues was also a reliable means of biosimilar information."[8]

83% of physicians surveyed were positive or very positive regarding biosimilars after they had used them.

An important shift that can be seen in the data is the evolution of the perception of biosimilars. It was found that 63% of physicians reported their perceptions of biosimilars had evolved over time, and perceptions seem to have become more positive (Exhibit 5). In addition, 83% of physicians surveyed were positive or very positive regarding biosimilars after they had used them. These physicians stated they had less positive views on biosimilars prior to use, with 39% of them viewing biosimilars as neutral or negative prior to using them.

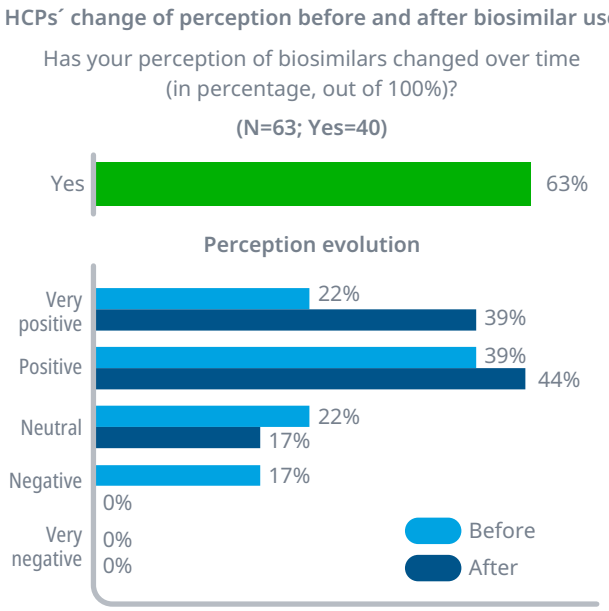
Exhibit 4: Biosimilar awareness and ranking of main sources of information



Source: IQVIA Survey of HCP (Oncologists and Immunologists) perception evolution on biosimilars, N=63.
Notes: HCP = Healthcare Professional.

The physicians initially had concerns around efficacy and bio-comparability of biosimilars, which limited their prescribing of the biosimilar. Over time, it appears that these concerns have lessened based on the increase in positive perception. Greater experience and acceptance of bio-comparability along with lower cost is a driver of use of biosimilars in naïve patients and for switching patients from reference medicine to biosimilars. Previous studies also indicate lower healthcare costs and resource use have been the major drivers of biosimilar use.[8]

Exhibit 5: HCPs' change in perception before and after biosimilar use and HCP concerns in the first year of biosimilar use



HCP concerns in the first year of biosimilar use

Rank	Concerns for not prescribing Biosimilar to all patients
1	Efficacy
2	Bio-comparability
3	Adverse events
4	Route of administration
5	Seeking to gather more information on biosimilars
6	Safety
7	• Ease of continuing the current drug • Need to see the collective experience from other colleagues before making a decision • Epic EHR administration requires a new ID for the biosimilar so in many cases the reference product has been given

Source: IQVIA Survey of HCP (Oncologists and Immunologists) perception evolution on biosimilars, N=63.
Notes: HCP = Healthcare Professional.

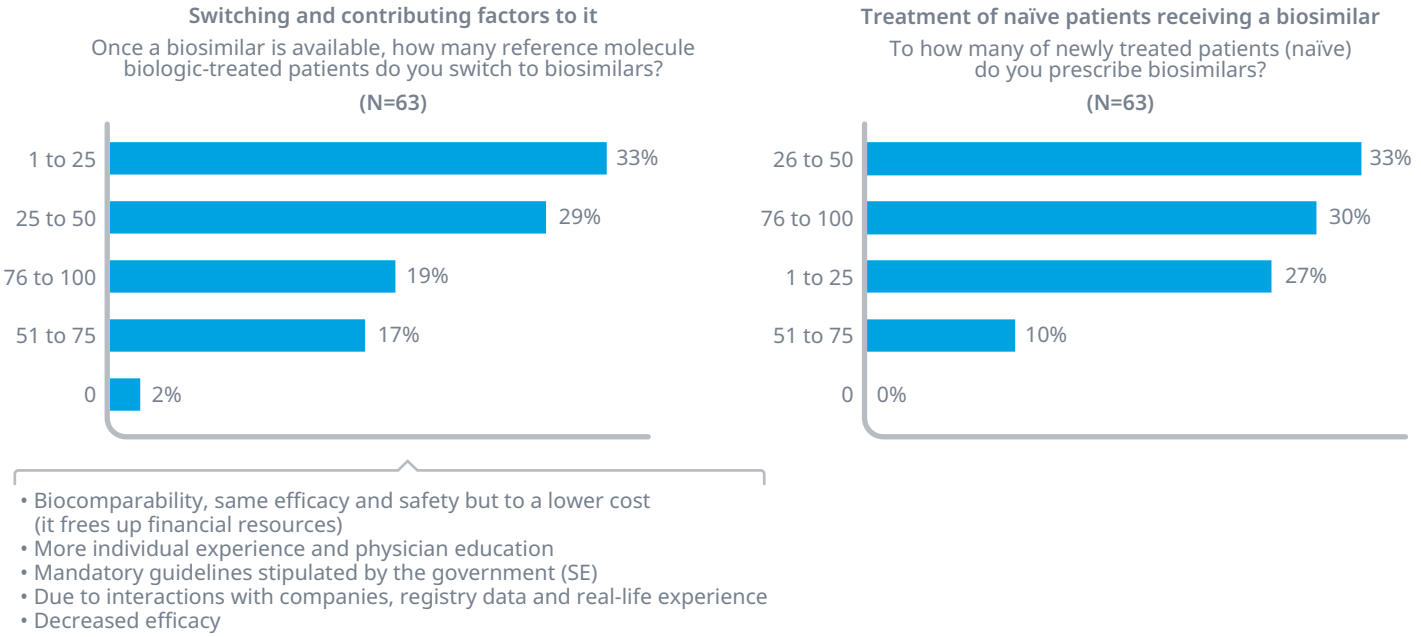
UTILIZATION AND SWITCHING ADMINISTRATION TYPE (SUBCUTANEOUS VERSUS INTRAVENOUS)

Biosimilars are seeing substantial use by immunologists and oncologists, with 63% of physicians stating they start over 50% of their new patients on biosimilars. Also, 36% of physicians switch 50% or more of their patients that are on the reference medicine to biosimilars (Exhibit 6). While there are some country variations, this trend of use is also reflected in the macro country level data on overall biosimilar use.[5] This use appears to be driven by the positive perception of biosimilars. Some countries and regions have biosimilars quotas and financial incentives to promote their uptake but in general, physicians appear to not be strongly driven by these factors. This may not have always been the case, as initial uptake may have been driven by these factors as suggested by previous studies. Additionally, quota level decision-making may take place at a hospital level. However, as physicians have gained more experience, they appear to be more driven by their own perception of comfort.

Interestingly, most physicians report there was an increase in the number of patients treated with the biologic molecule driven by the entry of the biosimilar overall after one year. The increase largely ranges from 15–20% in total patients (Exhibit 7). The reasons behind this increase need to be explored further as there could be many causes, such as an increase in access to biologics, greater resources due to lower costs, and others. A previous study has found that biosimilars in Germany have led to expanded access to biologics, with patients being treated one year earlier.[11]

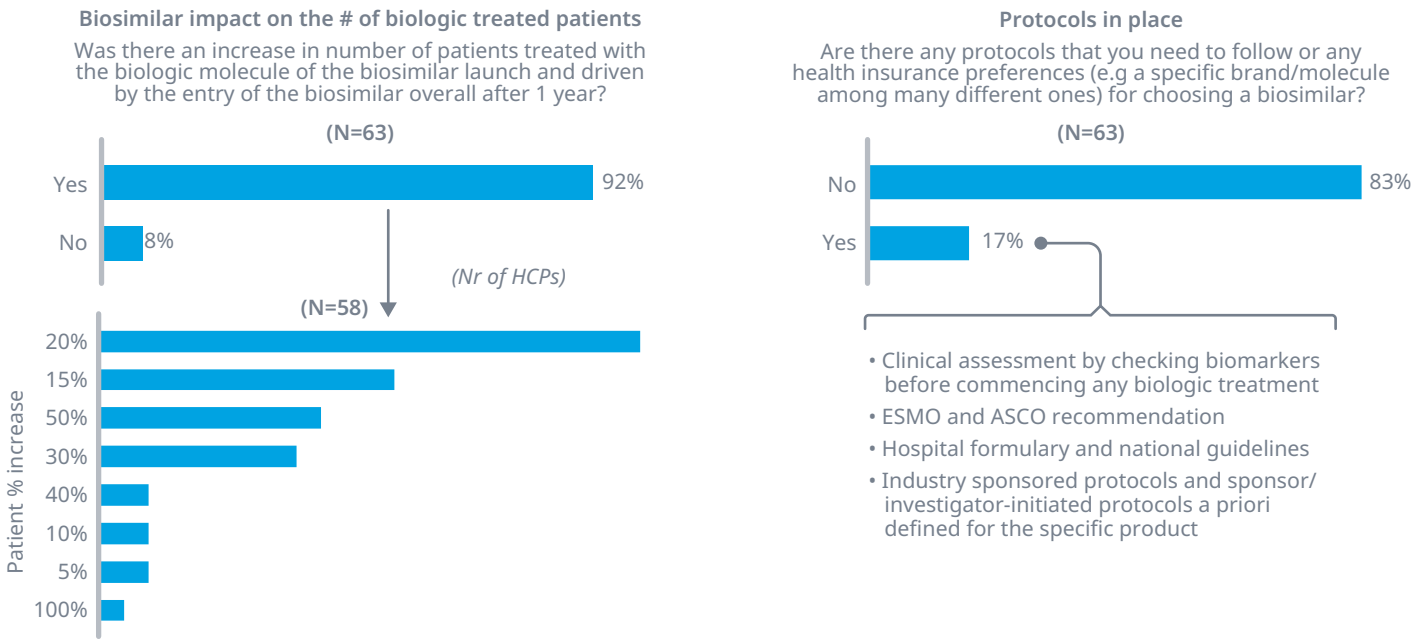
Competition between biosimilars and reference medicine may be driven by many factors that impact prescribing decisions. In some cases (for example, in the case of Trastuzumab and Rituximab), physicians have been presented with the choice of a less costly intravenous biosimilar versus a sub-cutaneous reference medicine.[12–14]

Exhibit 6: Switching of patients to biosimilars and treatment of naïve patients receiving a biosimilar (in percentage)



Source: IQVIA Survey of HCP (Oncologists and Immunologists) perception evolution on biosimilars, N=63.
Notes: HCP = Healthcare Professional.

Exhibit 7: Biosimilar impact on the number of biologic treated patients and the protocols in place for choosing a biosimilar



Source: IQVIA Survey of HCP (Oncologists and Immunologists) perception evolution on biosimilars, N=63.
Notes: HCP = Healthcare Professional; SC = Subcutaneous; IV = Intravenous

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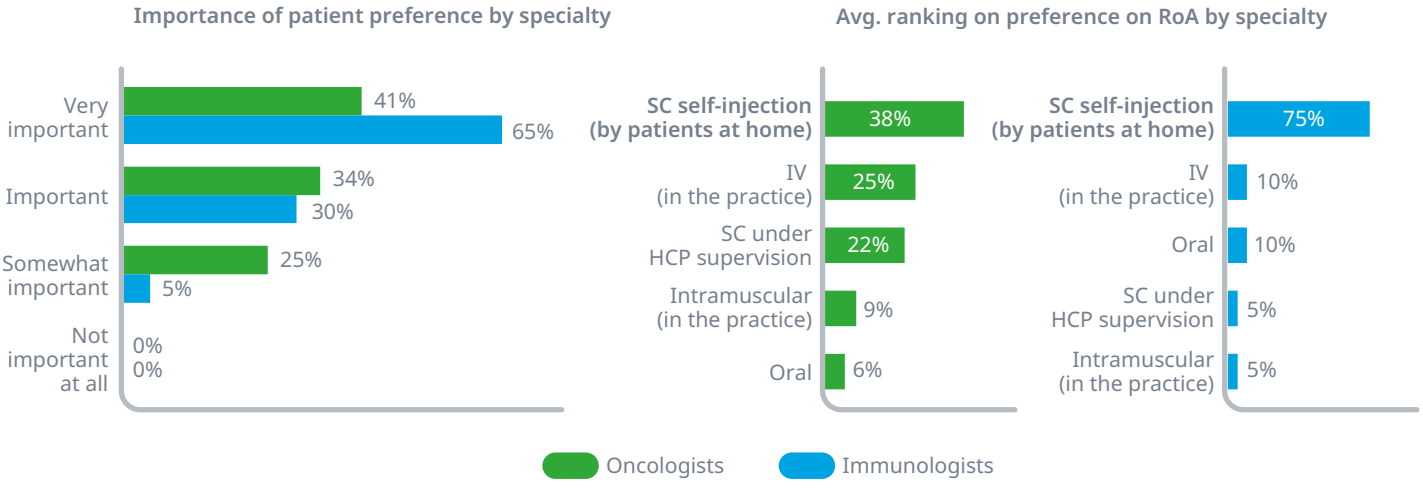
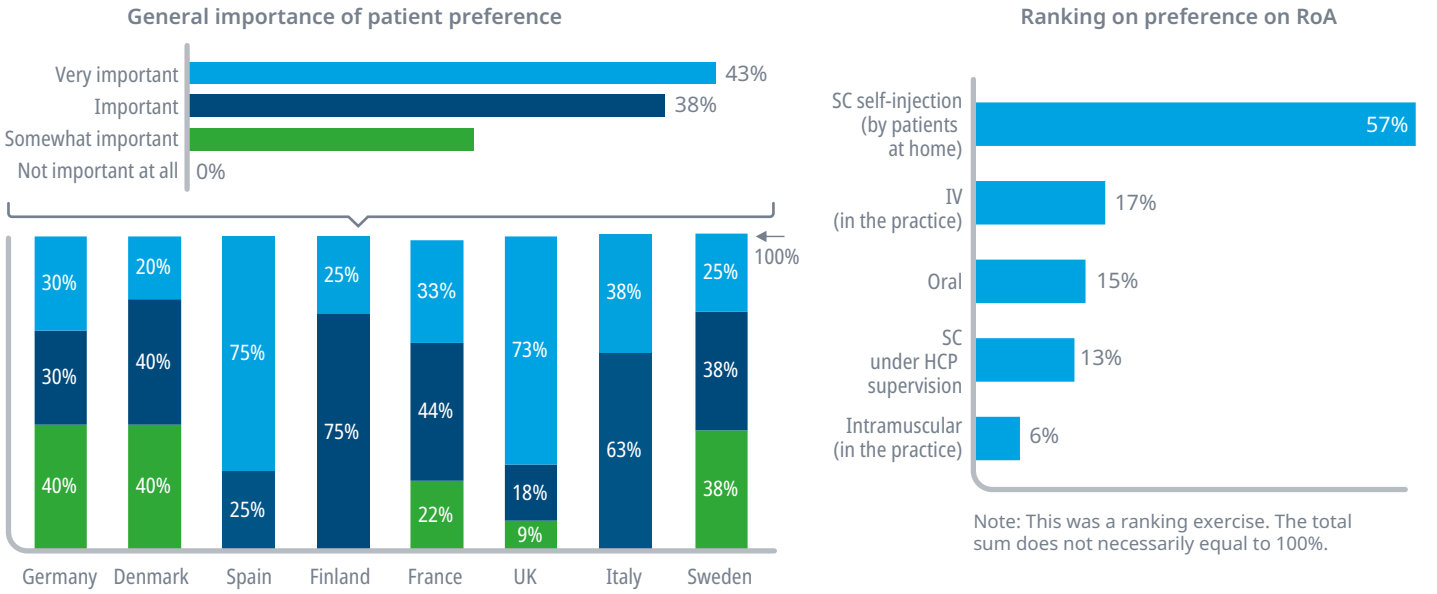
This is a situation that may arise in cases of future biosimilar entry as well and can impact the development of a healthy competitive space, hence it is worth exploring what factors may drive physician decision-making. In general, oncologists and immunologists view patient preference regarding route of administration as key and note that sub-cutaneous self-injection at home is most preferred, followed by intravenous administration at the office. Although, there is some variability across countries (Exhibits 8 and 9).

Exhibit 8: Impact of patient preference and ranking of patient preference regarding route of administration by specialty



Source: IQVIA Survey of HCP (Oncologists and Immunologists) perception evolution on biosimilars, N=63.
Notes: RoA = Route of administration. HCP = Healthcare Professional.

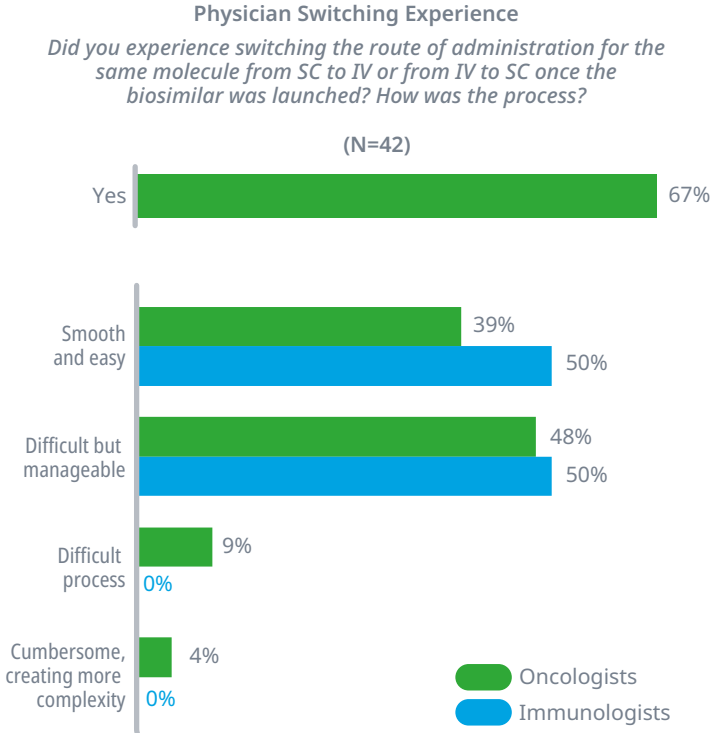
Exhibit 9: Impact of patient preference and ranking of patient preference regarding route of administration



Source: IQVIA Survey of HCP (Oncologists and Immunologists) perception evolution on biosimilars, N=63.
Notes: RoA = Route of administration; HCP = Healthcare Professional; SC = Subcutaneous; IV = Intravenous.

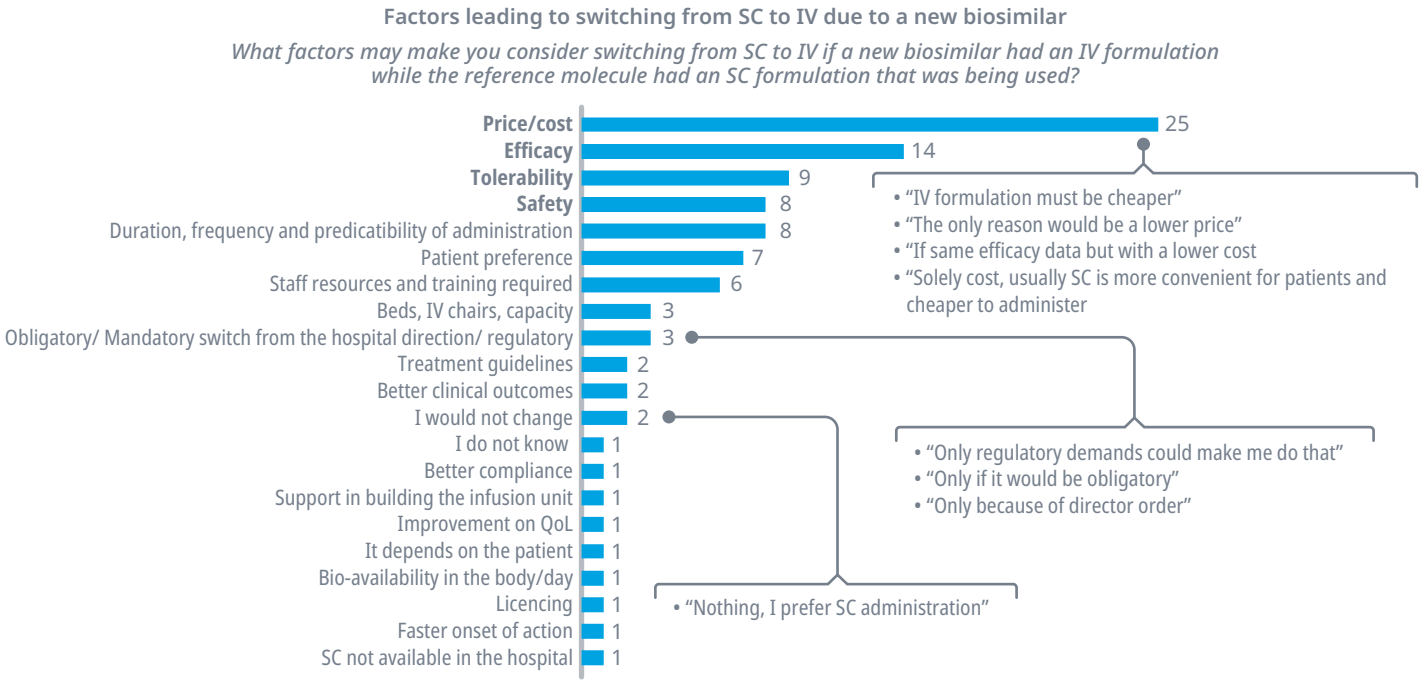
Out of the physicians who had to switch the route of administration, 50% of immunologists and 39% of oncologists viewed it as smooth and easy. The remaining physicians largely viewed it as difficult but manageable. A similar trend was seen when restricted to physicians who were managing this switch in administration for Trastuzumab and Rituximab. When asked what factors would make physicians consider switching from SC to IV if a new biosimilar had an IV formulation while the reference molecule had an SC formulation, physicians stated that price/cost would be the main driver (Exhibits 10 and 11).

Exhibit 10: Switching experience of physicians



Source: HCP (Oncologists and Immunologists) perception evolution on biosimilars, N=63.
Notes: RoA = Route of administration. HCP = Healthcare Professional; SC = Subcutaneous; IV = Intravenous.

Exhibit 11: Factors leading to switching from SC to IV due to a new biosimilar



Source: IQVIA Survey of HCP (Oncologists and Immunologists) perception evolution on biosimilars, N=63.
Notes: Bx: Biosimilar; SC = Subcutaneous; IV = Intravenous..

SHARING OF BEST PRACTICES

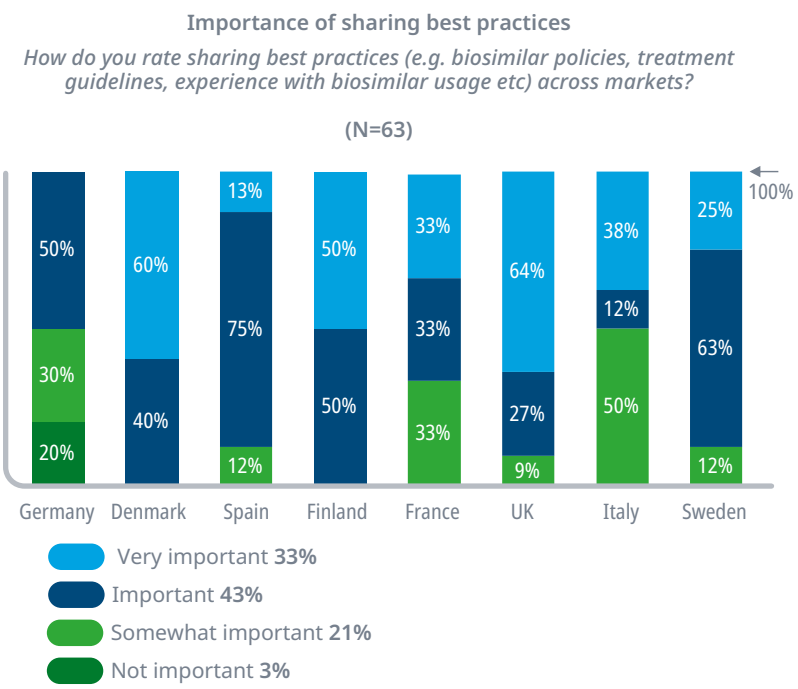
As mentioned earlier, most physicians who have had experience with biosimilars state that sharing of best practices across colleagues is an important part of the education process. Both oncologists and immunologists prefer to receive this information through physician associations. In terms of providing advice to other physicians who may not have yet used biosimilars, oncologists and immunologists recommend a number of approaches to enhancing education, from medical associations and treatment guidelines to discussions with other physicians who have vast experience (Exhibits 12 and 13).

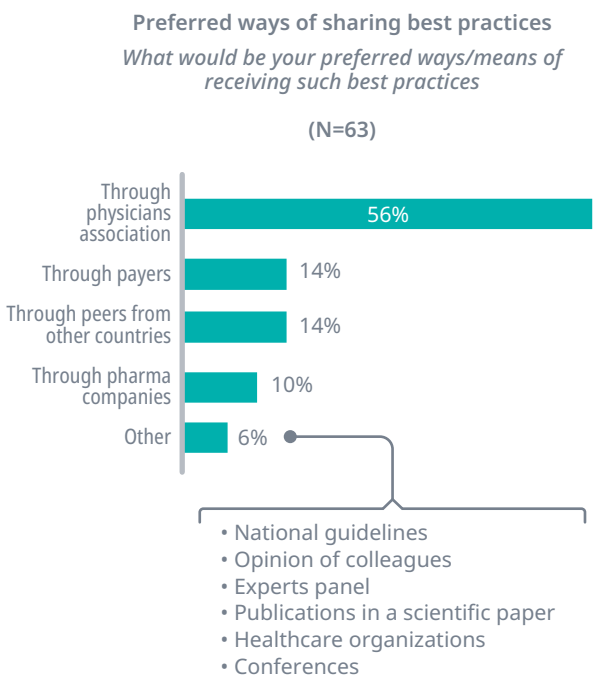
Out of the physicians who had to switch the route of administration, 50% of immunologists and 39% of oncologists viewed it as smooth and easy. The remaining physicians largely viewed it as difficult but manageable.

Exhibit 12: Select recommendations to physicians without experience with biosimilars

Source: IQVIA Survey of HCP (Oncologists and Immunologists) perception evolution on biosimilars, N=63.
Notes: HCP = Healthcare Professional.

Exhibit 13: Importance of sharing best practices and preferred ways of sharing them





Source: IQVIA Survey of HCP (Oncologists and Immunologists) perception evolution on biosimilars, N=63.
Notes: HCP = Healthcare Professional.

Awareness, perception and expected utilization of biosimilars: Neurologists

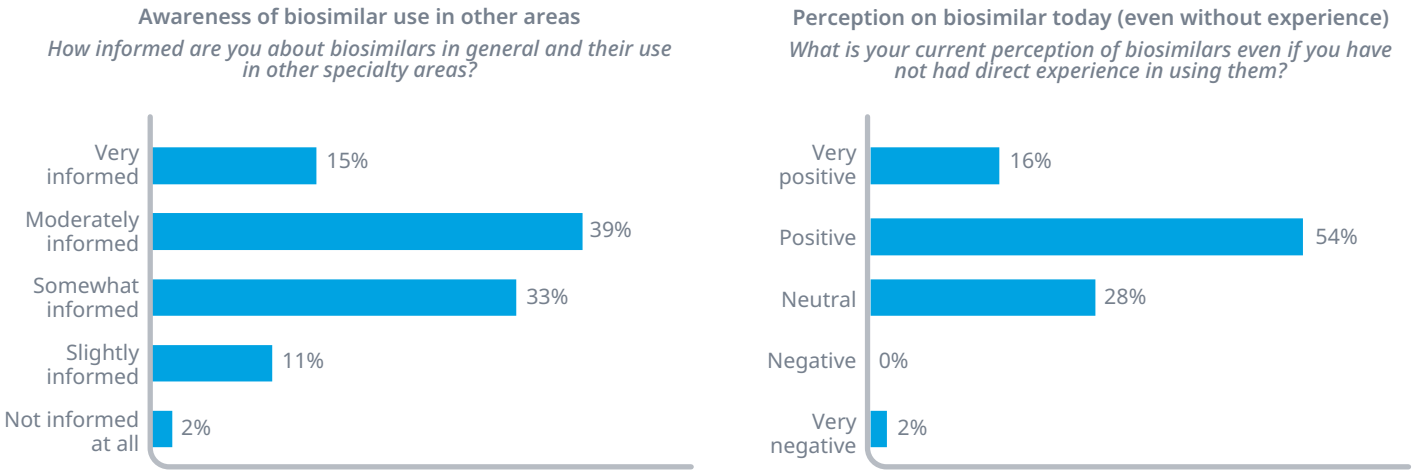
+ **More than half of neurologists stated they were moderately or very informed about biosimilars in general and about biosimilar use in other specialty areas, with 70% reporting a positive or very positive perception of biosimilars (irrespective of whether they have had direct experience with them).**
+ **Neurologists appear to be anticipating the expected launch of the natalizumab biosimilar with a moderately high degree of awareness of the MS biosimilar pipeline.**
+ **Neurologists expect to utilize biosimilars when available; 48% neurologists expect to utilize them for more than 50% of their patients. Reasons for prescribing biosimilars were mainly cost and access related.**
+ **When asked about their main concerns that would limit prescribing biosimilars in the first year of availability, physicians stated efficacy, safety, bio-comparability, and the need to gather more information as the main factors.**
+ **As biosimilars for multiple sclerosis become available, neurologists face a situation where the reference medicine is available in sub-cutaneous form (SC) but the biosimilar is available as an intravenous (IV) administration.**
+ **Many neurologists expect to switch patients from SC reference molecule to IV biosimilar due to the cost benefits but note that the process may be difficult (albeit manageable) and patient preference will be a factor.**
+ **Knowledge sharing among peers, nurses and patient education programs can help facilitate this process and sharing of best practices across specialties and through physician associations will be important.**
+ **To achieve a competitive market, manufacturers will need to understand the services provided currently to neurologists, as neurologists expect these services to be matched for them to switch to biosimilars.**

In September 2022, IQVIA also conducted a survey of 61 neurologists across Denmark, Finland, France, Germany, Italy, Spain, Sweden and the UK. Neurologists are expected to face biosimilar choices soon with a biosimilar for natalizumab expected in 2023. Given this background and the important role that biosimilars can play in the overall health system, it is important to understand the ways in which neurologists are thinking about biosimilars. The objective of this survey was to understand the current level of awareness, perception and expected utilization regarding biosimilars. Details on sample and countries can be found in the appendix.

AWARENESS AND PERCEPTION

Surveys found that 54% of neurologists stated they were moderately or very informed about biosimilars in general and about biosimilar use in other specialty areas, with 70% reporting a positive or very positive perception of biosimilars (irrespective of whether they have had direct experience with them). Based on discussions with some physicians, even the physicians who were not well informed about biosimilars had a positive perception driven by EMA statements and other news that they had come across. These findings suggest a relatively higher degree of awareness and perception compared to other studies from 2014 to 2018, although those studies were not focused specifically on neurologists (Exhibit 14).

Exhibit 14: Awareness of biosimilar use and perception of biosimilars



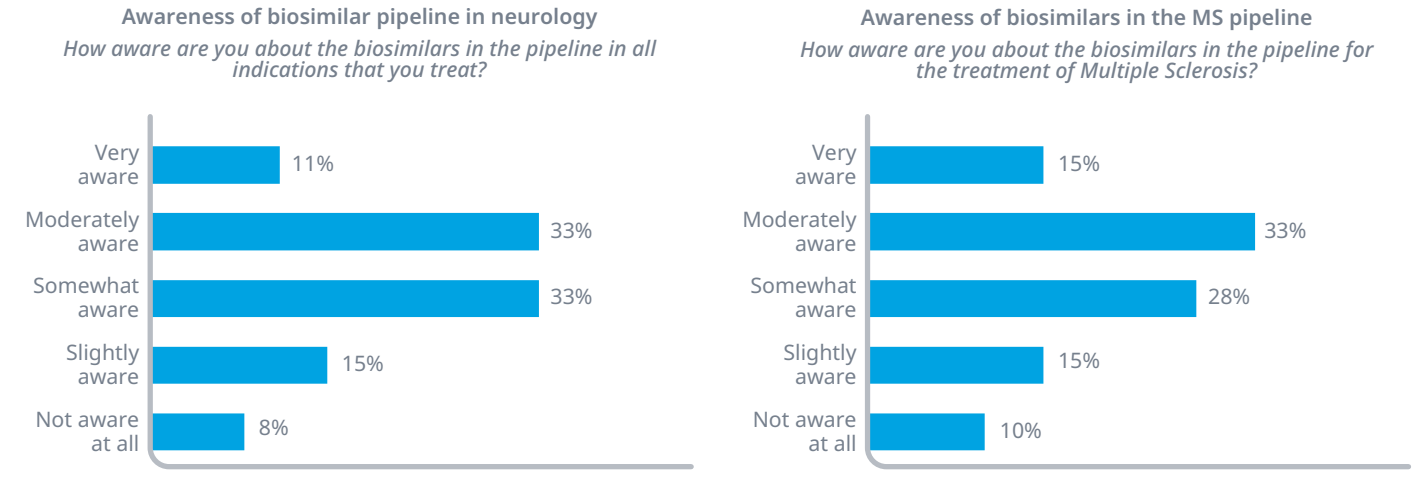
Source: IQVIA Survey of HCP (Neurologists) perception evolution on biosimilars, N=61.
Notes: HCP = Healthcare Professional.

Neurologists also appear to be anticipating the launch of the natalizumab biosimilar with a moderately high degree of awareness of the pipeline (Exhibit 15).

While this signals a reasonable degree of awareness and perception, there is still scope for improvement in terms of enhancing physician awareness and overcoming concerns.

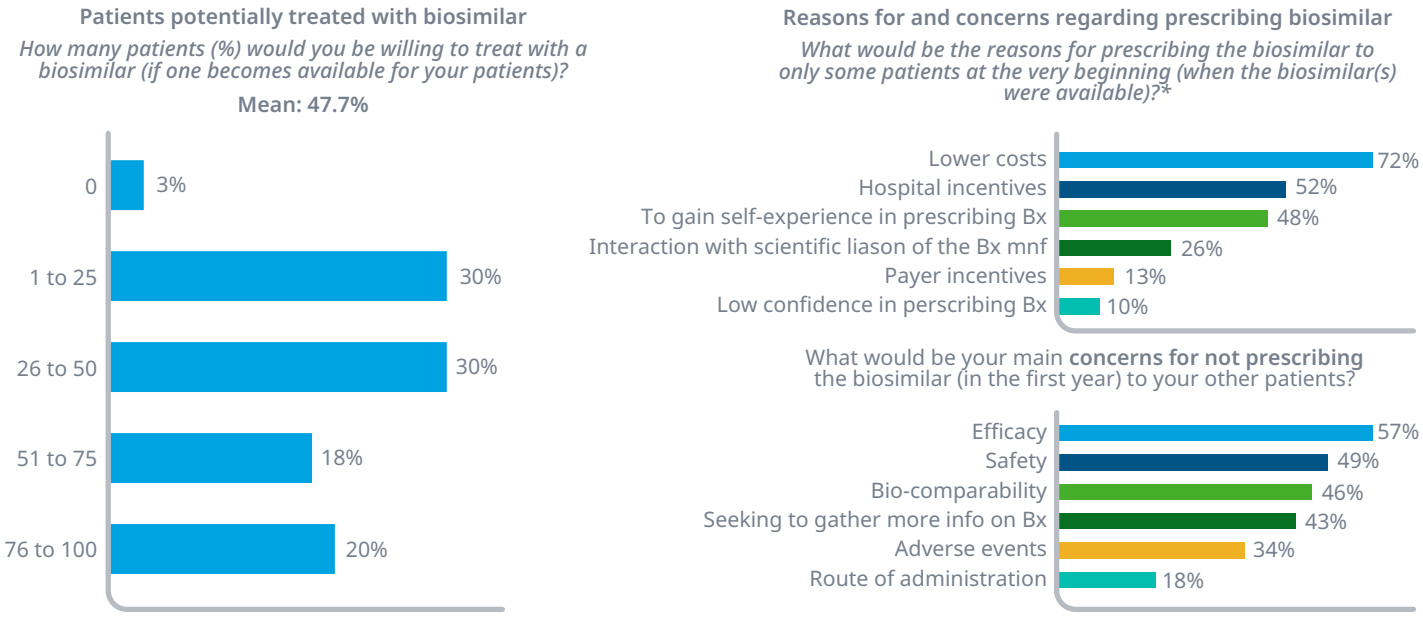
Surveys found that 54% of neurologists stated they were moderately or very informed about biosimilars in general and about biosimilar use in other specialty areas.

Exhibit 15: Awareness of biosimilars in neurology and MS pipeline



Source: IQVIA Survey of HCP (Neurologists) perception evolution on biosimilars, N=61.
Notes: HCP = Healthcare Professional.

Exhibit 16: Potential patients treated with biosimilar and reasons for biosimilar use along with concerns around use



Source: IQVIA Survey of HCP (Neurologists) perception evolution on biosimilars, N=61.
Notes: HCP = Healthcare Professional. * Totals may not add up to 100% as physicians can choose more than one option.

When asked about their main concerns that would limit prescribing biosimilars in the first year of availability, physicians stated efficacy, safety, bio-comparability, and need to gather more information as the main factors (Exhibit 16). This is important to address as there have been no efficacy concerns noted with biosimilars and EMA has stated that they are viewed as interchangeable with originators.

UTILIZATION AND SWITCHING ADMINISTRATION TYPE (SUBCUTANEOUS VERSUS INTRAVENOUS)

Neurologists expect to utilize biosimilars when available, and 48% of them are expecting to utilize them for more than 50% of their patients. Reasons for prescribing biosimilars were mainly cost and access related (Exhibit 17). Also, 80% of neurologists expect biosimilars for MS treatment to make a positive or very positive impact on treatment of patients and expect updates to treatment guidelines that would allow for earlier treatment with biosimilar natalizumab. An example of how the entry of a biosimilar may allow for broader access can be seen in the case of the UK, where currently NICE only provides the reimbursement approval for natalizumab in Rapidly Evolving Severe (RES) subpopulation, and not in Highly Active (HA) (also called suboptimal therapy (SOT)) population, which accounts for about 80% of total RRMS population.[15]

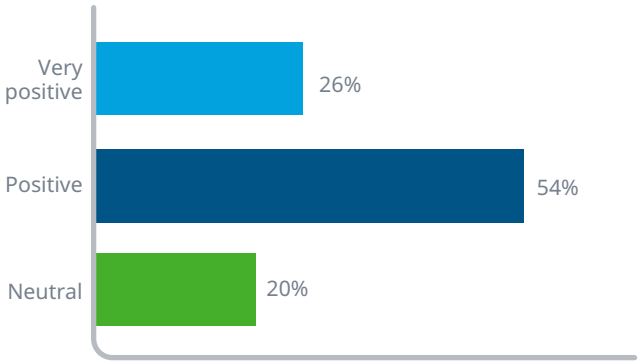
For HA population, the cost-effectiveness threshold was not met due to high cost of branded natalizumab. A biosimilar may have a more favorable cost effectiveness ratio due to lower costs and may allow for broader access.

Neurologists expect to utilize biosimilars when available, and 48% of them are expecting to utilize them for more than 50% of their patients. Reasons for prescribing biosimilars were mainly cost and access related.

Exhibit 17: Potential impact of biosimilars in MS and reasons for prescribing biosimilars for the first time

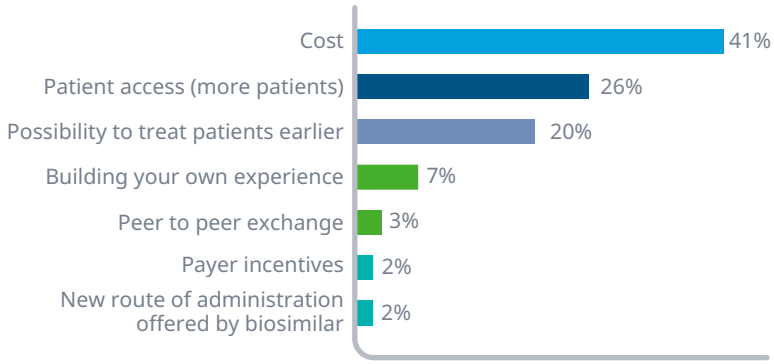
Potential impact of biosimilars in MS

What would be the potential impact in the treatment of MS patients if you could use biosimilars for more patients or early treatment to some patients (affordability)?



Reasons for prescribing biosimilars for the first time in MS

What of the reasons below would motivate you to prescribe biosimilars for the first time in MS?



Source: IQVIA Survey of HCP (Neurologists) perception evolution on biosimilars, N=61.
Notes: HCP = Healthcare Professional.

Hospital incentive schemes may also be a driver of use, along with other levers that have been used across Europe, such as gainsharing and government biosimilar quotas/targets. In the survey, neurologists assessed the potential incentive schemes that can impact uptake of biosimilars and stated that re-routing the savings back to hospitals was preferred, highlighting several approaches to reinvesting the savings (Exhibit 18).

Exhibit 18: Impact on current MS treatment guidelines and limitations on current treatment of MS with natalizumab

Impact on current MS treatment guidelines

Since biosimilars can be more cost-effective versions of the reference biologics, would you expect a change or an update in the treatment guidelines of MS that would allow an earlier treatment for the biosimilar (in percentage, out of 100%)?

(N=61, Yes=20)

"Yes, I would expect a change or an update in the treatment guidelines of MS that would allow an earlier treatment for the biosimilar"

"Because the access to affordable high-quality treatment options will become easier"

"This would require specific clinical trials for relapsing MS, CIS, progressing MS or PPMS"

"If the biosimilars are approved it would further the notion that more patients should start out on high-effective treatment"

"The cost will not impact the treatment guidelines, only an effective treatment or an alternative treatment will"

Limitations on current treatment of MS with natalizumab

Did you experience a limitation or cap on the number of patients that you can treat with Natalizumab given the high price (in percentage, out of 100%)?

(N=61, Yes=41)

"Although DMTs have become a cornerstone in the treatment of MS nevertheless the access is still a challenge"

"We can not really treat everyone who needs treatment"

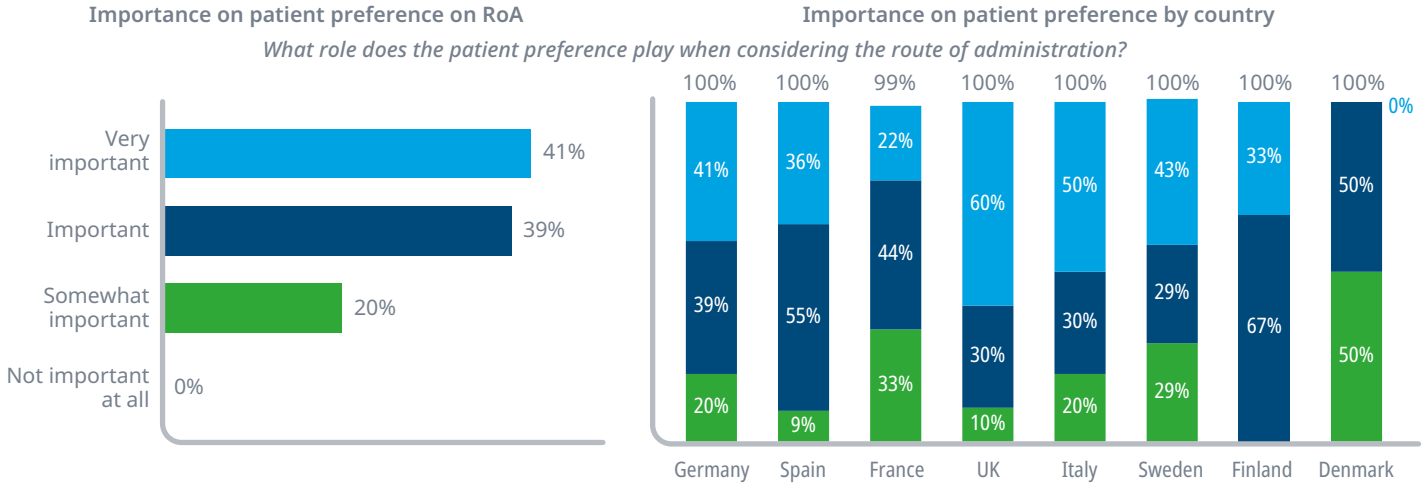
"Not actually, perhaps in the next future"

"Limitation are consequences of an increase in expenses in Neurology budgets"

Source: IQVIA Survey of HCP (Neurologists) perception evolution on biosimilars, N=61.
Notes: HCP = Healthcare Professional.

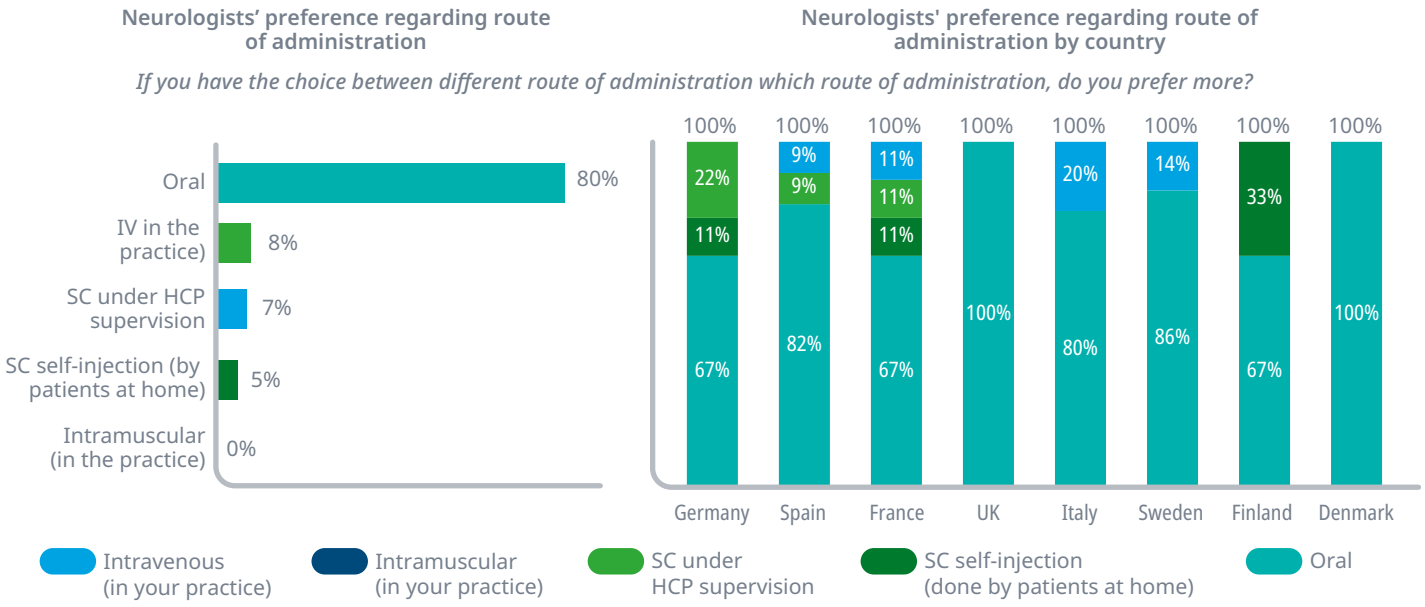
As biosimilars for multiple sclerosis become available, neurologists face a situation where the reference medicine is available in sub-cutaneous form (SC) but the biosimilar is available as an intravenous (IV) administration. Neurologists view patient preference as highly important and oral administration is considered the most preferred, followed by IV and SC. This preference varies slightly by country, with some of the Nordic countries having a stronger preference for SC injections (Exhibit 19 and 20).

Exhibit 19: Importance of patient preference regarding route of administration, overall and by country



Source: IQVIA Survey of HCP (Neurologists) perception evolution on biosimilars, N=61.
Notes: RoA: Route of administration; HCP = Healthcare Professional.

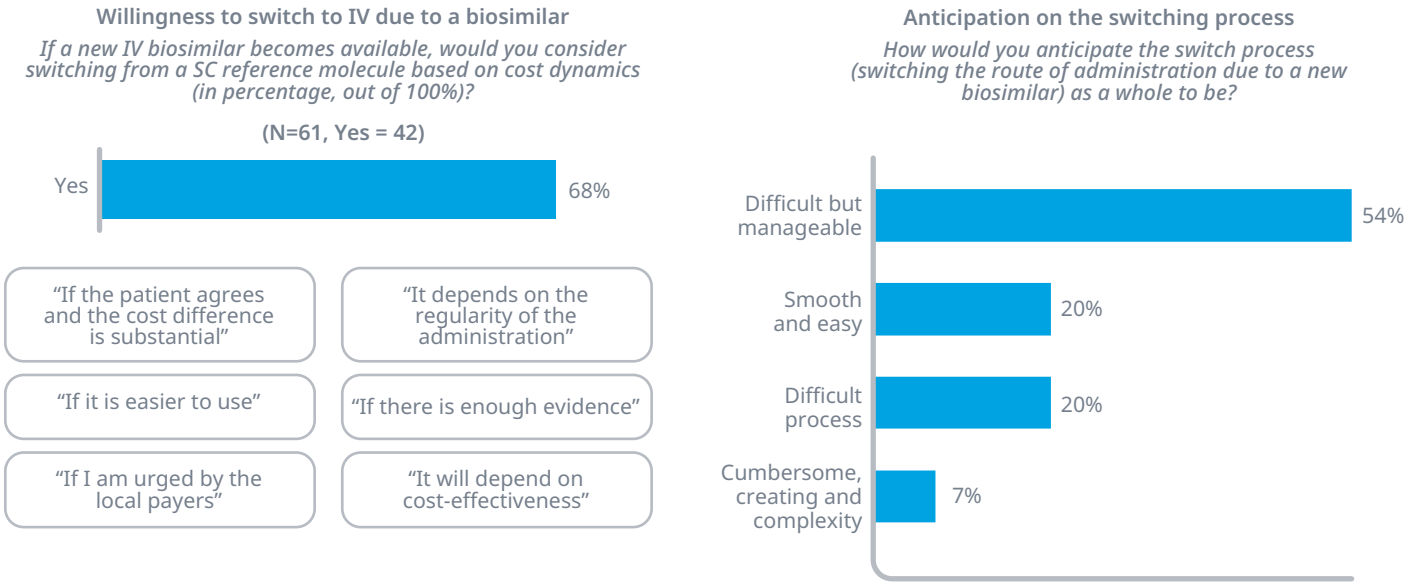
Exhibit 20: Neurologists' preference regarding route of administration, overall and by country



Source: IQVIA Survey of HCP (Neurologists) perception evolution on biosimilars, N=61.
Notes: HCP = Healthcare Professional; SC = Subcutaneous; IV = Intravenous.

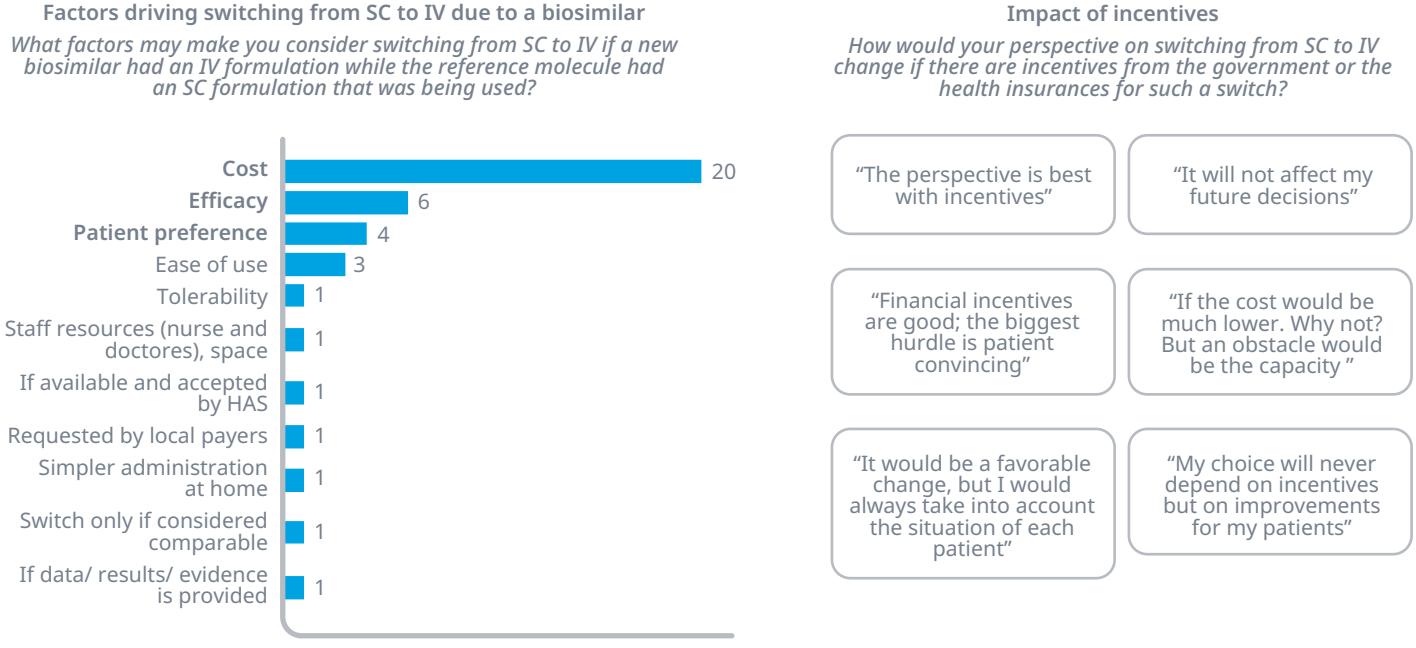
Many neurologists expect to switch patients from SC reference molecule to IV biosimilar due to the cost benefits but note that the process may be difficult (albeit manageable) and patient preference will be a factor (Exhibits 21 and 22).

Exhibit 21: Willingness to switch to IV due to a biosimilar and anticipation regarding the switching process



Source: IQVIA Survey of HCP (Neurologists) perception evolution on biosimilars, N=61.
Notes: HCP = Healthcare Professional; SC = Subcutaneous; IV = Intravenous.

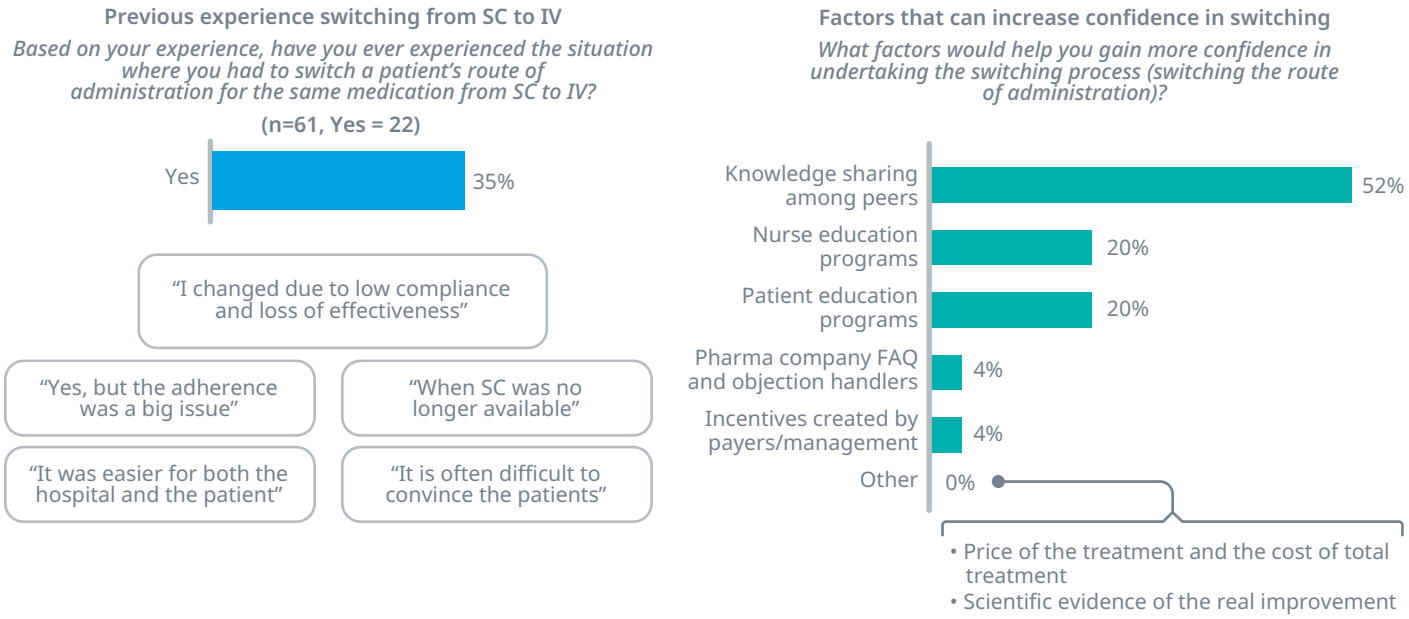
Exhibit 22: Factors driving switch to IV due to a biosimilar and impact of incentives



Source: IQVIA Survey of HCP (Neurologists) perception evolution on biosimilars, N=61.
Notes: HCP = Healthcare Professional; SC = Subcutaneous; IV = Intravenous.

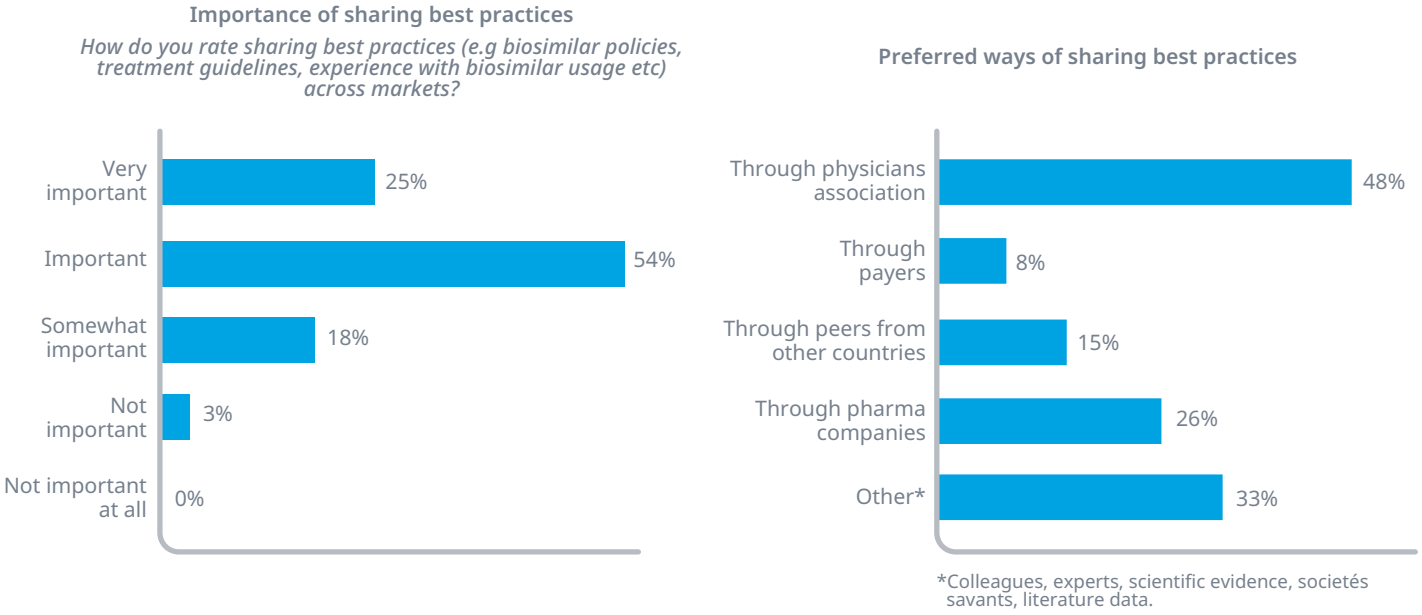
Knowledge sharing among peers, nurses and patient education programs can help facilitate the process of switching from SC to IV if that is viewed as appropriate by physicians and patients and sharing of best practices across specialties and through physician associations will be important (Exhibits 23 and 24).

Exhibit 23: Previous experience switching from SC to IV and factors that can increase confidence in switching



Source: IQVIA Survey of HCP (Neurologists) perception evolution on biosimilars, N=61.
Notes: HCP = Healthcare Professional; SC = Subcutaneous; IV = Intravenous.

Exhibit 24: Importance of sharing best practices and preferred ways of sharing best practices

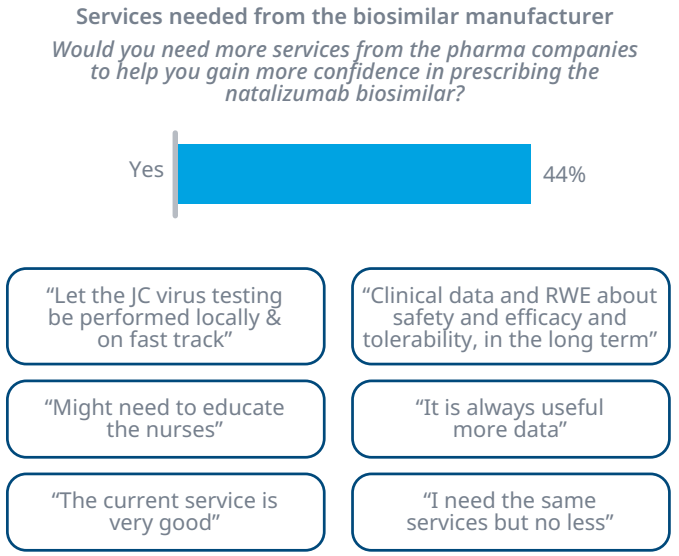


Source: IQVIA Survey of HCP (Neurologists) perception evolution on biosimilars, N=61.
Notes: This was a ranking exercise. The total sum does not necessarily equal to 100%. HCP = Healthcare Professional.

SERVICES

To achieve a competitive market, manufacturers will need to understand the services provided currently to neurologists as 44% of neurologists expect these services to be matched for them to switch to biosimilars (Exhibit 24).

Exhibit 25: Services needed from the biosimilar manufacturer



Source: IQVIA Survey of HCP (Neurologists) perception evolution on biosimilars, N=61.
Notes: HCP = Healthcare Professional.

Discussion

+ **Physician concerns around bio-comparability of biosimilars with reference medicines have decreased as they have gained more experience with biosimilar use. Although personal experience with biosimilars is important for physicians, many of them stated that peer-to-peer learning can help with increasing confidence in biosimilar use.**

+ **Most neurologists also stated that learning best practices from other specialties through physician associations as well as from other countries would be beneficial for them as biosimilars become an option.**

+ **A sustainable market for biosimilars can improve patient access and physician choices of safe and high-quality biologic medicines in a manner that considers the needs of all stakeholders while providing a means to manage existing healthcare budgets and safeguarding a healthy level of competition and supply.**

+ **Striking a balance between the HCP preference, patient preference, healthcare infrastructure challenges, and potential loss of savings will be critical and continued understanding of physician perceptions, increased education of physicians, and sharing of best practices will be crucial.**

+ **As more physician specialties get exposed to biosimilars, health systems have opportunities to unlock optimal savings in a timely manner. For example, key generic and biosimilar expected to launch over the next five years for MS are estimated to present an opportunity for €4.5–5.5Bn in savings in France, Germany, Italy, Spain and the UK.**

Biosimilar awareness has increased across physicians over time. Physicians who have utilized biosimilars have a positive impression of them and many physicians who have not yet gained experience with biosimilars also view them positively.

As the number of biosimilars launched and the overall experience with them has grown, physicians are becoming increasingly informed about them and comfortable with their use, with most oncologists and immunologists reporting a positive perception. Many neurologists who had not yet utilized biosimilars also reported a high degree of awareness of biosimilars, including upcoming ones that would be relevant for them, as well as a positive perception of biosimilars in general. This trend suggests that biosimilars are becoming increasingly accepted as part of the overall patient management tools and seems to be an advancement on some level from the physician perception studied between 2014 and 2018.

Initial concerns expressed by physicians were around bio-comparability, however these concerns appear to have reduced as physicians have gained personal experience (Exhibit 5 & 6). Physicians recognize that biosimilars can provide cost savings for the health system, which is a key driver of positive perception. Neurologists who do not yet have experience with biosimilars generally expected a natalizumab biosimilar to have a positive impact on patient care. Concerns around biosimilar use may be further reduced with the EMA's positive statement on interchangeability.

Despite these advances, some physicians — particularly those without direct experience — still retain concerns around efficacy and safety of biosimilars. With biosimilars becoming more common, it is important that physicians are aware and that their concerns are addressed so that they can make the best decisions for their patients and the health system.

Although personal experience with biosimilars is important for physicians, many of them stated that peer-to-peer learning can help with increasing confidence in biosimilar use. Certain specialties have gained greater experience as more biosimilars have become available. Forums for sharing of knowledge and experience across specialties can be an important tool for ensuring faster spread of knowledge. Most neurologists also stated that learning best practices from other specialties through physician associations as well as other countries would be beneficial for them as biosimilars become an option. Such spaces where multiple specialties can interact are limited and would need engagement by stakeholders across the healthcare spectrum.

Ensuring sustainable uptake of biosimilars will be crucial for unlocking savings and providing best possible care for patients

Several biosimilars and generics are on the horizon across multiple specialties. While generics have usually seen a good degree of uptake in a timely manner across countries, biosimilar uptake can be variable. It is important to distinguish between generics and biosimilars, as the latter are more complex to develop and manufacture, and physician or patient preferences can be stronger. These aspects of biosimilars suggest that creating a sustainable market where rewards are present for all stakeholders (i.e., payers, hospitals, manufacturers, physicians, patients), a healthy level of competition is maintained, and physician autonomy exists, is crucial.

Various government policies in Europe, such as gainsharing, quotas, and evolved procurement approaches, have been used to create this sustainable environment and to create savings for the health system that can help increase access to existing biologics and fund innovation. Gainsharing is a particularly meaningful policy for physicians, as it provides direct benefits and incentives for providers and physicians along with payers. Gainsharing contracts refer to selective contracts at the national/regional/provider level that

As the number of biosimilars launched and the overall experience with them has grown, physicians are becoming increasingly informed about them and comfortable with their use, with most oncologists and immunologists reporting a positive perception

incorporate elements of the sharing of benefits with physicians/clinical departments/providers (i.e., savings or other benefits such as lack of limits to biologic use) to incentivize the use of off-patent biologics and biosimilars. They have been successfully implemented in several European countries to increase the uptake of biosimilars and have led to an increase in savings. Such an approach may be considered for future biosimilars as well. While these policies have led to biosimilar uptake, more work is needed to ensure consistency in uptake and savings across Europe.

A sustainable system for biosimilars can improve patient access and physicians' prescription choice of safe and high-quality biologic medicines in a manner that considers the needs of all stakeholders while providing a means to manage existing healthcare budgets and safeguarding a healthy level of competition and supply. This sustainability also includes physician and patient education to address questions around biosimilar use, many of which are likely already addressed through EMA statements and a wealth of support for biosimilars use by governments and industry bodies[4,16], while ensuring that their preferences and autonomy is not impacted.

Ensuring physician and patient autonomy, unlocking cost savings, and creating a sustainable market for biosimilars will require careful balancing and consideration. The key value that comes from

competition may not always be achieved. For example, there have been cases where an SC version of the reference medicine has become available in the country earlier or around the same time as the launch of IV biosimilar(s), as was the case for Trastuzumab. Such situations are also likely to occur in future biosimilar launches as well, including in MS. In the MS space, Tysabri (natalizumab) IV lost its basic patent in 2020 for major European countries. However, no biosimilar has yet launched. Additionally, branded Tysabri is now available in SC formulation.[17] Thus, when a biosimilar enters the market with an IV formulation, it will likely compete with an SC version of natalizumab, although patients would remain in a hospital setting or clinical/specialist centre as the Summary of Product Characteristic (SmPC) states that this must be done under HCP supervision.[17] Making prescribing decisions can be challenging in such a scenario, even though both options have comparable safety and efficacy as patients or physicians may prefer one type of administration while another one may be more cost saving. With the SC version of the reference medicine launching first, there may be limited room for competitors to maneuver as many patients may already be shifted to SC administration, resulting in steep hurdles to achieving competitiveness. Other studies have highlighted the multi-dimensional nature of such decision-making as costs and preferences need to be balanced. This may be further complicated if patients have already started on one type of administration, hence decisions that are optimal for the health system may be ones that may add to physician and nurse burden or may not be preferred. Health systems will need to tackle such situations carefully to ensure that physician and patient preferences are incorporated while optimal decisions for the overall health system and biosimilar sustainability are taken. Appropriate communication of the benefits of biosimilars, including the potential for system improvements through reinvestment opportunities in infrastructure and capacity, such as additional staff, will be crucial.[7] Peer-to-peer learning across specialties and physician/patient education will be important elements in tackling these situations. Further assessment of such situations and approaches to ensure a healthy level of competition are needed as such situations may result in missed opportunities to gain further savings. Striking a balance between the HCP preference, patient preference, healthcare infrastructure challenges, and potential loss of savings will be critical.

In conclusion, health systems appear to be facing an important inflection point with respect to biosimilars. There is increasing acceptance of comparability – including the EMA stating inter-changeability between biosimilars and reference medicines – and growing recognition of their benefits across physicians in multiple specialties.[iv] This presents opportunities for the health system to unlock optimal savings in a timely manner. For example, based on IQVIA estimations, a major biosimilar and a generic expected to launch over the next five years for MS are likely to present an opportunity for €4.5–5.5Bn in savings in France, Germany, Italy, Spain and the UK if uptake is done in a timely and sustainable manner due to lower costs (see appendix for assumptions). Achieving these savings will be important for freeing up resources to fund innovative treatments while also enhancing the access of key biologic molecules to patients, especially given the costs associated with COVID prevention. If learnings from the experience of physicians are not utilized to optimize the use of biosimilars and the sustainability of the market, this would result in a missed opportunity to achieve these savings.

Appendix

Estimating potential future savings from biosimilars and generics

To estimate the potential future savings from biosimilars and generics, the following approach was used –

- For France, Germany, Italy, Spain, and United Kingdom, the quarterly volume in daily defined doses (DDDs) and sales from 2017 onwards of natalizumab and fingolimod molecules were accessed through IQVIA MIDAS database
- The compounded growth rate at a quarterly level was calculated and this growth rate was applied to the timeframe of 2023–2030 to estimate the overall volume of these molecules
- The following scenarios were then assumed based on previous biosimilar and generic experience –
    - Biosimilar — 20% reduction in overall average molecule level sales/DDD and slow uptake of biosimilar; 30% reduction in overall average molecule level sales/DDD and fast uptake of biosimilar
    - Generic — 80% reduction in overall average molecule level sales/DDD and relatively slower uptake of generic; 90% reduction in overall average molecule level sales/DDD and fast uptake of generic
    - Please note that this analysis does not account for potential changes in market landscape that would impact the overall volume trajectory

IQVIA survey background

Both sets of surveys were conducted through an online portal. The respondents were provided a link to the portal and could answer the questions per their convenience. The anticipated time to complete the survey was 45 minutes. A set of screening questions was used to ensure the appropriate physicians were selected. The screening questions included criteria based on years of practice, patients treated, prescribing of biologics, experience with biosimilars, etc. For the neurologists survey, a total of 44 questions were asked, while for the oncologists and immunologists, a total of 34 questions were asked.

Oncologist and immunologist survey sample

COUNTRY	ONCOLOGISTS	IMMUNOLOGISTS
Denmark	2	2
Finland	2	2
France	4	4
Germany	5	5
Italy	4	4
Spain	5	5
Sweden	4	4
UK	6	5
TOTAL	**32**	**31**

Neurologist survey sample

COUNTRY	NEUROLOGISTS
Denmark	2
Finland	3
France	9
Germany	9
Italy	10
Spain	11
Sweden	7
UK	10
TOTAL	**61**

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Notes on sources

THIS REPORT IS BASED ON THE IQVIA SERVICES DETAILED BELOW

IQVIA MIDAS™ is a unique data platform for assessing worldwide healthcare markets. It integrates IQVIA national audits into a globally consistent view of the pharmaceutical market, tracking virtually every product in hundreds of therapeutic classes and providing estimated product volumes, trends and market share through retail and non-retail channels. MIDAS data is updated monthly and retains 12 years of history.

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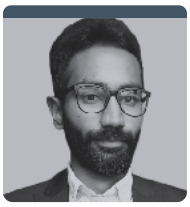
Murray Aitken is Executive Director, IQVIA Institute for Human Data Science, which provides policy setters and decisionmakers in the global health sector with objective insights into healthcare dynamics. He led the IMS Institute for Healthcare Informatics, now the IQVIA Institute, since its inception in January 2011. Murray previously was Senior Vice President, Healthcare Insight, leading IMS Health's thought leadership initiatives worldwide. Before that, he served as Senior Vice President, Corporate Strategy, from 2004 to 2007. Murray joined IMS Health in 2001 with responsibility for developing the company's consulting and services businesses. Prior to IMS Health, Murray had a 14-year career with McKinsey & Company, where he was a leader in the Pharmaceutical and Medical Products practice from 1997 to 2001. Murray writes and speaks regularly on the challenges facing the healthcare industry. He is editor of Health IQ, a publication focused on the value of information in advancing evidence-based healthcare, and also serves on the editorial advisory board of Pharmaceutical Executive. Murray holds a Master of Commerce degree from the University of Auckland in New Zealand, and received an M.B.A. degree with distinction from Harvard University.



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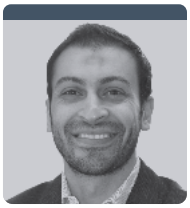
Vibhu Tewary is a Project Director at the IQVIA Institute for Human Data Science and is based out of New York, NY. His key areas of interest include healthcare policy, global market access, and economic modeling. Vibhu has authored multiple reports on global healthcare policy and market access. Prior to joining IQVIA, he worked as a researcher in a policy think tank in India. Vibhu did his undergraduate studies at the Indian Institute of Technology, Madras, and holds an MBA from Duke University.



AHMED ABOUZID
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Ahmed Abouzid is a Key Account Director at IQVIA, based in Munich. With more than 10 years of experience in the pharmaceutical industry, including six years in the biosimilar space, he has held various roles within IQVIA's consulting team and other pharmaceutical companies. Ahmed is a pharmacist by training and holds a master's degree in Health Economics from Cardiff University. His areas of expertise include market access, commercial, policy and healthcare sustainability.

About the Institute

The IQVIA Institute for Human Data Science contributes to the advancement of human health globally through timely research, insightful analysis and scientific expertise applied to granular non-identified patient-level data.

Fulfilling an essential need within healthcare, the Institute delivers objective, relevant insights and research that accelerate understanding and innovation critical to sound decision making and improved human outcomes. With access to IQVIA's institutional knowledge, advanced analytics, technology and unparalleled data the Institute works in tandem with a broad set of healthcare stakeholders to drive a research agenda focused on Human Data Science including government agencies, academic institutions, the life sciences industry, and payers.

Research agenda

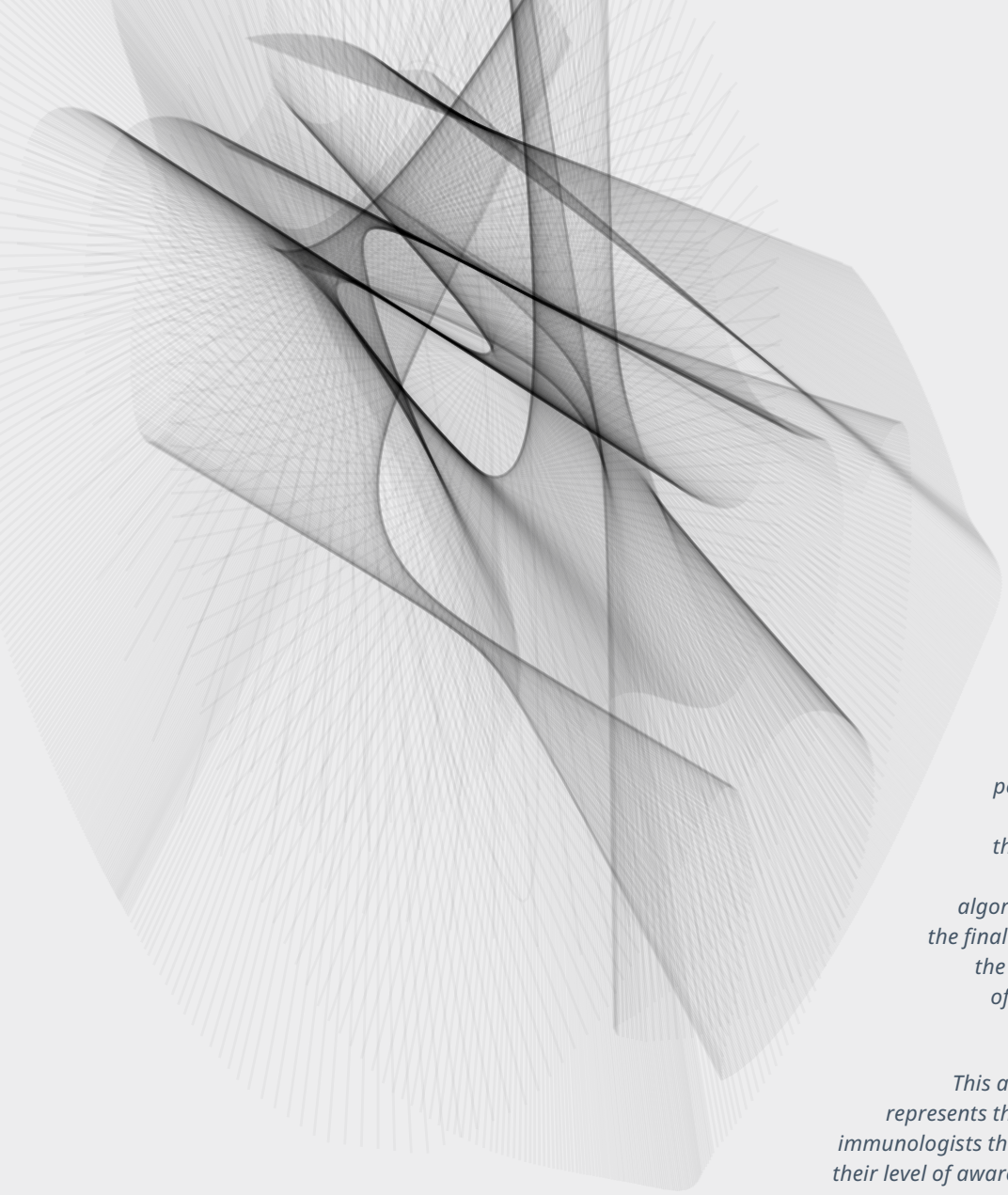
The research agenda for the Institute centers on five areas considered vital to contributing to the advancement of human health globally:

- Improving decision-making across health systems through the effective use of advanced analytics and methodologies applied to timely, relevant data.
- Addressing opportunities to improve clinical development productivity focused on innovative treatments that advance healthcare globally.
- Optimizing the performance of health systems by focusing on patient centricity, precision medicine and better understanding disease causes, treatment consequences and measures to improve quality and cost of healthcare delivered to patients.
- Understanding the future role for biopharmaceuticals in human health, market dynamics, and implications for manufacturers, public and private payers, providers, patients, pharmacists and distributors.
- Researching the role of technology in health system products, processes and delivery systems and the business and policy systems that drive innovation.

Guiding principles

The Institute operates from a set of guiding principles:

- Healthcare solutions of the future require fact based scientific evidence, expert analysis of information, technology, ingenuity and a focus on individuals.
- Rigorous analysis must be applied to vast amounts of timely, high quality and relevant data to provide value and move healthcare forward.
- Collaboration across all stakeholders in the public and private sectors is critical to advancing healthcare solutions.
- Insights gained from information and analysis should be made widely available to healthcare stakeholders.
- Protecting individual privacy is essential, so research will be based on the use of non-identified patient information and provider information will be aggregated.
- Information will be used responsibly to advance research, inform discourse, achieve better healthcare and improve the health of all people.



The IQVIA Institute for Human Data Science is committed to using human data science to provide timely, fact-based perspectives on the dynamics of health systems and human health around the world. The cover artwork is a visual representation of this mission. Using algorithms and data from the report itself, the final image presents a new perspective on the complexity, beauty and mathematics of human data science and the insights within the pages.

This algorithmic art is based on data which represents the key perspectives of oncologists and immunologists that have utilized biosimilars, including their level of awareness, positive or negative perception and overall usage in selected European countries.

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