

The Basel Area Life Sciences Ecosystem in a Global Landscape

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Executive summary

Life Sciences ecosystems are networks of interconnected stakeholders - including companies, research institutions, investors and healthcare facilities - that collaborate to drive innovation, economic growth and advancements in patient care. These ecosystems thrive through the integration of five key elements: stakeholders, talent, research and development (R&D), business activities and a supporting environment. Among renowned hubs such as Boston and London, the Basel Area stands out as a prominent Life Sciences cluster recognized for its exceptional economic productivity, high density of Life Sciences stakeholders and a strong collaboration culture. To understand the effectiveness of the Basel Area's ecosystem and to validate the hypothesis that it provides a highly favorable environment for innovation, this report assesses its performance across these five key elements, compares it to Boston and London, and identifies strengths as well as opportunities for growth.

Our findings indicate that the Basel Area excels due to its dense and diverse network of stakeholders, including major pharmaceutical leaders like Roche, Novartis, and Johnson & Johnson, along with numerous start-ups, research institutions and investors. This concentration fosters a collaborative research environment, reflected in the region's high research output per capita. The Basel Area also boasts a well-developed infrastructure, featuring science parks and ample laboratory space that enhance operational efficiency for Life Sciences companies. The region's talent landscape emphasizes quality over quantity. While producing fewer graduates than Boston and London, the Basel Area's research-intensive academic institutions attract international talent and drive strong R&D capabilities through close industry collaboration. A notable emphasis on late-stage clinical trials, with 59% in Phase III, underscores the region's strength in advancing therapies toward market readiness. However, limited early-stage research represents

an area for growth; bolstering early-phase activity could strengthen the innovation pipeline. Business activities in the Basel Area are characterized by targeted and high-value transactions, with deal sizes comparable to those in larger ecosystems. The funding landscape is strongly focused on venture capital and late-stage funding, providing economic stability but constraining opportunities for early-stage ventures. A declining trend in early-stage funding highlights the need to enhance financial support for start-ups to sustain a robust flow of innovation. The Basel Area's specialization in biopharma is a key driver of its success, yet it also exposes the region to market fluctuations specific to this sector. Diversifying into medtech and digital health could create new avenues for cross-sector innovation, increase resilience, and position the Basel Area to address a broader range of healthcare challenges.

Overall, the Basel Area Life Sciences ecosystem demonstrates remarkable efficiency and productivity relative to its size, excelling in stakeholder density, infrastructure, and strategic investment. To remain competitive with larger ecosystems like Boston and London, the Basel Area must address gaps in early-stage funding, diversify its sector focus and streamline academic-industry collaboration. By building on its current strengths and pursuing these strategic opportunities, the Basel Area can further solidify its status as a leading global hub for Life Sciences innovation.

Further note: Please note that the data and information presented in this report may not be exhaustive and reflects the completeness and timeliness of the sources utilized. Readers are advised to interpret the findings within the context of the specified timeframes and to consider potential limitations in the data's comprehensiveness and accuracy as provided by the referenced databases and sources.

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About Basel Area Business & Innovation

Basel Area Business & Innovation is a non-profit agency dedicated to helping start-ups, institutions and companies find business success in the Basel Area. As an independent organization funded by the cantons of Basel-Stadt, Basel-Landschaft and Jura, as well as by the Swiss government and private foundations, we help develop a robust business climate and support innovative ventures. We attract and support companies moving into the area, connect organizations and entrepreneurs with collaboration partners, and help create a vibrant ecosystem that fosters innovation.

Innovative Life Sciences ecosystems

What are innovative ecosystems and why are they important?

Innovation in Life Sciences refers to the process of translating scientific discoveries and technological advancements into practical applications that improve health outcomes. This includes the development of novel drugs, medical devices, diagnostics and healthcare delivery models that address unmet medical needs and enhance patient care.

Innovative Life Sciences ecosystems are networks of interconnected organizations, including companies, research institutions, investors, service providers and healthcare facilities, which collaborate to drive innovation, cutting-edge solutions and economic growth.

These ecosystems bring together a diverse range of stakeholders and enable them to thrive by facilitating knowledge sharing, promoting the efficient use of resources, expertise and collaborative opportunities, and accelerating innovation pace, from discovery to delivery. Innovative Life Sciences ecosystems are essential for achieving breakthroughs that no single entity could accomplish alone, thereby impacting the economy and society positively.

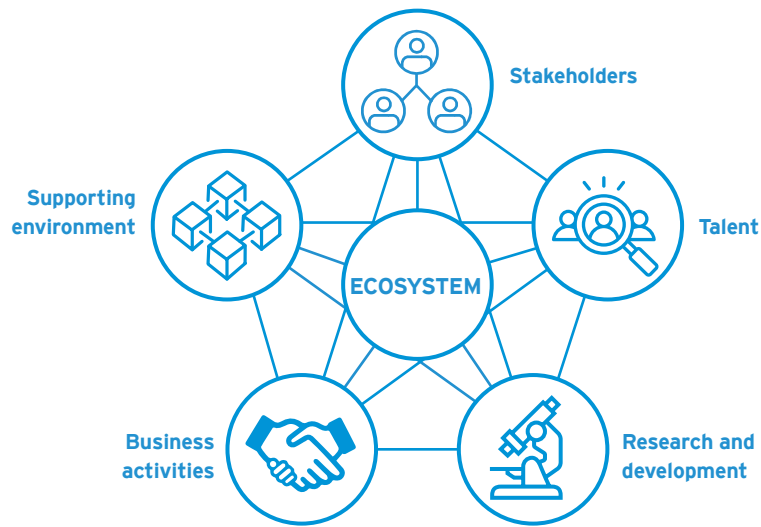
Elements of successful & innovative Life Sciences ecosystems

A successful Life Sciences ecosystem builds on different elements that, together, drive innovation and positively impact the economy.

We have identified five interdependent elements (Figure 1):

1. **Stakeholders** consist of companies, from start-up to large corporations, research institutions or investors working together directly or indirectly and driving business within the ecosystem.
2. **Talent** in the form of recent graduates or experienced employees is essential for any ecosystem to bring in new perspectives and effectively grow in the long term.
3. **Research and development** are the essence of the Life Sciences industry, and a truly successful ecosystem enables companies to develop and progress innovative therapies.
4. **Business activities**, considering deals or funding provided by investors, are at the heart of every ecosystem providing its stakeholders with the financial resources to transform promising ideas into innovative market-ready solutions.
5. **Supporting environment** such as a working infrastructure, a community network or partnership opportunities further help an ecosystem to attract new players, exchange knowledge and expertise, and accelerate innovation.






Figure 1: Ecosystem elements



Source: EY-Parthenon analysis teams

However, the mere presence of these elements is not sufficient to define a truly innovative ecosystem. All five elements need to come together for a Life Sciences ecosystem to flourish socially, economically and politically and ultimately to foster innovation. The success and effectiveness of an innovative Life Sciences ecosystem can be measured along various drivers which depend on the positioning, size and strategy of an ecosystem (Figure 2).

Figure 2: Selected drivers of ecosystem elements

Element	Driver
Stakeholders 	<ul style="list-style-type: none"> ▶ # Life Sciences companies¹ ▶ # Institutions (e.g., hospitals, universities, research centers, etc.) ▶ # Investors (e.g., Venture Capital, Private Equity, etc.)
Talent 	<ul style="list-style-type: none"> ▶ # Life Sciences graduates ▶ % International students ▶ # Employees in ecosystem ▶ % Employment across sub-sectors²
Research and development 	<ul style="list-style-type: none"> ▶ # Active clinical trials in the ecosystem ▶ # Pipeline assets per phase ▶ % Pipeline distribution by therapeutic area
Business activities 	<ul style="list-style-type: none"> ▶ # Deals and disclosed deal value ▶ % Deals by origin, type and subsector ▶ # Funding and disclosed funding value ▶ % Funding by origin, type and subsector
Supporting environment 	<ul style="list-style-type: none"> ▶ # Collaborations in clinical trials ▶ # Collaborations in pipeline assets ▶ # Publications from ecosystem ▶ # Available laboratory inventory

¹. Including for example, start-ups and established companies from biopharma, medtech and digital health, service providers, consulting agencies, manufacturing organizations, etc.

². Sectors include biopharma, medtech and digital health

For an innovative Life Sciences ecosystem to be successful, these drivers need to interact in a way that logically integrates and mutually reinforces each other's core strengths.

The foundation consists of a dense and diverse network of **stakeholders**. A high diversity of companies across various sectors offers opportunities for cross-disciplinary collaboration. The strong presence of research institutions, hospitals and universities provides platforms for new discoveries, research and development, and education of scientific talent. An active and engaged investor community supplies essential capital and strategic support to push high-risk, high-reward innovation forward.

Building on this foundation, the attraction, training and retention of **talent** is crucial. High-quality educational institutions produce Life Sciences graduates in relevant fields, ensuring a dense and diverse pool of skilled talent capable of translating fundamental research into practical applications and innovative solutions. Attracting international talent further enriches the ecosystem with diverse perspectives. Offering various employment opportunities across sub-sectors helps retain skilled professionals. Talent drives research and development, fueling the innovation process.

Research and development are driven by the exchange between academia and industry. This exchange ensures a continuous transfer of knowledge, resources and expertise, leading to the emergence of promising start-ups and skilled talent working for established companies. The result is a steady pipeline of ideas as well as numerous active clinical trials with assets across development stages and therapeutic areas. Both demonstrate a commitment to advancing medical and scientific knowledge and can lead to strong patent activity, intellectual property and investment in research and development.

Access to **capital and funding** plays a critical role in helping companies, especially early-stage start-ups facing the high-risk phase known as the "valley of death", to survive, scale and progress innovation. While sufficient funding from local and international sources ensures that companies can secure necessary capital at all stages, high funding values from different investor types contribute to a stable financial environment. Significant deal flow across sectors facilitates growth and expansion and indicates that innovative therapies and solutions are ready for scaling and commercialization.

At the base of these elements there is a **supporting environment** that enhances efficiency and sustainability. High levels of collaboration, especially in clinical trials and pipeline assets, accelerate development and leverage collective expertise. Robust publication output enhances the ecosystem's reputation and disseminates knowledge globally. Adequate laboratory and research space provides the infrastructure necessary for ongoing research and growth.

The seamless integration of these elements and the realization of key success factors (summarized in Table 1) within each element, creates a dynamic and resilient ecosystem. Stakeholders collaborate, talent drives research, innovation emerges from their synergy, business enables market realization, and supporting factors sustain operations. Each element reinforces the others, aligning individual efforts toward the common goal of delivering transformative innovation. This in turn signals to international stakeholders that the ecosystem is fertile ground for relocation and active participation in advancing innovation and economic growth. The resulting attraction of external companies, investors, and talent positively impacts ecosystem growth and the development of innovative therapies and healthcare solutions, ultimately allowing an innovative Life Sciences ecosystem to realize its full potential.



Table 1: Success factors of ecosystem elements

Element	Success factor 1	Success factor 2	Success factor 3
Stakeholders	High diversity of companies covering various sectors	Strong presence of research institutions, hospitals and universities	Active, robust and broad investor community that is engaged with the ecosystem
Talent	High output of Life Sciences graduates in relevant scientific fields	Strong attraction of international talent incl. students, professors and professionals	Various employment opportunities across the Life Sciences value chain and sub-sectors
Research and development	Diverse pipeline with numerous assets balanced across various development stages and therapeutic areas	Numerous active clinical trials balanced across trial phases and therapeutic areas	Strong patent registration activity with high registrations across sub-sectors
Business activities	Significant deal flow with high number of deals across sectors	Sufficient funding with various funding mechanisms from local and international sources	High level of funding value from different investor types
Supporting ecosystem	High level of collaboration particularly in clinical trials and pipeline assets	Robust publication output with numerous authors having an affiliation with the Basel Area	Adequate laboratory and research space for both start-ups and established companies

Source: EY-Parthenon analysis teams

Examples of innovative ecosystems

To understand the characteristics of successful Life Sciences ecosystems, we examine three examples of established hubs that are well-known for their contribution to Life Sciences innovation: Boston, London, and the Basel Area. Each of these hubs is unique in its approach to innovation, environment, constitution, and the way it contributes to the global Life Sciences industry.

Boston: Located in the United States, Boston is renowned for its vibrant Life Sciences ecosystem. The city hosts numerous global pharmaceutical companies, biotech firms, research institutions and prestigious universities like Harvard and MIT. Boston's ecosystem thrives on robust collaboration between academia and industry, significant funding activities and a strong emphasis on early-stage ventures. This dynamic environment fosters innovation, attracts international talent and consistently develops groundbreaking therapies and technologies.

London: As the capital of the United Kingdom, London is a global economic center with a diversified Life Sciences sector. The city hosts numerous biotech companies, research

institutions and world-class universities like Imperial College London and University College London. London's ecosystem benefits from its international connectivity, substantial investment activities and a strong financial sector that supports Life Sciences ventures. While Life Sciences represent a smaller portion of London's overall economy compared to Boston and Basel, the city excels in attracting global talent and fostering innovation across various sub-sectors, including biopharma, medtech and digital health.

Basel Area: Situated in northwestern Switzerland near the borders of Germany and France, the Basel Area encompasses the cantons of Basel-Stadt, Basel-Landschaft, and Jura (Figure 3). The Basel Area is an economic powerhouse, one of Switzerland's most dynamic business environments, as well as one of Europe's most successful Life Sciences ecosystems. It is a thriving hub for innovation and home to numerous leading companies, research centers, and investors. The high density of leading Life Sciences companies such as Novartis, Roche, Abbott, Moderna, Johnson & Johnson, Bayer, or Lonza attracts further up-and-coming small and mid-sized companies like Alentis, Cimeio, and T3 Pharma. The presence and collaboration of a high variety of sectors, such as biotechnology, pharmaceuticals, medtech, digital health and chemistry, makes the Basel Area a top-tier Life Sciences cluster.

Figure 3: Basel Area ecosystem geographic location

Cantons covered by the ecosystem




Source: EY-Parthenon analysis teams; Basel Area

Each of these ecosystems is unique in their existence, and a first high-level comparison of inhabitants, area and GDP per capita outlines the differences and exceptional positioning of the Basel Area (Table 2). Despite its smaller geographical size and population, the Basel Area is outperforming the larger cities of Boston and London with a ~21% higher GDP per capita in comparison to Boston and a ~82% higher GDP per capita in comparison to London. The unique strength

of economic productivity can especially be seen when comparing the nominal Life Sciences labor productivity¹ per hour between ecosystems. For this metric, the Basel Area (CHF 115 per hour) again outperforms by far the valued Life Sciences productivity for Boston and London (both CHF 53 per hour) and even lies above the Swiss average of CHF 100 per hour (Table 2).

Table 2: Overview of the Basel Area, Boston and London ecosystems

Ecosystem	Inhabitants	Area	GDP per capita	Productivity
 Basel Area	~ 580,000	~ 1,400 km ²	CHF 116,457.8	CHF 115 per hour
 Boston	~ 4,941,632	~ 9,029 km ²	CHF 96,294.8	CHF 53 per hour
 London	~ 8,945,000	~ 1,572 km ²	CHF 63,934.7	CHF 53 per hour

Source: EY-Parthenon analysis teams; Websites of cantons Basel-Stadt, Basel-Landschaft and Jura; BAK economics; BAK Economics & Interpharma, "Bedeutung der Pharmaindustrie für die Schweiz", 2024

Note: GDP per capita does not consider employees of the ecosystem with a residence in a neighboring state, county, or country. This may cause an overrepresentation of the actual GDP value.

Labor productivity is often used as an indicator to evaluate the competitiveness of a sector or location. It reflects the relation of work effort and the creation of value and depends on the interaction of various factors such as availability of stakeholders, highly skilled talent and supportive elements such as infrastructure and collaborative culture.

A high nominal labor productivity suggests that the different elements of an ecosystem smoothly integrate and interplay enabling the region to flourish. Comparing the five ecosystem elements defined above of the Basel Area, Boston, and London and how they come together helps to better understand how a successful Life Sciences ecosystem becomes truly innovative. Further, it shows how different factors may contribute to an ecosystem's success and explains why especially the Basel Area stands out as a dynamic and entrepreneurial ecosystem on a global scale.

Aim and objectives of this study

We hypothesize that the Basel Area is an innovative Life Sciences ecosystem that provides an innovation-favorable environment and a platform for future growth. This is due to

its high economic productivity, concentrated Life Sciences industry, strong collaborative culture and effective integration of the key elements that constitute a successful ecosystem.

Therefore, this study focuses on evaluating the Basel Area's effectiveness as an innovative Life Sciences ecosystem by analyzing it through the lens of the five key elements stakeholders, talent, research and development, business activities and supporting environment.

To test and verify this hypothesis, our study aims to cover the following three key objectives:

1. To assess the Basel Area's performance across the five key elements of a successful Life Sciences ecosystem.
2. To compare the Basel Area with other leading ecosystems, specifically Boston and London, to understand how different factors contribute to their success.
3. To identify the strengths and areas for improvement within the Basel Area ecosystem, providing insights to enhance its global competitiveness.

¹ BAK Economics & Interpharma, "Bedeutung der Pharmaindustrie für die Schweiz", 2024

Ecosystem evaluation: The Basel Area in perspective

Stakeholders

Stakeholders form the backbone and function as the engine of a successful and innovative Life Sciences ecosystem. The different stakeholders within an innovative ecosystem need to act jointly to boost cutting-edge technology, develop breakthrough therapies and attract new companies and talent. Achieving critical mass and the right balance across different stakeholder types is fundamental for any ecosystem to effectively drive innovation and directly influences the availability of funding, collaboration, talent, research output and economic growth.

The Basel Area's Life Sciences ecosystem is distinguished by its dense and diverse network of stakeholders, encompassing over 650 companies (Figure 4). This network includes global pharmaceutical giants such as Roche and Novartis, as well as a wide variety of start-ups and specialized firms across biopharma, medtech and digital health sectors. More than 260 companies have their headquarters in the region, underscoring the Basel Area's attractiveness as a central hub for innovation.

The region hosts 13 research centers and 13 science and technology parks, such as the Switzerland Innovation Parks or the Tech Park Basel, serving as collaborative platforms for industry leaders, academic researchers and emerging companies. The ecosystem is further enriched by three universities with over 250 research groups in Life Sciences, providing access to groundbreaking research and cultivating a growing pool of scientific talent.

An active investor community of more than 60 investors, including venture funds, venture capital firms and accelerators, such as the Novartis Venture Fund, BaseLaunch, Versant Ventures, Pureos Bioventures and BioMedPartners, provides financial backing and industry expertise. This healthy investment landscape supports ventures of all sizes and throughout the ecosystem, facilitating sustained growth and innovation.



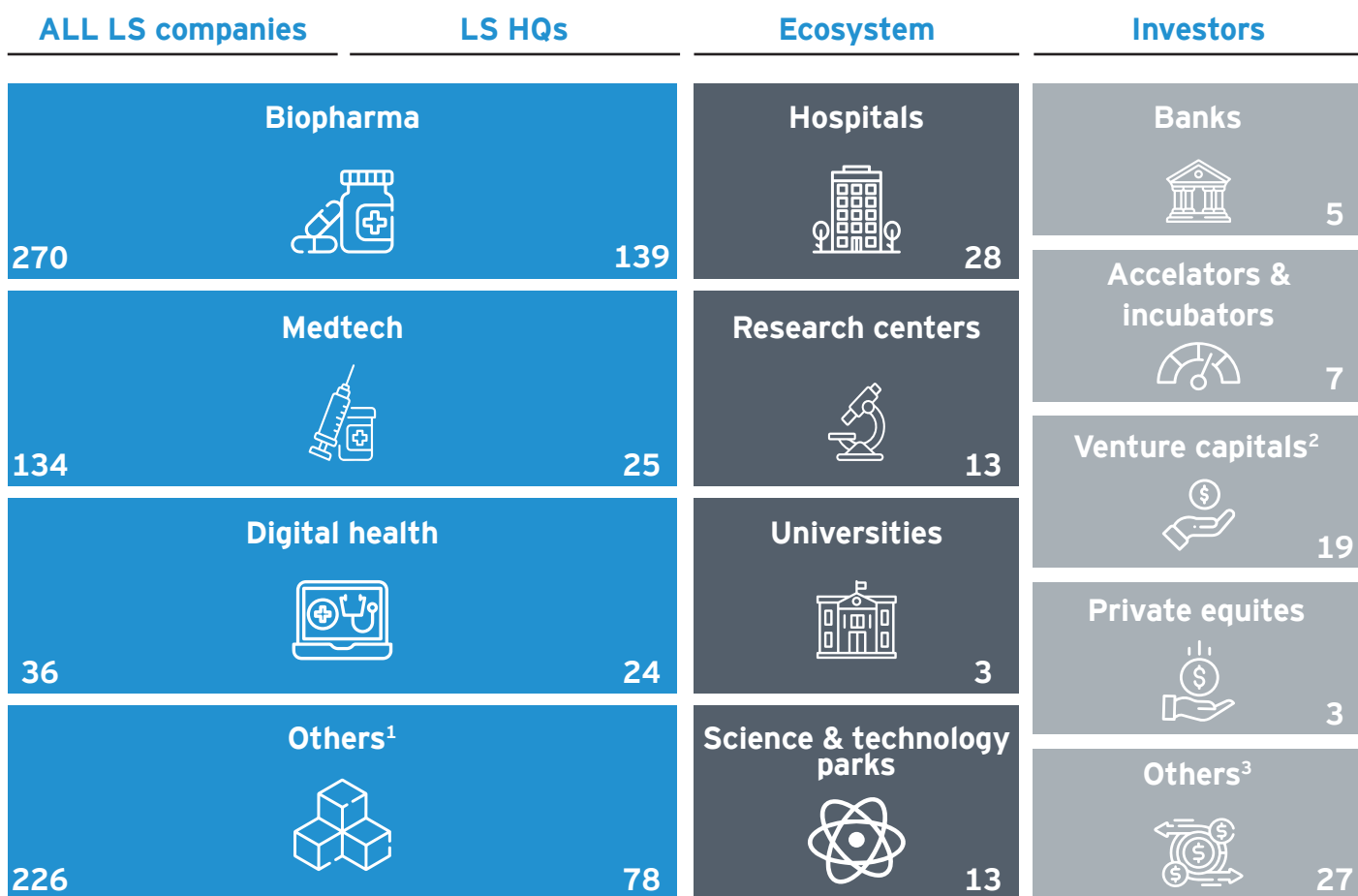
“

There are more than 700 biopharmaceutical companies in the region, from small companies to giants like Novartis and Roche. It's an important center if you want to include Europe in your vision of a global company.”

John V. Oyler; Co-founder, CEO and Chairman BeiGene, Basel

Figure 4: Basel Area stakeholder ecosystem

Stakeholders by category within the Basel Area ecosystem



Source: EY-Parthenon analysis teams; Basel Area; BAK economics; Margermarket; Crunchbase

Note: Only companies and investors with headquarters in the Basel Area were considered in this analysis, other companies with offices in the Basel Area may not be included.

¹ Other stakeholders linked to the Life Sciences sector, e.g., consulting firms, government institutions, chemical companies, device providers, etc.

² Including venture debts and venture funds

³ Other investors include family offices, government programs, public funds or charities

The Basel Area stakeholder network includes global leaders, established players and a robust start-up scene which has led to the emergence of more than 100 successful companies such as Bottneuro, Engimmune Therapeutics and Onena Medicines. Start-ups and spin-offs often choose to set up their offices in innovation parks like the Switzerland Innovation Park Basel Area in Allschwil and Jura, or the Novartis Campus in Basel to collaborate with major industry players and benefit from a supportive, interconnected environment.

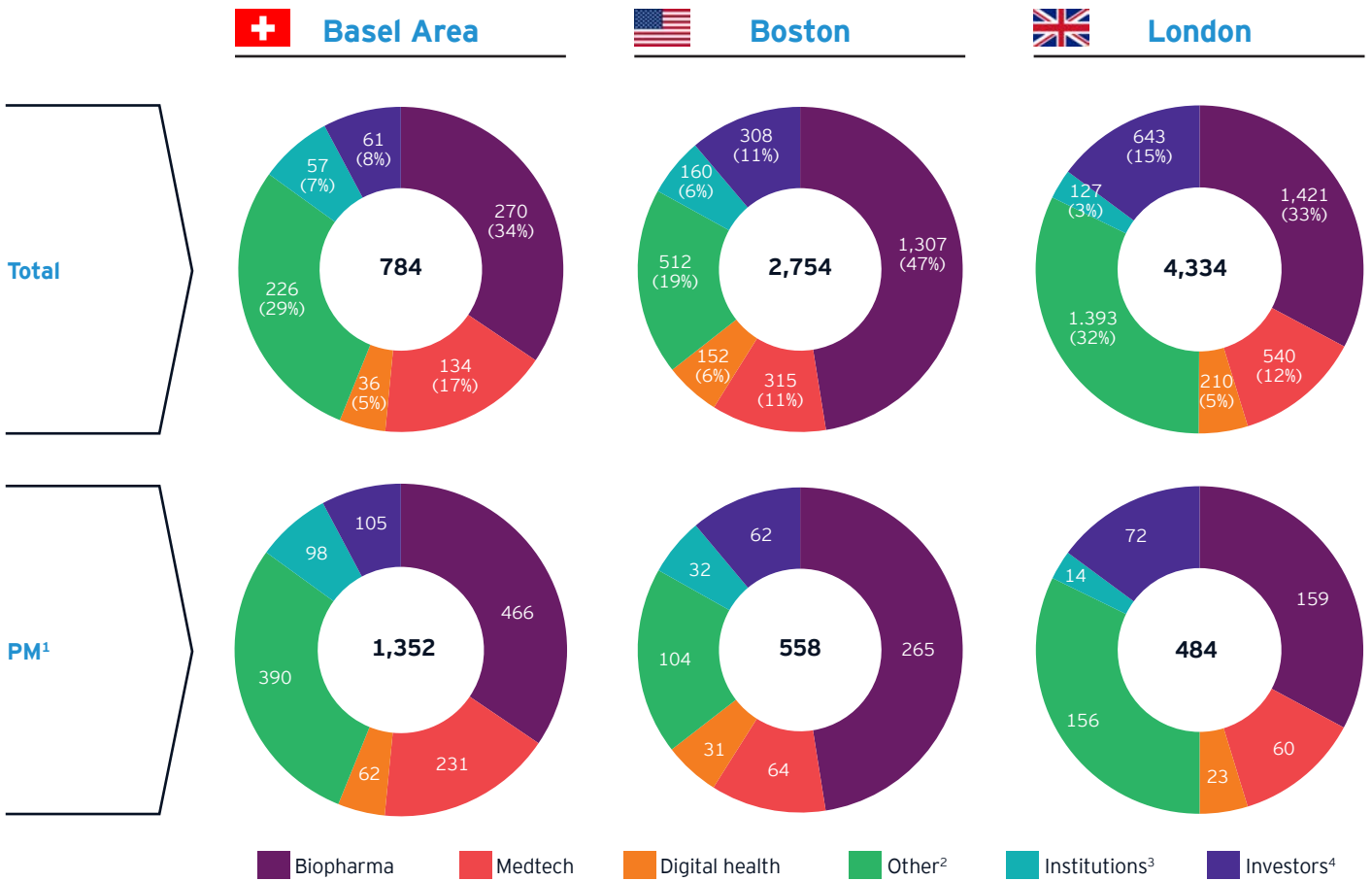
In comparison, the larger ecosystems of Boston and London have a greater total number of stakeholders due to their size and international standing (Figure 5; Appendix Figure 1 and 2). Especially London as the financial capital of Europe is home to many more potential investors.

¹ Source: Basel Area Business & Innovation

However, the Basel Area displays a higher density of Life Sciences stakeholders per million inhabitants. Additionally, it exhibits a slightly more balanced diversity across stakeholder types in comparison with Boston, which has a high focus on biopharma (47%). This higher concentration and diversity create fertile ground for cross-sector collaboration, leading to accelerated and more robust research and innovation. Further, this combination allows the Basel Area to operate as an agile, highly integrated ecosystem that has the potential to swiftly adapt to market changes while continuously driving innovation and economic success. The latter can be noticed in Basel Area's position as a major exporter of Life Sciences products, accounting for CHF 75.5 billion, or 63% of Switzerland's total Life Sciences exports¹.

Figure 5: Stakeholder landscape of the Basel Area, Boston, and London

Stakeholders by category within the Basel Area ecosystem



Source: EY-Parthenon analysis teams; Crunchbase; BiotechGate

Note: Data from Crunchbase was used to identify stakeholder numbers. Data may be non-exhaustive, and more stakeholders could be within the respective ecosystems;

¹ PMI = per million inhabitants

² Other stakeholders include data and service providers, consulting firms, pharmacies, chemical companies or medical service provider

³ Number of relevant hospitals, research centers, universities and science & technology parks in the ecosystem

⁴ Number of relevant banks, accelerators / incubators, venture capitals, private equities and other investor types in the ecosystem

However, all three ecosystems can further enhance their competitiveness and robustness. In an era where artificial intelligence and machine learning are increasingly influential in data analysis, diagnostics and therapy planning, expanding the number of companies in digital health could benefit all three ecosystems. Especially for the Basel Area, a stronger emphasis on digital health, which is gaining more importance at the intersection with pharma, could be a strategic move to

maintain and enhance its competitiveness against the larger ecosystems of Boston and London. Given that the Basel Area cannot match these ecosystems in the total number of stakeholders due to its smaller size, investing in advanced technological solutions and innovative digital health products would allow the ecosystem to differentiate itself from its competitors and to put its focus on quality and innovation rather than quantity.

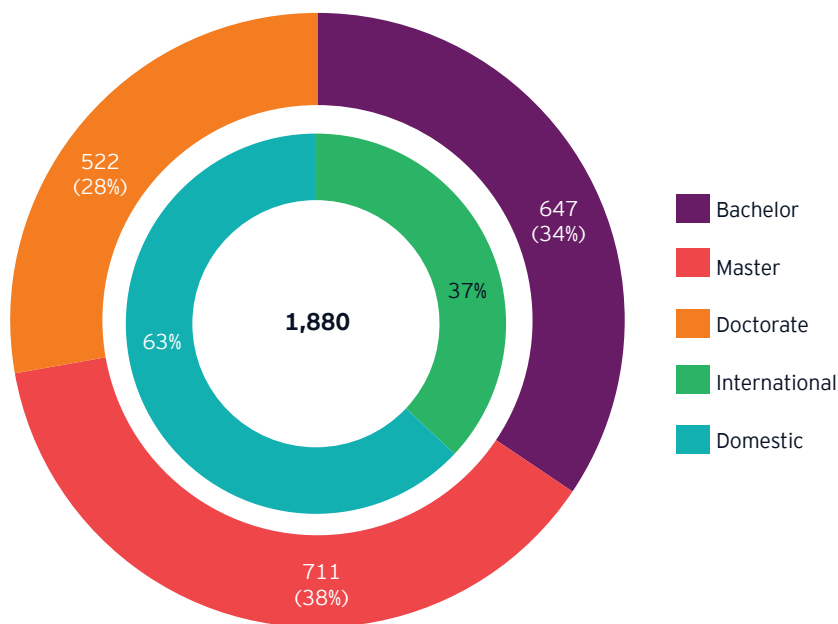
Talent

If stakeholders are the engine of a successful Life Sciences ecosystem, Talent is the fuel, providing the skills and expertise necessary to translate research into real-world applications. A strong talent pool and a continuous influx of highly skilled individuals into the ecosystem power innovation and business development, enabling start-ups and established companies alike to thrive. Attracting and nurturing diverse talent is critical for maintaining a competitive edge and fostering sustainable growth within the ecosystem.

The Basel Area talent pool is backed by three key academic institutions within the region, the ETH Zurich Department of Biosystems Science and Engineering (D-BSSE) in Basel, the University of Basel (Switzerland's oldest university) and the University of Applied Sciences Northwestern Switzerland (FHNW) School of Life Sciences in Muttenz. Together, these universities produce a significant number of annual Life Sciences graduates, including 647 bachelor's degrees, 711 master's degrees and 522 PhDs in 2023 (Figure 6). When comparing the total number of graduates in 2023, the Basel Area is far behind Boston's 13,205 and London's impressive 55,000 graduates. This is not surprising given Boston's 42 universities and colleges and London's 25 universities.

Figure 6: Basel Area Life Sciences graduates by degrees and origin

Life Science graduates by degree type and share (%) of international students, 2023



Source: EY-Parthenon analysis teams; University websites (University Basel, ETH BSSE, FHNW)

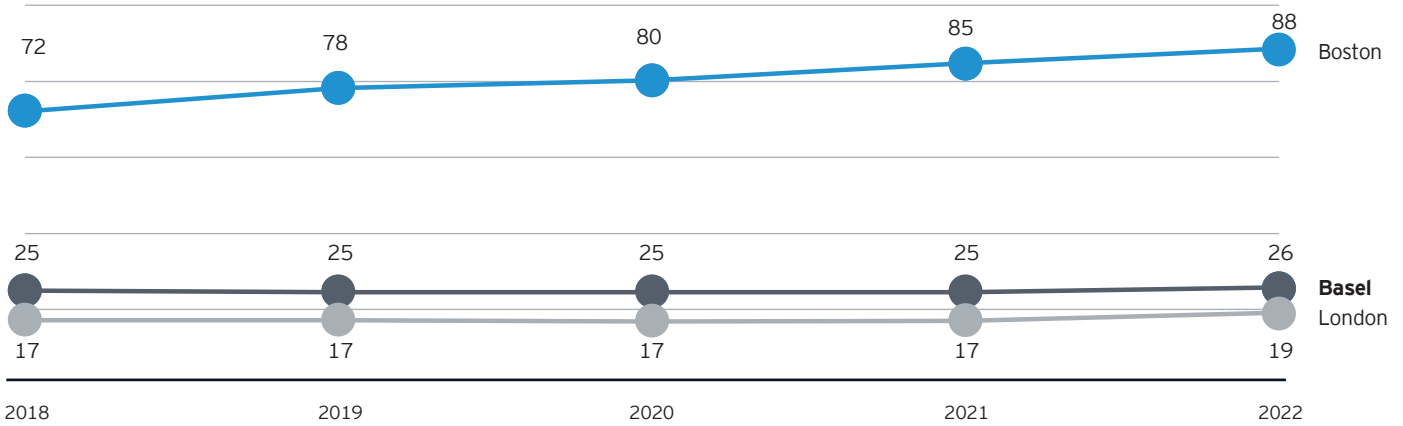
However, quantity is no guarantee for quality. With more than 250 research groups, the academic institutions of the Basel Area are as likely to contribute to fundamental and cutting-edge research as those of the other two ecosystems. The academic output is enriched by a global perspective as 37% of the graduates come from international backgrounds, contributing also to the region's cultural and intellectual diversity (Figure 6). Many domestic and international students are drawn to the Basel Area due to opportunities to engage with leading Life Sciences companies. Upon completing their studies, a substantial proportion of graduates (31%) transition into industry roles within the

region's Life Sciences ecosystem and 52% pursue research careers in academia.

Between 2018 and 2022, the Basel Area and London were able to maintain the number of employees in their highly specialized workforce in the Life Sciences sector (Figure 7). However, Boston stands out with a larger total number of Life Sciences employees and a compound annual growth rate of approximately 5%, reflecting its strong focus on Life Sciences. In contrast, London has fewer Life Sciences employees than the Basel Area, indicating that Life Sciences play a smaller role in London's economy.

Figure 7: Historical development of employment

workers in thousands, 2018 - 2022



Source: EY-Parthenon analysis teams; BAK economics; MassBioEd Massachusetts Life employment outlook 2024; MedCity; growLondon

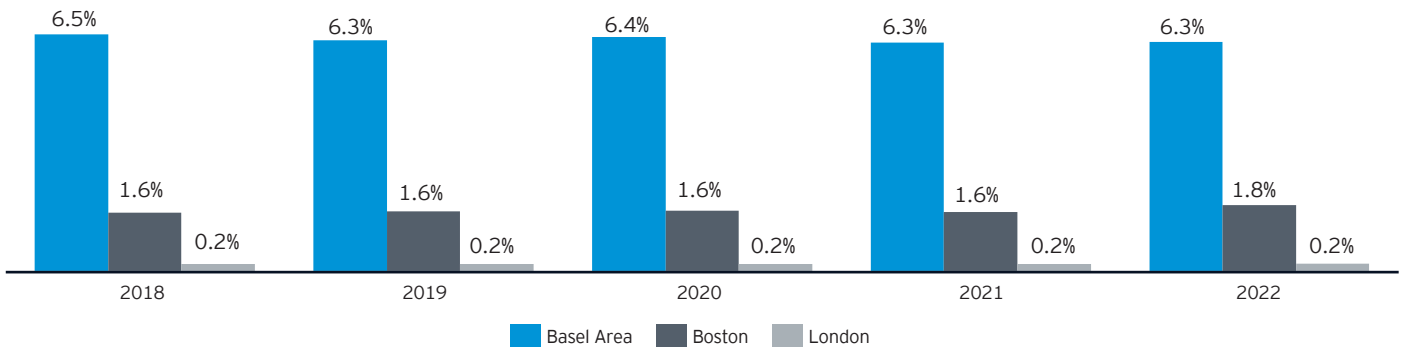
Note: Based on employment reports of MassBioEd, the Boston Planning & Development Agency (BPDA) research division and information from the Hinrich foundation, the employment numbers of the Suffolk and Middlesex counties have been used to calculate the total number of employees within the Boston ecosystem under the assumption that companies with their respective employees not located in Suffolk are with very high likelihood closely located to the borders of Suffolk.

When looking at the share of Life Sciences employees from the total number of employees in the ecosystem, it is the Basel Area that stands out with the highest concentration of Life Sciences employees, consistently hovering just above 6% between 2018 and 2022 (Figure 8). This share is more than

three times higher than for Boston (around 2%) and over thirty times higher than for London (approximately 0.2%). This high level of economic specialization highlights the critical importance of the Life Sciences sector as a primary driver of the Basel Area's regional economy.

Figure 8: Share of Life Sciences employment from total employment over time

Share (%) of Life Sciences employment from total employment by ecosystem, 2018 - 2022



Source: EY-Parthenon analysis teams; Basel Area; BAK economics; MassBioEd Massachusetts Life employment outlook 2024; MedCity; growLondon

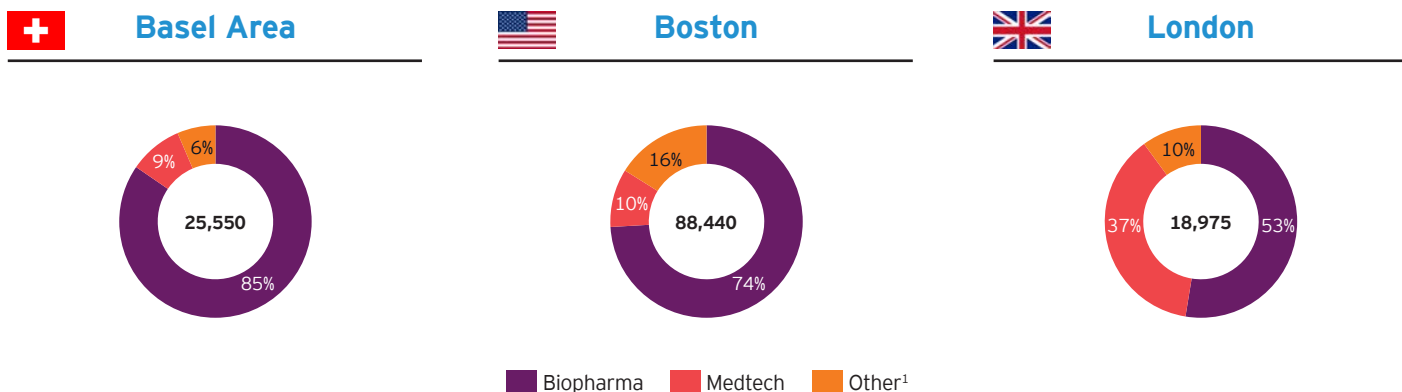
Note: Based on employment reports of MassBioEd, the Boston Planning & Development Agency (BPDA) research division and information from the Hinrich foundation, the employment numbers of the Suffolk and Middlesex counties have been used to calculate the total number of employees within the Boston ecosystem under the assumption that companies with their respective employees not located in Suffolk are with very high likelihood closely located to the borders of Suffolk.

A high concentration of Life Sciences employees leads to a robust talent pool and attracts global companies, researchers and investors. It fosters deep integration of expertise, where different stakeholders can easily collaborate due to the density of specialized talent. However, with approximately 85% of its Life Sciences employees in one sector, the Basel

Area's workforce is heavily concentrated in biopharma in comparison to Boston's 74% and London's 53% (Figure 9). This sectoral focus enhances specialization and expertise but also means the ecosystem is highly dependent on the success of the biopharma industry, exposing it to biopharma-specific market risks.

Figure 9: Ecosystem sector distribution of employment

Share (%) of total, 2022



Source: EY-Parthenon analysis teams; BAK economics; MassBioEd Massachusetts Life employment outlook 2024; MedCity; growLondon

¹ Other sectors include research and development, data and service providers, consulting firms, pharmacies, chemical companies and medical service providers.

To mitigate these risks and enhance resilience, the Basel Area should diversify and balance employment across other Life Sciences sectors such as medtech and digital health. A higher diversification as seen in Boston and London could create new opportunities for cross-sector innovation and make the ecosystem more adaptable to market volatility and technological advancements. While the Basel Area's three universities cannot compete with the sheer number of graduates produced by the numerous universities in Boston and London, the region can attract domestic and international talent by offering attractive employment opportunities across sectors. By providing compelling career prospects, competitive salaries and a dynamic work environment, the Basel Area can draw skilled professionals from around the world. This strategy helps to bolster its talent pool despite producing fewer graduates locally, sustaining its competitive edge in the global Life Sciences industry.

Research and development

Research and development (R&D) are critical to enhance innovation in Life Sciences ecosystems, leading to medical and scientific breakthroughs that improve an ecosystem's reputation and economic growth and contribute to patients' health outcomes. Successful R&D relies on talent, investment and collaboration, and at the same time attracts stakeholders, creates business opportunities and directly impacts patient care.

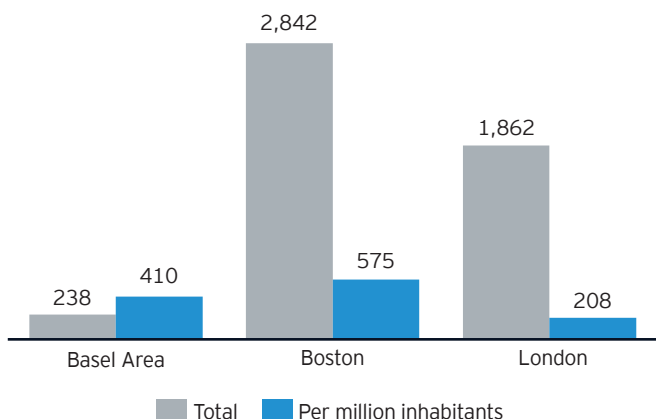
All three ecosystems demonstrate an exceptional R&D activity (Figure 10). In terms of density, the Basel Area, with its 410 active trials per million inhabitants, surpasses

London's 208, and comes close to Boston's 575, but lags behind in terms of absolute numbers due to its smaller size. Overall, this high trial density underscores the region's deep involvement in advancing drug development toward market-ready therapies, yet it suggests competitive patient recruitment and potential limitations due to the smaller population.

Regarding trial distribution across phases, the Basel Area focuses heavily on later-stage trials that are close to commercialization, with 59% of its trials being in phase III. This outlines the ecosystem's strength in advancing therapies across phases toward regulatory approval. Consequently, with only 9% of trials in phase I and 23% in phase II, early-stage trials are less prominent in the Basel Area in comparison to Boston (19% of trials in phase I and 33% in phase II) and London (10% of trials in phase I and 26% in phase II). This tilt towards advanced stages may be influenced by the ability of the region to attract international companies that see in the Basel Area the right spot to perform late-stage clinical trials but also by the Basel Area's strong presence of established biopharma companies, such as Roche and Novartis, which often concentrate resources on therapies with substantial preclinical or early clinical support. This strategy minimizes risk by focusing on assets with demonstrated viability, aligning with investor preferences in the region for later-stage investments. However, balancing this distribution towards earlier clinical phases by attracting and supporting more early-stage ventures, financially but also operationally, could enrich and expand the Basel Area's early-stage research and ensure a continuous clinical development of innovative treatments which can then move to advanced clinical trial stages.

Figure 10: Active clinical trials in ecosystem

trials in area and share (%) per phase by ecosystem, July 2024



Phase	Basel Area	Boston	London
I	9%	19%	10%
I/II	5%	14%	11%
II	23%	33%	26%
II/III	3%	3%	5%
III	59%	31%	48%

Source: EY-Parthenon analysis teams; ClinicalTrials.Gov

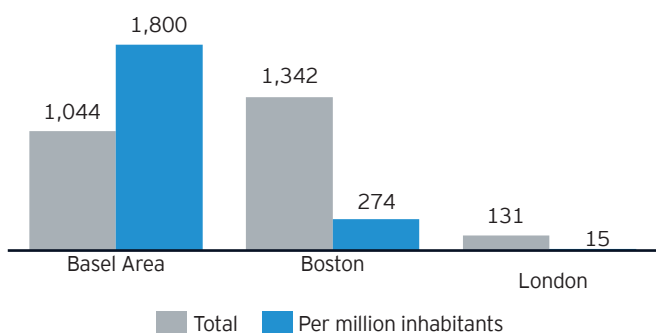
Note: Pipeline data retrieved from TrialTrove on 17 July 2024 using filters: Trial Status = Planned & Ongoing, Sponsor HQ City = Basel, Boston & Cambridge, or London; Clinical trial data retrieved from Clinicaltrials.gov on 17 July 2024 using filters: Location = Basel, Boston & Cambridge, or London, "Not yet recruiting", "Recruiting", and "Active not recruiting"; Any study beyond phase III or observational study has not been considered and included in the evaluation.

Despite its smaller size, the Basel Area excels in generating pipeline assets (drugs, treatments and formulations currently in clinical testing and development) with its 1,044 total assets competing with Boston's 1,342 assets and far exceeding London's 131 assets (Figure 11). This high asset count underscores the region's efficiency in translating research into clinical development. Examining the distribution of these pipeline assets across development phases reveals that companies headquartered in the Basel Area have a particular strength in mid-stage development, approximately 37% of the Basel Area's assets are in phase II.

Except for phase III, in which both the Basel Area and Boston outperform London with only 14% of assets in phase III, the share of trials distributed across the phases look similar for the three ecosystems. This demonstrates that all three regions have the capability to advance early-stage therapies towards mid- and late-stage development, except that some companies headquartered in London may face potential hurdles to successfully transition all their assets from phase II to phase III. Yet, since all three ecosystems show a similar pattern of trial distribution, it is to be assumed that all follow a common trend which may not follow specific rules.

Figure 11: Pipeline status of ecosystems

pipeline assets with sponsor HQ in area and share (%) per phase by ecosystem, July 2024



Phase	Basel Area	Boston	London
I	25%	30%	30%
I/II	12%	14%	21%
II	37%	30%	32%
II/III	2%	2%	4%
III	23%	24%	14%

Source: EY-Parthenon analysis teams; TrialTrove

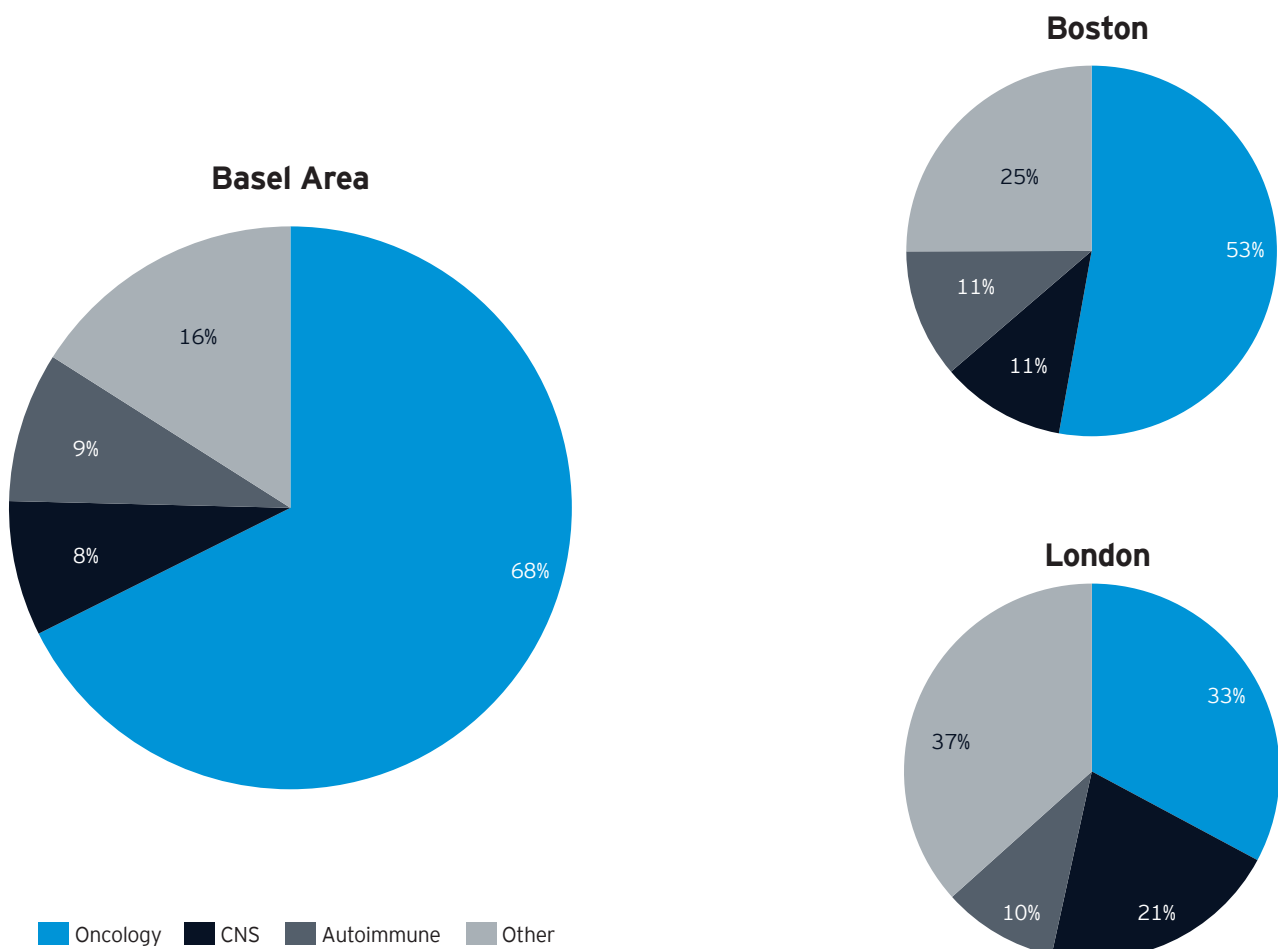
Note: Pipeline data retrieved from TrialTrove on 17 July 2024 using filters: Trial Status = Planned & Ongoing, Sponsor HQ City = Basel, Boston & Cambridge, or London; Clinical trial data retrieved from Clinicaltrials.gov on 17 July 2024 using filters: Location = Basel, Boston & Cambridge, or London, "Not yet recruiting", "Recruiting", and "Active not recruiting".

The Basel Area pipeline is heavily specialized: 68% of its assets are concentrated in oncology, reflecting the influence of the portfolio strategies of global giants Roche and Novartis headquartered in the region as well as an overall focus of academic institutions and local start-ups in this field (Figure 12). While this specialization attracts talent and investment, it may reduce resilience and limit the ecosystem's ability to address a broader range of diseases. To enhance competitiveness and reduce dependency on these major players, the Basel Area could, like Boston and London,

diversify its pipeline by expanding efforts in therapeutic areas like infectious diseases, metabolic disorders, autoimmune conditions and CNS disorders. This ultimately means more companies and ventures conducting R&D outside of oncology would need to be supported, financially or systemically, and (re-)located to the ecosystem. This would allow the Basel Area to address a wider range of unmet medical needs, strengthening its position as a comprehensive Life Sciences hub that is capable of developing innovative therapies for those patients who need it most.

Figure 12: Pipeline distribution across therapeutic area

Share (%) of therapeutic area by ecosystem, July 2024



Source: EY-Parthenon analysis teams; TrialTrove

Note: Pipeline data retrieved from TrialTrove on 17 July 2024 using filters: Trial Status = Planned & Ongoing, Sponsor HQ City = Basel, Boston & Cambridge, or London; Clinical trial data retrieved from Clinicaltrials.gov on 17 July 2024 using filters: Location = Basel, Boston & Cambridge, or London, "Not yet recruiting", "Recruiting", and "Active not recruiting".

In conclusion, the Basel Area's R&D activities demonstrate a highly efficient and specialized ecosystem that excels relative to its population size. By addressing opportunities for diversification and early-stage research expansion, the Basel Area can enhance its innovation capacity, sustain growth and maintain its competitive edge against the larger ecosystems of Boston and London.

Business activities

Business activities, such as access to capital in form of deals and funding, are vital for Life Sciences ecosystems. They provide the financial support necessary for start-ups and established companies to transform innovative ideas into market-ready solutions. Deals (especially acquisitions) and investments create pathways for companies to scale their operations and expand their market reach. Access to diverse funding sources, including venture capital, private equity, or public investments (such as grants), is crucial for sustaining growth, especially for early-stage ventures navigating high-risk phases. A strong business environment fosters stability, drives long-term economic growth, supports ongoing research and development, and attracts new stakeholders that nurture further innovation.

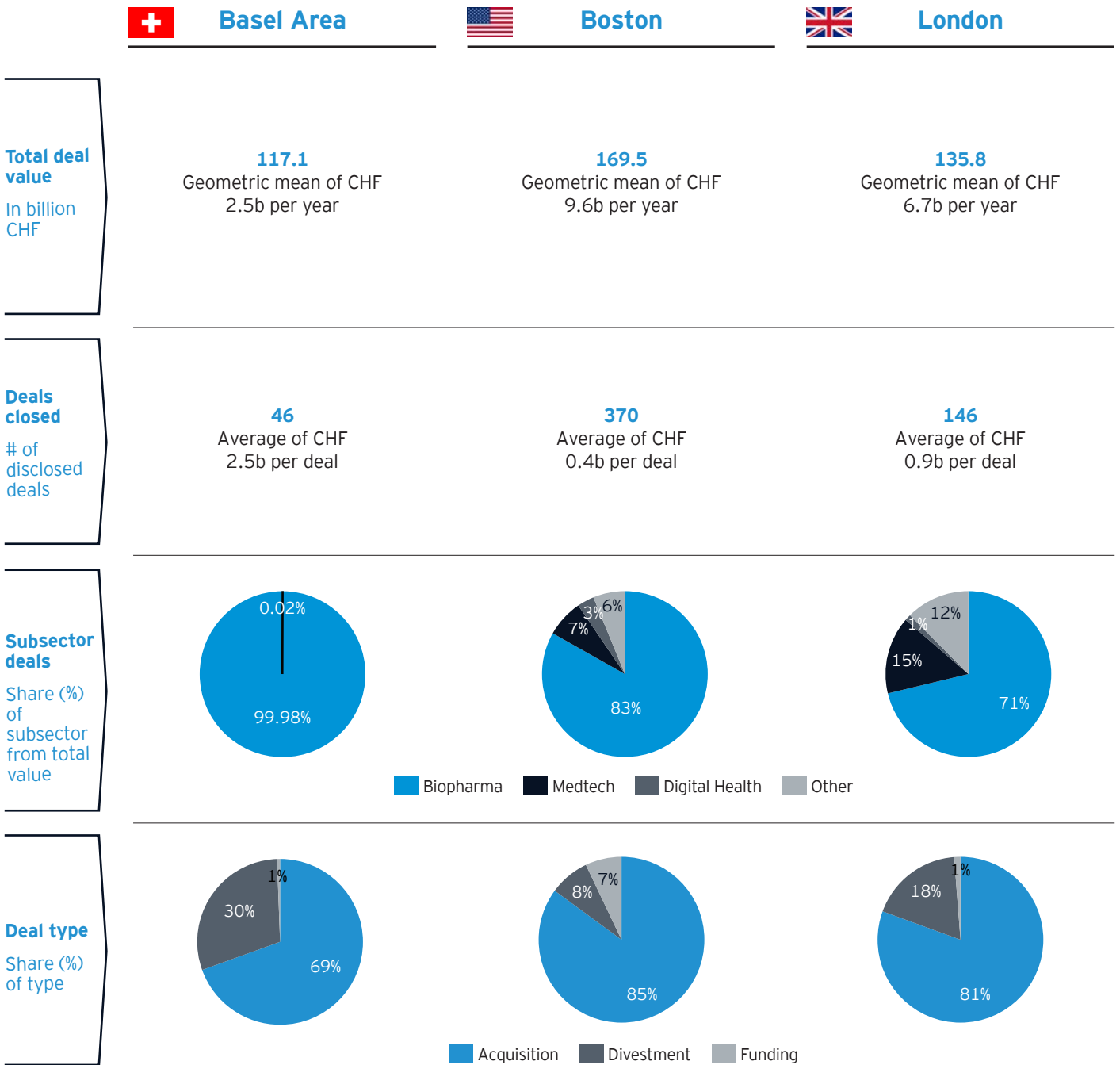
Deal activities

Despite its smaller size, the Basel Area exhibits notable business activity compared to the two larger ecosystems. In total deal count between 2015 and 2023, the Basel Area completed 65 deals, while Boston and London saw 441 and 241 deals conducted, respectively. However, due to non-disclosure, only 46 Basel Area deals, 370 Boston deals and 146 London deals were included in the analysis. In this time frame, the Basel Area achieved a total deal value of CHF 117 billion across the 46 disclosed deals, averaging CHF 2.5 billion per deal (Figure 13). While the number of deals is significantly lower than Boston and London, Basel Area's high average deal value indicates a focus on high-stake, large-scale transactions. This targeted investment approach is largely driven by major local players such as Roche, Novartis, Johnson&Johnson and Syngenta, whose strategic moves have shaped the region's deal landscape.



Figure 13: Cumulative deal activities across ecosystems

Respective cumulative data covering 2015 to 2023



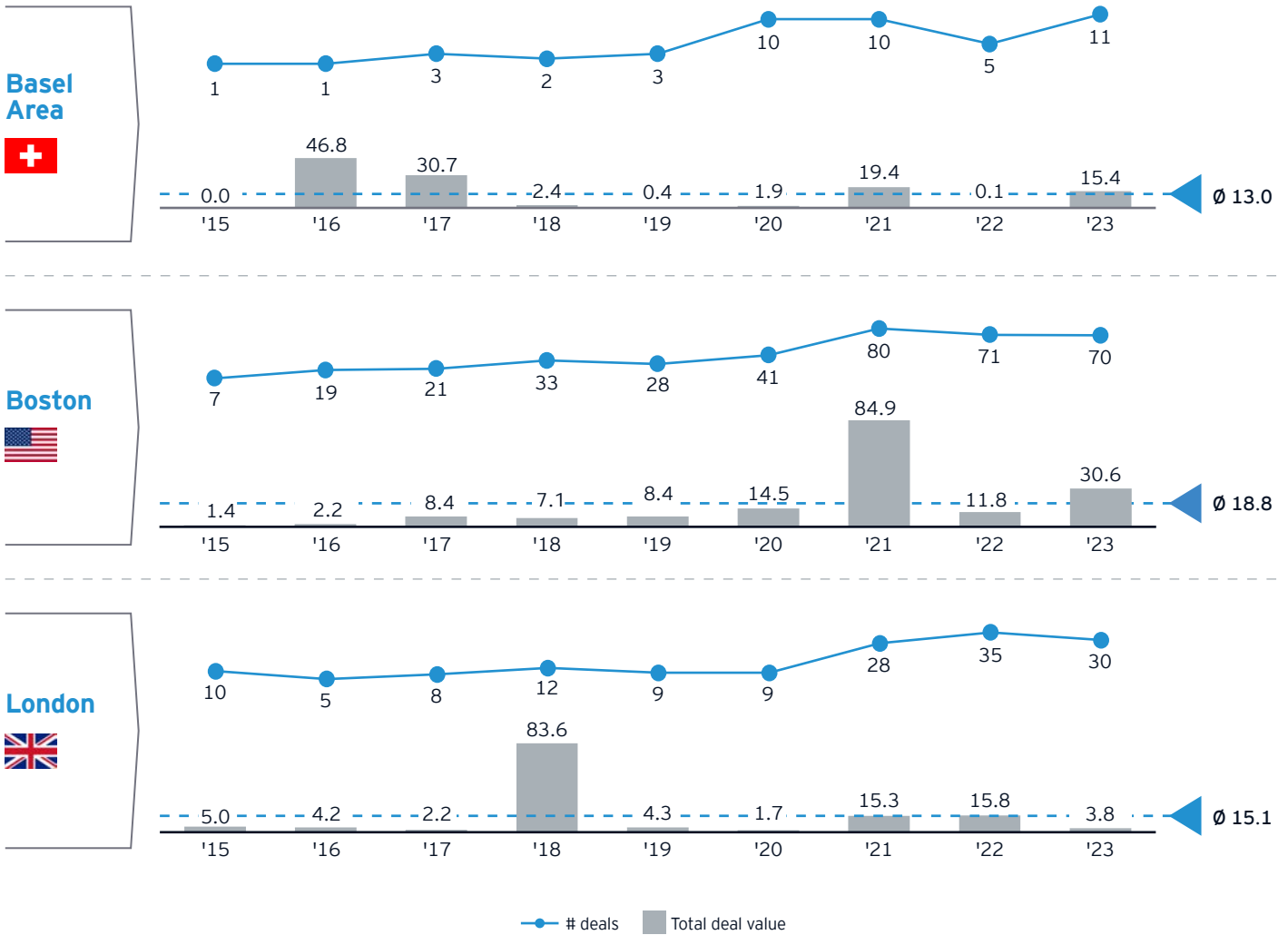
Source: EY-Parthenon analysis teams; Mergermarket

Note: Deal-type funding arises from strategic partnerships or transactions within the ecosystem, such as joint ventures or licensing agreements. Deal-type funding is typically structured around specific collaborative goals or resource sharing rather than merely supplying capital, and it often involves negotiated terms for resource exchange, shared development, or market access. In comparison to classical funding, deal-type funding does not encompass financing obtained through venture capital (VC), private equity (PE), or initial public offerings (IPOs).

The Basel Area deal activity is highly concentrated in biopharma, accounting for over 99% of its deals (Figure 13). On the one hand, this level of specialization makes the ecosystem a unique global hub for biopharmaceutical mergers, acquisitions and research and development. On the other hand, it may limit or miss opportunities in fast-growing sectors like medtech and digital health, which are more prominent in ecosystems like Boston and London. The underrepresentation in these sectors is a potential weakness in an era where technology-driven health innovation, such as AI in drug discovery, telemedicine, and wearables, is gaining momentum.

Figure 14: Active clinical trials in ecosystem

deals and deal value in billion CHF, 2015 - 2023



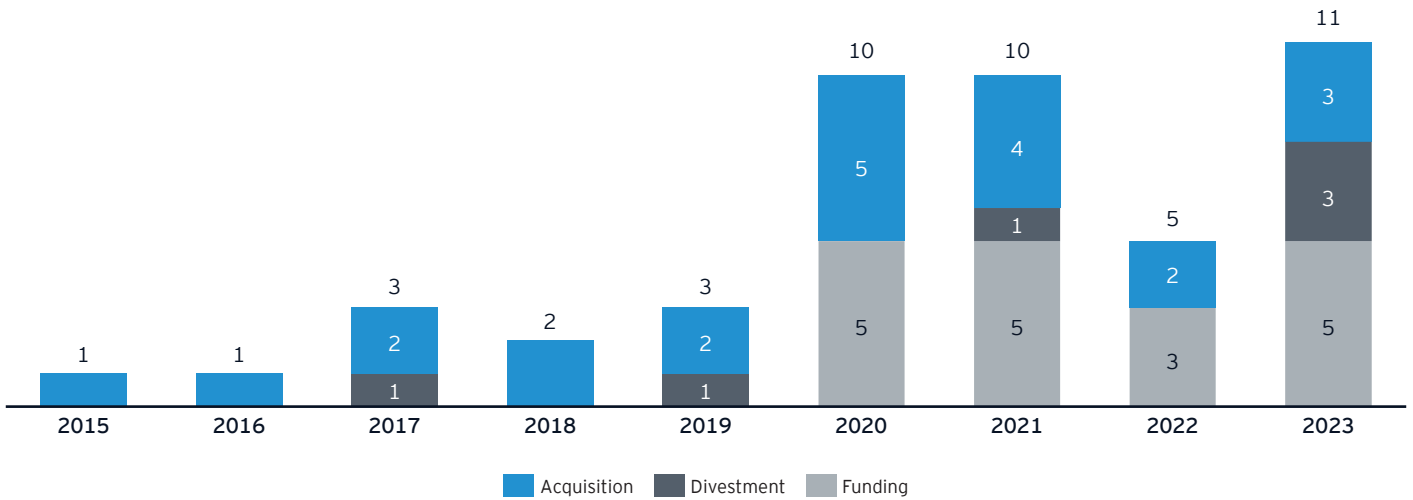
Source: EY-Parthenon analysis teams; Mergermarket

Over recent years, the deal landscape in the Basel Area has been dominated by significant corporate moves from its major players, leading to fluctuations in deal activity (Figure 14). Notable recent peaks in deal value occurred in 2021 and 2023, influenced by Roche's share buyback from Novartis and Novartis's Sandoz carve-out. The largest peak valued at CHF 46.8 billion in 2016 was due to the acquisition of Syngenta by ChemChina. This deal was one of China's biggest foreign acquisitions. Similar peaks can be observed in Boston for 2021 or in London for 2018. Such large transactions highlight the strategic importance of key players

within an ecosystem, but also suggest a certain reliance on their general deal activity and value, causing more volatility across the deal landscape. All three ecosystems have seen consistent growth in the number of deals per year, indicating a global trend and continuous development driven by high attractiveness to investors. While the Basel Area averages fewer deals per year, these deals are of a much larger average deal size, suggesting that its deals are highly strategic and involve significant investments, primarily focused on targeted acquisitions within the biopharma sector.

Figure 15: Historical evolution of deals in the Basel Area

deals per type and by year, 2015 - 2023

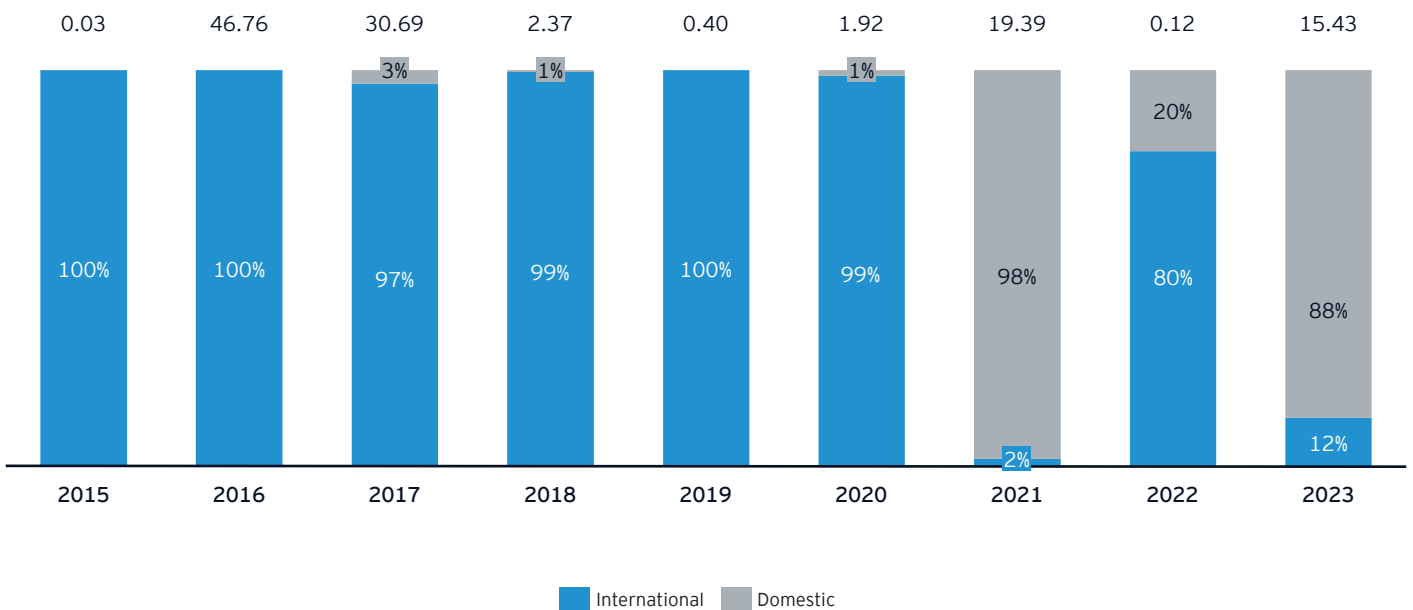


Source: EY-Parthenon analysis teams; Mergermarket

This becomes clearer when assessing the Basel Area’s deal landscape more closely (Figure 15). The historical evolution of deals by type illustrates a maturing ecosystem with acquisitions forming the backbone of conducted transactions, suggesting active investor participation and dynamic integration of promising ventures into established players. Further, the Basel Area has drawn significant international investments (Figure 16) underlining the region’s attractiveness for international collaborations and cross-border investments.

Figure 16: Historical evolution of deal value and deal origination in the Basel Area

Total deal value in billion CHF by origin and year, 2015 - 2023



Source: EY-Parthenon analysis teams; Mergermarket

Funding activities

In terms of funding activity in the same period, the Basel Area has seen a total of 239 funding rounds, while Boston and London saw 2,341 and 992 funding rounds conducted, respectively. However, due to non-disclosure, only 193 Basel Area funding rounds, 1,882 Boston funding rounds, and 664 London funding rounds were included in the analysis. The Basel Area's cumulative funding value between 2015 and 2023 was CHF 8.2 billion across the 193 disclosed funding rounds, comparable to London's CHF 7.5 billion but significantly less than Boston's CHF 82.9 billion (Figure 17). Despite the lower total value, the Basel Area's average funding of CHF 42.6 million per round mirrors that of Boston and surpasses London's average, whereby this average does not reflect the respective average per funding type (early-stage, VC, late-stage and other).

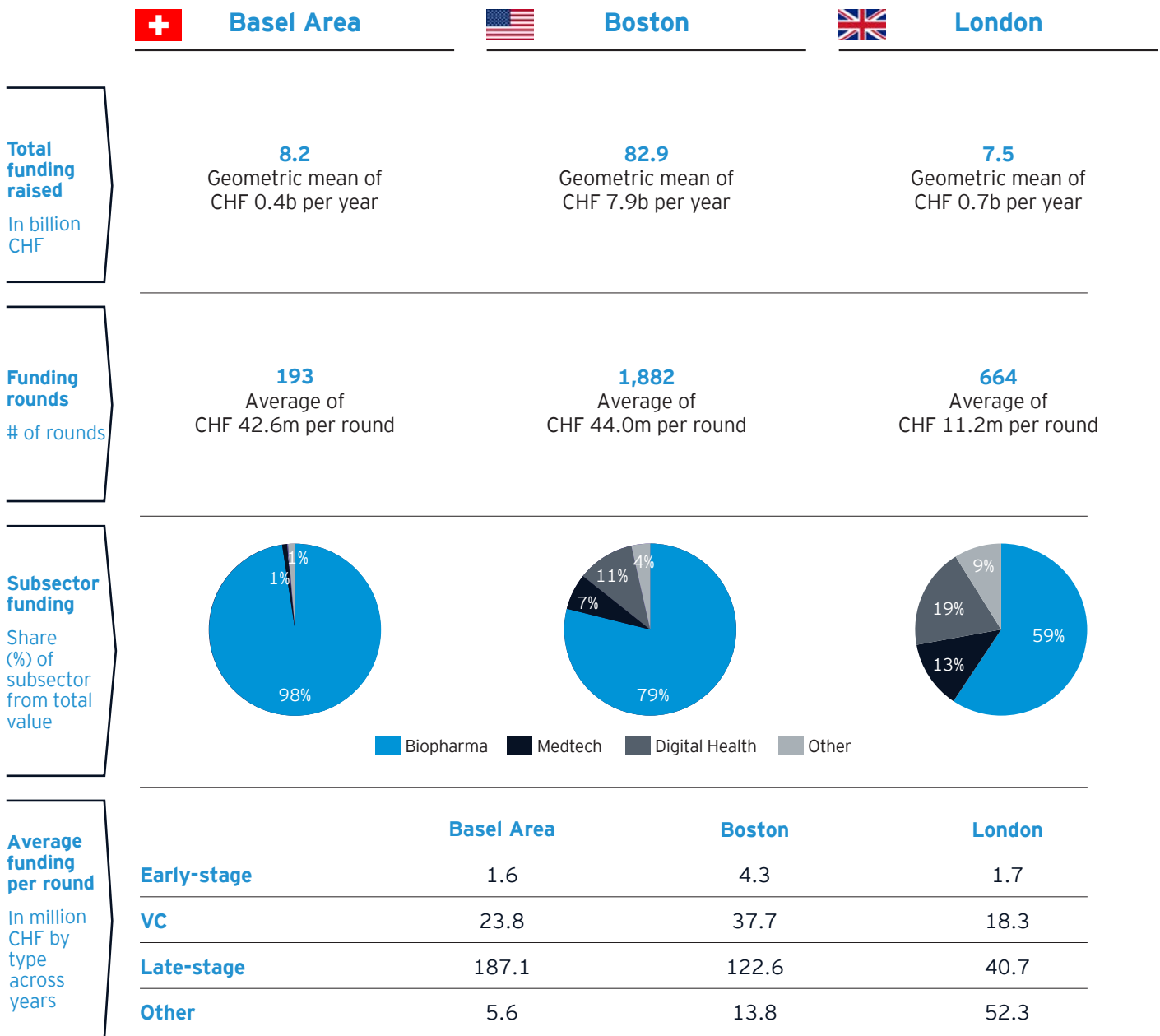
The Basel Area's funding landscape is highly concentrated on biopharma (98%), again reflecting the unique positioning and importance of the biopharma sector for this ecosystem, while Boston's and London's funding scenes appear more diversified. This limited presence of funding in medtech and digital health (each around 1%) in the Basel Area suggests a high potential for expansion in these sectors, benefiting especially early-stage ventures.

A direct comparison of the average value of funding rounds per funding type across the years can give us an idea of how much each ecosystem invests in early ideas, start-ups and more established companies (Figure 17, bottom). It appears clear that Boston's early-stage funding rounds (CHF 4.3 million) are, on average, two to three times higher than their European counterparts (CHF 1.6 million and CHF 1.7 million for Basel Area and London, respectively), confirming that Boston is a fertile ground for early-stage start-ups seeking to develop disruptive technologies. A similar conclusion can be drawn for VC funding rounds, which see Boston's companies raising one and a half times more funding than Basel Area companies and two times more than London ventures. This could be an explanation why many European start-ups seek funding in the US once they reach maturity. On the other hand, the Basel Area's more established companies could raise substantially larger late-stage funding rounds (CHF 187 million) compared to Boston's CHF 122 million and London's CHF 40 million. While this can indicate a stronger focus on late-stage funding in the Basel Area and may signal limited opportunities for start-ups and early-stage ventures, a more granular assessment is needed to uncover funding distribution across years and types.



Figure 17: Cumulative funding across ecosystems

Respective cumulative data covering 2015 to 2023



Source: EY-Parthenon analysis teams; Crunchbase

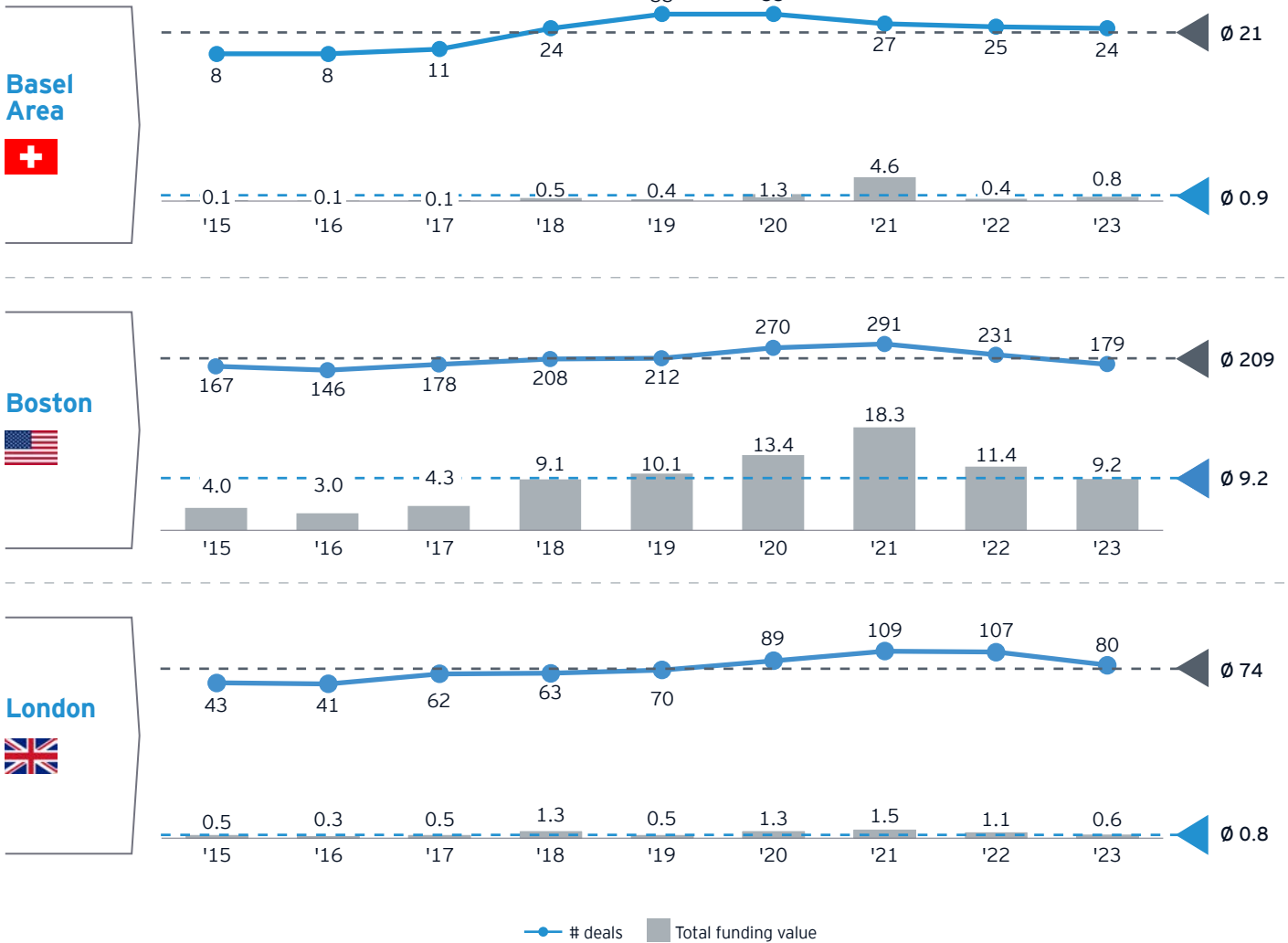
Note: Early-stage funding considers grants, angel investors, pre-seed and seed funding; VC funding considers series A to H, unknown venture series funding, and convertible notes; Late-stage considers post-IPO (debt, equity or secondary), and private equity. Other funding considers corporate rounds, debt financing, equity crowdfunding, non-equity assistance, product crowdfunding and secondary market.

When assessing the historical evolution of funding between 2015 and 2023, the Basel Area funding landscape is characterized by selective high-value investments with an average annual funding value of CHF 0.9 billion across 193 funding rounds for the past 8 years (Figure 18). The Basel Area peak funding year was 2021, during which CHF 4.6 billion were raised, largely due to SoftBank's post-IPO acquisition of a CHF 4.2 billion non-voting stake in Roche.

Since 2020, funding activity has stabilized, reaching 24 rounds in 2023, reflecting a more consistent yet lower frequency of investments compared to Boston and London. This may suggest a highly concentrated but strategic investment approach. To better understand this dynamic, a closer assessment of the funding rounds and value per funding type is described below.

Figure 18: Historical evolution of funding

rounds and funding value in billion CHF, 2015 - 2023



Source: EY-Parthenon analysis teams; Crunchbase

By breaking down the historical evolution of funding rounds per type across all three ecosystems, we can observe that early-stage funding of the Basel Area and London accounts for 51% and 59%, respectively, of total funding rounds (Figure 19). On the other hand, venture capital funding rounds are the most prevalent funding type (51%) in Boston, which might reflect the higher number of mature start-ups seeking funding for growth in this ecosystem. An interesting observation is the comparable trend that all three ecosystems have faced in the past 8 years. In particular, both the Basel Area and London have seen a consistent increase in funding rounds, indicating the growing importance of Life Sciences in these ecosystems, with an obvious spike concentrated around 2019-2021 in conjunction with the COVID-19 pandemic and the consequent shrinking of

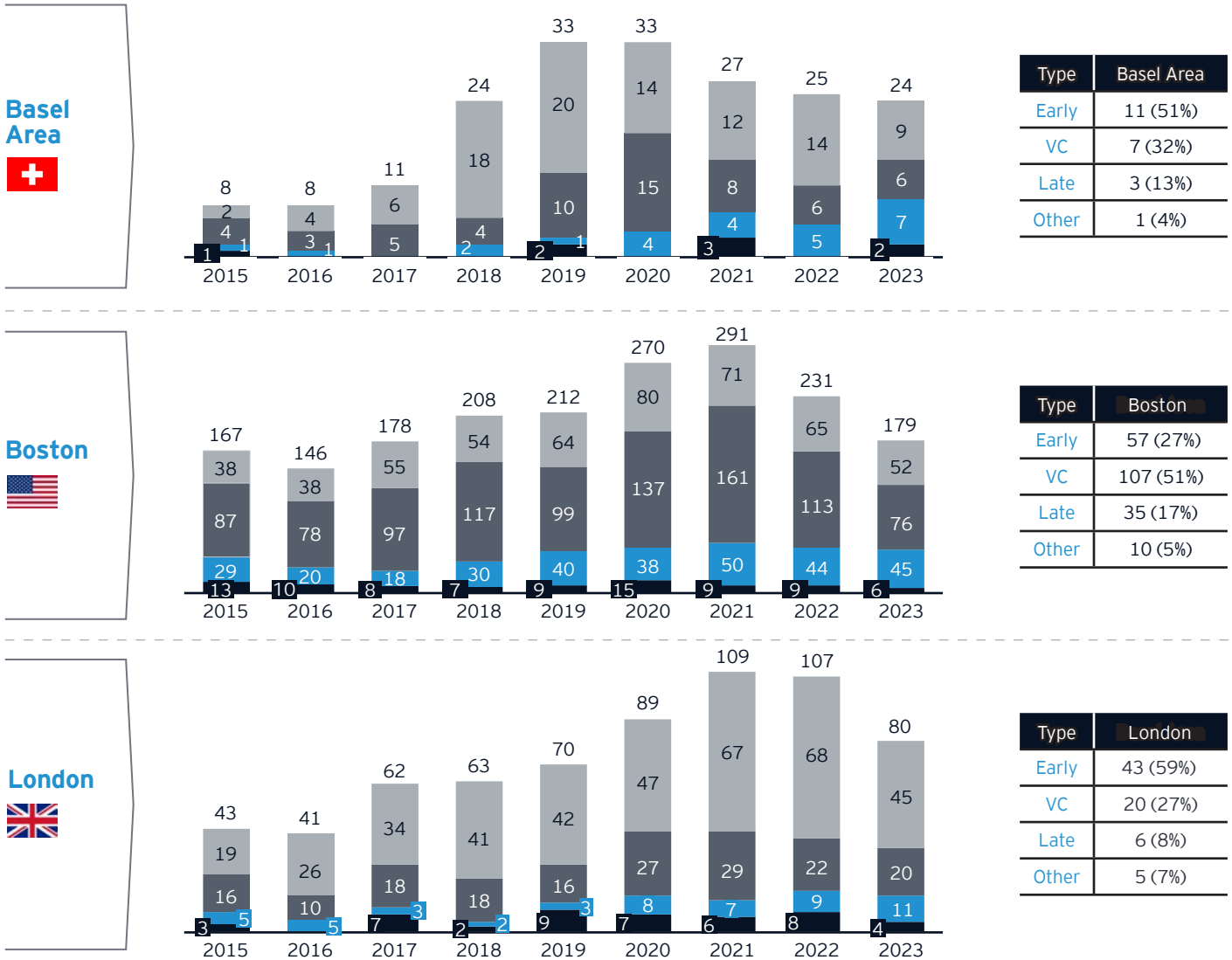
investments in the latter years. However, while the Basel Area has raised three times more funding rounds in 2023 than in 2015 and London has doubled its efforts in the same period, Boston has kept its funding landscape at the same level as in 2015, indicating that this specific ecosystem might have reached saturation.

Overall, early-stage funding rounds in the two European ecosystems are consistently higher than VC and late-stage funding rounds, calling for a stronger emphasis on supporting nascent ventures. However, both their early-stage funding rounds and funding value remain lower compared to the Boston ecosystems (Figure 17, bottom). To understand how funding value is distributed across the respective funding types, the historical evolution of the total and average funding value is examined next.

Figure 19: Historical evolution of funding rounds per ecosystems

funding rounds and average per type and year by ecosystem, 2015 - 2023

Early VC Late-stage Other



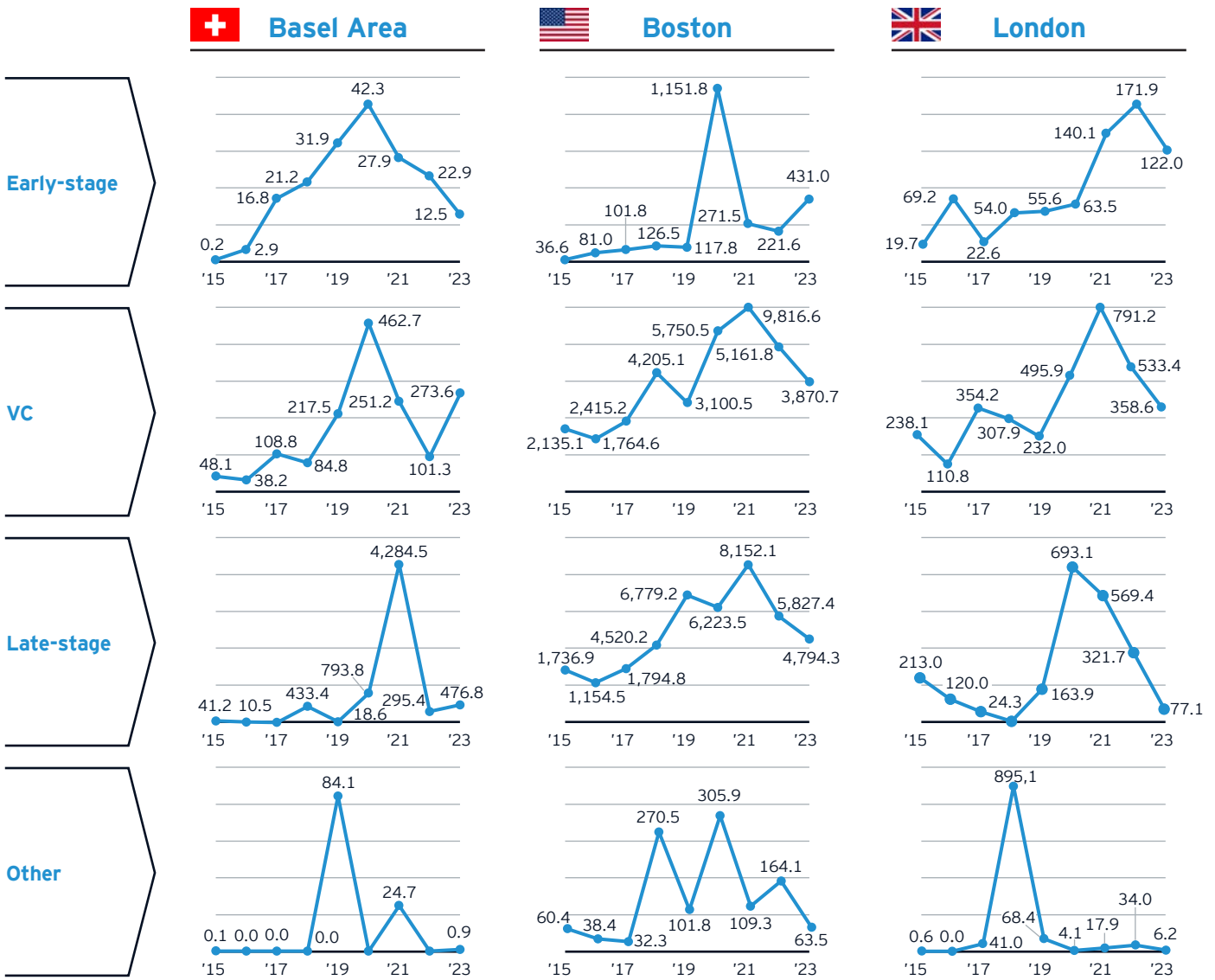
Source: EY-Parthenon analysis teams; Crunchbase

First, when comparing the total funding value per funding type, it becomes clear that all three ecosystems follow a common trend (Figure 20). Boston clearly leads the field and displays higher total funding across all funding types, focusing its efforts on venture capital funding. London showcases remarkable growth in early-stage funding over the past years but shows as well a consistent decrease in venture capital and late-stage funding since 2020. The Basel Area has consistently less early-stage and VC funding compared to Boston and London but clearly has a stronger focus on late-stage funding. The data reveals an initial increase in early-stage funding until 2020, and a sharp decrease afterward, showing that the current funding landscape has dropped to the levels of 2017. So, despite an overall increase in the

early-stage funding rounds over the years (Figure 19), their number has decreased by a third between 2020 and 2023, while the early-stage funding value was almost quartered within the same time frame. This indicates that funding value has decreased disproportionately with respect to funding rounds. An exact cause cannot be concluded from the data available and is to be determined. Yet, exploiting new early-stage funding sources that provide sufficient grants, pre-seed and seed funding would be a strategic imperative for the Basel Area. Enhancing financial support at foundational and early stages could be an opportunity to foster the successful establishment of emerging ventures and may attract start-ups from other locations where early-stage funding would be less extensive.

Figure 20: Historical development of funding value across ecosystems

Total funding value in million CHF per type and by year and ecosystem, 2015 - 2023



Source: EY-Parthenon analysis teams; Crunchbase

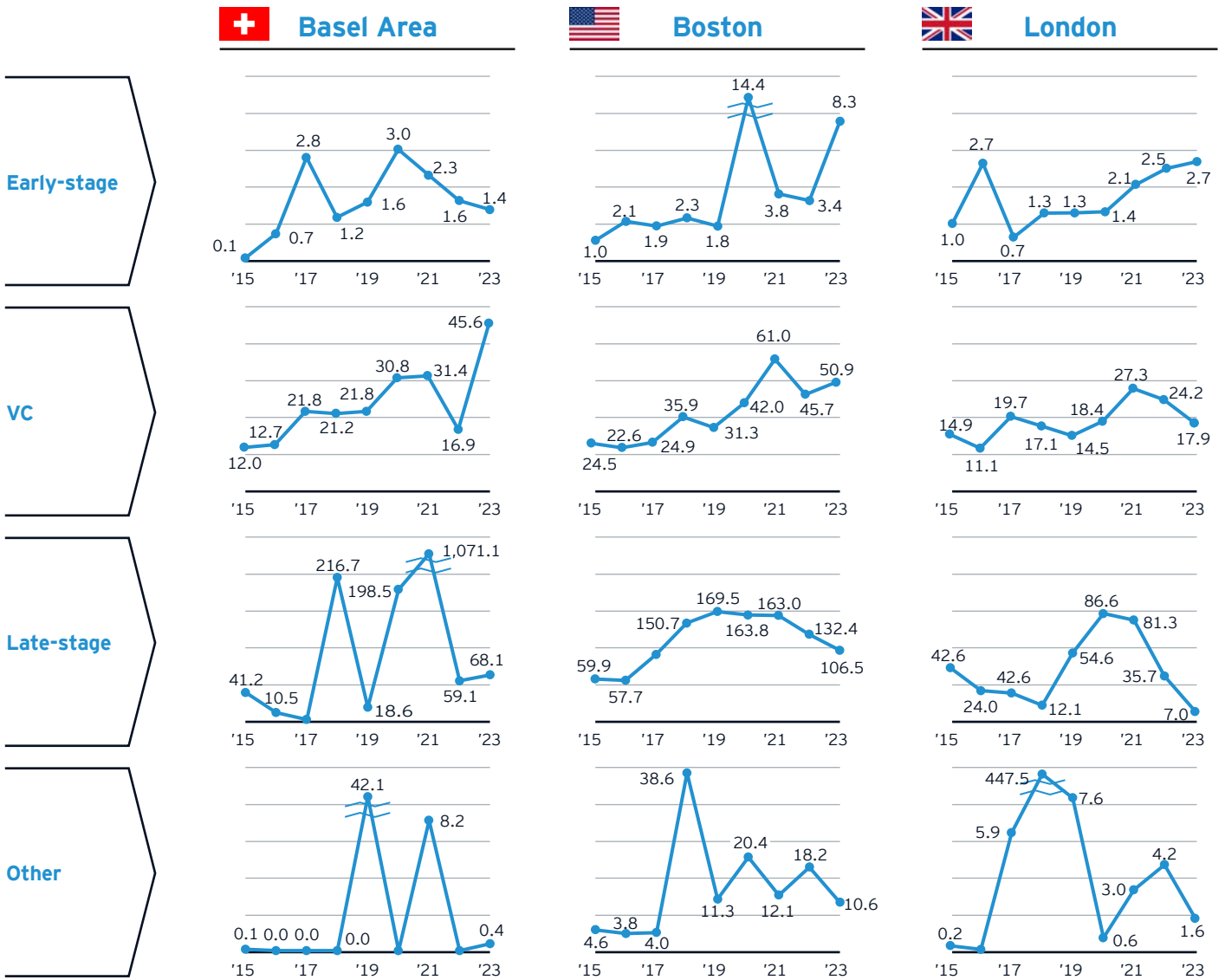
A second, closer evaluation of the average funding value per round underlines the previous observations (Figure 21). The average early-stage funding value per round for the Basel Area has overall increased in the past eight years but the value decreased from CHF 3 million in 2020 to CHF 1.4 million in 2023. In comparison, both London and Boston show a clear growth in early-stage funding value per round and an average higher value per round, indicating their strength to attract high-volume funding targeted to support early-stage ventures. In contrast, and except for a small dip in 2022, the venture capital funding values per round in the Basel Area and Boston have shown growth over the past years, indicating that local ventures are attractive to investors. London's venture capital funding value per round remains at lower levels compared to the other two ecosystems and shows more fluctuations across the years. When assessing

late-stage funding and disregarding the outlier year of 2021 with Roche's buyback of shares, the Basel Area can compete with Boston in terms of funding value per funding round and can raise substantially more late-stage funding per round in comparison to London.

This once more underlines that increasing support for new ventures via early-stage funding is key for the Basel Area to foster innovation at foundational stages. In addition, to strengthening investments in medtech and digital health, the Basel Area can foster a more comprehensive growth path. Providing start-ups with greater initial capital would also nurture a robust pipeline of innovation from the earliest stages. These strategic shifts would enhance the region's attractiveness to smaller promising ventures, solidify its position as a leading Life Sciences hub and drive long-term growth and global competitiveness.

Figure 21: Historical development of funding value across ecosystems

Average funding value in million CHF per type and by year and ecosystem, 2015 - 2023



Source: EY-Parthenon analysis teams; Crunchbase

Supporting environment

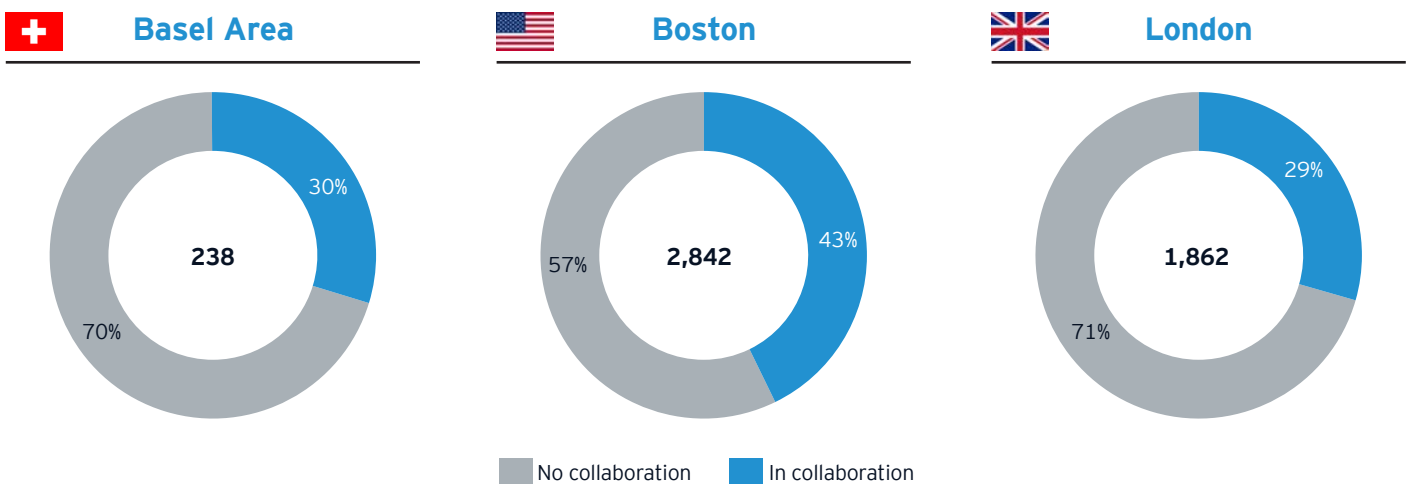
A supporting environment within the ecosystem plays a crucial role in reducing barriers for start-ups and growing companies conducting research and development (R&D), enabling them to drive innovation and achieve more effective development cycles. The environment acts as a catalyst for innovation and growth within Life Sciences ecosystems by providing the necessary tools, structures and advantages for stakeholders to consider location, collaboration and talent enhancement. This in turn increases innovation and business outcomes while improving the reputation of the ecosystem.

High levels of collaboration among diverse stakeholders, especially across clinical trials and pipeline assets, academic publications and laboratory space, collectively foster a favorable environment for R&D. These elements not only facilitate knowledge exchange and resource sharing but also attract investments and talent, further strengthening the ecosystem's foundations.

A high level of collaboration in active clinical trials underscores an ecosystem's ability to facilitate impactful research partnerships, even within a smaller ecosystem like the Basel Area. With 71 collaborative trials out of 238 total trials (30%), the Basel Area has a substantial share that is comparable to London's 548 collaborative trials out of 1,862 total trials (29%) (Figure 22). The Boston ecosystem features an impressive 1215 collaborative clinical trials out of 2,842 total trials (43%), showing that its R&D environment is highly dynamic and helpful to cooperation. While all three ecosystems suggest that their environment supports scientific exchange and collaboration in R&D activity, the Basel Area and London can learn from the Boston ecosystem. A higher collaboration in clinical trials might signal a stronger collaborative culture overall, but it can also signal that it is economically more convenient to set up and conduct clinical trials in partnership. This in turn would reflect higher clinical trial costs or a bigger clinical trial size in Boston as compared to the Basel Area or London.

Figure 22: Collaboration in active clinical trials

Share (%) of active trials with collaborator per ecosystem, July 2024



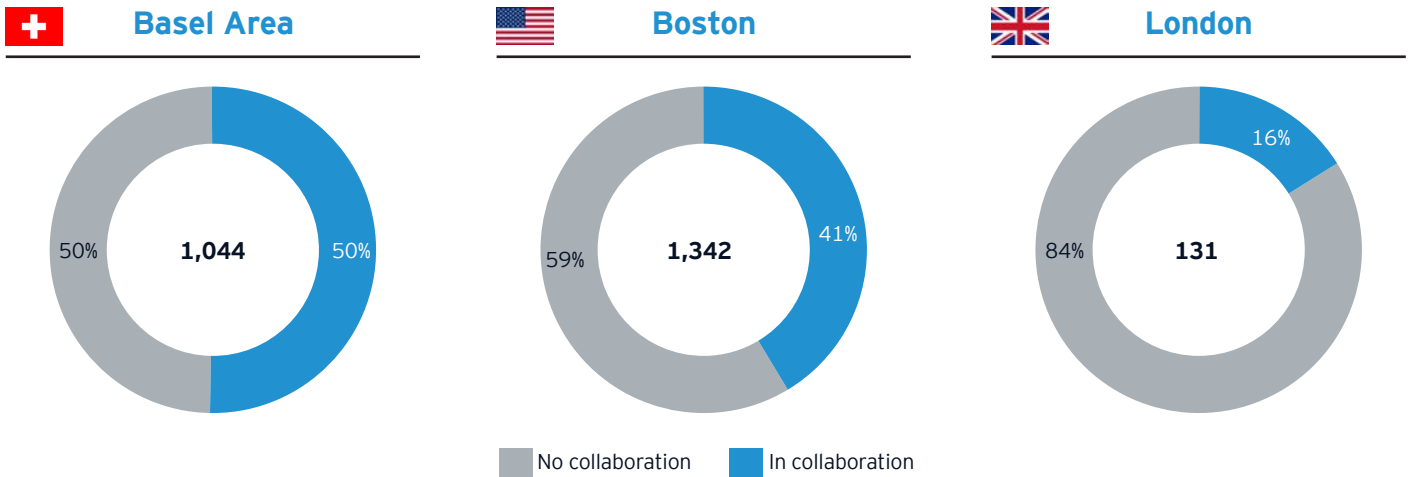
Source: EY-Parthenon analysis teams; ClinicalTrials.Gov

The Basel Area's high number of collaborations in pipeline assets further highlights its exceptional capacity for fostering innovation through partnerships. With 50% (526 collaborative assets of 1,044 total assets) of its pipeline assets developed in collaboration, the Basel Area ecosystem by far surpasses both Boston with 41% (556 collaborative assets of 1,342 total assets) and London with 16% (21 collaborative assets of 131 total assets), indicating

that companies headquartered in the Basel Area have a deeply collaborative approach to developing new drugs and therapies (Figure 23). Again, this suggests that stakeholders from within the Basel Area commonly team up, build and strengthen partnerships with other domestic or international stakeholders to drive the creation of new medical advancements in collaboration.

Figure 23: Collaboration in pipeline assets

assets with collaboration per ecosystem, July 2024



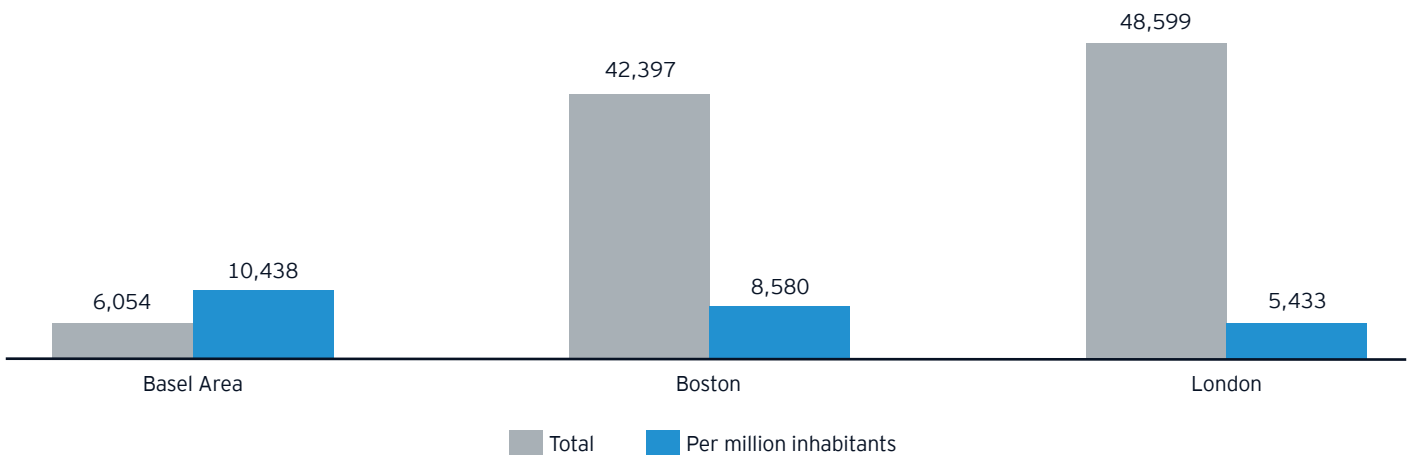
Source: EY-Parthenon analysis teams; TrialTrove

A high level of joint publications can elevate the visibility of innovative research and improve the overall impact of scientific endeavors. Moreover, higher levels of collaboration in publications lead to more efficient research, enrich the quality of scientific outcomes and foster the future connection of stakeholders. To identify the level of collaboration across publications, we counted the number of publications for which at least one author has an affiliation with the respective ecosystem of the Basel Area, Boston and London. In terms of total number of publications in 2023, the London and Boston ecosystems stand out with more than 48,000 and 42,000 publications in collaboration, respectively (Figure 24). The Basel Area, with a bit more than 6,000 publications, is not able to keep up with these

absolute numbers, likely to be given by the lower count of universities and research groups (Figure 4, Appendix Figures 1 and 2). Comparing the ecosystems with respect to their population size, the Basel Area ecosystem, with an output of 10,438 publications per million inhabitants, surpasses both Boston's 8,580 and London's 5,433 publications (Figure 24). This high rate of publications not only underscores the Basel Area's ability to generate significant scientific output and collaborate effectively within the local, regional and global research community, but also reflects the region's commitment to advancing the frontiers of science and reinforces its reputation as a hub of knowledge and discovery in the Life Sciences.

Figure 24: Collaboration to and collaboration in publications

publications with at least one author having an affiliation to the respective ecosystem, 2023



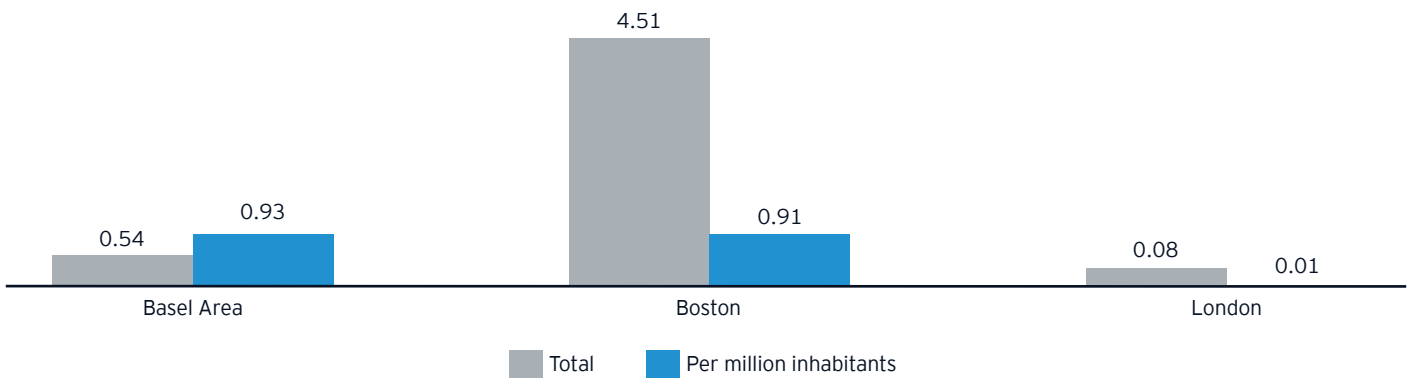
Source: EY-Parthenon analysis teams; PubMed

In order to effectively collaborate, each Life Sciences ecosystem needs to provide the environment and space for stakeholders to engage, connect and work. All three ecosystems encompass various science and technology parks, innovation centers and shared working spaces (Figure 4, Appendix Figures 1 and 2). Innovation parks, for example, offer to academic institutions, start-ups and big pharma companies the opportunity to be located within close proximity of, and at a high density with, each other. On top of providing attractive science and technology parks, an ecosystem also needs to provide sufficient laboratory space, allowing an ecosystem to attract Life Sciences ventures and support local start-ups in finding adequate infrastructure to conduct their research and development. Hereto, the Basel

Area's inventory of laboratory space remains a critical asset within the Life Sciences ecosystem. With 0.93 million square meters of lab space per million inhabitants, the Basel Area is on par with Boston's 0.91 million square meters, both vastly exceeding London's mere 0.01 million square meters per million inhabitants (Figure 25). In absolute terms, Boston leads with 4.51 million square meters of laboratory space reflecting its status as a global hub, while the Basel Area and London offer 0.54 and 0.08 million square meters of laboratory space, respectively. This once more underscores that, despite Basel Area's smaller overall lab space, it is highly accessible relative to its population size, creating a robust environment for research and development.

Figure 25: Inventory of Laboratory space

Area of laboratory space in million square meter per ecosystem, Spring 2024



Source: EY-Parthenon analysis teams; CBRE-European Life Science Ecosystem report; CRESA, Annual CRE Market Insights Report Greater Boston Life Sciences, Spring 2024

In addition to these structural elements of a supporting environment, further contextual elements such as the urban infrastructure, office location, public transportation, or tax benefits play a significant role in attracting and retaining companies. Contextual elements are less quantifiable and their sufficiency may depend on the needs and perception of the respective stakeholders.

Being ranked among the top 15 cities¹ with the highest quality of living in 2023, residents of the Basel Area enjoy a vibrant life, thanks to an efficient public transport system that makes it easy to get to suburban areas, rural landscapes and recreational spots. In comparison, Boston on rank 41 and London on rank 45.



“

The entire culture is undergoing a shift here towards entrepreneurship and Basel, as I look at it, is right now the hub for that entire convergence: cultural, scientific and beyond.

Greg Verdine; Co-founder and CEO LifeMine

¹Source: Mercer, Quality of Living City Ranking 2023

Regarding taxation, all three ecosystems are facing the impacts of the OECD 15% minimum taxation on local businesses with a revenue of more than 750 million and are likely to have plans around taxation packages and measures taking the OECD taxation into account. For the Basel Area, the canton of Basel-Stadt is planning to implement a comprehensive package of measures and funding aimed at enhancing its economic attractiveness, specifically for the Life Sciences sector for 2025. Currently, the Basel Area offers a competitive corporate tax rate of 13-15% depending on location and potential deductions for R&D activities which can lead to an effective corporate income tax rate of approximately 11%. These and further financial and tax incentives (such as tax holidays) make the Basel Area an attractive location for small businesses, mid-sized companies or multi-national corporations.

Conclusions

The evaluation of the Basel Area Life Sciences ecosystem confirms that it is indeed a unique hub that drives Life Sciences innovation, especially remarkable given its smaller size compared to global leaders like Boston and London. The hypothesis that the Basel Area is an innovative Life Sciences ecosystem that provides an innovation-favorable environment and a platform for future growth holds true in relative terms. The Basel Area demonstrates a higher density of Life Sciences stakeholders per million inhabitants, exceptional clinical trial density and a significant per capita output in patent registrations and pipeline assets. Further, the region excels in high economic productivity, has an unrivaled concentrated focus on biopharma and lives a strong collaborative culture.

However, in absolute terms, the Basel Area trails behind Boston and London in total number of stakeholders, overall funding volumes and stakeholder diversity. Specifically, the lack of early-stage funding and the Basel Area's very strong focus on biopharma may cause the ecosystem to miss out on innovative opportunities to attract and support early-stage ventures and companies in digital health and medtech that could position the Basel Area as a leading Life Sciences ecosystem, next to its peers Boston and London.

Therefore, while the Basel Area ecosystem is highly effective and surpasses larger hubs in relative measures, there are opportunities for growth to enhance its global competitiveness. By building on its key strengths and addressing areas of opportunity, the Basel Area can further establish itself as a go-to destination for Life Sciences stakeholders globally.





Final outlook

Based on the quantitative insights gained through evaluation of all three ecosystems, as well as qualitative insights gained through interviews with selected key stakeholders from within the Basel Area, we were able to distill the key strengths of the Basel Area ecosystem and its opportunities for growth to become a truly innovative Life Sciences ecosystem that can compete globally with other renown hubs like Boston and London.

Key strengths

1. **High density and diversity of stakeholders:** The Basel Area ecosystem stands out with its high concentration of Life Sciences companies and diverse stakeholder groups, including major industry players such as Roche, Novartis, J&J, or Syngenta, a robust network of start-ups, research institutes, investors and academic institutions. This density fosters a highly collaborative and effective research environment, demonstrated by the Basel Area's exceptional research output per capita. The high density of clinical trials and pipeline assets per capita as well as the high number of partnerships and collaborations in clinical trials and pipeline assets indicate a high commitment to exchange knowledge and accelerate innovation.
2. **Unique sector focus on biopharma:** The Basel Area has an unmatched focus on the biopharma sector, demonstrated by the high density of biopharma companies, significant share of employment in biopharma and a concentration of over 98% of both deals and funding in this area. This specialization has created a globally competitive environment that supports biopharma innovation through targeted investments, robust research and extensive infrastructure tailored to the sector's needs. This commitment enhances the Basel Area's reputation as a biopharma powerhouse, attracting top-tier talent, investors and industry leaders, thereby reinforcing the ecosystem's position as a leading hub for drug discovery, development and commercialization.

3. **Targeted investment and strategic business activities:** The Basel Area's funding landscape is characterized by a strong focus on venture capital and late-stage funding, providing similar funding values per round as Boston and London. Specifically, the high venture capital and late-stage funding value per round make the ecosystem a highly attractive location for biopharma companies that consider (re-)location to Europe. This strategic focus allows the Basel Area to signal support for mid- to late-stage innovators and establish the region as an attractive location for both domestic and international mature ventures and companies seeking expansion or currently expanding.
4. **Well-developed infrastructure and laboratory space inventory:** With laboratory space on par with Boston on a per capita basis, the Basel Area offers a robust infrastructure for research and development. The presence of multiple science and technology parks condenses both established companies and start-ups and fosters a strong collaborative environment. This in turn enables the different stakeholders to collaborate within close proximity, enhancing connectivity and operational efficiency, allowing these companies and ventures to scale and innovate within a well-equipped environment.

Opportunities for growth

1. **Reinforce early-stage funding and support:** The Basel Area's current funding landscape is heavily skewed towards late-stage and post-IPO investments and, in addition, displays decreasing early-stage funding. Both early-stage funding rounds and volume have declined over recent years, limiting opportunities and support for start-ups and early-stage ventures that require financial backing in this critical phase. In comparison, the Boston and London ecosystems have experienced a growth of early-stage funding per round, indicating that this is not a global trend but may have a local cause. To remain competitive, the Basel Area must nurture innovation from the foundational stages by increasing early-stage

funding through grants, seed capital, and early-series venture capital initiatives in terms of volume and value. Expanding these financial support mechanisms would help build a robust pipeline of emerging companies, fostering a more dynamic and inclusive ecosystem that drives sustained innovation and growth.

- 2. Diversify across Life Sciences sectors:** While the Basel Area excels in the biopharma sector, this heavy concentration presents potential risks and limits opportunities in other fast-growing areas such as medtech and digital health. Diversifying investments and support into these sectors would enhance ecosystem resilience, foster cross-sector innovation and attract a broader array of stakeholders. Such a strategic diversification would enable the ecosystem to address a wider range of medical needs and technological advancements, strengthening its position as a comprehensive Life Sciences hub.
- 3. Improve and accelerate collaboration between academia and industry:** Although the Basel Area offers an environment that fosters a strong collaborative culture, bureaucratic hurdles typical of academic environments and different expectations regarding timelines can impact concrete collaborative efforts. Discussions around funding for innovative ideas and

start-ups that stem from universities are often delayed with academia not able to keep up with the dynamic timelines foundational ventures face. Many new ventures struggle to negotiate favorable terms when spinning out from academic institutions in terms of IP retention and company shares, making it challenging for them to survive this critical stage. Streamlining academic funding processes and reducing bureaucratic hurdles may enable more effective partnerships, facilitating knowledge exchange and resource sharing. Developing structured programs that unite various stakeholders can foster greater engagement and accelerate the translation of research into market-ready solutions.

- 4. Broader therapeutic area diversification in clinical trials:** With a strong focus on oncology, the Basel Area's pipeline is driven by the portfolio strategies of its global powerhouses Roche and Novartis. The ecosystem could benefit from diversifying its clinical research into additional therapeutic areas, such as CNS disorders, infectious diseases and metabolic conditions. Expanding clinical trial activities in these areas would further attract specialized talent, broaden investment appeal and address a wider range of unmet medical needs, thereby strengthening the ecosystem's holistic contribution to healthcare innovation.



Appendix

Abbreviations used within this report

- ▶ **CAGR** = Compound annual growth rate
- ▶ **CHF** = Swiss Francs
- ▶ **CHF xxm** = million Swiss Francs
- ▶ **CHF xxb** = billion Swiss Francs
- ▶ **CNS** = Central nervous system
- ▶ **GDP** = Gross Domestic Product
- ▶ **HQs** = Headquarters
- ▶ **IPO** = Initial public offering
- ▶ **km²** = Square kilometer
- ▶ **LS** = Life Sciences
- ▶ **m²** = square meter
- ▶ **PE** = Private equity
- ▶ **PMI** = per million inhabitants
- ▶ **TAs** = Therapeutic areas
- ▶ **VC** = Venture capital

Description of funding stages used in this report

- ▶ **Grants:** Non-repayable funds provided by governments, institutions, or foundations to support specific projects or initiatives without equity exchange
- ▶ **Angels:** Individual investors who provide capital for start-ups, usually in exchange for convertible debt or ownership equity, often during the early stages of business development
- ▶ **Pre-seed funding:** Utilized to refine an initial business concept into a structured plan
- ▶ **Seed funding:** Allocated to advance product development and establish foundational business operations

- ▶ **Series A funding:** Directed towards scaling validated business models and expanding customer acquisition efforts
- ▶ **Series B funding:** Supports established businesses in amplifying market penetration and optimizing operational efficiencies
- ▶ **Series C funding:** Facilitates significant scaling activities, often preparing the company for a public offering or extensive market expansion
- ▶ **VC funding:** Investment from venture capital firms to fuel growth in more established start-ups, typically post-seed and pre-IPO
- ▶ **PE funding:** Private equity investment typically comes into play for later-stage companies looking to restructure or prepare for a sale, not necessarily public
- ▶ **IPO:** Initial public offering, where shares of a company are sold to institutional investors and usually the public
- ▶ **Post-IPO:** Activities and funding following the IPO, focused on further scaling, acquisitions and operational enhancements

Commentary on the analysis and methodology

The analysis and resulting insights featured in this report is the outcome of EY-Parthenon's teams and Basel Area's sector monitoring, assessment and evaluation of the Life Sciences sector in Basel, Boston and London. To ensure comparability and usability of the different data, EY-Parthenon teams and Basel Area made sure to use the same main sources for data where possible. Insights and data have been leveraged from public and licensed sources, including websites, reports, news, press releases, listings, interviews and companies. To maintain independence, data leveraged from above-mentioned sources and used within this report have not been modified or altered to meet personal views. The views of third parties set out in this publication are not necessarily the views of the global EY organization or its member firms. Moreover, they should be seen in the context of the time they were made.

Data from publicly available and licensed sources was the basis for this report. The provided data represents an outside-in view. Undisclosed information and unavailable insights were not assessed or included in the analysis to prevent false claims. Data leveraged from the respective databases may be incomplete and the respective information provided throughout this report may be non-exhaustive. Kindly note that some information of this report has been collected through company, government and institutional websites and is dependent on the actuality of the respective sources. EY-Parthenon teams and Basel Area do not take responsibility for changed information that may be displayed on these websites later than the publication date. Data of ClinicalTrials.Gov, TrialTrove, Citeline, Crunchbase, Mergermarket, Start-up Genome and PubMed has been retrieved on 17 July 2024. Please read the report and provided analysis in context of the time they have been developed.

Data has not been processed with any special software or with the help of third-party providers. Calculations and the resulting evaluations have only been made with publicly available numbers to enable reproducibility. If not stated otherwise, data is displayed in accordance with the respective indicated date and along the indicated metrics. For total values, the actual collected data has been provided; for the representation per million inhabitants, the respective total number has been divided by the respective population of the ecosystem and multiplied by 1 million.

Additional insights generated through interviews with key ecosystem stakeholders from across sectors and stakeholder types were used to further expand rationale on data analysis and ecosystem evaluation.

List of key sources

- ▶ EY-Parthenon analysis teams
- ▶ Basel Area Business & Innovation
- ▶ BAK economics
- ▶ BiotechGate
- ▶ CBRE Research
- ▶ ClinicalTrials.Gov
- ▶ Crunchbase

- ▶ CRESA Annual Market Insights Report Spring 2024
- ▶ Interpharm – Association of researching pharmaceutical companies Switzerland
- ▶ JLL – Jones Lang Lasalle IP
- ▶ Knight Frank LLP Reports on Real Estate Insights
- ▶ London MedCity Reports & Websites
- ▶ MassBio, Massachusetts Life Sciences Organization
- ▶ Mergermarket
- ▶ National Health Services (NHS) England
- ▶ One London – Initiative of the Government of London
- ▶ Pitchbook
- ▶ PubMed
- ▶ Start-up Genome
- ▶ Statistic Economics Report of Basel-Stadt, Basel-Landschaft and Jura 2024
- ▶ Swiss Chamber of Commerce
- ▶ Swiss Federal Office of Public Health (BAG)
- ▶ Swiss Health Observatory
- ▶ Swiss Start-up Radar 2023/2024
- ▶ Swiss Venture Capital Report 2024
- ▶ Switzerland Innovation Park Reports & Websites
- ▶ TrialTrove / Citeline
- ▶ UK BioIndustry Association BIA
- ▶ UK Department for Business, Energy & Industrial Strategy
- ▶ University websites
- ▶ US Bureau of Labor Statistics
- ▶ US Health Resource and Service Administration (HRSA)
- ▶ US National Institutes for Health
- ▶ Websites of Cantons Basel-Stadt, Basel-Landschaft and Jura

Further insights on sources used may be provided upon request.

About the EY-Parthenon Strategy Health & Life Sciences team

The EY-Parthenon Strategy Health & Life Sciences team believes every successful business strategy is underpinned by an in-depth understanding of industry dynamics and the competitive landscape in which it sits.

Aging populations and chronic disease are putting pressure on health resources around the world just as scientific progress, augmented intelligence and digital data are transforming traditional health care models. This is causing a power shift with new entrants (often not driven by profit) disrupting the incumbents.

Staying competitive and providing the personalized experience that patients demand require Life Sciences organizations to find new ways of working. Partnering with others to share data, medicine and resources while anticipating trends and regulatory changes will help ensure sustainability in the increasingly evidence-based, outcomes-focused sector.

We help clients across the biotechnology, pharmaceutical and medical technology fields develop actionable and impactful ways to manage complex shifting challenges and transform their organizations.

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About Basel Area Business & Innovation

Basel Area Business & Innovation is a non-profit agency dedicated to helping start-ups, institutions and companies find business success in the Basel Area. As an independent organization funded by the cantons of Basel-Stadt, Basel-Landschaft and Jura, as well as by the Swiss government and private foundations, we help develop a robust business climate and support innovative ventures. We attract and support companies moving into the area, connect organizations and entrepreneurs with collaboration partners, and help create a vibrant ecosystem that fosters innovation.

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Appendix Figures

Appendix Figure 1: Boston stakeholder ecosystem

Stakeholders by category within the Boston ecosystem

ALL LS companies	LS HQs	Ecosystem	Investors
Biopharma  1,307	775	Hospitals  68	Banks  17
Medtech  315	177	Research centers  36	Accelerators & incubators  187
Digital health  152	150	Universities  42	Venture capitals²  169
Others¹  512	379	Science & technology parks  14	Private equities  67
			Others³  38

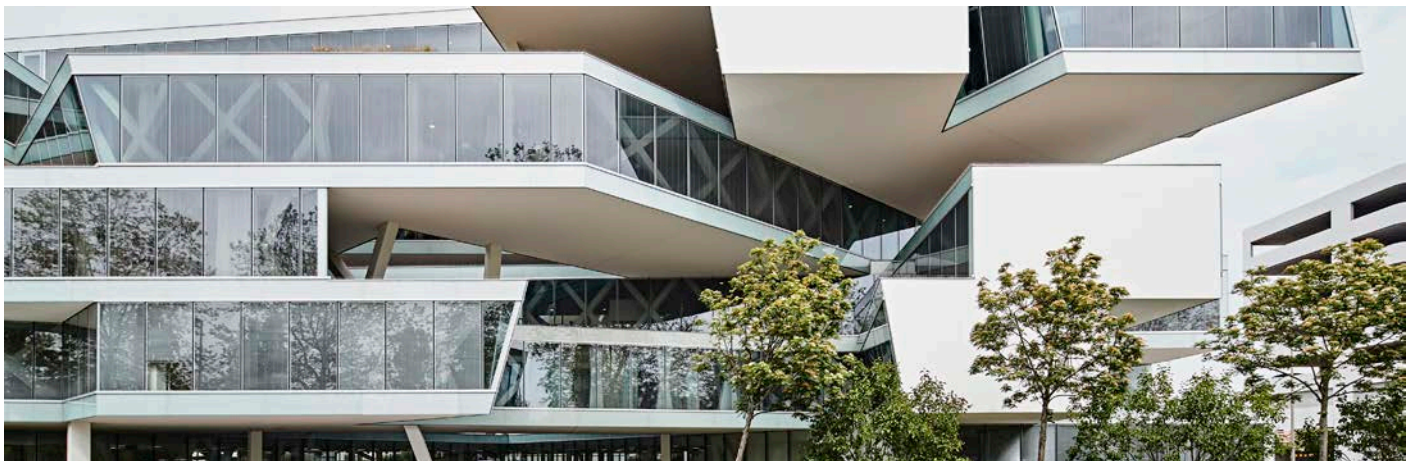
Source: EY-Parthenon analysis teams; Basel Area; BAK economics; Mergermarket; Crunchbase

Note: Only companies and investors with headquarters in the Basel Area were considered in this analysis, other companies with offices in the Basel Area may not be included.

¹ Other stakeholders linked to the Life Sciences sector, e.g., consulting firms, government institutions, chemical companies, device providers, etc.

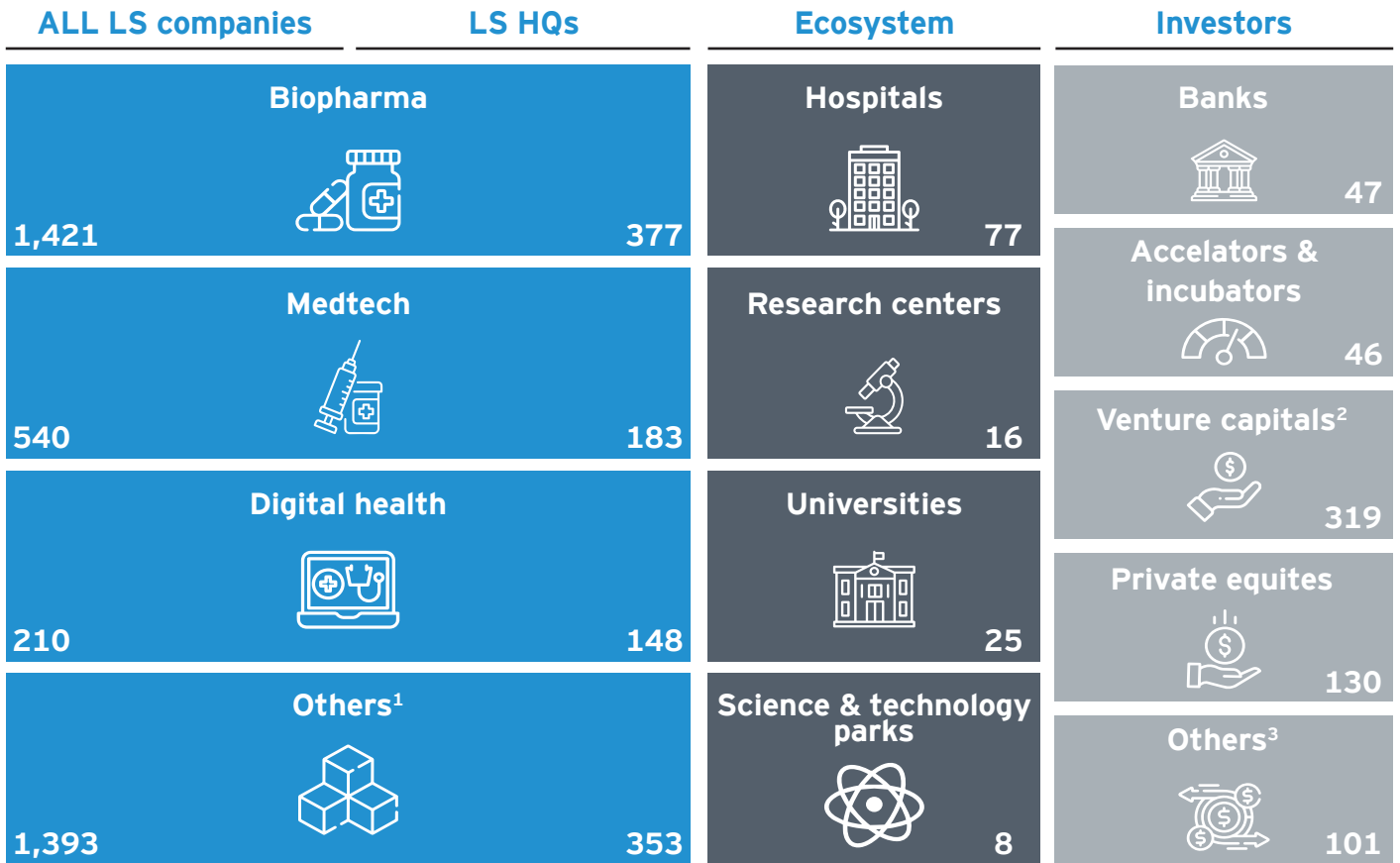
² Including venture debts and venture funds

³ Other investors include family offices, government programs, public funds or charities



Appendix Figure 2: London stakeholder ecosystem

Stakeholders by category within the London ecosystem



Source: EY-Parthenon analysis teams; Basel Area; BAK economics; Mergermarket; Crunchbase

Note: Only companies and investors with headquarters in the Basel Area were considered in this analysis, other companies with offices in the Basel Area may not be included.

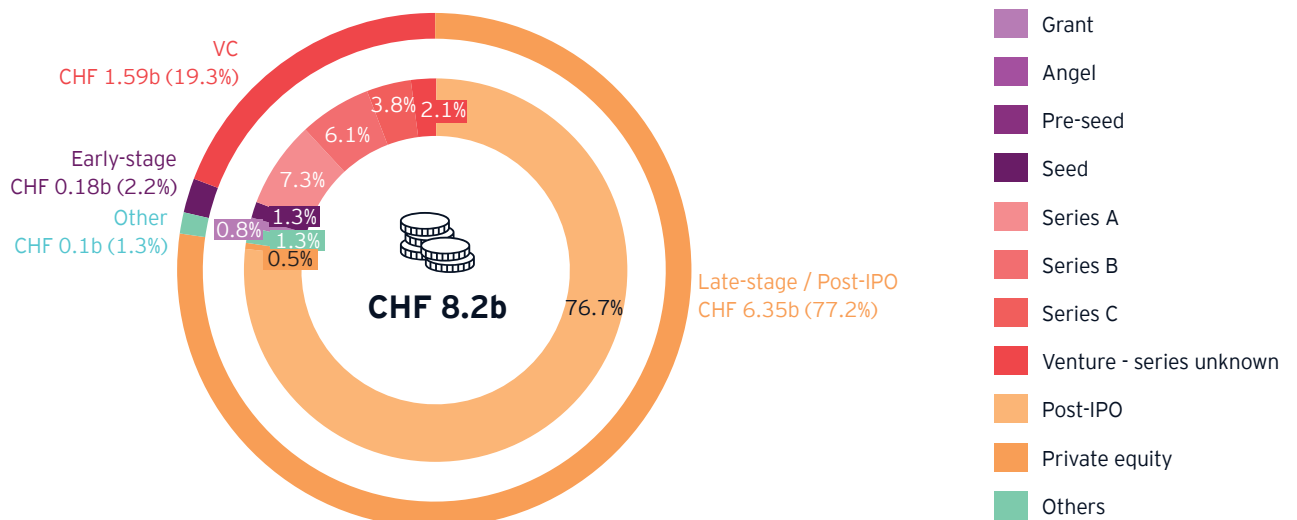
¹ Other stakeholders linked to the Life Sciences sector, e.g., consulting firms, government institutions, chemical companies, device providers, etc.

² Including venture debts and venture funds

³ Other investors include family offices, government programs, public funds or charities

Appendix Figure 3: Cumulative funding raised in the Basel Area between 2015 and 2023

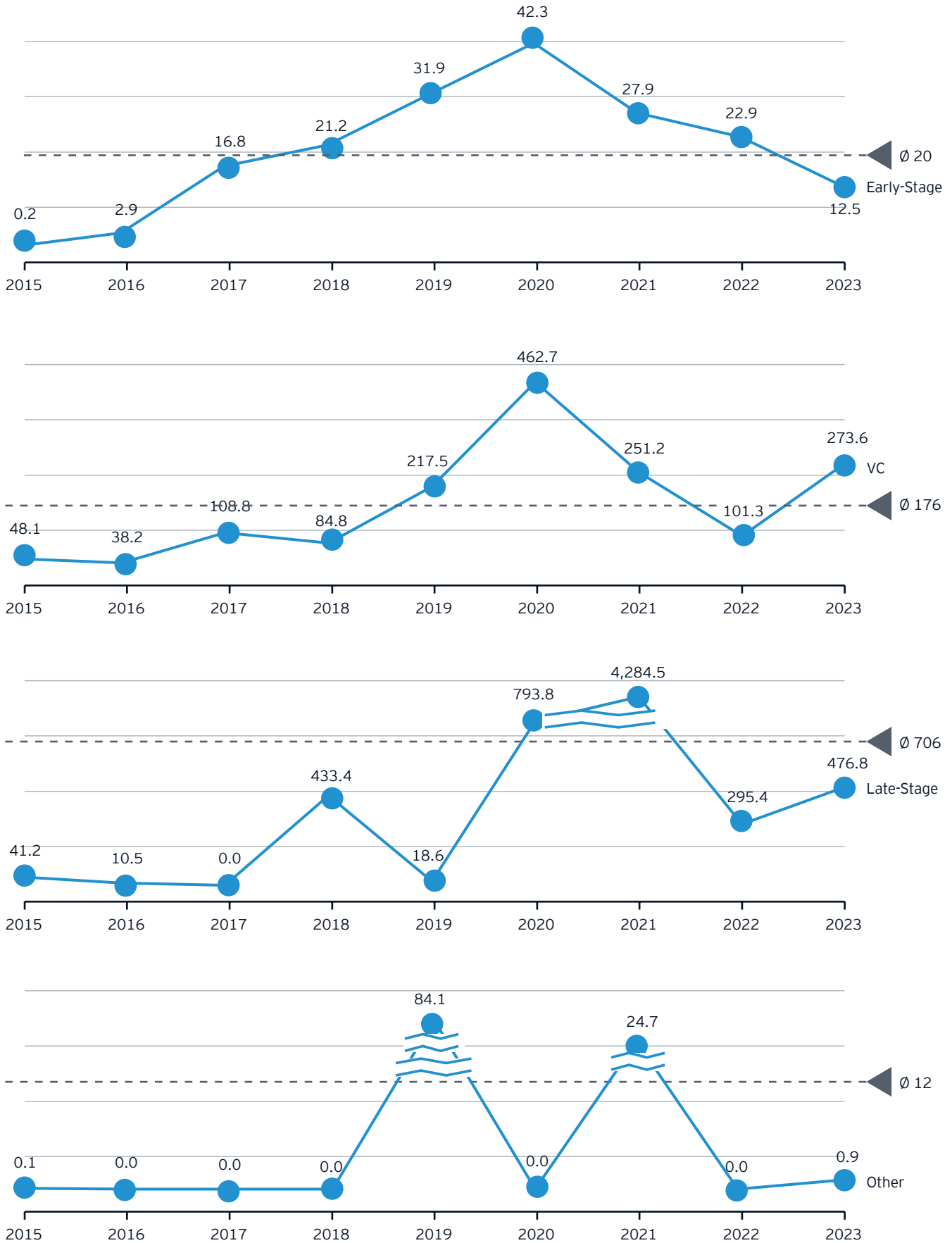
Total cumulative funding value per type and funding stage, 2015 - 2023



Source: EY-Parthenon analysis teams; Basel Area; BAK economics; Mergermarket; Crunchbase

Appendix Figure 4: Historical development of funding value in the Basel Area

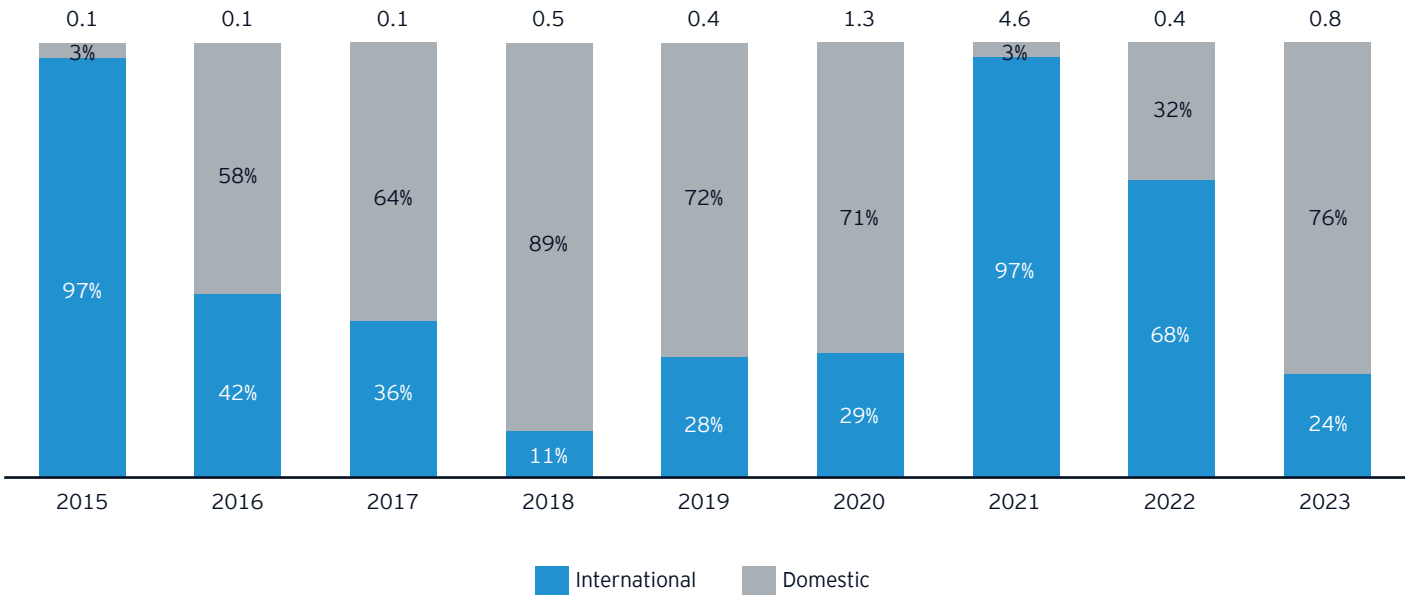
Funding value in million CHF per type and by year, 2015 - 2023



Source: EY-Parthenon analysis teams; Crunchbase

Appendix Figure 5: Historical evolution of funding value and origination in the Basel Area

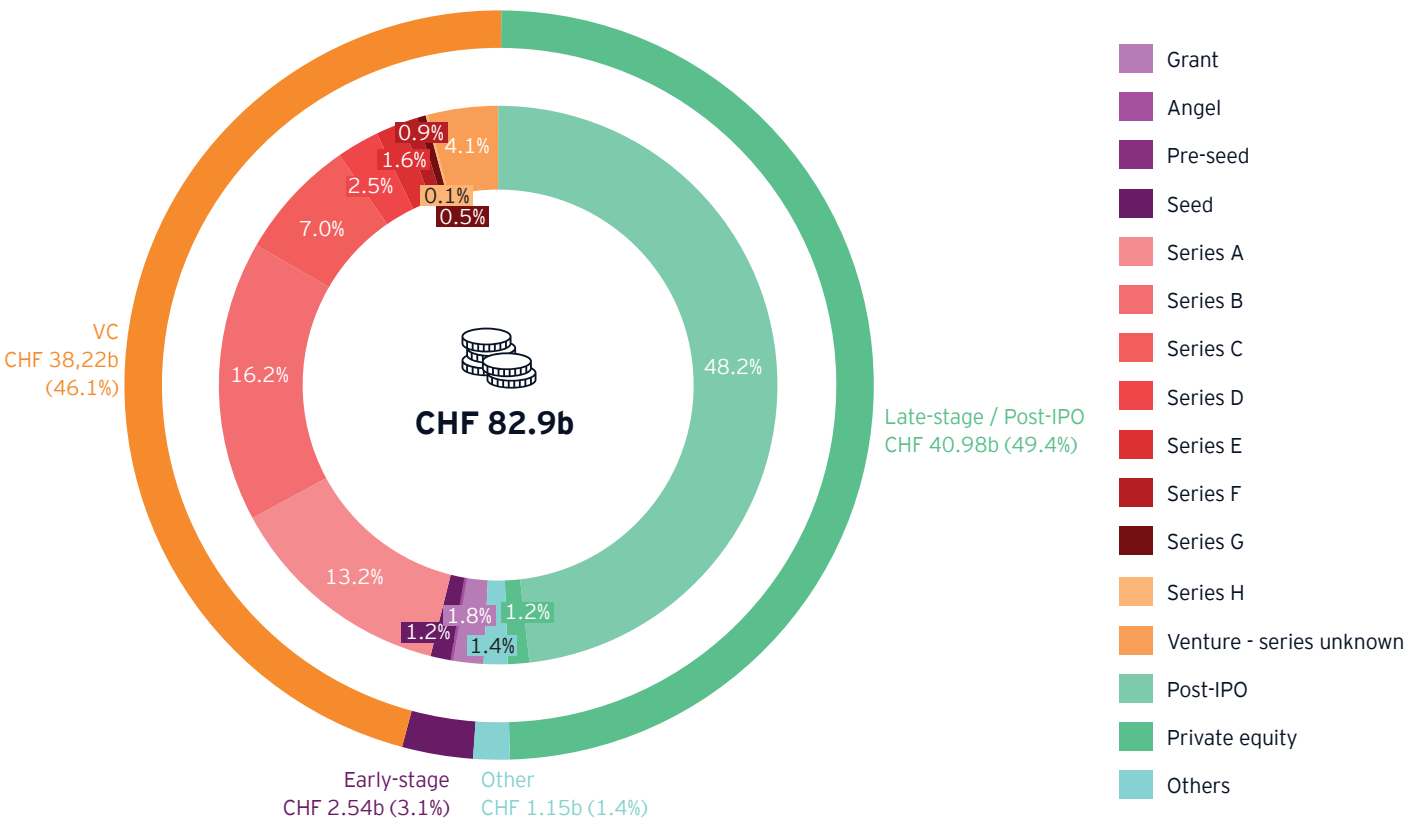
Total funding value in billion CHF by origin and year, 2015 - 2023



Source: EY-Parthenon analysis teams; Crunchbase

Appendix Figure 6: Cumulative funding raised in Boston between 2015 and 2023

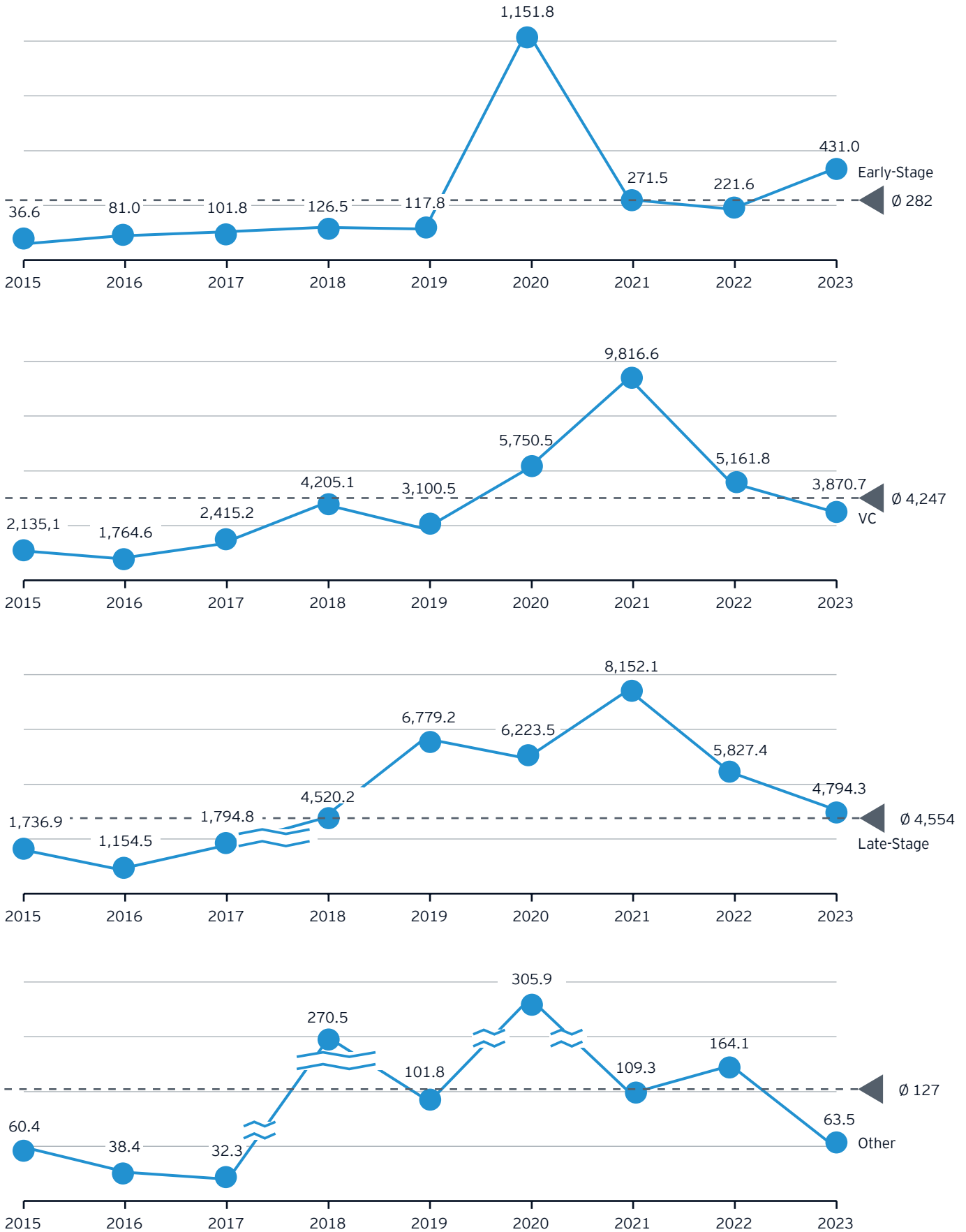
Total cumulative funding value per type and funding stage, 2015 - 2023



Source: EY-Parthenon analysis teams; Crunchbase

Appendix Figure 7: Historical development of funding value in Boston

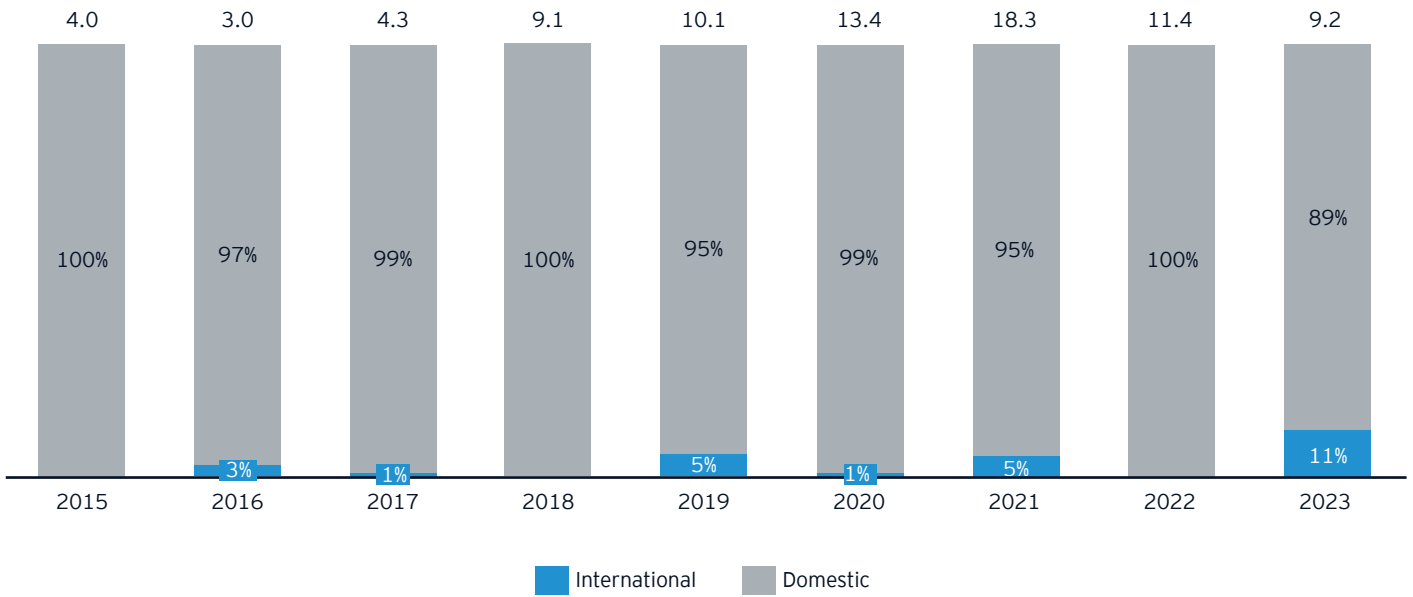
Funding value in million CHF per type and by year, 2015 - 2023



Source: EY-Parthenon analysis teams; Crunchbase

Appendix Figure 8: Historical evolution of funding value and origination in Boston

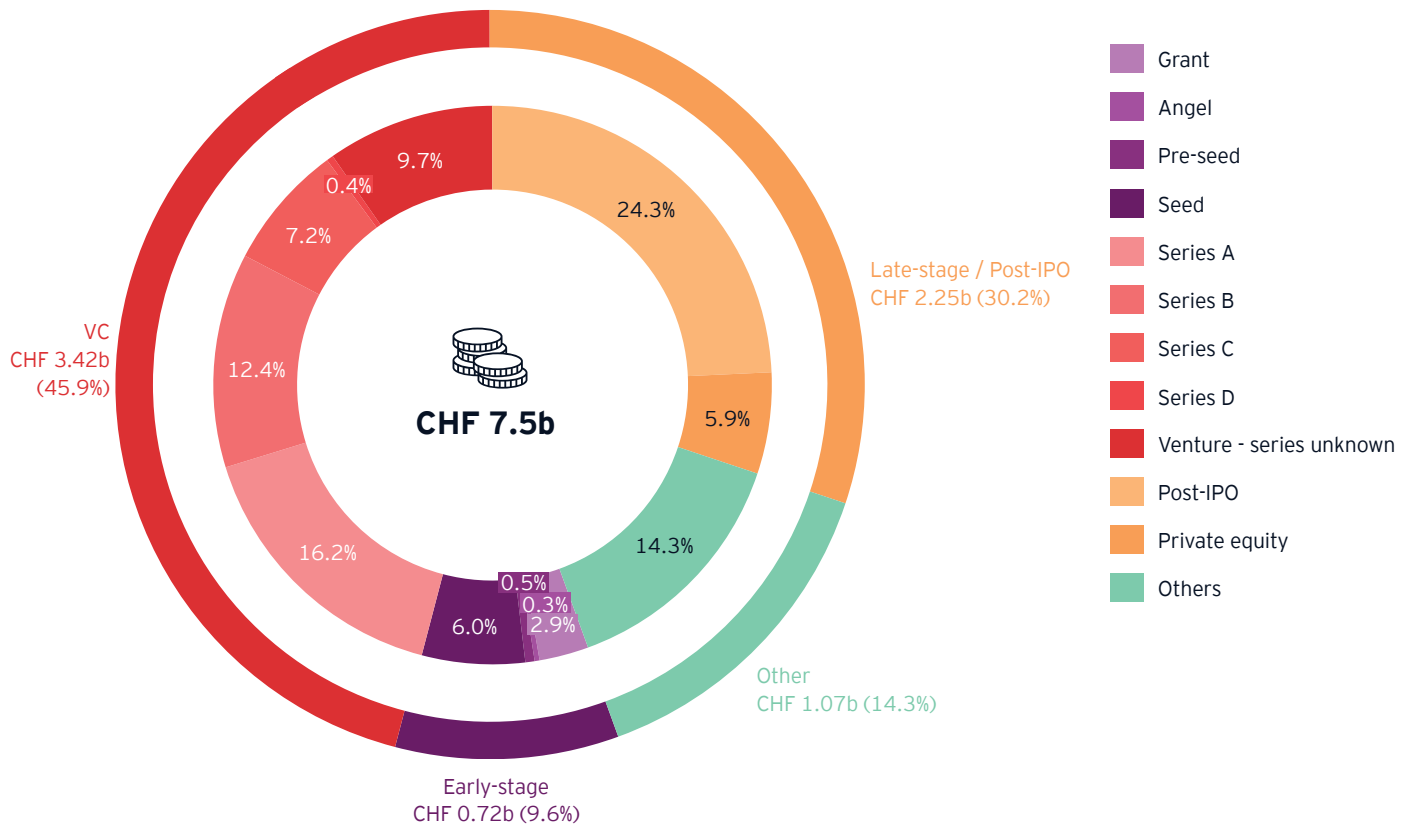
Total funding value in billion CHF by origin and year, 2015 - 2023



Source: EY-Parthenon analysis teams; Crunchbase

Appendix Figure 9: Cumulative funding raised in London between 2015 and 2023

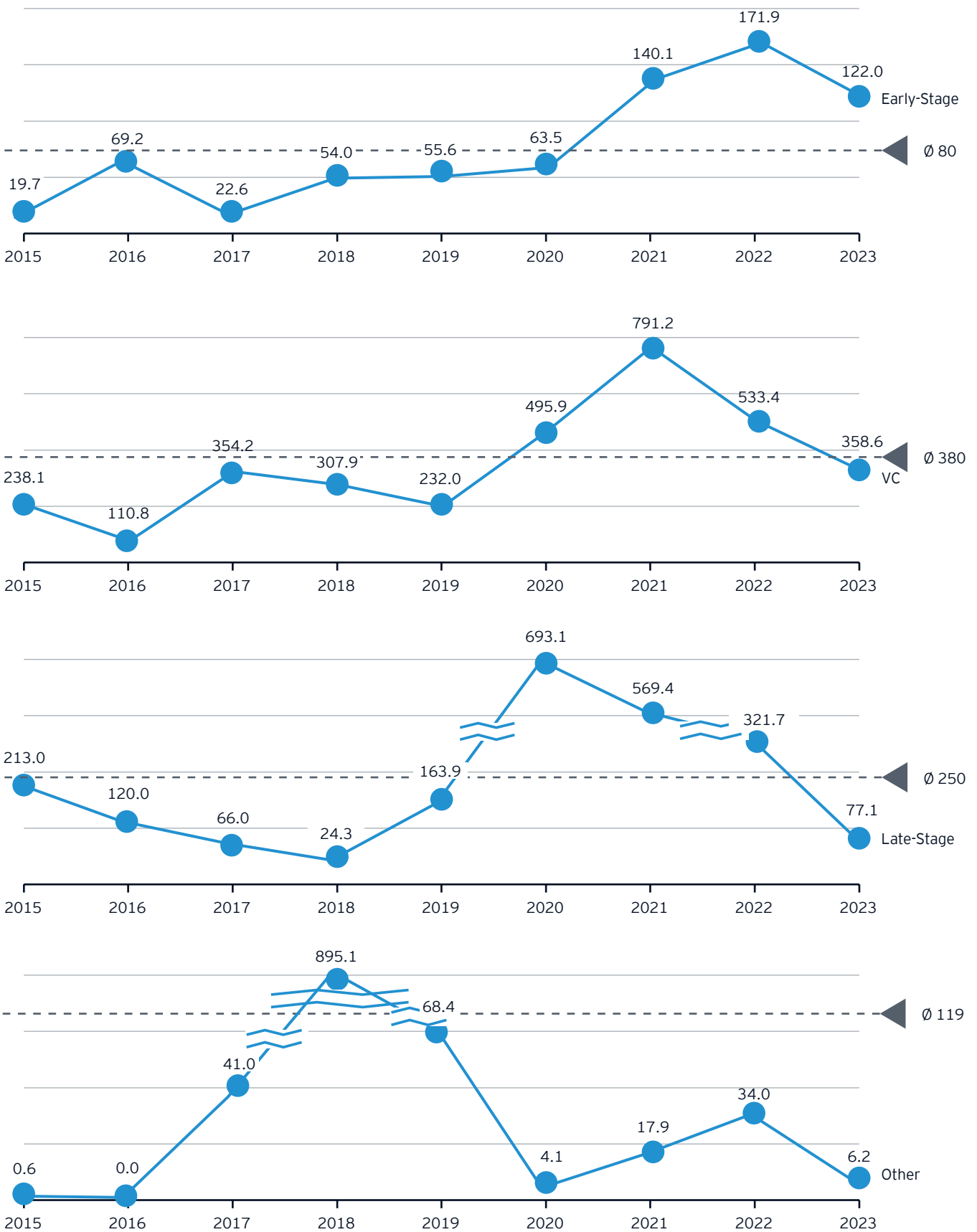
Total cumulative funding value per type and funding stage, 2015 - 2023



Source: EY-Parthenon analysis teams; Crunchbase

Appendix Figure 10: Historical development of funding value in London

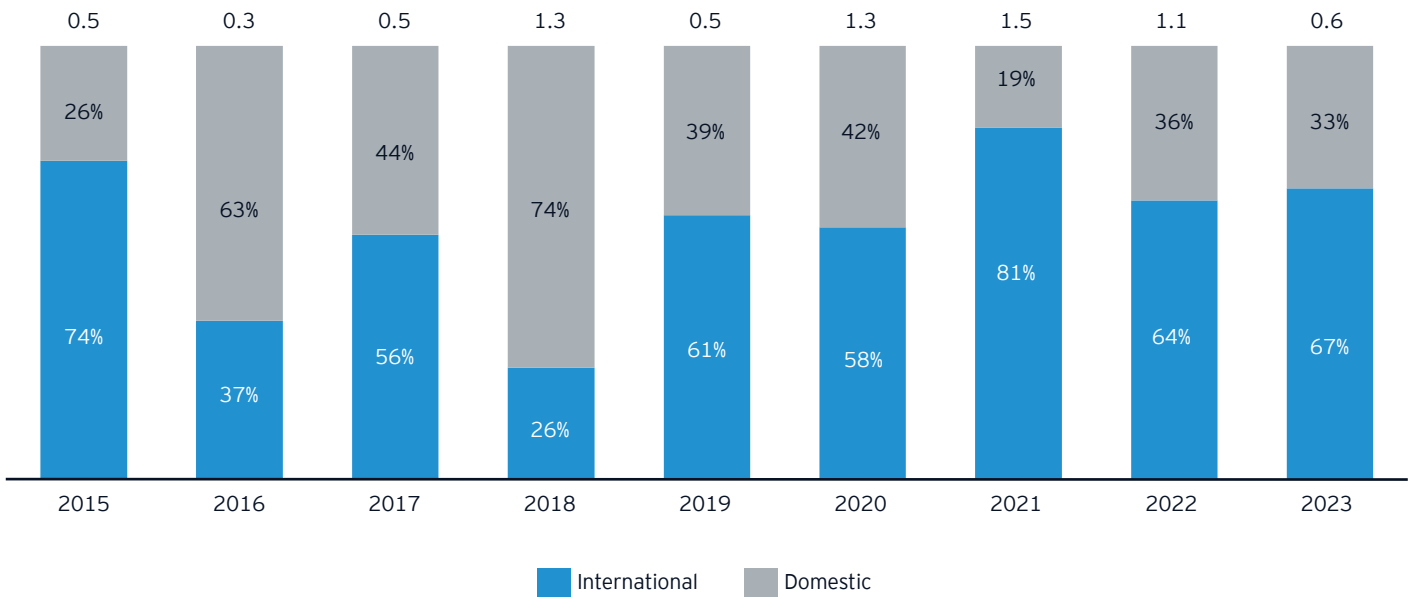
Funding value in million CHF per type and by year, 2015 - 2023



Source: EY-Parthenon analysis teams; Crunchbase

Appendix Figure 11: Historical evolution of funding value and origination in London

Total funding value in billion CHF by origin and year, 2015 - 2023



Source: EY-Parthenon analysis teams; Crunchbase



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