

UK Life
Science
Start-Up
Report

2022

About the Authors

Glenn Crocker is an Executive Director at WAPG and a Senior Consultant in JLL's UK Life Science team. He was the founding CEO of BioCity until the end of 2018. Glenn has a DPhil in Immunology from Oxford University and qualified as a Chartered Accountant with EY, focusing on working with biotech companies in Palo Alto, California and Cambridge, UK, where he headed up the UK Biotech practice for EY. At BioCity, he grew a thriving life science incubation business on the back of a strong commitment to building successful life science companies. He is a non-executive director of several life science companies and consults on business incubation, start-up creation and cluster growth. He has been directly involved in investing in life science companies through BioCity's own or managed funds since 2006. In 2019, Glenn also took the role of Head of Life Sciences for leading property advisers, JLL and in 2021 handed the role to Chris Walters, remaining as a Senior Consultant to the business. In 2014 Glenn received an MBE for services to the biotechnology industry.

Ross Gray is the Research Analyst for JLL UK Life Sciences. He has a PhD in Ecology from Imperial College London, where he used drones to map and model the fluctuations in rainforest plant and insect dynamics. Prior to this, he worked as a research assistant at the University of Oxford and obtained an MRes in Tropical Forest Ecology and a BSc in Zoology from Imperial College London. He has extensive experience in analytical modelling, statistical predictions and machine learning as well as a thorough understanding of life sciences.

Acknowledgements

Thanks go to Ross Gray, who undertook much of the data collection, initial analysis and drafting, and to Avnish Panesar, who was responsible for the design, layout and production of this report.

Contents

Introduction	4
Methodology	5
The Numbers	6
Subsectors	18
University Spin-outs	22
Funding	31
Conclusion	40
Appendix: List of Tables and Figures	44

Introduction

The impact of cutting-edge life science research on the world has been well demonstrated over the past two years. The pandemic has reshaped global economies and altered outlooks, shining a spotlight on the life science sector with everything from protective equipment to inhalers to vaccines, all playing a role in solutions to COVID-19.

Investors are flocking to back industry players following the positive impact the sector has demonstrated from its research and development, the resilience shown in share prices and, from a venture and real estate perspective, the potential returns it can yield. In 2021, life science companies globally raised a record-breaking £113 billion, following the £77 billion raised in 2020, itself a milestone year. This increased investor focus in further driving the growth of companies and the creation of new ones. The United States is still at the forefront of life science company creation and development, with Boston the undisputed centre of global life sciences, but the UK sector is developing strongly, showing remarkable growth since our last report.

UK life sciences has gone from strength to strength with a record £4.5 billion investment raised in 2021, up from £2.8 billion in 2020. As well as wider investor sentiment, there is increased attention and support from Government that is cementing the life science industry as its own real estate asset class.

The flood of investment into life science companies is driving unprecedented growth, which in turn is driving demand for laboratories. This requirement is increasingly attracting the attention of real estate investors and developers at a time when other sectors, such as retail, are facing uncertainty. JLL estimates there is £20 billion of funds looking to invest in UK life science real estate. Life science companies cannot function without the specialist facilities they need, so the provision of more space can only be good for the industry. However, life sciences is very different to retail or office and a full understanding of the sector is necessary to make sound decisions and deliver what the industry needs. In part, this is what this report is about.

This analysis of life science start-ups was initiated by BioCity over fifteen years ago. This was because early-stage companies formed the main constituency with which BioCity worked - whether that was through venture development, investment or providing laboratory space in the most flexible and supportive ecosystem possible. Therefore, understanding what was happening in this part of the industry was as essential back in 2006 for BioCity as it is today for We Are Pioneer Group, even though the group is now home to companies from start-up to major internationals.

The update to this report comes at a pivotal time for Life Sciences in the UK in years to come. As the industry expands rapidly, there is a need to take a view of the industry's future – a future that will be heavily influenced by the start-up activity over the last few years, as these companies will become the face of the industry in the UK. As in previous reports, we look at life science start-ups that have formed and raised investment over a five year period - this time 2016 to 2020. We compare that with previous time periods to look at trends and concentrations of activity to provide insight into where the sector might be going.

This version of the report is a collaboration between WAPG and JLL, bringing the resources of both organisations together to produce what we hope will be an interesting read.

Methodology

The data in this report is gathered from multiple databases including the Office for Life Sciences, Companies House alongside commercial databases, and JLL and WAPG's own research, where it is then cleansed and wrangled into a 'complete' dataset representing the five years of life science company creation in the UK from 2016 to 2020. Complete is placed in quotation marks, because, as with any dataset, there will likely be companies missed or uncounted but from our search we are confident this is a representative list of life science companies created between 2016 and 2020 in the UK. We adhered to strict criteria when selecting companies to be included and this follows the same criteria as in previous reports. A company will be included if it has substance and is more than just a name or registration number in Companies House. Substance in this case is defined by having raised venture capital, produced a product that is now in the market, or is otherwise demonstrably active in its operations. For spin-outs, a company is included if the university owns intellectual property or equity in the company. With the company data there can be variations between years in the numbers recorded and near-term data specifically can distort the picture, as companies have yet to prove their worth. Therefore, we have grouped the data into a rolling five-year period – which also maps the previous reporting and allows us to draw on trends across time periods.

For this report we had the added complexity of companies being formed during the Covid pandemic to undertake testing. These are in theory "diagnostic" companies, however we excluded these from the data as they are not necessarily what most industry-watchers would call "life science companies" and their existence may be transient.

For each start-up, information is gathered on location, investment raised, grant funding (if announced) and university source, if any. Companies are also classified into subsectors which we have defined and for which a definition of each is included in the report. The data is analysed to draw out industry trends across geographies and through time. As we move into the new age of life science following the pandemic, we hope this report will provide context to the start-up industry and a benchmark for the years to come.

The Numbers

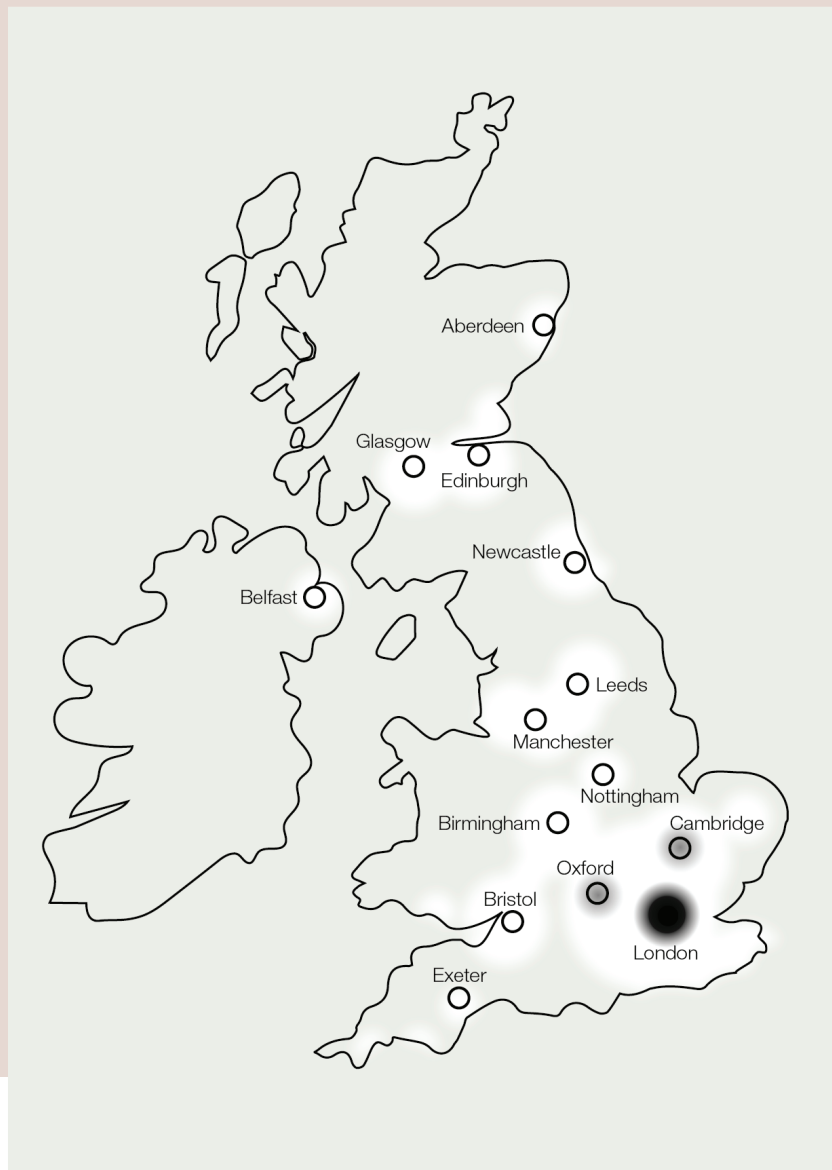


Figure 1

Number of life science start-ups

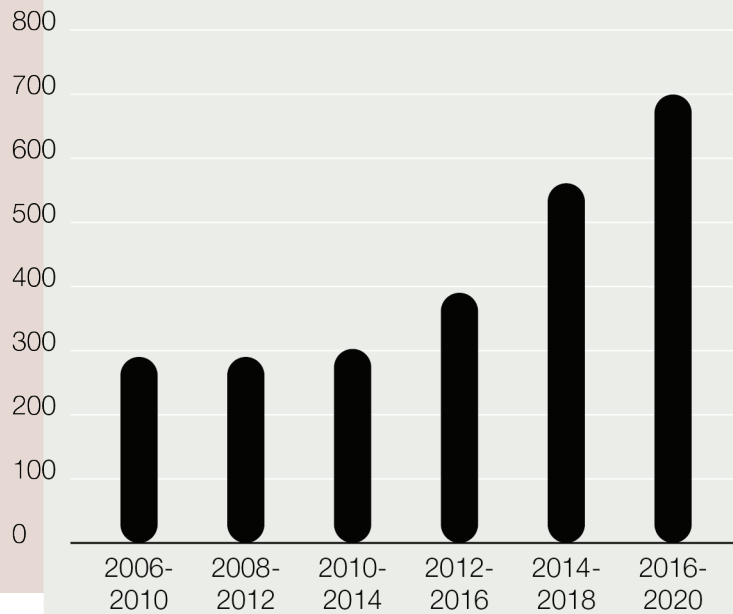


Figure 2

One of the most astonishing facts in this report is the continued growth in the number of life science start-ups in the UK, which has increased by 24% on the previous five year period between 2014 to 2018, to 681 start-ups in 2016 to 2020. This follows an upward trend established almost a decade ago and is more than double the rate at that time.

There are many potential reasons for this growth. Firstly, the increased investment into the sector is providing a pull-factor, with the availability of funding encouraging start-up formation. Changes in university spin-out strategies and the impact of technology transfer teams can also have a significant impact on

cluster development in a particular region. There are other factors such as the availability of space for early-stage companies - lack of space hinders growth in a particular location, while space coming on stream can boost the establishment and location of start-ups in an area. Further underpinning the growth in start-ups has been the increasing breadth and sophistication of accelerators and other company start-up support. WAPG, for example, now operates its accelerators across much of the UK and in Ireland.

A complication to analysing this data arose from the Covid pandemic and the formation of companies to undertake Covid tests. These are technically diagnostics companies, but we excluded them from the population as they do not fit with an industry-observer's view of a life science company and would potentially skew results.

While there is more to a successful life science sector than simply the number of companies, this growth in start-ups demonstrates the strength of the industry and, at the very least, more companies means more opportunities to create billion-dollar businesses and develop life changing technologies.



Wilton Centre, WAPG



Number of start-ups by region (2016 - 20)

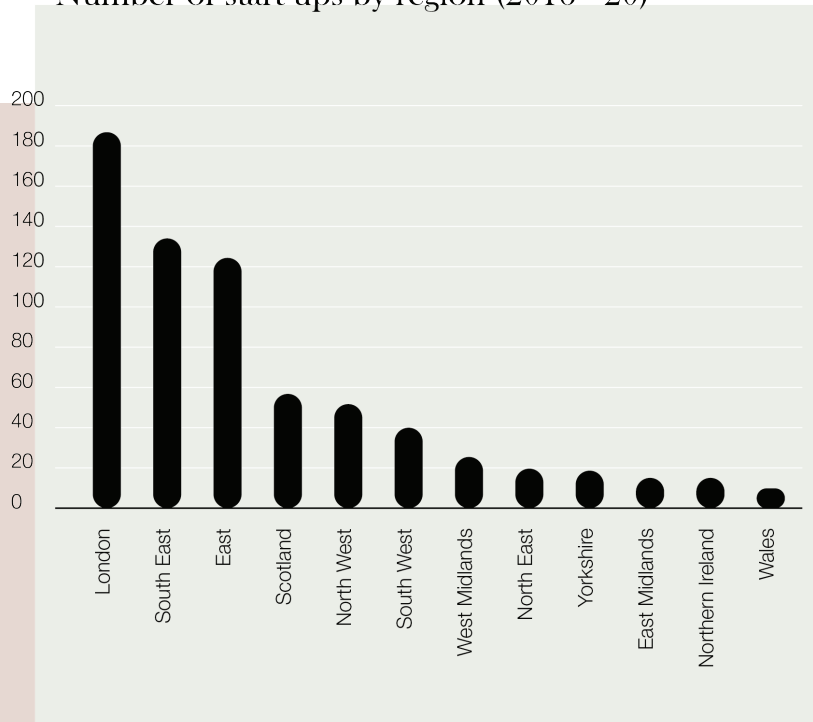


Figure 3

% change in number of start-ups (2014 - 18 v 2016 - 20)

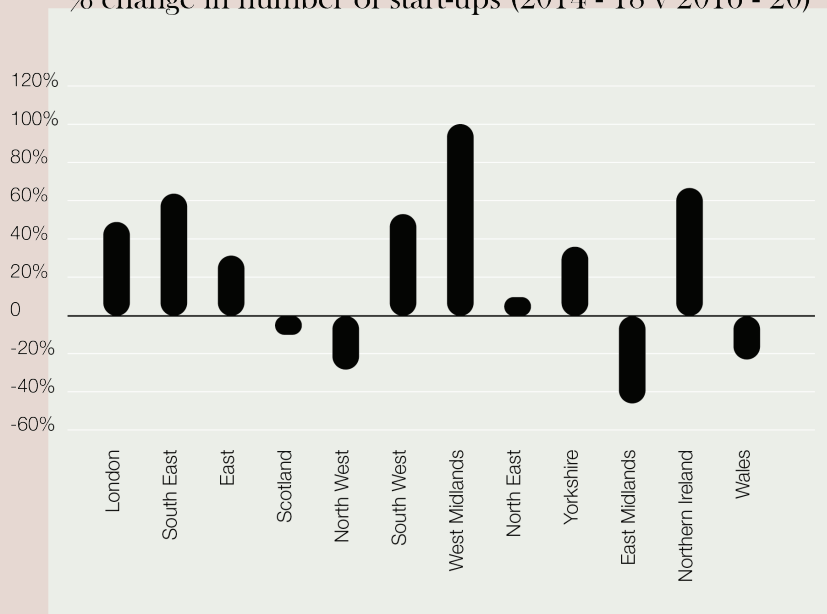


Figure 4

The UK's so-called Golden Triangle, the area encompassing Cambridge, Oxford, and London, continues to dominate the life science landscape, bolstering the strength of life science activity in London, the South East and the East of England regions. Indeed, although there are individual regional variations, these three regions are where all the growth has occurred. The number of start-ups in these three locations combined increased by 44% compared to the number in the last report, whereas it fell by 3% (effectively flat) across the rest of the UK.

Interestingly it is the most established regions outside of the South East - Scotland, North West, and East Midlands, that have shown a fall in the number of start-ups, whereas the emerging areas - South West and West Midlands in particular, are showing strong growth, which largely offsets declines elsewhere.

The common factor between the South West and West Midlands has been a significant rise in university spin-out activity, whereas spin-out numbers in Scotland, the North West and East Midlands have declined. We cannot say whether there is any causal relationship, but the impact of universities at the heart of the life science ecosystem cannot be denied. This is a subject we will return to in a later section.

The number of life science start-ups in London, the South East and East of England increased by 43%, but fell by 3% across the rest of the UK.

Number of start-ups in regions over time

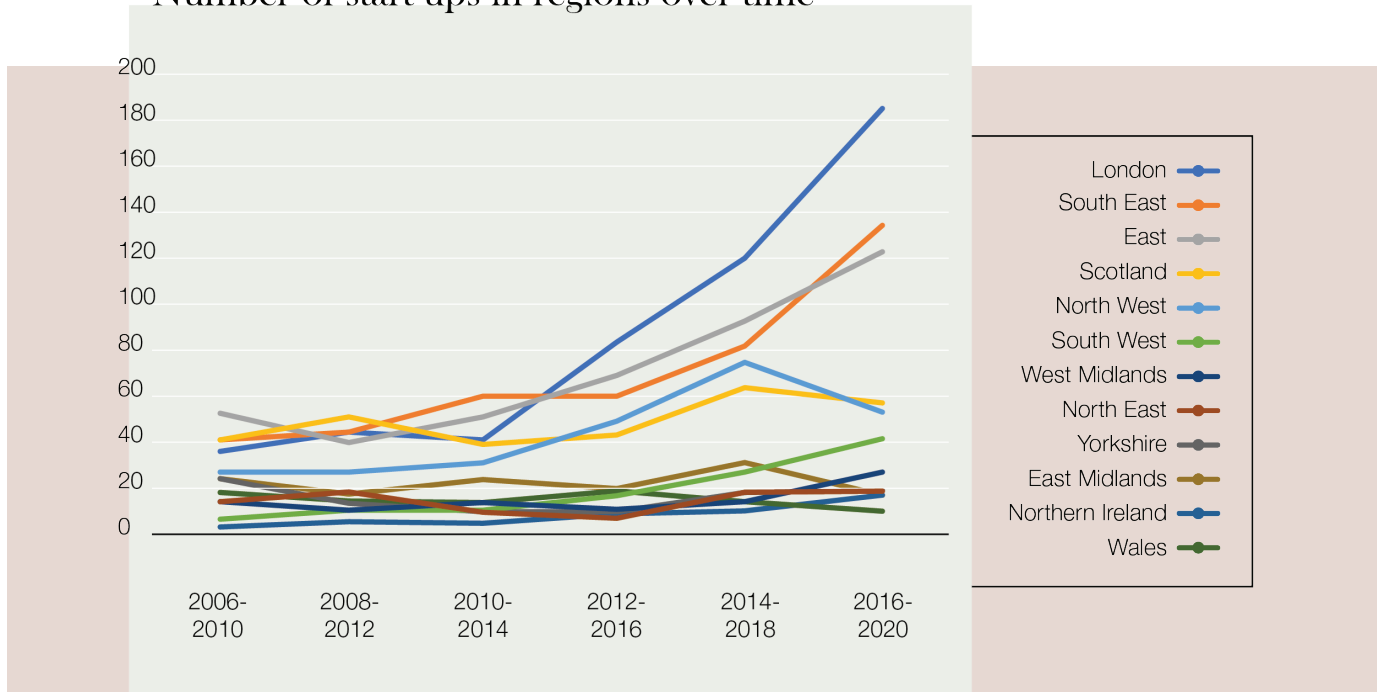


Figure 5

Regional ranking for start-ups

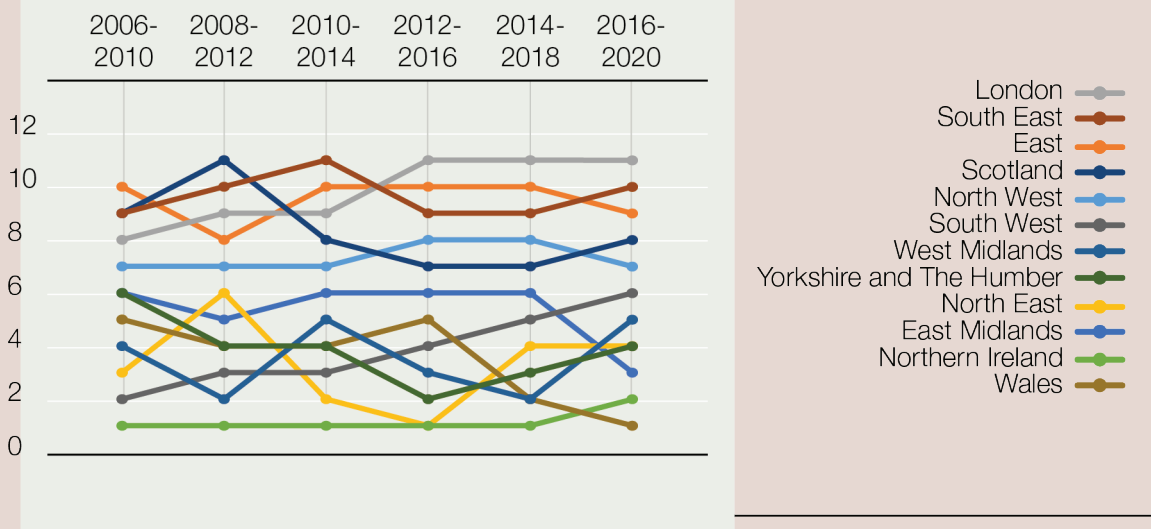


Figure 6

While overall the change in the rank order of the UK's regions and nations is minimal when comparing one period with the next, especially in the upper group, there are some trends that can be picked out of longer-term data, that indicate emerging centres for life sciences in the country.

For example, the South West of England's upward progress through the rankings is notable and reflects the growth of Bristol as an increasingly important centre for life sciences. Similarly, London became the leading centre for start-up activity in the 2012 to 2016 cohort and has retained, and indeed built upon that top slot ever since.

The East of England and South East have swapped position several times since this report was first created. This time it is the South East's turn to take the upper slot. As might be expected, much of the activity is centred around Oxford, which is home to 57% of the companies in the region, bolstered significantly by the presence of Oxford Science Enterprises. This in turn attracts other investors to the area to invest in spin-outs from the world leading university, as well as start-ups that are independently generated. Some way behind Oxford come Guildford and Reading, each with around 8% of the start-ups in the area.

The steady decline in Wales' position in the table, which now sits at the bottom, reflects the growth in the number of new life science businesses in other regions over time as well as a steady decline in Wales. Arguably the sector could be performing more strongly in Wales than it is.

Conversely, Northern Ireland has seen steady growth in start-up numbers, in part driven by the activity at Queen's University, Belfast, and this has resulted in an emerging life science sector in and around the capital.

Other regions fluctuate up and down and little can be discerned from these dips and bumps, it is the trends that matter.

Number of start-ups by city region

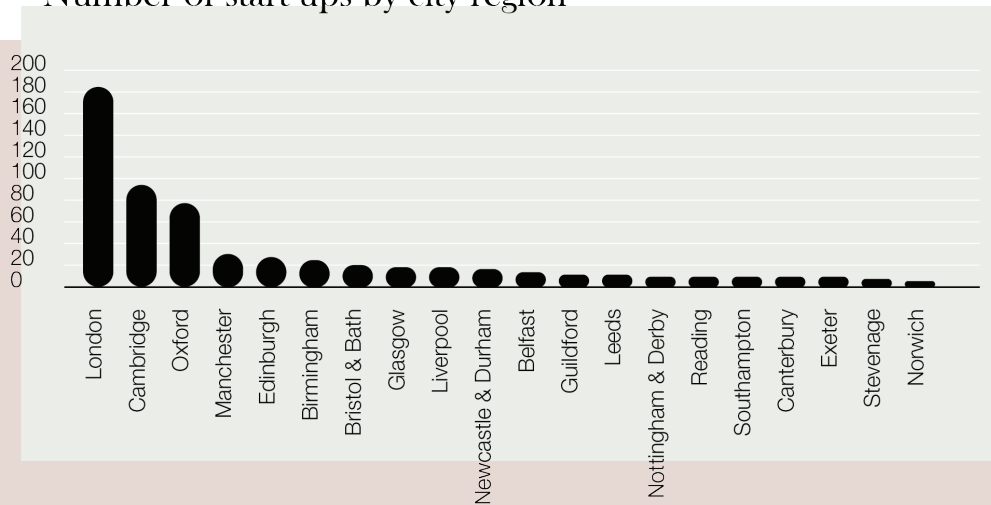


Figure 7

The data tells us where a start-up is based, not necessarily where it started, unless it is a university spin-out. Consequently, the location analysis, at a city or regional level, is of where start-ups are based.

At a cluster level, the Golden Triangle markets continue to storm ahead, with London far out in front when it comes to start-up numbers. The presence of high-ranking universities and access to deep capital has not only maintained London's leading position but propelled it further out front.

Other established markets such as Manchester, Edinburgh, and Glasgow remain high on the list.

For the purposes of this analysis, Manchester includes the former AstraZeneca site at Alderley Park, which is home to over half the Manchester start-ups. Further developments in the city itself, such as ID Manchester and City Labs 3.0 on the Oxford Road Corridor, as well as the establishment of the University of Manchester's Innovation Factory in 2020 may indicate a future rise in start-up numbers in the city region.

Birmingham, which has seen the largest leap forward compared to other cities, is starting to become an established birthplace of life science companies, and indicating potential future growth of the cluster.

Surrey Research Park is also home to several start-ups and has resulted in Guildford sitting in the top 20 list. The placing of Guildford Business Park on the market with the potential offering of more life science space may see the start-up numbers in the area continue to grow.

The top 10 cities between them account for 86% of all the start-ups in the UK: those cities are quite well spread across the UK, covering most English regions and Scotland. Belfast is just outside the top 10 but there are no Welsh cities in the top 10 or 20.

The top 10 cities account for 86% of all UK life science start-ups



20 YEARS

building and operating life science and
technology campuses that support and
grow ambitious life-science businesses

Our name is brand new
but we are not

WAPG
We Are Pioneer Group

WWW.WEAREPIONEERGROUP.COM

Life science start-ups as a share of total life science companies

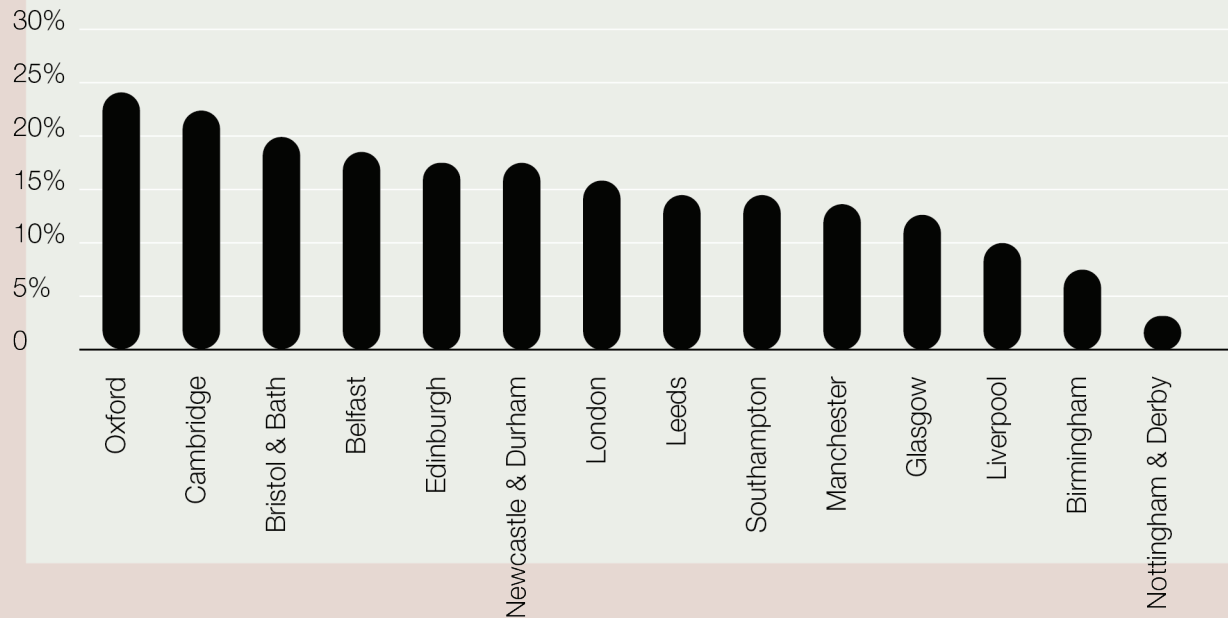


Figure 8

It is useful to know the maturity profile of a local cluster to help understand the needs of the companies in the area.

The Oxford and Cambridge clusters have a particularly high proportion of early-stage companies, reflecting the recent high levels of company formation. However, in London, start-ups make up a lower proportion of the total, despite having the highest level of company formation. This is because of the large existing population of more established businesses.

Start-ups also need space to establish and grow and some locations, such as Nottingham, have been a victim of their own success, with minimal space available to accommodate new companies due to the rapid growth of established ones. Consequently, we see the market in Nottingham dominated by more mature companies. This space pinch has now been partially addressed with further plans to address it in the near-term pipeline.



Colworth Science Park, WAPG

**We find the space,
you do the science.**

jll.co.uk/en/industries/life-sciences



Subsectors

To understand which fields the start-ups are operating in, we have categorised the companies into four subsectors. Inevitably there is some subjectivity in categorising the businesses and some don't fall cleanly into one category or another, but the classification provides an indication of the areas of growth and where funds are being invested. The subsectors are as follows:

Pharma and Biotech

Includes most pharmaceutical and biotechnology companies conducting research and development to develop novel medicines or treatments. It includes companies in drug discovery and development of therapeutics as well as those developing novel ingredients, chemicals, or processes. Therapeutic platform companies are included in this category.

Medtech

Covers companies developing technologies that have a medical application. It includes start-ups that are designing new prosthetics, implanted devices, or diagnostic tests (excluding providing Covid testing but not developing novel tests), tools and equipment.

Digital Health and Pharmatech

Includes companies that utilise software or hardware to provide benefits to health or wellbeing. It includes companies using artificial intelligence and machine learning to solve complex medical issues and to improve the drug discovery and development process.

Discovery and Development Services

Comprises companies that provide services to other subsectors. It includes contract research, development and manufacturing services, industrial biotechnology, and platforms that aid the optimisation of research and development.



Subsector distribution of start-ups

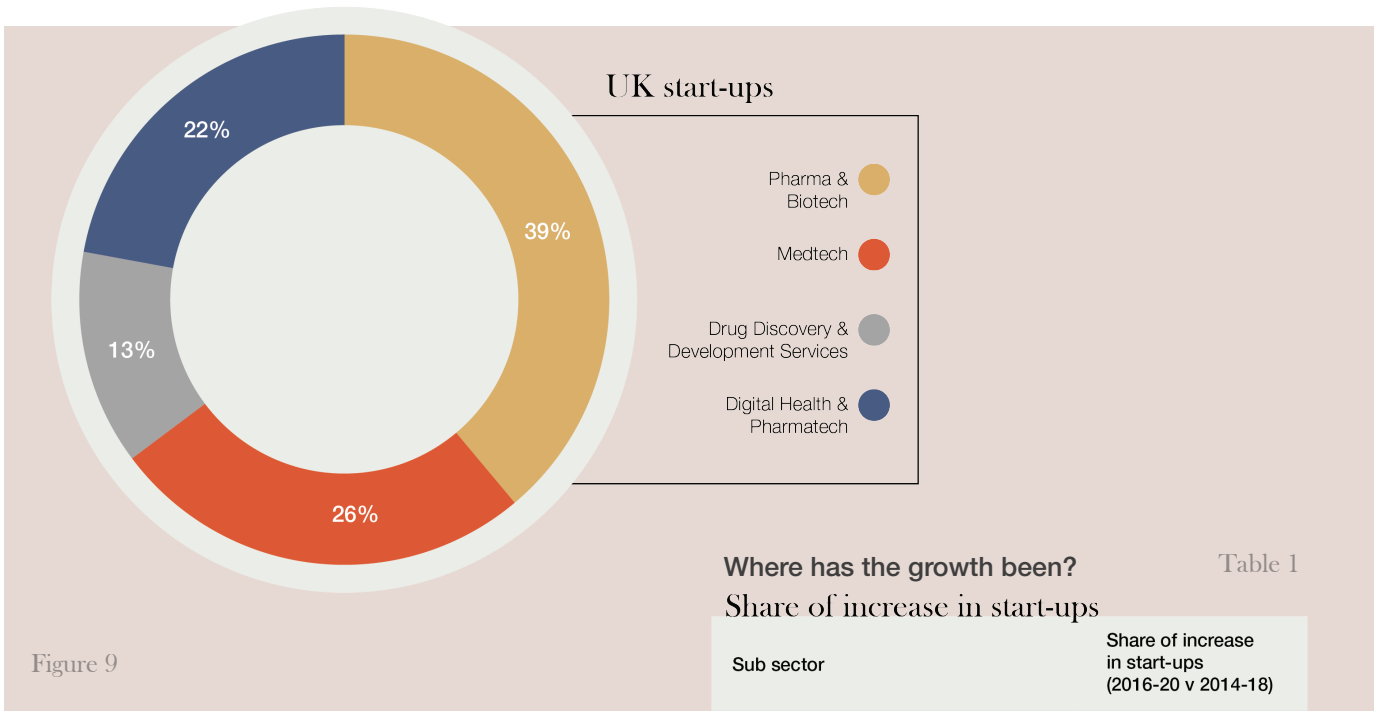


Figure 9

Where has the growth been?

Table 1

Share of increase in start-ups

Sub sector	Share of increase in start-ups (2016-20 v 2014-18)
Digital health & Pharmatech	18%
Drug discovery & development services	7%
Medtech	19%
Pharma & Biotech	56%
	100%

Almost 40% of all the start-ups formed are classified as Pharma and Biotech - companies focused on developing new treatments for diseases. This is a further reflection of the strength of the academic research base in the country as these companies are likely to be founded on intellectual property. Pharma & Biotech companies also represent a disproportionate share of the increase in start-ups compared to the previous report, likely reflecting investors' increased interest in this area and so resulting in more companies being launched.

Approximately one third of all the Pharma & Biotech start-ups are university spin-outs, which still means that most companies in this category have not spun-out directly from a university. This includes companies such as Nodthera, which raised £74 million in the reporting period, and Mestag Therapeutics, created by Johnson & Johnson Innovation.

Medtech is the second most common group, at over a quarter of companies and about the same proportion as in the last report (27%). As above. The proportion of Digital Health and PharmaTech start-ups, which includes HealthTech, is steady in comparison to the previous year grouping.

Regional subsector distribution

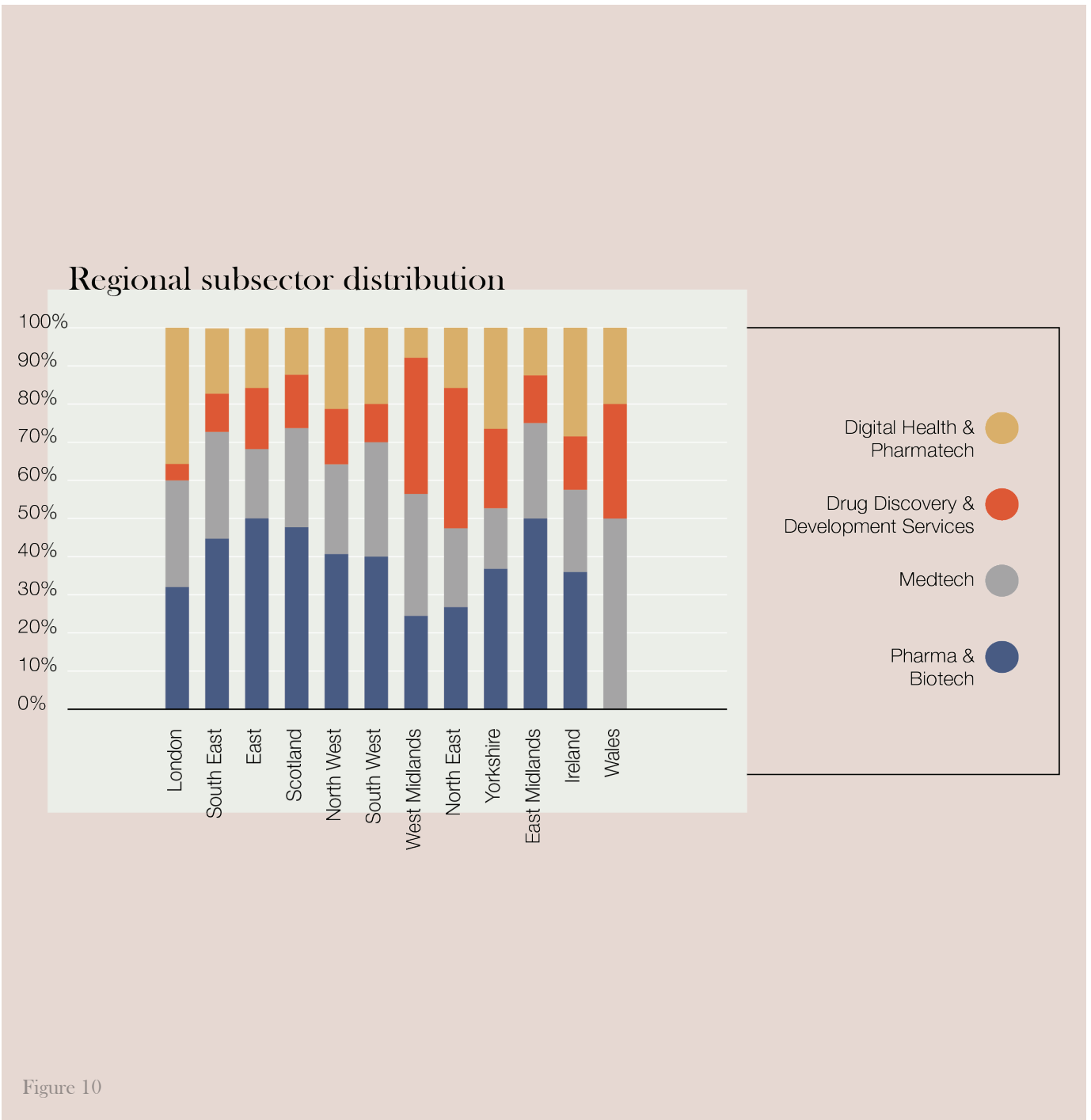


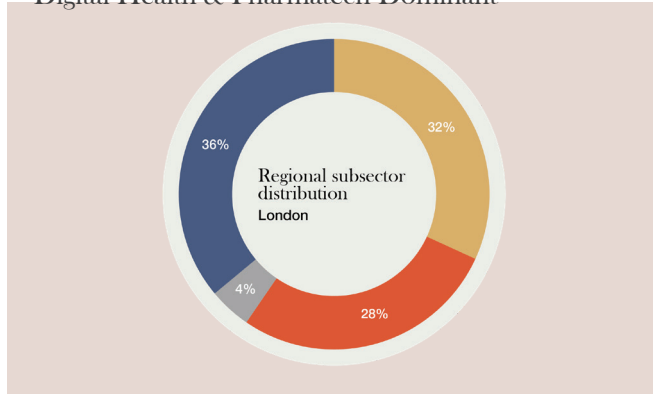
Figure 10

The make up of the start-up company base varies significantly across the UK. The pie charts show three different distribution profiles, exemplified firstly by London, second by the South East and East of England and third by the West Midlands and the North West of England.

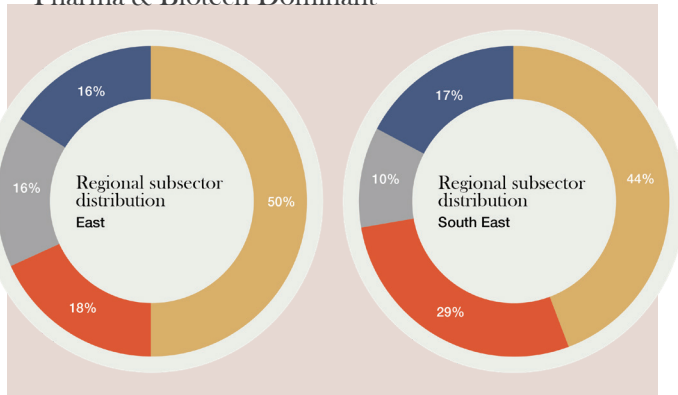
Examples of regional sub sector profiles

Figure 11

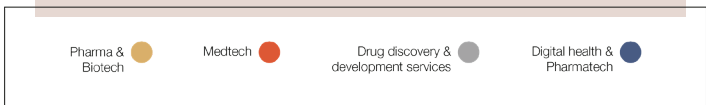
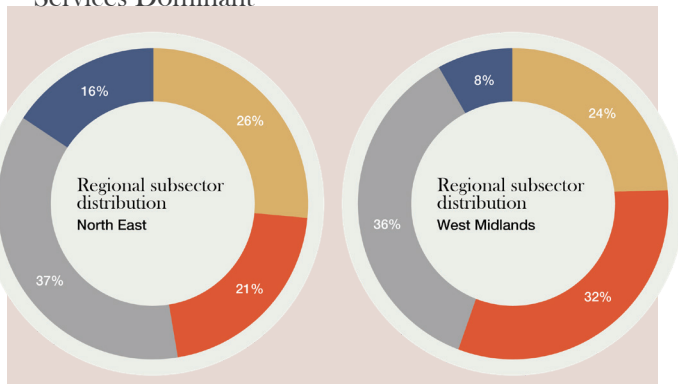
Digital Health & Pharmatech Dominant



Pharma & Biotech Dominant



Services Dominant



In London, Digital Health and Pharmatech companies make up the largest subgroup at 36%. Together with Medtech, these two sectors constitute nearly two thirds of all the start-ups and helps to explain the space conundrum in London. The conundrum is as follows: there is very little laboratory space in London and yet London has seen a huge growth in the number of life science companies over the past five to ten years, so where are they going? The answer is that most of the companies in the Digital or Medtech fields do not necessarily need lab space. Indeed, some of the Pharma & Biotech companies may operate virtually and so wouldn't need labs either. Discovery & Development Services companies, which are most likely to require laboratories represent a tiny proportion of the total, at 4%. There is a cause-and-effect debate to be had around the make-up of the London life science start-up population - are there fewer lab-based companies because there are fewer labs? When we look at university spin-outs in a later section, we will see that there is a net migration of spin-outs out of London, possibly because they could not be accommodated in the capital.

Compare London with the profile of companies in the South East and East, where Pharma & Biotech businesses dominate. The profile of these two regions is similar, with slight variations around the share of Discovery & Development Services and Medtech companies. This profile reflects the combination of availability of capital and the availability of laboratory space, enabling therapeutics companies to thrive.

In the West Midlands and North East, the market is very different again. Capital is in much shorter supply but space reasonably abundant and low cost. Consequently, Discovery & Development Services companies are the dominant sub-group. These companies usually require less capital to become established but do often need lab or manufacturing space and profit margins are a consideration, so cost is important.

Finally, it is worth mentioning Wales as an outlier. Although the number of overall start-ups is declining in Wales, those companies that are formed are predominantly in the Medtech space. There is a growing Medtech scene in Cardiff with the development of Cardiff Edge Science Park further supporting this growth. Medtech is also proportionately stronger in Scotland, the West Midlands and London; the West Midlands building on a long established engineering base.

University Spin-outs

Spin-outs

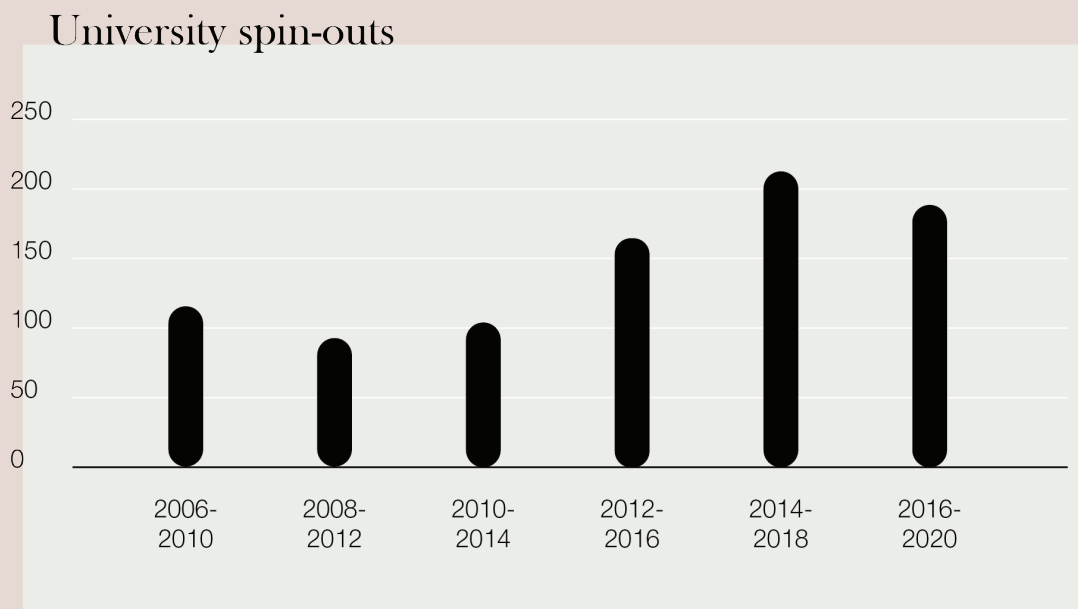


Figure 12

Universities are a major source of start-ups in the UK due to the internationally renowned strength of their research, despite the commercialisation of science not being as high a priority compared to many major US universities.

Although the total number of life science start-ups has increased significantly compared to the last report, the number of university spin-outs has declined slightly - from 212 to 191.

One of the reasons for the decline in spin-outs at a time when investment capital is near record levels and the total number of start-ups is growing, could be that some opportunities are not making it through the exit marked "Spin-out" but are ending up directly in the hands of pharmaceutical companies in exchange for direct payments. Pharma companies are at the stage in the cycle when they are prepared to support very early-stage technology or products and have become adept at seeking this out directly from universities. Sometimes, these licensed technologies do find their way into a new start-up, but it won't be recorded as a university spin-out.

Number of university spin-outs - leading institutions

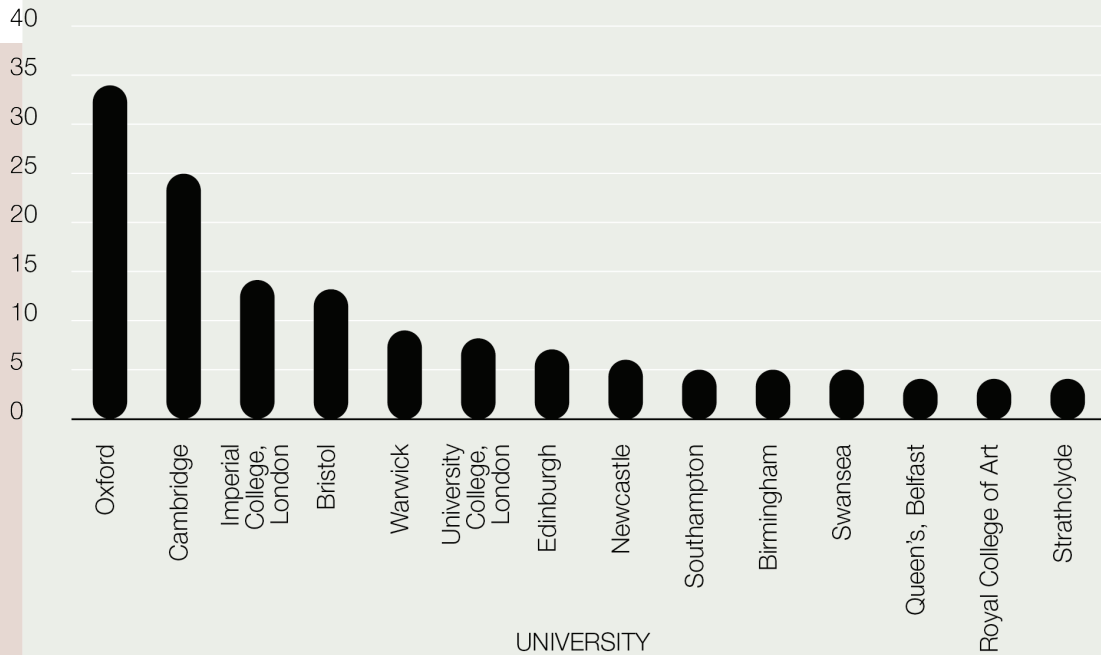


Figure 13

The headline spin-out figures mask significant variation between universities with some spin-out activity increasing dramatically and others falling.

Oxford remains the most prolific university when it comes to spinning out life science companies, with the number of businesses created increasing from 14 back in the 2006 to 2010 year group, to 34 in the current report. This growth has been largely driven by the creation in 2015 of Oxford Sciences Innovation, now Oxford Science Enterprises (OSE), a £600 million investment fund aligned with the University.

Cambridge University has similarly increased the number of spin-outs it produces, from a much lower base. Again, the presence of the £300 million Cambridge Innovation Capital Fund will likely have influenced this growth. Other universities that have significantly upped their spin-out game include Bristol, Warwick and UCL. Of the three, only Warwick doesn't have an associated spin-out fund, albeit the UCL Technology Fund and University of Bristol Enterprise Fund, both managed by Parkwalk, are on a smaller scale compared to the Oxford and Cambridge funds.

The University of Warwick placed in the top five for the first time, producing nine start-ups between 2016 and 2020 – including NanoSyrinx, a company developing “nanosyringes” to deliver therapeutic payloads to cells, which recently raised a £6.2 million seed round from M Ventures, IQ Capital, Jonathan

Milner and BioCity Investments. Notable absences from the list above are Manchester, Glasgow and Nottingham Universities which each have a very strong life science research base but have produced few spin-outs recently.

The appearance of the Royal College of Art on the list will perhaps raise a few eyebrows. It is not a typical life science university, but it ranks well for spin-outs due to the collaborations it has in place on many design projects – often with medical applications. For example, Nitrogen is developing smart textiles to be incorporated in wearable physiotherapy and stroke rehabilitation equipment. Similarly, Charco Neurotech has designed a non-invasive device to be worn by patients diagnosed with Parkinson's to improve movement and quality of life and has raised £8.2 million since 2019.

**DOORS WILL
OPEN FOR THOSE
BRAVE ENOUGH
TO KNOCK.**

WAPG Accelerator Programme

We designed an accelerator programme specifically for life science entrepreneurs because we understand that entrepreneurs are not all the same.

They work with a determination, a drive, an endless energy and commitment to turn a great idea into reality.

HOW TO APPLY, VISIT: WWW.WEAREPIONEERGROUP.COM/ACCELERATOR-PROGRAMME

WAPG

Spin-outs as a % of total start-ups

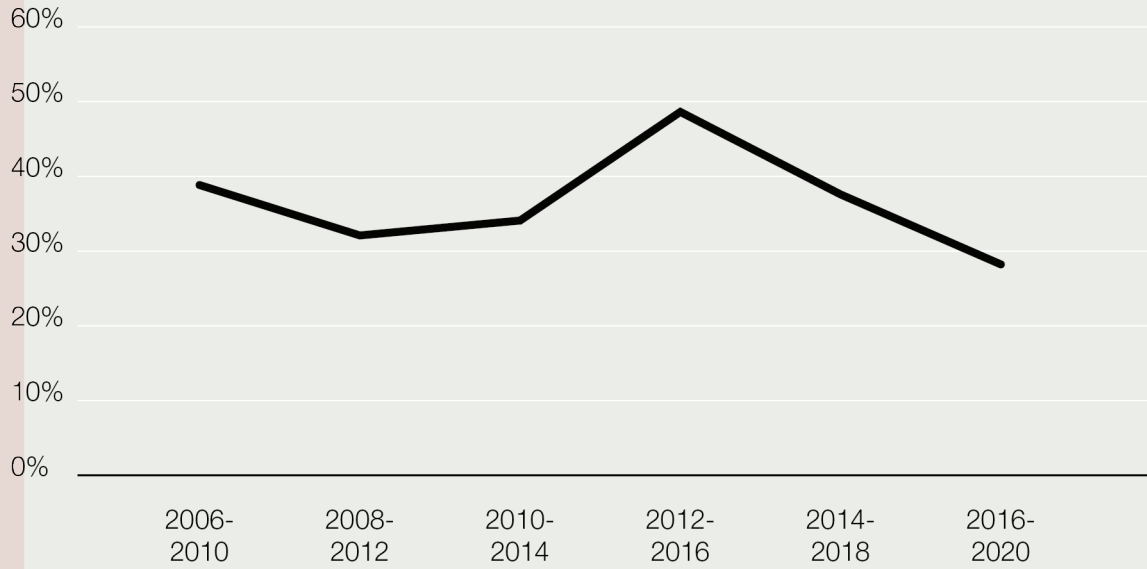
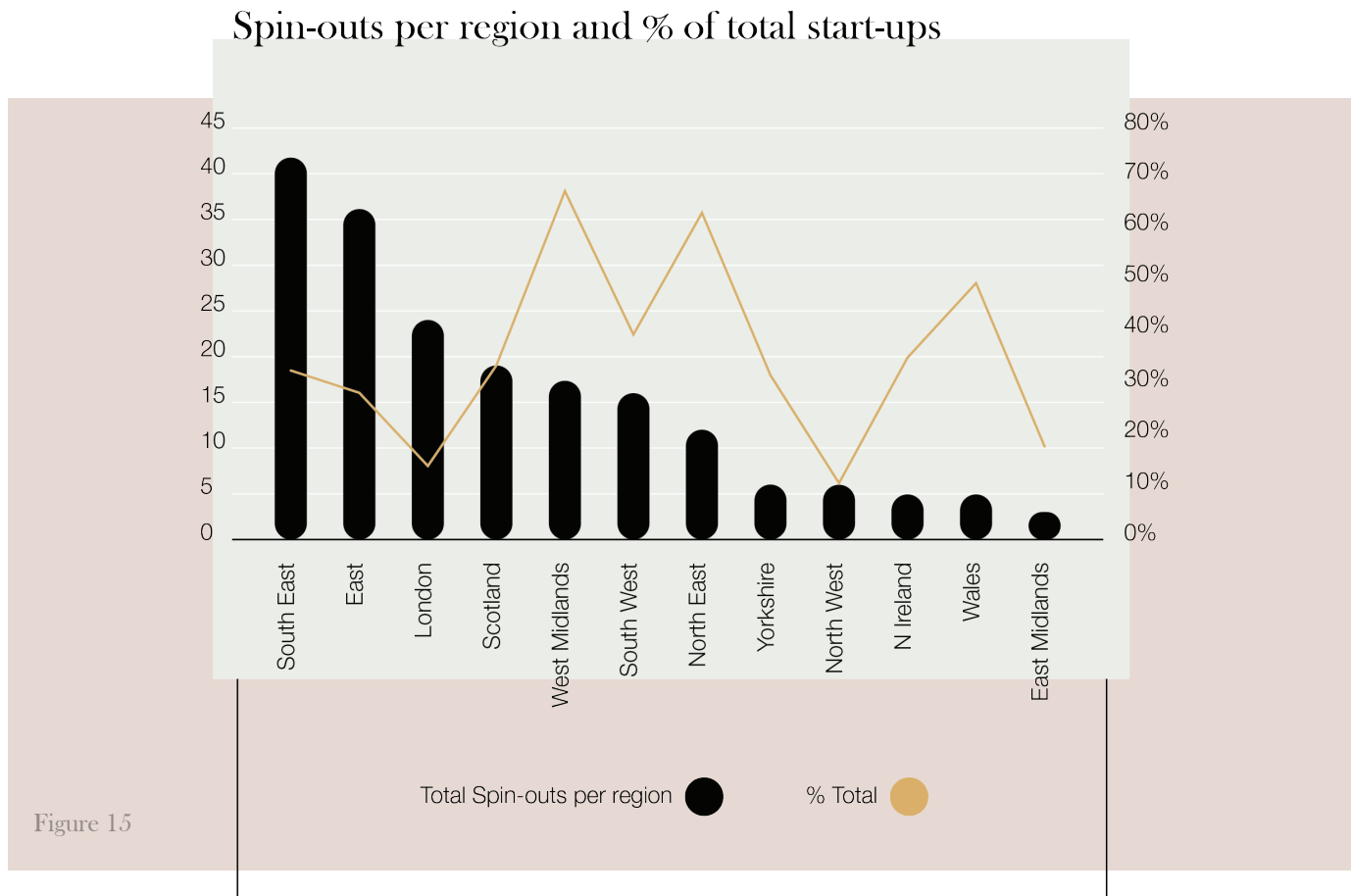


Figure 14



The proportion of start-ups that are university spin-outs has declined from around 38% to 28%. In fact, all the growth in start-ups from report-to-report has been in companies that aren't university spin-outs. However, as the chart shows, the share of university spin-outs fluctuates from period to period, generally sitting between 30% and 40% of the total so this dip should not be interpreted as evidence of a longer term relative decline.

Spin-outs by region



Regional trends in spin-out activity are reflective of the wider start-up trends. The South East, East of England and London still dominate although London is no longer leading. This demonstrates the spin-out strength of the University of Cambridge and the University of Oxford, outcompeting four major science universities in London.

The universities play a widely varying role in local start-up ecosystems. In the West Midlands and North East university spin-outs account for 68% and 63% of all start-ups, respectively, making the universities central to the emerging ecosystems. In other areas, such as the North West, East Midlands and London, the universities play a much lesser role.

In the North East, the universities of Newcastle and Durham are the main generators of spin-outs. Several of these companies have come from the Medical School in Newcastle University, including Aelius Biotech founded in 2017, which is using human trial and lab models to provide expertise on gut biology to aid in drug delivery. In the West Midlands, Warwick University has become the leading force, accounting for over half the university spin-outs in the region and a third of all start-ups.

Net migration of spin-outs

Not all university spin-outs remain close to their parent institution, some move away for various reasons - facilities, talent, or to be near a partner institution or organisation. Perhaps unsurprisingly, this is seen most acutely in London, with spin-outs there moving out to the Stevenage-Cambridge area and the home counties, but also to the North West and in one case, Scotland.

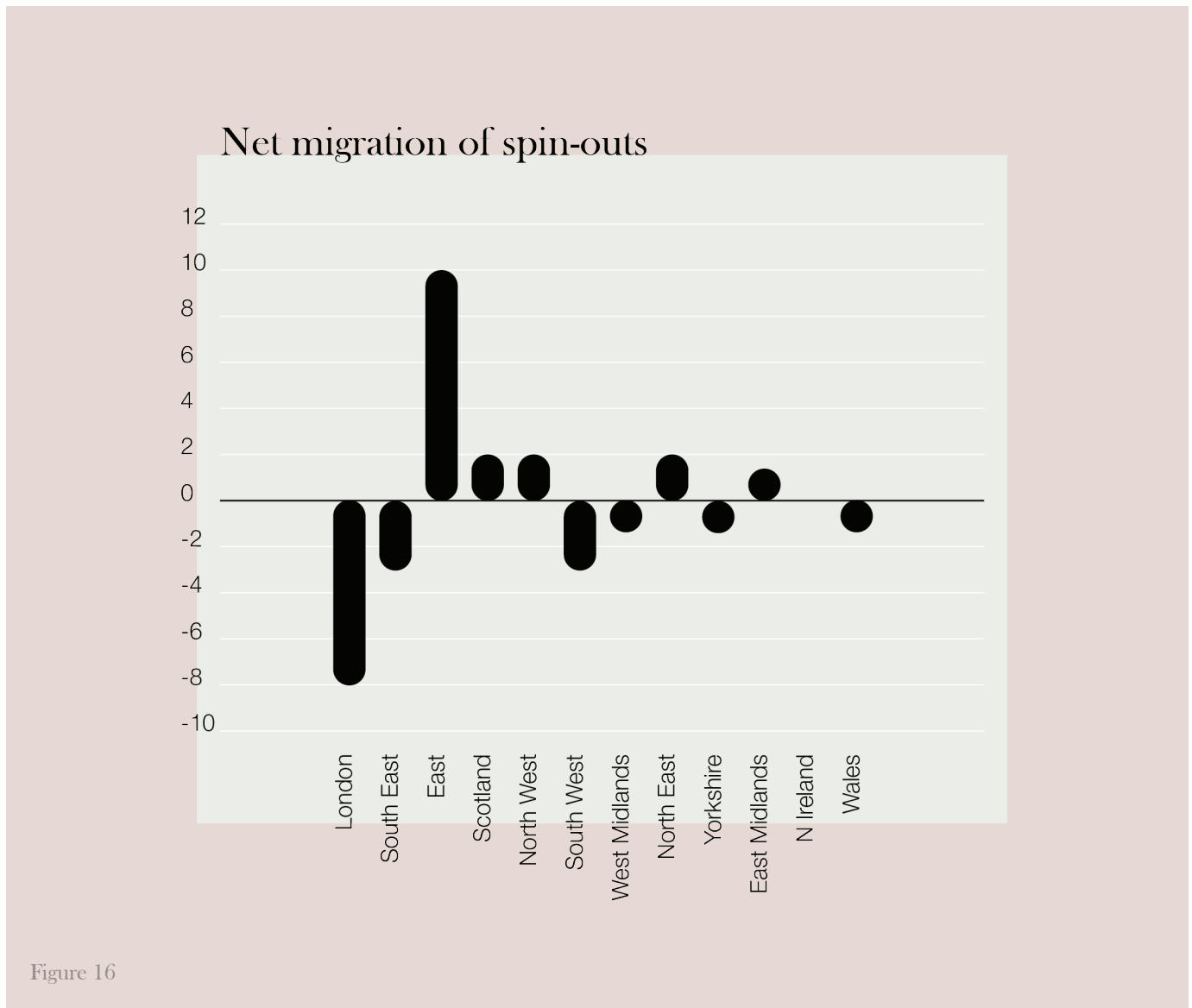


Figure 16

LOOKING FOR LAB SPACE?

Office and lab space to rent goes quickly at WAPG, this could be your chance to join us.





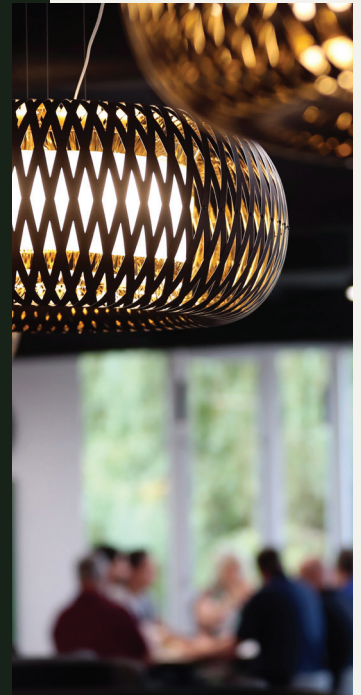
OFFICES TO RENT

An office isn't just four walls. It's an opportunity to join a cluster of like-minded and ambitious people.

Behind every door is someone trying to make something happen, something that has the potential to revolutionise healthcare.

www.wearepioneergroup.com/available-space

WAPG



Spin-outs v research power

(UKRI Funding, Leiden Ranking, Times Higher Education Ranking)

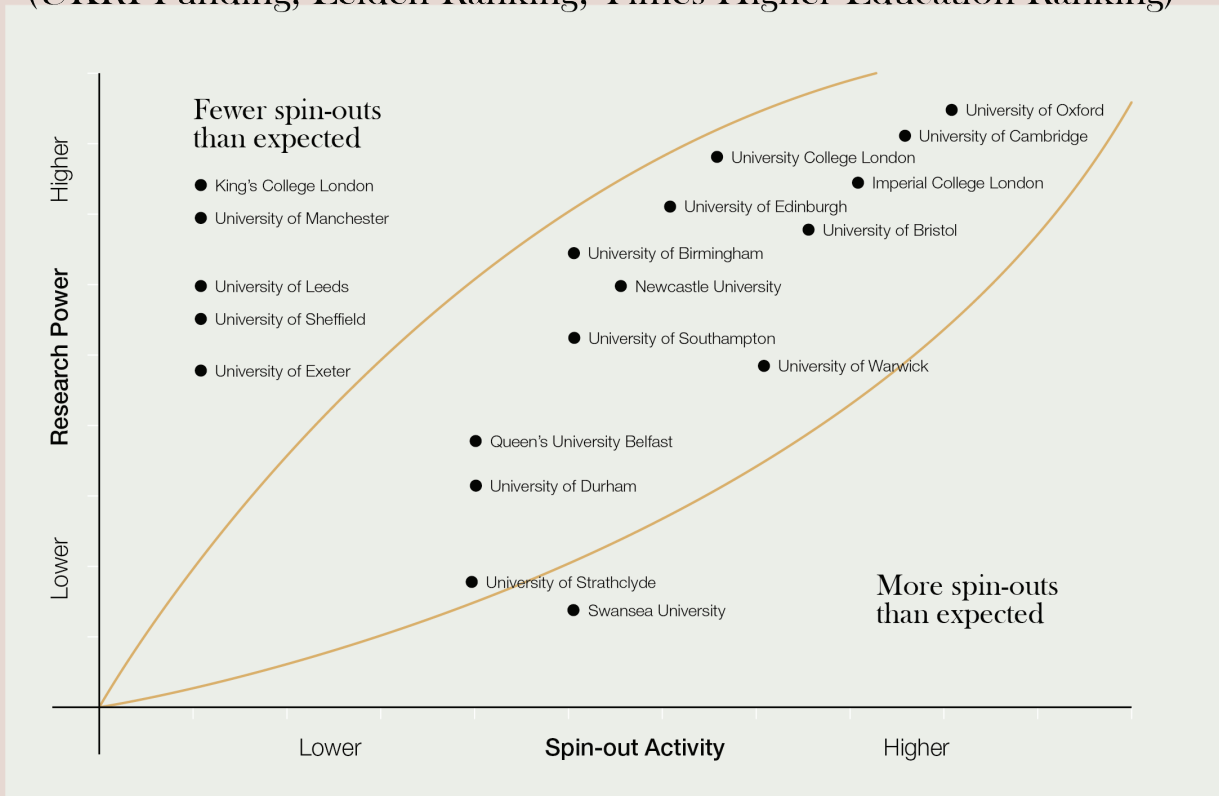


Figure 17

We examined how each leading spin-out-generating institution performed compared to its underlying research strength.

To determine research strength, we looked at three metrics: the amount of UKRI funding awarded in life sciences fields; the global Leiden ranking based on the number of biomedical and health publication citations; and the Times Higher Education ranking. These metrics are combined to provide an estimate of relative research strength. Metrics are treated equally with no weighting applied. The relative research strength

is then compared to the number of spin-outs each university produces, and each university is then mapped relative to the others.

The University of Oxford, University of Cambridge, UCL and Imperial all perform well, producing a high number of spin-outs on the back of high research strength. The spin-out activity of most universities is in line with their research strength. Some institutions produce fewer spin-outs than might be expected - for example, Manchester, King's College, London, and Leeds - while Swansea University performs better.

Several initiatives across the universities could see a higher translation of research into spin-outs in the future. For example, The Innovation Factory in Manchester and the new developments around King's College at London Bridge, could encourage more spin-out activity and provide space for growth. Outside of the Golden Triangle, the Universities of Edinburgh, Bristol, and Warwick, all perform well with regards to research power translating to spin-outs.

Funding

Amount of funding to UK start-ups

Total start-up investment (M)

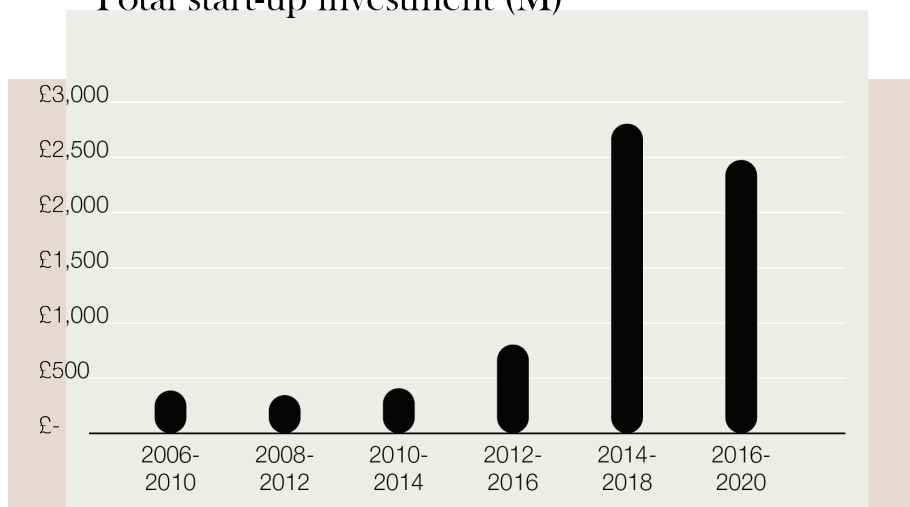


Figure 18

Funding is the life-blood of early-stage company growth, providing opportunity to develop new products, to grow employment and to expand. The flow of venture capital into early-stage companies has continued, albeit at the slightly lower level of £2.5 billion compared to the record £2.8 billion reported in the previous review. Despite the small decline it is worth noting the amount is still nearly 7-fold greater than the 2010 to 2014 period less than 10 years ago.

There is however a paradox: the number of start-ups has increased, but the total investment raised has gone down. What's going on?

The proportion of companies created and raising investment of more than £100k in the 2016 to 2020 period is 56%, almost identical to the 57% that raised venture capital in the previous report. But the average amount raised has fallen, from £8.6 million to £6.5 million.

However, the number of companies that have raised more than £25M in total has further increased from 24 in previous years to 31 companies in this year grouping. So, on the face of it, it doesn't look like the scale of investments has declined, until we look at the top end of the fundraising list and this is where the big change has taken place.

In the 2014 to 2018 cohort some start-ups raised huge sums in the period: Orchard Therapeutics raised £221 million; Freeline raised £137 million; Autolus £132 million. In fact, the top six fundraisers raised over £1 billion between them. This year the top 6 raised around half that amount, with Achilles Therapeutics heading the list at £177 million. This variation is to some extent an artifact of the need to draw some timelines around the data collection because several of the biggest fundraisers in the current cohort went on to raise large rounds in 2021, outside of the scope of the report. For example, Achilles raised a further £130 million via IPO in April 2021, Gyroscope added £148 million to its £56 million total in March 2021 and Evox therapeutics added £69 million in February 2021. Overall, we shouldn't read too much into a slight decline in investment levels and judge it to be materially flat. Investors still appear to be very interested in early-stage life science companies.

Investments by region

As in previous reports, most of the investment into life science start-ups is made into companies in London, the South East and East of England, accounting for about 83% of funds invested and about the same as last report's 82%.

However, while this appears to paint a dim picture for the rest of the UK and certainly highlights the importance of the UK Government's "levelling up" agenda, it is not quite as dire as it first appears. For example, much of the large-scale investments into companies in the Golden Triangle will be going into therapeutics companies, sometimes virtual or semi-virtual. Much of their discovery and development work will be outsourced, often to companies such as Sygnature Discovery, Quotient or BioAscent, which are the ultimate recipients of some of the investment and which are all located away from Oxford, Cambridge, and London in much less expensive locations where the type of talent these companies need is also available. So, funds invested in companies in the South East, are often building clusters in other parts of the country.

Of course, the early-stage companies in the regions across the UK could still benefit from a greater pool of investment, and initiatives such as the Northern

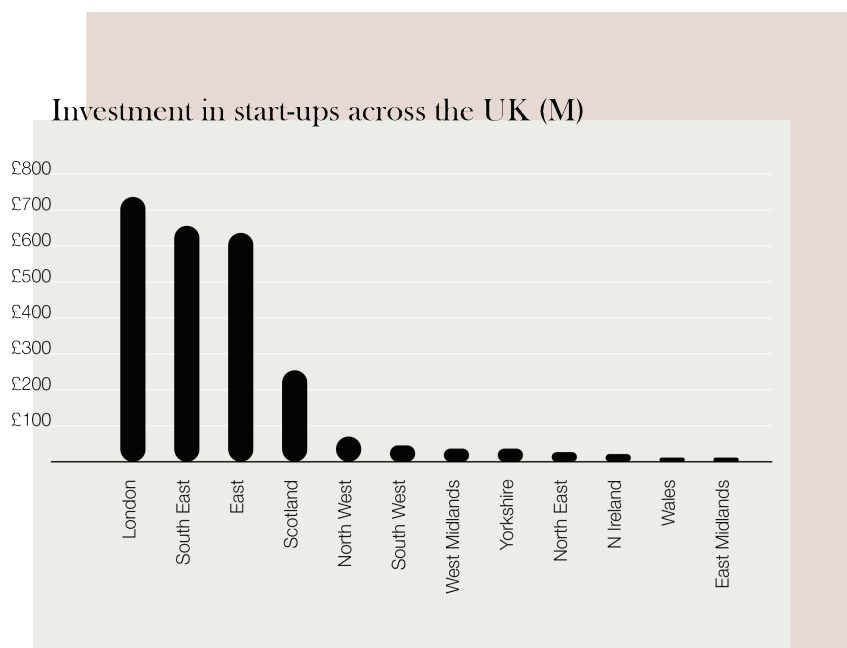


Figure 19

Gritstone Fund, aimed at doing for Northern University spin-outs what OSI did for Oxford, could have an impact.

The Government could have further impact if it wanted to, through the distribution of grant funding and the future location of major public funded research initiatives. Most of the latter are located within the Golden Triangle and an excellent report published in 2020 by Tom Forth and Richard Jones for NESTA - The Missing £4 billion¹ - highlighted that if the Government were to spend on R&D at the same intensity in the rest of the country as it does in the wider South East, it would spend an extra £4 billion. Moreover, if the Government were to follow-through on its stated objective of moving the UK's R&D spend as a percentage of GDP closer to that of France, Germany and the USA, then the opportunity exists to make that change without detracting from the existing strong regions. A significant proportion of the additional £4 billion would end up in life sciences and would be completely transformative for the sector.

¹ https://media.nesta.org.uk/documents/The_Missing_4_Billion_Making_RD_work_for_the_whole_UK_v4.pdf



Investments by subsector

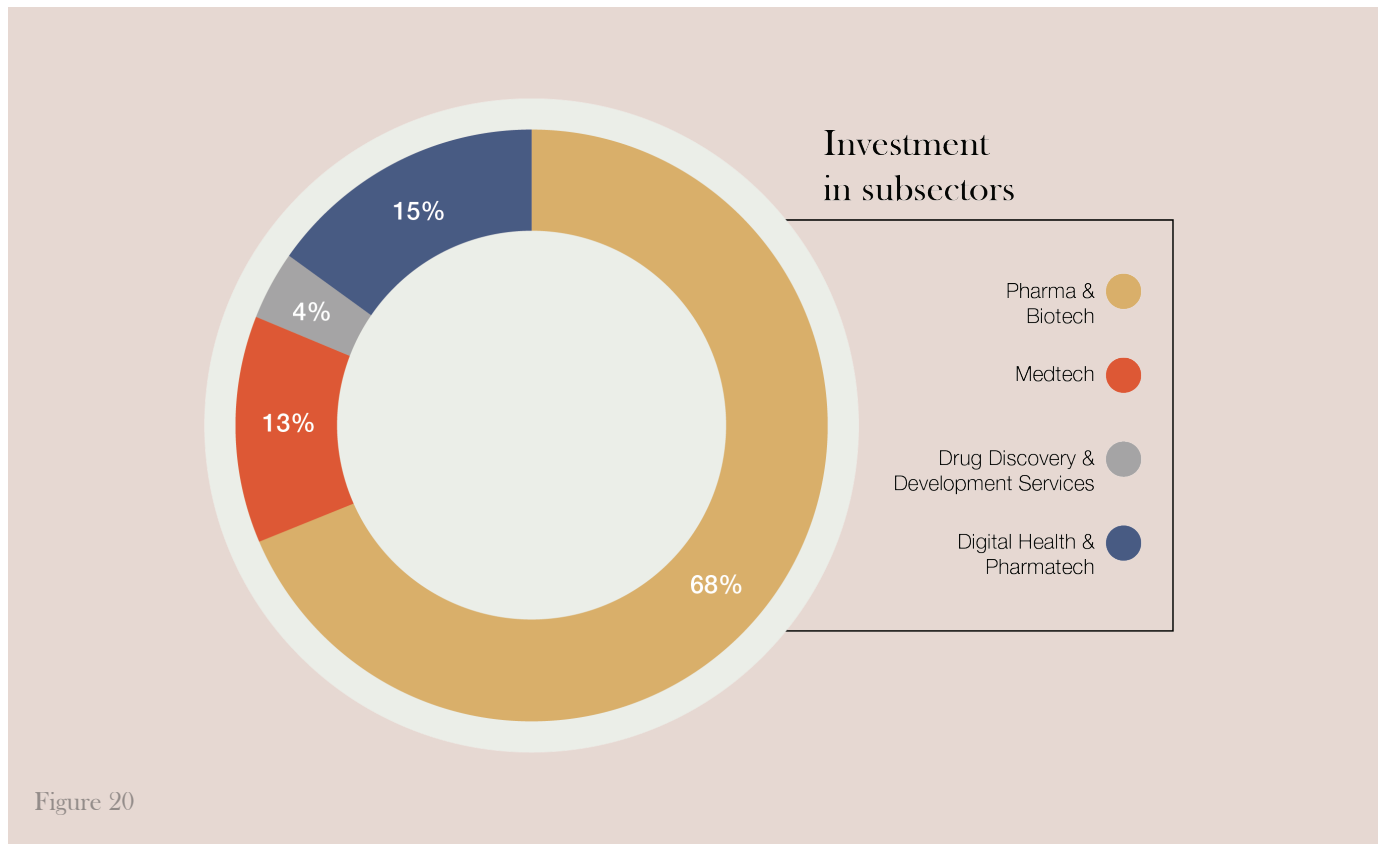


Figure 20

Unsurprisingly, Pharma & Biotech companies command by far the most investment in start-ups. These companies generally need to be well funded to progress their products. It also goes some way to explaining why investment is so disproportionately high in companies in London, the South East, and East, which are home to around two-thirds of Pharma & Biotech start-ups. In comparison, the three regions house less than 45% of

Discovery & Development Services firms, which traditionally require much less investment. The question is – is there less investment outside the greater South East because there are fewer Pharma & Biotech companies or are there fewer Pharma & Biotech companies because there is less investment?

Investors are increasingly turning their attention to Digital Health and Pharmatech companies, with the amount being invested in start-ups from this sector growing by 250% compared to the 2014 to 2018 cohort. Sustained growth of this subsector in London and its emergence in cities like Leeds are establishing these clusters as centres where technology and life science research collide. This was especially true during the pandemic when the need for technology that allows for remote monitoring of patients and large database analytics through machine learning resulted in large investment into the subsector.

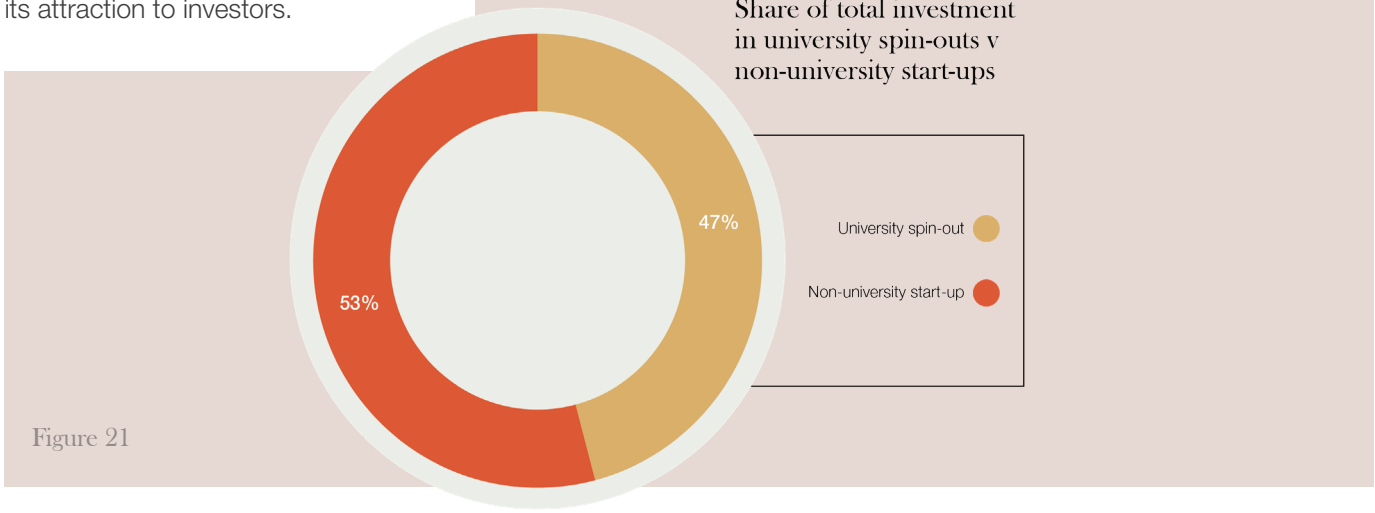
Investments into university spin-outs

The power of Oxford Science Enterprises in driving investment into the University of Oxford spin-outs is clearly demonstrated in the fact that Oxford spin-outs raised 66% more investment than the next institution on the list, Cambridge.

A new entrant to the top 10 in this year's grouping is the University of Bristol. The wider growth of the city and the university as a hub for life science start-ups is arguably driving its attraction to investors.

Table 2

University	Amount of funding into university spin-outs (£M)
University of Oxford	554.48
University of Cambridge	334.69
University College London	198.03
University of Bristol	61.27
University of Dundee	53.00
King's College London	46.24
University of Warwick	43.59
University of Edinburgh	38.61
Francis Crick Institute	36.19
University of Leeds	10.10



Although university spin-outs decreased as a proportion of total start-ups and they constitute only 28% of the cohort, they were very successful at raising investment, garnering nearly half of the total funding going into the early-stage companies. This means that the average amount raised per company (that raised more than £100k) is much higher for spin-outs at £11.5 million per company, compared to £4.6 million raised on average by other start-ups.

This difference is because IP-rich companies developing novel therapeutics are more likely to emanate from universities and these will also require significant levels of investment.

A slightly lower proportion of spin-outs raised investment compared to other companies: 53% vs 58%. This may be because companies in the university environment are better able to access grants and sustain themselves on grant funding in the very early stages. They can also access university facilities, which are not readily available to other companies. Finally, some of the university companies that didn't raise investment in the 2016 to 2020 period, did raise their first significant round in 2021, while others will have raised investment, but it will not have been announced and so not included in the data.

READY TO GIVE BACK TO YOUR INDUSTRY?

A powerhouse of esteemed figures for the world of life sciences who give their time, advice and guidance to the WAPG Collective. Joining the ranks of our Expert Network is usually by invitation only as our standards are high. Experts are not consultants or on the look-out for a new project. They have or had successful careers in industry and held positions within the upper echelons of commercial life sciences.

THEY ARE

Presidents, VPs, CEOs of successful biotechs, board members and chairs of global organisations.

THEY HAVE SUCCESSFUL CAREERS IN

Drug discovery, drug development, finance, fundraising, grants, commercial strategy, insurance, intellectual property, marketing, human resources, leadership/executive teams, legal, operations and administration, outsourcing, R&D strategy, regulatory affairs; to name but a few.

THEY GIVE THEIR TIME BECAUSE

Our experts have achieved their own successes and want to pay it forward by giving back to their industry. They choose to give their time to WAPG because they share our approach, our goals and our determination to help ideas out of the lab and into the world.

www.wearepioneergroup.com/expert-network

WAPG
We Are Pioneer Group

Leading UK investors in life science start-ups

Investment in start-ups that have raised more than £5 million in the 2016 – 2020 period was made by over 420 different investors.

Leading the table is Parkwalk, which manages several university-associated funds including the University of Oxford Innovation Fund and Enterprise Funds for the Universities of Cambridge and Bristol, and Imperial College.

Another university-linked fund, UCL Technology Fund, is managed by AlbionVC, which also features on the leading investor list and places funds from several sources.

Scottish Enterprise (SE) is the main public sector investor in the industry through a range of co-invest and direct investment funds. SE participated in half of the life science start-up fundings in Scotland.

Leading investors in UK life science start-ups

Investors	Number of investments	Location
Parkwalk Advisors (Various Funds)	26	London, UK
Oxford Sciences Innovation/Enterprises	21	Oxford, UK
Scottish Enterprise	14	Glasgow, UK
SV Health Investors	11	London, UK
LifeArc	10	London, UK
AlbionVC	9	London, UK
Mercia	9	Henley-in Arden
Epidarex Capital	8	Edinburgh, UK/Bethesda, US
Longwall Ventures	8	Oxford, UK
Oxford Investment Consultants	7	Oxford, UK
Advent Life Sciences	6	London, UK
Cambridge Innovation Capital	6	Cambridge, UK
Hoxton Ventures	6	London, UK
Google Ventures	6	Mountain View, US/London, UK
Syncona	6	London, UK

Table 3

Note that the investors are listed based on number of investments not on the amount invested. Most firms are headquartered in London, Cambridge, or Oxford, which is to be expected as it is where most of the activity in the sector occurs. However, it should be said that many of the London firms do invest in companies further afield.

Conclusion

This report suggests the UK life science sector is in robust health. The start-ups of today are the billion-dollar companies of the future and the greatly increased number of new companies offers more shots on goal: more opportunities to bring life changing technologies to patients. Of course, unless the start-ups can secure the funding they need to become successful, the absolute number of firms is meaningless with a risk of the industry simply creating many zombie companies.

This is where further analysis of the growth is interesting. Of the 121 additional start-ups in the period compared to the previous report, all of them were in London, the South East and East of England, whereas there was a small decline across the rest of the UK. Start-up numbers grew by 43% in the former and decreased by 3% in the latter.

And this is where the money is, with around 83% of all investment in life science start-ups going into companies in London, the South East and East.

The start-up data can be indicative of emerging clusters, with the greater Birmingham area and Bristol notable in this regard. The wider metropolitan areas of these cities have increasing numbers of university spin-outs, start-ups, and investments, suggesting that these may be places to watch in the future, joining the more established regional centres such as Manchester, Edinburgh, Nottingham, and Glasgow.

The role of the universities is extremely varied, with some, such as Oxford, Bristol and Warwick, significantly increasing the number of spin-outs they produce while others, such as Manchester, reducing. Of course, creating a spin-out company is not the only way of commercialising university intellectual property. In some cases, licensing the technology may be a more valid route and can lead to greater returns for the institution. However, the fundamental difference between a spin-out and a licensing deal is that the spin-out will tend to remain in the area and contribute to building the local ecosystem, while licensed IP could end up anywhere in the world. The importance of universities in developing local clusters is well known. While many are making a significant contribution in this regard, many are also underperforming. This needs to change- for the sake of local economies, for the UK life science industry as a whole and for patients.

So, the overall picture is of a very strong and growing life science sector in the UK. However, over the fifteen years we have been collecting start-up data we have seen the sector appear to become increasingly polarised between South and North. That may not matter. Great technology emerging from Oxford, Cambridge and the London Universities is well funded in good quality companies. The UK's life science sector is highly regarded internationally, retaining its premier league position. Moreover, the money raised in those companies

is often being spent with leading discovery and development service companies in the regions, where operating costs can be half as much as in the South East - an important factor when profit margins come to the fore. As we see in the distribution of the various types of start-ups in different locations, the market is, to some extent, directing the formation of businesses where they can be most successful.

The market isn't working perfectly however, and lack of investment - both grant and equity - is still holding back the development of some potential star companies. The UK Government's recently released Levelling Up White Paper clearly sets out the challenges. We wait to see whether action will follow.



WAPG
We Are Pioneer Group

JOIN US

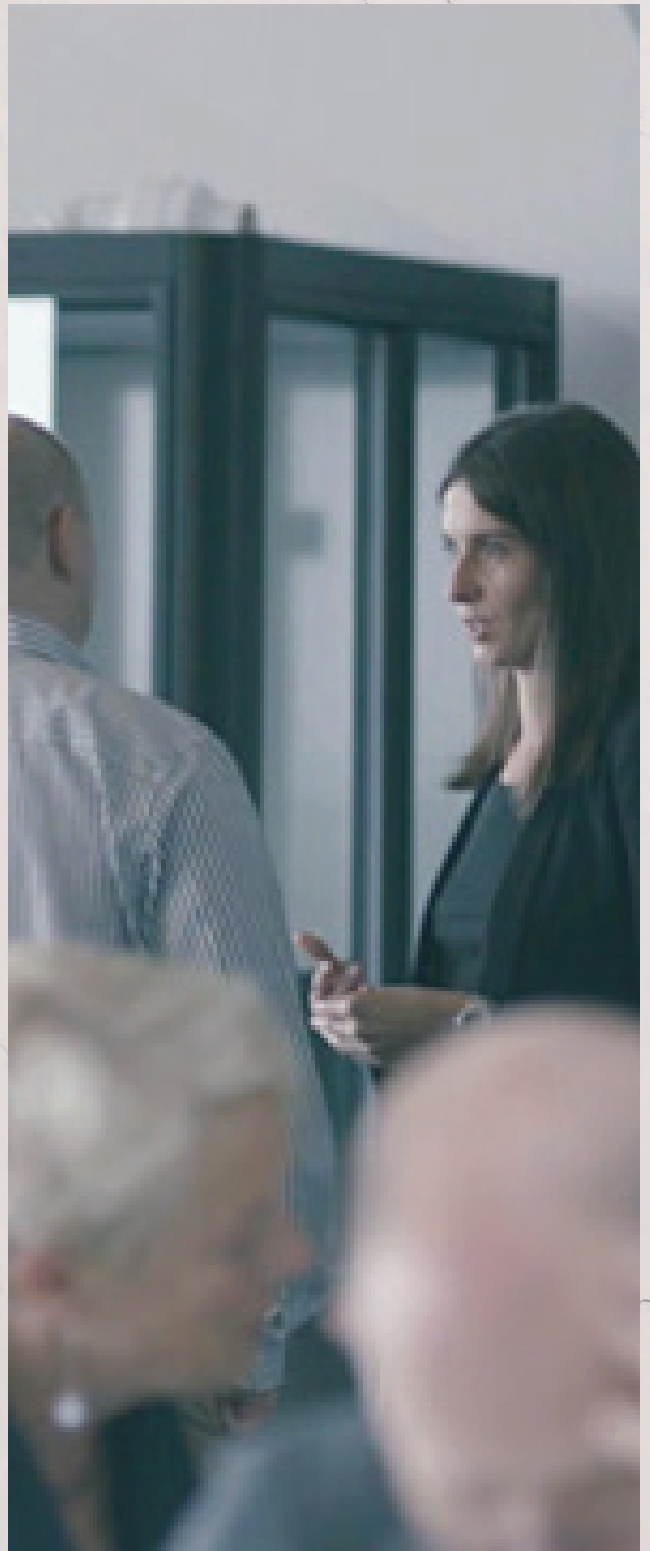
Alex Birks,
Suji BFR

“where it becomes really powerful is when you start getting introduced to everyone within WAPG. Through the Expert Network I was fortunate to meet my chairman and through that our COO.”

The UKs most connected place-based, sector-focused campuses.

**We act as the matchmaker,
connecting entrepreneurs
who have questions with
experts who have the
answers.**

Rather than relying on algorithms or AI, every connection between expert and entrepreneur is personally made. Our team have the technical, operational and commercial expertise to truly understand the industry and the challenges which science entrepreneurs face.



JOIN US: WWW.WEAREPIONEERGROUP.COM

Appendix:

List of tables and figures

	Page
Figure 1. Heatmap of UK life science start-ups	6
Figure 2. Number of start-ups per year grouping	7
Figure 3. Number of start-ups by UK region	10
Figure 4. Percentage change in start-ups by region	10
Figure 5. Number of start-ups in regions over time	11
Figure 6. Regional ranking in number of start-ups	12
Figure 7. Number of start-ups by city	13
Figure 8. Life science start-ups as a share of total life science companies	15
Figure 9. Subsector distribution of start-ups	19
Table 1. Share of increase in start-ups from each subsector	19
Figure 10. Regional subsector distribution of start-ups	20
Figure 11. Examples of regional subsector profiles	21
Figure 12. University spin-outs by year grouping	22
Figure 13. Number of university spin-outs	23
Figure 14. Spin-outs as a percentage of total start-ups	25
Figure 15. Number of spin-outs by UK region and % of start-ups	26
Figure 16. Net migration of spin-outs	27
Figure 17. University spin-out activity vs. research power	30
Figure 18. Total start-up investment (£M) per year grouping	31
Figure 19. Start-up investment (£M) across the UK	32
Figure 20. Investment to start-up subsectors	34
Table 2. VC investment (£M) into university spin-outs	35
Figure 21. Investment into university vs. non-university start-ups	35
Table 3. Leading investors in UK life science start-ups	37



About WAPG

We Are Pioneer Group (WAPG) build and operate life science and technology campuses across the UK.

At their campuses, WAPG help high-tech businesses thrive, from start-up to large corporate, with the support of venture building activity and connected ecosystems.

WAPG focus on:

Real Estate. Life science and technology focused property, facilities and support services.

Ecosystems. The UK's most connected set of place-based, sector-focused, curated ecosystems.

Venture Building. Dedicated coaching in starting-up, raising investment and scaling-up.

For further information, visit:
www.wearepioneergroup.com

To read and download past UK Life Science Reports:
www.wearepioneergroup.com/reports/

About JLL

JLL (NYSE: JLL) is a leading professional services firm that specialises in real estate and investment management. JLL shapes the future of real estate for a better world by using the most advanced technology to create rewarding opportunities, amazing spaces and sustainable real estate solutions for our clients, our people and our communities.

JLL is a Fortune 500 company with annual revenue of \$18.0 billion, operations in over 80 countries and a global workforce of more than 94,000 as of March 31, 2020. JLL is the brand name, and a registered trademark, of Jones Lang LaSalle Incorporated.

For further information, visit: www.jll.com

About JLL Life Sciences

JLL Life Sciences provides specialist advice to real estate owners, occupiers, investors and developers in the science sector. The dedicated team utilises a deep industry knowledge and extensive experience to provide clients with the best possible advice in connection with acquiring, developing or disposing of sites, creating portfolio strategy, connecting with occupiers or finding the optimal space to locate.

For further information, visit:
www.jll.co.uk/en/industries/life-sciences

The information contained in this document has been compiled from sources believed to be reliable. Neither Jones Lang LaSalle (JLL) and any of its affiliates nor We Are Pioneer Group Ltd (WAPG) accept any liability or responsibility for the accuracy or completeness of the information contained herein. And no reliance should be placed on the information contained in this document.

UK Life
Science
Start-Up
Report

2022
