



Geographical clusters: a vision for the future

Report of a workshop held at Newcastle University,
1 February 2017

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Executive summary

The 'Geographical clusters' FORUM workshop was held on 1 February 2017 by the Academy of Medical Sciences and the Wellcome Trust, following on from a highly successful meeting held in 2015.¹ It aimed to develop a collective future vision for life sciences clusters in the UK and set out ways to achieve this by overcoming current challenges. Delegates considered the wider political context of the Government's Industrial Strategy and identified where Government, funders and others can work together to capitalise on research and innovation in the UK.²

The UK consistently 'punches above its weight' in the life sciences, producing notably high levels of outputs, such as research publications, intellectual property and generated revenue. Life sciences clusters can offer tangible economic benefits, helping companies to maximise their innovative potential.³

However, there are still challenges that limit the benefits of the life sciences clusters. Key points identified over the course of the meeting included:

- The need for **better connectivity and collaboration** across clusters, allowing them to showcase the UK and compete effectively at an international level rather than competing with one another or becoming too parochial. **There are currently few political incentives to encourage such joined-up working.**
- To address this, **an overarching network is needed** to coordinate the groups and create **a single, compelling UK-wide voice** founded on the strengths of the individual clusters. The differentiation and bottom-up assembly of clusters around their individual strengths is essential to ensuring this rich UK offering. Case studies could be used to demonstrate the value of successful partnerships to key decision-makers.
- Brexit has hastened the need for a **joined-up national clusters strategy**. Although UK Government has recognised the excellent and important contribution of the life sciences in the UK, reassurances are needed on the status of funding, availability of talent, regulation and other legislation to ensure that the UK clusters can remain competitive.
- The **regional agenda and increasing focus on local economies may indeed discourage collaboration** between clusters and foster greater competition between regions. For example, devolved funding for collaborative projects may be regionally restricted, limiting the capacity to work across geographical networks. The Industrial Strategy should consider support for a 'supercluster' through cross-regional strategies. Clusters should also engage with both national and local Government to build and link long-term regional strategies and local investment.
- Currently, funding for cluster organisations is often provided in two or three year cycles. However, **clusters need more long term (patient) investment, visions and strategies** to be able to fully integrate within their regions and provide sustainable support for the growth of small businesses.
- There is an **insufficient diversity of funding for businesses across different regions**. Private financing is concentrated in the South East of England and there is almost no patient capital available for start-ups in the North of England, for example. It is therefore important to incentivise the spread of, and access to, such funding including support from Government, Venture Capital (VC) and other investment streams across all UK regions. This also links to the wider need for investment in regional and national infrastructure around clusters to support their formation and growth.
- **A diverse, skilled and flexible talent pool** that meets regional needs should be maintained. Efforts should be made to build and attract capacity and capability across different clusters by assessing current and future skills gaps, and addressing the need for more entrepreneurial and business skills to drive translation of innovation. This can be achieved, in part, through training provided by educational institutions.
- Clusters need to clearly **demonstrate economic impact** and other measures of 'value' to funders, members and key stakeholders, and should seek to **quantify their impact on health, social and economic inequalities**. Though this is

¹ Academy of Medical Sciences (2015). *Geographical Clusters*. www.acmedsci.ac.uk/policy/policy-projects/geographical-clusters

² Department for Business, Energy & Industrial Strategy (2017). *Building our Industrial Strategy*. https://beis.gov.uk/citizenspace.com/strategy/industrial-strategy/supporting_documents/buildingourindustrialstrategygreenpaper.pdf

³ Office for Life Sciences (2011). *Strategy for UK Life Sciences*. www.gov.uk/government/publications/uk-life-sciences-strategy

challenging, it is essential, particularly as contribution to the economy does not necessarily correlate with reducing inequalities and can sometimes exacerbate this divide.

- Definitions of **geographies, timelines and other key metrics such as economic impact need to be better aligned** between Government and healthcare/life sciences bodies so that their aims and approaches match up with what clusters are looking to achieve.

Clusters and the UK Life Sciences Industrial Strategy

The Office for Life Sciences' (OLS) Life Sciences Strategy, first published in 2011, recognised the benefits of geographical clusters including knowledge transfer and spillover, driving STEM skills and increasing capability and capacity more widely. Delegates stressed that the renewed Strategy should continue to build upon the offerings of the life sciences clusters and support cluster growth in the UK as part of the NHS and health infrastructure. The importance of the life sciences – and specifically clusters – to the UK economy is highlighted in the ten pillars of the Government's Industrial Strategy Green Paper.⁴ In particular, this recognises that the UK should focus on areas where it excels and therefore has a competitive advantage, and that these areas differ across the country with local innovation playing a significant role. To drive growth across the UK, the Green Paper describes the importance of supporting clusters, whether led by business, institutions or others, and creating appropriate support networks to grow innovation at both a local and national level. The life sciences clusters form an integral part of delivering the Life Sciences Industrial Strategy and the wider Industrial Strategy, which should aim to continue fostering and nurturing existing clusters and partnerships, and support the growth of new clusters where appropriate.

⁴ Department for Business, Energy & Industrial Strategy (2017). *Building our Industrial Strategy*
https://beis.gov.uk/citizenspace.com/strategy/industrial-strategy/supporting_documents/buildingourindustrialstrategygreenpaper.pdf

The environment for life sciences clusters

Connectivity and collaboration

The importance of improved connectivity within and between life science clusters to facilitate collaboration and networking was emphasised, a theme also discussed at the 2015 meeting.⁵ Linking clusters enables best practice, resources and expertise to be shared, and will facilitate the development of a national strategy that promotes the UK as a competitive location for international investment. As described in the future vision, a single network joining-up the clusters is a valuable opportunity to maximise the coordination, reach and impact of the clusters.

Internal connectivity in clusters

- Internal connectivity between the organisations in a cluster is essential to capitalise on available specialisms, resources and data. It would be beneficial to create a roadmap or guide to help cluster organisations access expertise within a cluster or in other clusters. This could assist with technology scouting, knowledge transfer, scale-up of research and development, supply chain access and coordinating new opportunities. Many examples of the benefits of working collaboratively were discussed, such as: the Northern Health Science Alliance's (NHSA) role in coordinating multi-centre trials of an antimicrobial resistance diagnostic across different universities and NHS Trusts; and the increase in highly cited research outputs from the three NHS trusts working within King's Health Partners.^{6,7}
- Traditional **competitive instincts between institutions have to be overcome** to create a 'spirit' of collaboration where organisations work together effectively on shared aims and areas of interest as part of a cluster.
- Clusters must be dynamic and adapt to the changing scope of their membership, new scientific developments, shifting demographics and changing Government policy. Clusters must also engage with non-science organisations who can contribute to the cluster by supporting areas such as the supply chain, patient engagement and data storage and use.

External networks

- Clusters can significantly **benefit from forming national innovation networks**.⁸ These networks facilitate collaborative working and provide a combined voice for interaction at a national level such as with Government. They also provide signposting for external investment and stakeholders, attracting and guiding funding and political and local support. However, delegates warned against simply creating another entity, which may further complicate the environment and confuse external partners. United Life Sciences was referenced as an example of an effective network that spans several clusters and industry bodies, enabling members to engage with stakeholders through one 'front door'.⁹
- Clusters must **recognise each other's capabilities and seek to specialise in their own areas of strength**, whilst being aware of potential gaps between their work.
- Clusters should share their experiences of starting or growing clusters, pilot schemes and other initiatives with each other to foster a culture of support and sharing best practice.

⁵ Academy of Medical Sciences (2015). *Geographical clusters*. www.acmedsci.ac.uk/policy/policy-projects/geographical-clusters

⁶ Northern Health Science Alliance (2017). *Portable technology to fight antimicrobial resistance brought into North Hospitals* www.thenhsa.co.uk/2017/01/portable-technology-fight-antimicrobial-resistance-brought-north-hospitals/

⁷ King's Health Partners (2016). *Second Annual Report*. www.kingshealthpartners.org/latest/478-annual-report-published

⁸ United Life Sciences (2015). *UK Life Sciences Manifesto 2015-2020*. www.unitedlifesciences.org/library/manifesto.pdf

⁹ www.connectedhealthcities.org/

- **International alignment** is critical and UK clusters should connect with other clusters internationally to share expertise and best practise. Global landscaping should be conducted to identify international opportunities for collaboration and inform future work.
- **International investment** is also crucial and can only be accessed through interactions founded on strong regional or national offerings. Clusters and member organisations need guidance on how to attract this type of international funding.
- **Engagement with the health and clinical community and public** through wider networks is essential for productive discussions on healthcare and research, including on the use of health data. For example, primary care clinicians and clinics are the ‘gatekeepers’ for the NHS and could help engage the public in clinical trials to improve enrolment, which is relatively low at present. Delegates noted the successful model adopted by King’s Health Partners, where trained staff have been introduced to discuss patient participation in research when a patient enters the hospital, and it was proposed that this model could be considered elsewhere.

Data

- **Access to integrated health and social care data** is essential to facilitating collaboration between clusters and will also help to direct discussions around health outcomes and inequalities across regions. Clusters could play an important role in benchmarking progress on data use or developing a common platform across different healthcare systems. It was noted that the Connected Health Cities initiative is designed to collate these kinds of data in Northern England, and could be implemented across other regions.¹⁰
- Data collection and dissemination is largely heterogeneous and regionally fragmented. It was agreed that a set of common standards for data collection, analysis and sharing would enable greater collaboration within and between clusters.
- There is a need to link up plans on the use of health monitoring and ‘apps’, and to build up trustworthiness around the use of health data in order to engage patients with these issues. This can use learnings from current activities such as the SHARE initiative which is a register of people who are interested in participating in health research in Scotland.¹¹

Funding and pathways for growth

It is often challenging to attract the long-term funding needed to grow start-ups and small businesses and engagement through a wider cluster can help to attract this type of investment to a region. However, it was noted that large, long-term, cross-regional or cross-sector collaborations can struggle to access funding due to restrictive eligibility criteria (e.g. for specific locations or sectors). Practical routes for establishing and growing clusters and businesses were discussed, including the use of current resources and potential areas for future investment.

- At the meeting, OLS described a broad set of criteria to define a cluster, such as: a high density of life sciences businesses or universities; a well-established supply chain; areas of research specialisation; and evidence of innovation and knowledge transfer. Delegates discussed the optimum number of clusters for the UK, as too many small, unsustainable clusters may further fragment the landscape. It was proposed that Government guidelines on forming new clusters could help ensure that they meet the OLS requirements, and that there should be clear distinctions drawn between a ‘cluster’ and a ‘network’.
- **Patient investment** is fundamental to the growth and development of start-ups and small business, and grant funding and incentives such as tax relief and infrastructure also play an important role (e.g. investment in specialised ‘clean rooms’ for manufacturing). Participants agreed on the need for a clearer funding pathway with long-term support available along its entirety. This would particularly address the lack of sufficient funding available for established companies looking to build, scale up or expand into new markets.

¹⁰ www.connectedhealthcities.org/

¹¹ www.registerforshare.org/index.php

- Most VC funding is short-term, focusing on quick returns such as intellectual property or buy-out and on certain parts of the growth pathway. Delegates proposed an early stage Government funding strategy to support businesses from the 'pre-company' to early stages of development.
- A **greater diversity of funding** is needed to overcome the **variable access across different regions** (and therefore clusters). The majority of private financing concentrated in the South-East of England and, for example, there is almost no patient capital available for start-ups in the North of England. It was agreed that funding needs to be spread across the country, including from angel investors, and there is a role for Government to incentivise UK-wide seed funding and VC investment.
- Technology transfer organisations (TTOs) need to be better engaged and work with smaller institutions to commercialise research, with more flexibility for participating in longer-term investment in the complete product development cycle.
- Following the Brexit vote, there is a need to **maintain funding provided by European grants** such as Horizon 2020 and ensure the continuation of international collaborations that are essential to the life sciences. The recent Government commitment to guaranteeing competitive EU funding awards including Horizon 2020 beyond Brexit was welcomed.¹²
- When considering funding for partnerships or collaborative work, it was noted that the Research Excellence Framework (REF) does not properly recognise collaborative outputs which may negatively impact willingness to collaborate. Similarly, funding from devolved governments or the NHS may be difficult to access for joint work due to ring-fenced budgets or reservations about committing to long-term, cross-institutional projects.
- A long-term strategy for **investment in large scale infrastructure**, such as HS2 and digital capabilities, is an important component of an industrial strategy that will link clusters and increase mobility of talent. Direct investment in business infrastructure also has notable benefits, such as the Enterprise Zones which encourage cluster formation and engagement in key strategic locations.¹³ Participants discussed the advantages of incubator and accelerator sites, but stressed the need for a clear rationale when selecting areas, cautioning against sites that lack the basic supportive infrastructure required to attract businesses and talent.

Skills

The importance of clusters having access to the right skills base in order to maximise research and innovation capabilities was emphasised. The attraction of talent and skills to regions can be facilitated through general investment in regional infrastructure as described above.

- Clusters rely on a **diverse, skilled and flexible talent pool**, who are attracted to a region by factors including job opportunities, positive living/working environment and connectivity with the rest of the UK. Although populous or built-up regions may have greater access to talent, less populous areas need to identify ways to recruit talent and it was suggested that a regional strategy for attracting talent may help to deliver this.
- The UK lacks sufficient **entrepreneurship and business skills** which are essential for the life sciences ecosystem. It is important to invest in these skills for the future, for example by embedding them in undergraduate courses, instigating an entrepreneurial culture in universities and encouraging academics to build such expertise. Those at the start of their careers would also benefit from a clearer understanding of how to engage with non-traditional career pathways in different industries. Clusters provide an overarching outreach opportunity to drive this educational agenda and bring together different talents.
- Narrow measures of success are often used in academia such as publications and grants. Though the positive move to measure impact in the REF was noted, there is still a clear need to reward other highly valued behaviours that do not fall within these traditional criteria such as entrepreneurship.

¹² HM Government (2017). *The United Kingdom's Exit from and Partnership with the EU*. www.gov.uk/government/uploads/system/uploads/attachment_data/file/589191/The_United_Kingdoms_exit_from_and_partnership_with_the_EU_Web.pdf

¹³ www.enterprisezones.communities.gov.uk/

- When considering the diversity of skills required, **multi-disciplinarity** and the involvement of other disciplines such as physics, mathematics and computational science alongside the traditional life sciences is critical. Any future initiatives around skills should recognise the importance of diversity.
- Attracting and retaining international talent is critical for the UK life sciences ecosystem. Brexit may impact the flow of such talent to the UK and so steps must be taken to ensure that the UK continues to draw the best international entrepreneurs, chief executives, researchers and skilled support workers.

Political factors

It was widely agreed that Government and regulators have a key role to play in helping the life sciences clusters to achieve their vision for the future. The Government's Industrial Strategy provides an important platform to grow the reach and influence of life sciences clusters so that by operating on a UK-wide level, they can compete internationally.

- Opportunities may exist across different geographies but due to regional challenges such as difficulties attracting investment or a skilled workforce, Government support may be essential to realising this potential. Therefore, it was proposed that Government should be willing to assist the development of new clusters in regions where they would be beneficial, whether through direct support or indirect investment such as local infrastructure.
- Participants cautioned that the increasing localism and **regional agendas do not incentivise collaboration** and indeed too much devolution might destabilise parts of the clusters agenda. Local and devolved governments are essential to nurturing clusters and should be closely involved in generating economic strategies. However, localised strategies could also result in local budgets being ring-fenced and a focus on short-term economic impact, fostering increased competition if stakeholders do not recognise the benefits of cross-regional collaboration. For example, it was suggested that some city initiatives have forced cities to compete rather than collaborate, such as 'Devo Manc', the devolution of control of funding for public services including health and social care to Manchester.¹⁴
- Local Enterprise Partnerships (LEPs) have the potential to help drive engagement between clusters and local government. Clusters described having both positive and negative experiences of working with LEPS but building these relationships will be helpful in the future.
- In addition, there are few Government-mediated incentives to **encourage cross-cluster linkage and overcome competition** between organisations. The importance of considering different fiscal incentives and potential barriers was discussed such as tax credits, the patent box and the Enterprise Investment Scheme (EIS).
- There are key **differences in the definitions of geographies and timelines** between Government and healthcare bodies (for example, political and health geographical boundaries can be different). These views need to be aligned with what the clusters are trying to achieve, particularly when considering short-term deliverables against long-term aims and a UK-wide strategy.
- There needs to be **greater connectivity across Government**. Government departments such as the Departments of Health, Business, Energy and Industrial Strategy and Work and Pensions, need to be better joined up to ensure that they are able to communicate a single vision and work cooperatively to achieve it. It was proposed that this alignment could be supported by the Office for Strategic Coordination of Health Research (OSCHR) given its role in coordinating health related funding bodies.

Metrics

The value of metrics for identifying successes and failures and driving best practice was discussed. Participants acknowledged the variation in expectations and interpretations of metrics across different sectors.

¹⁴ HM Treasury and GMCA (2014). *Greater Manchester Agreement: devolution to the GMCA & transition to a directly elected mayor* https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/369858/Greater_Manchester_Agreement_i.pdf

- Economic impact is an important metric for funders and clusters need to find ways to better communicate their impact to Government and other key stakeholders. However, **measures of economic impact differ across sectors** and these definitions need to be aligned across Government, funders, clusters and others to ensure that the metrics are meaningful for all stakeholders and that long-term goals are maintained alongside tangible, short-term successes in line with funders' expectations.
- Economic contribution is not always easily quantifiable for cross-sector, cross-regional or collaborative outputs. Participants also highlighted the value of including other metrics of success, such as translation and adoption of innovation, academia-industry mobility and collaboration alongside estimating the impact of *not* carrying out different projects and initiatives through the cluster.
- It was agreed that tackling regional and local **inequalities in health, social and economic aspects** is a key priority. Impact of clusters on social divides in health and wealth is an essential metric for cluster organisations to collect, as contribution to local economy does not necessarily correlate with reducing these divides and may widen them if benefits only reach the upper end of the socioeconomic scale. Participants referenced Government investment in infrastructure in Stratford following the 2012 Summer Olympic Games, which attracted talent and business to the area and reduced local inequalities.

Next steps

The key conclusion from the wide-ranging discussions at the workshop was the need for greater connectivity within and between clusters so that a UK-wide network can be formed. All participants agreed on the significant value of greater collaboration between life sciences businesses, universities and hospitals, and that sharing best practice, data, expertise and resources will allow the UK to remain competitive on the global stage.

Delegates agreed that life sciences clusters in the UK need an independent, informal group that can initiate actions on behalf of the clusters. Following the meeting, representatives of the major UK life sciences clusters established a steering committee to further develop a unified vision and strategy, and to create a single 'front door' for engagement with stakeholders, including Government, industry, funders and international collaborators.



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