

*March 2022*

# **Thematic analysis of knowledge exchange funding accountability information**

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**Final report to Research England**



Version 13

*March 2022*

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### **Final report to Research England**

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## Executive summary

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This study was commissioned by Research England to extract and analyse financial and narrative data from the Higher Education Innovation Fund (HEIF) allocations submitted by higher education providers (HEPs). Extracted data was used to explore trends in expenditure of HEIF funding and alignment with a number of themes.

The analysis of financial data reveals fairly consistent expenditure across expenditure types and infrastructure / activity categories over the period 2015/16 – 2019/20, though some differences were found when examining expenditure by KEF cluster and geographical region. Comparing past expenditure and future planned expenditure by expenditure type shows that proportions will be largely maintained, albeit with some evident convergence. The same analysis of the infrastructure / activity categories shows a similar picture, albeit with more steady trends. Where significant differences across KEF clusters or regions do exist, these could largely be attributed to specific cluster characteristics or the structural distribution of HEPs in England.

Analysis of narrative data has confirmed that HEPs have responded to areas of interest to Research England as well as the Office for Students, the objectives of HEIF, and knowledge exchange more broadly. With regards to the UK government agenda, all providers covered by this analysis cite the Industrial Strategy and Innovation Strategy in their statements, and the majority of providers discuss other government policy areas such as the levelling-up agenda, the R&D Roadmap, and Build Back Better. In addition, student benefits featured in all of the analysed accountability statements with approximately half of HEPs describing instances where students act as agents of knowledge exchange. The importance of place was described by a significant majority of institutions in their statements.

In addition to these strongly featured thematic areas, referencing to a set of topics that HEPs were not explicitly asked to report on was also observed. Specifically, the analysis has found this to be the case for discussions around the Knowledge Exchange Concordat and Framework as well as equality, diversity, and inclusion (EDI). All three areas were referred to by most providers at their own initiative. Positive results were also observed for collaborations between English HEPs eligible for HEIF as well as references to a range UKRI-funded knowledge exchange activities including but not limited to Knowledge Transfer Partnerships (KTPs), the Strategic Priorities Fund (SPF), and the Connecting Capability Fund (CCF).

The analysis has also yielded insight into the impact on the Covid-19 pandemic on HEPs. Within their Covid and interim accountability statements, a large proportion of providers specified pressures emerging from Covid of which funding-related challenges, project cancellations and suspensions, and pressures on students were the most common. On a positive note, however, an equally large portion of HEPs described opportunities to help emerging from the pandemic, including support to the survival, recovery, and resilience of SMEs.

# 1 Introduction

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## 1.1 This study

This study was commissioned by Research England to extract and analyse information on the use of Higher Education Innovation Fund (HEIF) allocations, with a view to examining trends within several themes. The study has three main objectives:

- i) Design and establish an appropriate coding structure for a sector-wide overview of what is driving the behaviour and actions of English higher education providers (HEPs) in their use of their higher education innovation fund (HEIF) allocations
- ii) Extract quantitative numerical data from the narrative accountability statements, and produce analysis of trends in the use of HEIF and how this relates to strategic objectives and government priorities
- iii) Produce high quality, evidence-based resources that demonstrate outcomes of the analysis, including a report, graphical materials, case studies and a searchable database

To address these objectives, the study was designed to deliver an agile and robust data-driven approach. The study has made use of automated data-driven approaches that enable large amounts of narrative data to be handled efficiently, with a 'human in the loop' to provide quality assurance and spot-checking of the analyses performed.<sup>1</sup>

## 1.2 This report

This report presents the findings of the analysis of financial and narrative data retrieved from HEIF accountability statements building on coding methodology specially-developed for this exercise. The analysis carried out for this report was structured along the two data types included in the statements. The financial data was used to analyse trends based on past expenditure and expected future expenditure of HEIF funding across 2015/16-2024/25. The narrative contained within the statements was coded and used to explore of a set of predetermined themes and sub-themes. For both analyses, headline findings are presented in terms of key trends in the use of HEIF funding along expenditure and infrastructure categories as well as indicators of the level of references to narrative themes across HEPs. Furthermore, regional differences as well as variations across KEF clusters were also explored as part of this analysis. The remainder of this report is structured as follows:

- **Chapter 2** provides a brief introduction to HEIF
- **Chapter 3** provides a brief overview of the methodology used in the analysis, focusing on highlighting the main amendments made to the methodology since the previous submission of a methodological note to Research England
- **Chapter 4** presents the results of the financial analysis, with further breakdowns available as an appendix
- **Chapter 5** presents the findings of the narrative analysis by theme and by KEF cluster and region
- **Chapter 6** provides concluding remarks

Furthermore, the report also includes a set of appendices providing supplementary data and information to the main results presented in the report.

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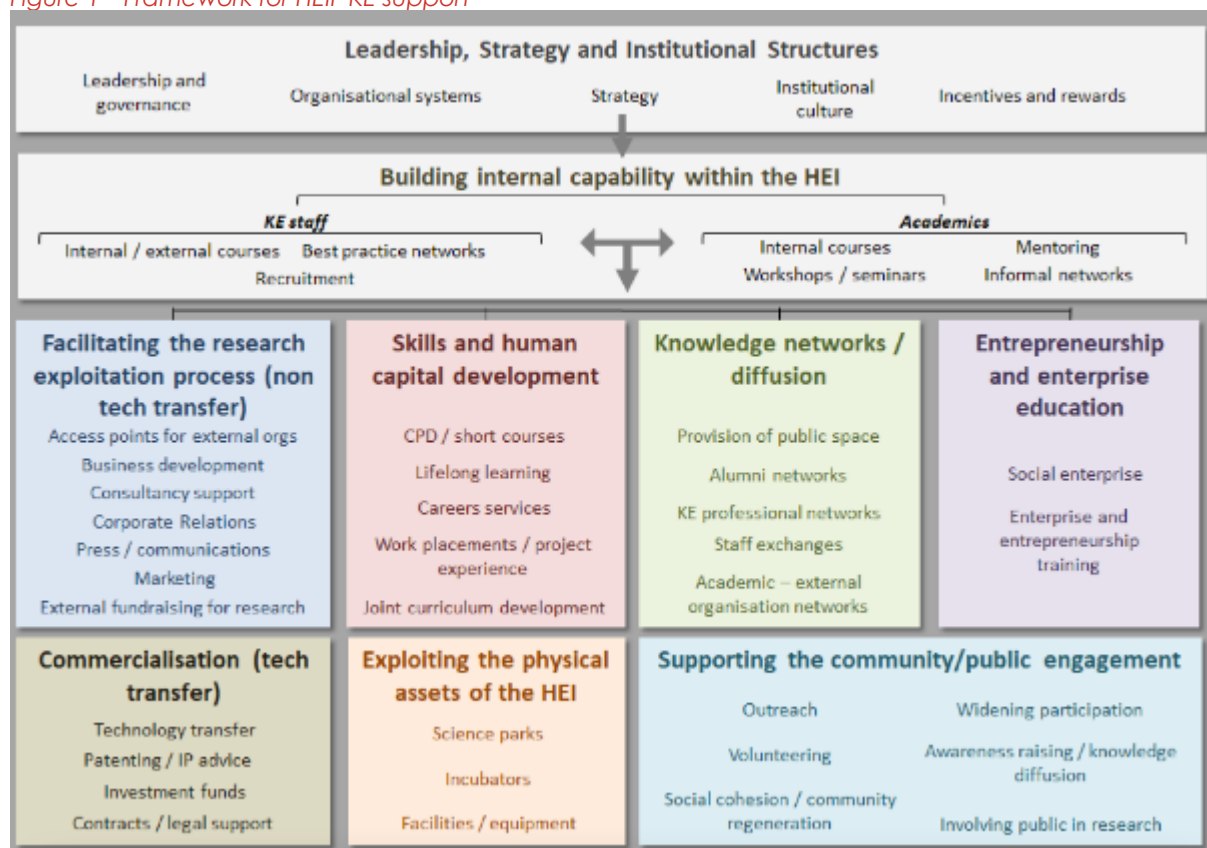
<sup>1</sup> Against the original information sources

## 2 Introduction to HEIF

Research England's Higher Education Innovation Fund (HEIF) provides funding for the support of knowledge-based interactions between higher education providers (HEPs) and the wider economy and society. Specifically, HEIF incentivises knowledge exchange with business, public and third-sector organisations, community bodies, and the wider public.

The total of allocated HEIF funding over the period of analysis for this report (2015/16 to 2019/20) is £954m. This includes a contribution of £47m per year from the budget of the Department for Education (DfE). The amount of HEIF funding that is allocated per Higher Education Provider (HEP) is determined entirely by their performance with regards to knowledge exchange, which is primarily informed on an annual basis by the Higher Education Business and Community Interaction (HE-BCI) survey. The KE areas that HEPs report against are summarised in Figure 1, below.

Figure 1 Framework for HEIF KE support



Source: Ulrichsen, T.C., 2020. *Assessing the Gross Additional Impacts of the Higher Education Innovation Fund (HEIF): An update for the period 2015/16 – 2018/19*

### 3 Methodology

#### 3.1 Coverage of documents

The results presented in this final report cover all HEIF documents available to the study team as of the 11<sup>th</sup> of October 2021. Table 1 shows the extent to which institutions in receipt of HEIF are covered by the sample of documents.

*Table 1 Overview of documents included in the analysis*

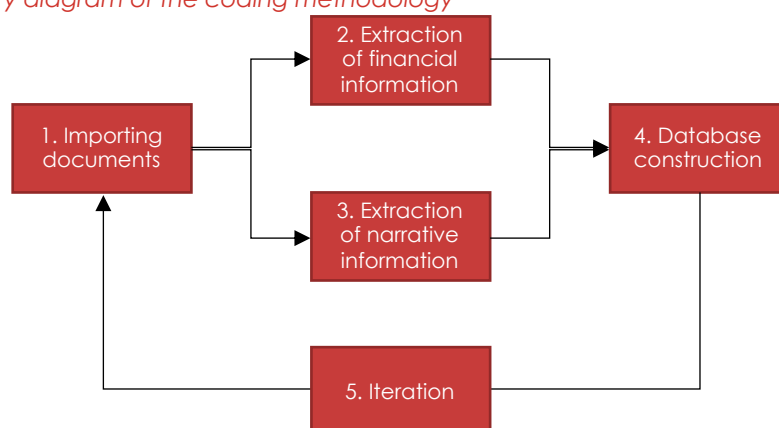
Documents	Number of institutions covered*	Relevant analysis
HEIF Accountability Statements from 2020-21 to 2024-25	109	Narrative
HEIF allocation tables from 2020-21 to 2024-25	109	Financial
HEIF Annual Monitoring Statements from 2015-16	100	Financial
HEIF Annual Monitoring Statements from 2016-17	97	Financial
HEIF Annual Monitoring Statements from 2017-18	102	Financial
HEIF Annual Monitoring Statements from 2018-19	104	Financial
HEIF Annual Monitoring Statements from 2019-20	107	Financial
HEIF Interim Accountability Statements from 2020-21	108	Narrative
Covid Statements	108	Narrative

\* As of 11/10/2021

#### 3.2 Analytical approach

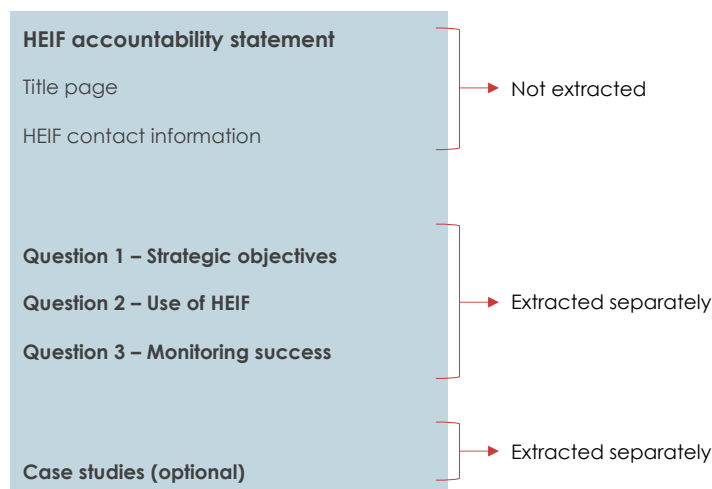
The overall coding methodology can be summarised in five main steps (see Figure 1). The first step was to import all available documentation and conduct data cleaning as required. Minor data cleaning was undertaken for the financial statements, while no cleaning was deemed necessary for the narrative statements.

*Figure 2 Summary diagram of the coding methodology*



Once imported, the relevant sections of the documents were extracted separately such as Questions 1 to 3 and the case studies of the accountability statements (see Figure 3).

Figure 3 Example of the extraction process for a HEIF Accountability Statement



For HEIF financial statements, numerical data on total spend (for the period 2015/16 – 2019/20) and planned spend (for the period 2021/22 – 2024/25) was extracted and placed into a single data frame for each year. The value of the 2020/21 expenditure is not considered in the analysis, as it is not known how each HEP spent it. This permitted a direct quantitative analysis of the financial data to be undertaken. Since the value of HEIF spend on specific expenditure categories per HEP for 2021/22 – 2024/25 is unknown at this point in time, the analysis focused on the relative distribution of past and future HEIF spending across expenditure and infrastructure categories (3 and 6 categories respectively). Since the expenditure per category can be expressed as a proportion of total HEIF allocation, comparisons between past and planned spending can still be drawn.

With regards to the analysis of narrative data, the statements were coded using a list of predetermined themes and sub-themes (Table 2). Specifically, dictionaries of keywords and phrases were developed in collaboration with Research England for each sub-theme. These dictionaries were designed to capture the concepts and terminology that HEPs typically use in their statements to describe said themes. The full dictionaries used for each theme are available in Appendix A. For each sub-theme, the word frequency of terms included in the corresponding dictionary was computed for the relevant source document and section. These frequencies served as the main input to the narrative analysis and allows to assess the extent to which a theme appears repeatedly in a given document.

For a small set of sub-themes, the use of a dictionary was complemented by a co-occurrence approach whereby the analysis focused on instances where particular key words (e.g., 'SMEs') were discussed in the same sentence as terms from a larger dictionary (e.g., 'support', 'resilience', 'recovery'). This approach allows for a more targeted extraction of information on discussions involving two different concepts. One drawback of this technique is that it relies on the clear demarcation of separate sentence with a full stop. In cases where HEPs do not report in complete sentences (e.g., table cells), larger chunks of text would be combined into one sentence. However, quality checks of the results suggests that this has not diminished the overall accuracy of the co-occurrence approach to a significant extent. Sub-themes that were assessed through co-occurrence are indicated in Table 2 with an asterisk.

*Table 2 Overview of themes and sub-themes used in the analysis of narrative data*

Theme	Sub-theme	Source document and section
Impact of Covid-19	Opportunities to help SMEs*	HEIF 2020-21 Interim accountability & HEIF AMS Covid responses
	Emerging pressures in HEPs and partners*: <ul style="list-style-type: none"> <li>• Students</li> <li>• Staff workload</li> <li>• Skills &amp; expertise</li> <li>• Collaboration with SMEs</li> <li>• Collaboration with local/community partners</li> <li>• Changing ways of working</li> <li>• Funding</li> <li>• Project cancellations and suspensions</li> </ul>	HEIF 2020-21 Interim accountability & HEIF AMS Covid responses
	Other opportunities arising from the pandemic	HEIF 2020-21 Interim accountability & HEIF AMS Covid responses
References to Government Priorities	Industrial and Innovation Strategies, and related concepts	HEIF Accountability Statements (Q1-Q3)
	Innovation Strategy technology areas: <ul style="list-style-type: none"> <li>• Advanced materials and manufacturing</li> <li>• AI, Digital and Advanced Computing</li> <li>• Bioinformatics and Genomics</li> <li>• Engineering Biology</li> <li>• Electronics, Photonics and Quantum</li> <li>• Energy and Environment Technologies</li> <li>• Robotics and Smart Machines</li> </ul>	HEIF Accountability Statements (Q1-Q3)
	Levelling-up agenda	HEIF Accountability Statements (Q1-Q3)
	Research and Development Roadmap	HEIF Accountability Statements (Q1-Q3)
	Build Back Better*	HEIF Accountability Statements (Q1-Q3)
References to other UKRI funded KE activity	References to other UKRI funded KE activity	HEIF Accountability Statements (Q1-Q3)
Student involvement in KE activity	Student benefits of knowledge exchange*	HEIF Accountability Statements (Q1-Q3)
	Students as 'agents' of knowledge exchange*	HEIF Accountability Statements (Q1-Q3)
Drivers for strategic objectives of KE	Importance of place	HEIF Accountability Statements (Q1-Q3)
Collaboration between HEPs	Collaboration between (English) HEPs*, distinguished by HEIF eligibility	HEIF Accountability Statements (Q1-Q3)
Collaborations with HEPs from devolved nations	Collaboration with HEPs from Northern Ireland	HEIF Accountability Statements (Q1-Q3)
	Collaboration with HEPs from Scotland	HEIF Accountability Statements (Q1-Q3)
	Collaboration with HEPs from Wales	HEIF Accountability Statements (Q1-Q3)

Other methods to achieve value for money, efficiency and effectiveness	Engagement of academic staff in improved knowledge exchange	HEIF Accountability Statements (Q1-Q3)
	HEIF contributions to improved VfM, effectiveness, and efficiency	HEIF Accountability Statements (Q1-Q3)
	Equality, diversity and inclusion (EDI)	HEIF Accountability Statements (Q1-Q3)
	KE policy improvements e.g., IP policies	HEIF Accountability Statements (Q1-Q3)
References to other policy areas	KE Concordat (KEC)	HEIF Accountability Statements (Q1-Q3)
	Knowledge Exchange framework (KEF)	HEIF Accountability Statements (Q1-Q3)
Innovation in KE	Innovation in KE*	HEIF Accountability Statements (Case studies)

\* Indicates the use of co-occurrence

In addition to headline findings regarding financial trends in HEIF expenditure or the number/proportion of institutions making reference to a particular theme, additional cross-tabulations were produced based on KEF clusters and NUTS1 regions of England. This has allowed for an assessment of any similarities or differences across institutions that have a geographical dimension or are related to particular institutional characteristics.

### 3.3 Data limitations

Prior to the presentation of the results of the study, it is important to outline the limitations associated with the data and coding methodology and to provide the caveats that must be kept in mind when drawing conclusions from the findings.

There are two main limitations of the narrative data. Firstly, a large part of the narrative analysis relies on the frequencies of sets of keywords that are considered to be relevant to specific themes. These keywords have been selected and refined through an iterative process including randomised spot checks and in close consultation with Research England. While this has minimised the inclusion of so-called false positives, i.e., instances where a particular term is incorrectly attributed to a theme, the large volume of text that has been analysed means that a complete absence of false positives in the results cannot be guaranteed. However, through consistent manual inspection we have ensured that such instances are minimal and do not overestimate the results to a significant degree.

Secondly, the methodology counts instances in which institutional HEIF accountability statements cite different thematic areas. This means that, strictly speaking, any findings and conclusions from the results presented in this report are only valid within the context of what HEPs describe in their statements. Therefore, if an institution is not found to make reference to, for instance, collaborations with other HEPs from Wales, this does not necessarily mean that said institution does not collaborate with Welsh HEPs at all. As such, HEIF accountability statements serve as an imperfect proxy for the full scale of activities that HEPs are engaged in and the conclusions from this study must be interpreted as such.

Furthermore, the *a priori* likelihood that certain themes feature in HEIF accountability statements is directly related to the questions HEPs are asked to report on (see Appendix C). For instance, references to Government strategies are very likely to be included since HEPs are explicitly asked to indicate such links in their accountability statements whereas HEPs are not explicitly asked to describe their activities in terms of equality, diversity and inclusion, or links to the Knowledge Exchange Framework or Concordat. However, we have developed our methodology to also identify and examine themes that do not explicitly feature in reporting questions.

Additionally, there are two main caveats to the interpretation of results. Firstly, the geographical concentration of HEPs analysed across NUTS1 regions of England varies highly with a high concentration in Greater London and relatively fewer institutions for example in the North East (see Table 3 for a visual overview). To account for these differences when comparing regions, the number of institutions citing a particular theme will always be normalised by the total number of HEPs included in the analysis for the same reason when presenting results. Wherever choropleth maps are displayed, these always show proportions of HEPs referencing a theme rather than the absolute number.

*Table 3 Summary of the distribution of HEPs and value of HEIF allocation per region*

NUTS1 Region	Number of HEPs	Concentration of HEPs	Total HEIF allocation (2015/16 – 2019/20)	Average HEIF allocation per HEP (2015/16 – 2019/20)
East Midlands	8	7%	£78,303,000	£9,787,875
East of England	6	6%	£106,668,000	£14,754,304
Greater London	32	29%	£223,782,929	£7,489,364
North East England	4	4%	£42,497,000	£8,499,400
North West England	12	11%	£113,208,095	£9,578,043
South East England	17	16%	£125,452,861	£8,818,102
South West England	11	10%	£69,160,000	£9,115,651
West Midlands	10	9%	£90,051,411	£9,580,797
Yorkshire and the Humber	9	8%	£93,695,330	£11,711,916

*Table 4 Summary of the distribution of HEPs and value of HEIF allocation per KEF cluster*

KEF cluster	Number of HEPs	Concentration of HEPs	Total HEIF allocation (2015/16 – 2019/20)	Average HEIF allocation per HEP (2015/16 – 2019/20)
ARTS	10	9%	£31,429,000	£4,462,008
E	29	27%	£212,914,035	£7,286,644
J	16	15%	£72,215,305	£4,562,886
M	9	8%	£16,320,800	£2,506,529
STEM	9	8%	£60,452,000	£8,332,921
V	17	16%	£332,978,316	£19,586,960
X	19	17%	£227,213,169	£11,868,206

A final caveat relates to the word count per type of document as this also impacts the likelihood that any given keyword is identified. Again, this must be kept in mind where comparisons are drawn between regions and sectors, especially where these differ considerably in the average word count per statement. By cluster, M is one which has considerably fewer words, on average, across the different types of statements although it should be noted that, generally speaking, smaller HEPs with smaller HEIF allocations had lower word counts. The average word counts per type of document by KEF cluster and by NUTS1 region are reported in Appendix B.

## 4 HEIF fund expenditure: past spend and future plans

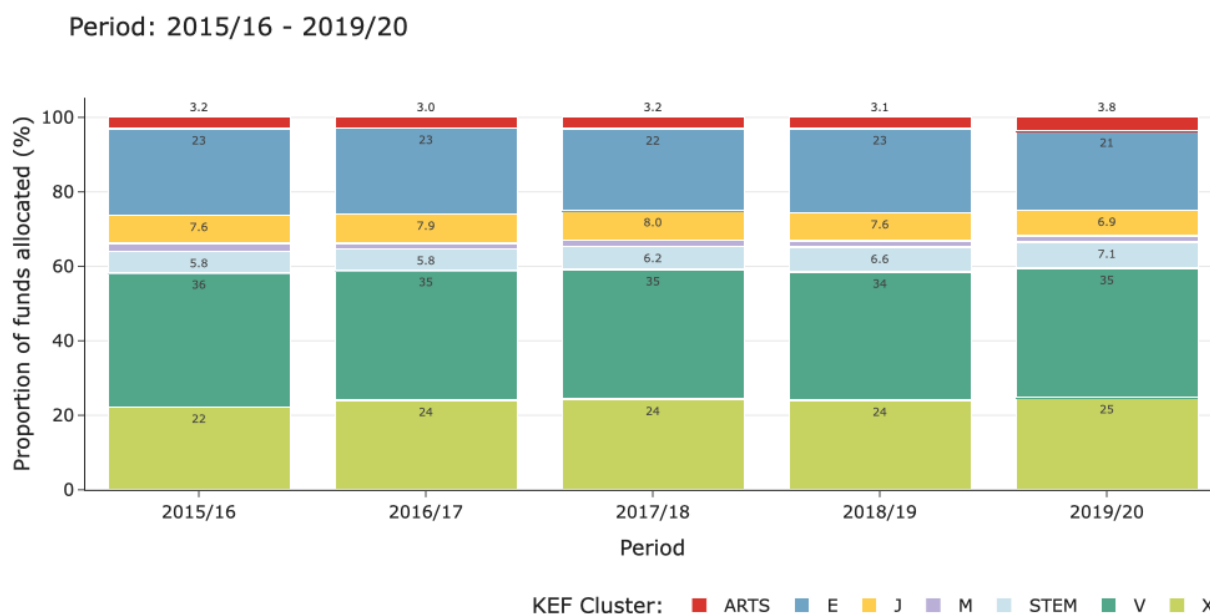
### 4.1 HEIF allocations between 2015/16 and 2019/20

Prior to discussing the results regarding the expenditure of HEIF funds, we present a brief overview on the total value of HEIF allocations to HEPs in the period 2015/16 to 2019/20. Specifically, we reflect on the main differences in (relative) HEIF allocation between KEF clusters and NUTS1 regions throughout the period.

#### 4.1.1 Overall HEIF allocation by KEF cluster

Examining proportional allocations by KEF cluster shows that cluster V accounts for 34%-36% of HEIF funds allocation over the period. Cluster X (22%-25%) and cluster E (21%-23%) account for the next largest allocations, while clusters J, M, Arts and STEM each account for less than 8% of the total allocation each year. Clusters X, Arts, and STEM are the only KEF clusters showing an increasing trend over the period, while the rest show a decreasing trend (see Figure 4). Proportional allocations reflect the number of HEPs within a cluster and are likely to vary between clusters since HEIF allocation is based on performance in a number of areas of knowledge exchange undertaken and HEPs within different clusters will have differing resources for knowledge exchange. For example, HEPs in cluster V are characterised in the KEF as 'Very large, very highly research intensive and broad-discipline universities undertaking significant amounts of excellent research', which explains the high proportion of funds allocated.

Figure 4 HEIF allocation by KEF cluster



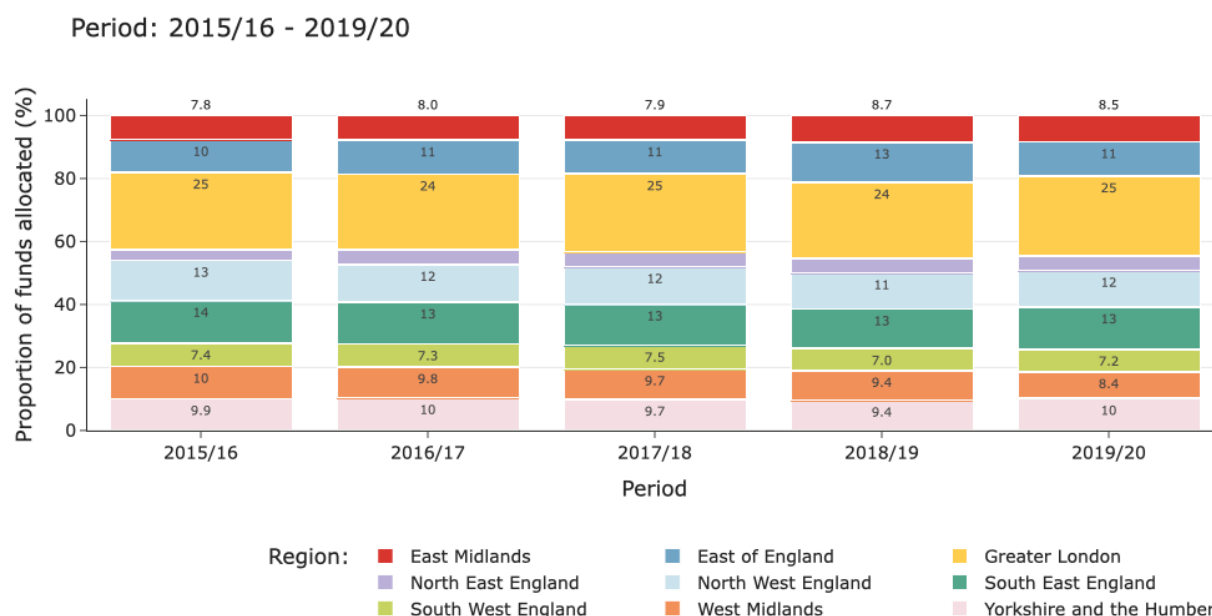
Source: analysis based on provided HEIF returns

#### 4.1.2 Overall HEIF allocation by region

Examining the proportion of past HEIF allocations by region shows that the Greater London region accounted for around 24%-25% of the total HEIF allocation each year during the 2015/16 – 2019/20 period (see Figure 5). South East England (13%-14%), North West England (11%-13%), and the East of England (10%-13%) account for the next largest proportions of the total

allocation over the period. The East Midlands, North East, South West England, West Midlands and Yorkshire and the Humber each account for 10% or less of the total allocation in each year of the analysis period. These regional allocations reflect the structural distribution of HEPs in England.

Figure 5 HEIF allocation by region



Source: analysis based on provided HEIF returns

## 4.2 Expenditure of HEIF funds between 2015/16 – 2019/20

This section draws on documented HEIF expenditure as detailed in the annual monitoring statements for the academic years 2015/16 to 2019/20.<sup>2</sup> As per the methodology (see Chapter 3), numerical data was extracted and placed into a single data frame for each year to enable a quantitative analysis. The analysis has focussed on relative HEIF spend per expenditure and infrastructure categories to facilitate comparisons with planned HEIF expenditure for the period 2021/22-2024/25 of which the value of the spend per expenditure category per HEP is not currently known. For each year, HEPs were asked to set out the proportions of HEIF they had spent or planned to spend on each expenditure and infrastructure category. Table 5 provides an example of the template used for financial reporting by HEIF recipients.

Table 5 Example of a HEIF Accountability Statement return

Breakdown by expenditure category	Breakdown by infrastructure category	Funding period (e.g. 2021-22)
B. Dedicated KE staff	Approximate overall proportion of HEIF funds expected to be used for dedicated KE staff?	--%
	Facilitating the research and exploitation process (non TT)	--%
	Commercialisation (technology transfer)	--%

<sup>2</sup> In 2015, "commercialisation" was grouped under "facilitating the research and exploitation process". Both categories are therefore analysed and visualised from 2016 onwards.

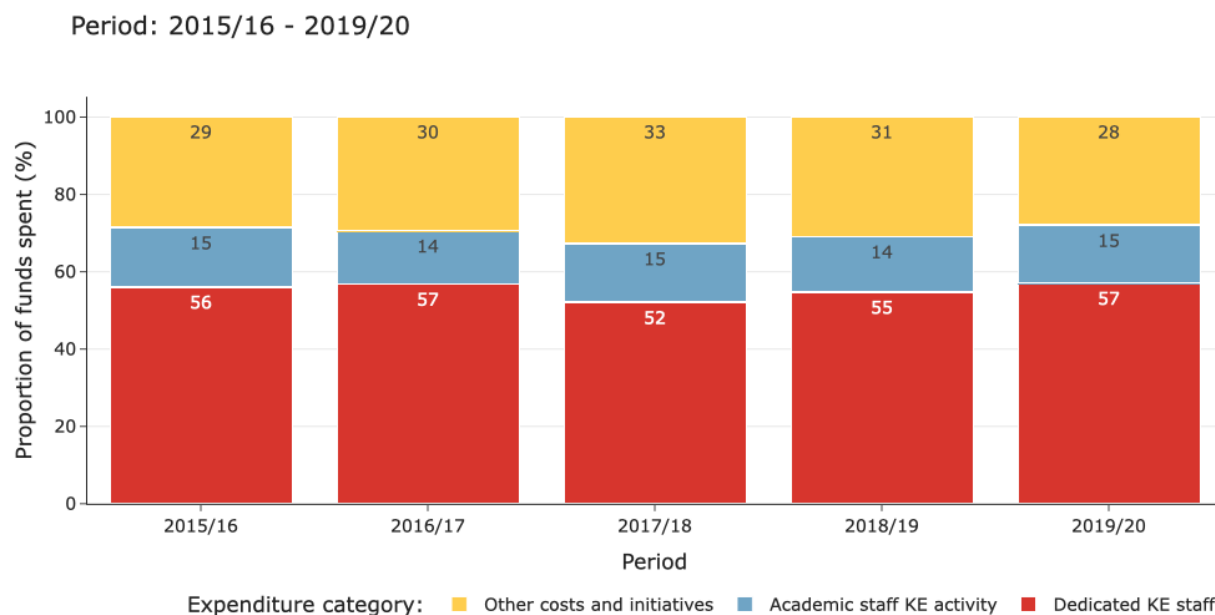
	Skills and human capital development	--%
	Knowledge sharing and diffusion	--%
	Supporting the community/public engagement	--%
	Enterprise and entrepreneurship	--%
	Exploiting the HEI's physical assets	--%
	<b>Total dedicated KE staff (should sum to 100%)</b>	<b>100%</b>
<b>C. Academic staff KE activity (including buying out academic time to engage in KE)</b>	<b>Approximate overall proportion of HEIF funds expected to be used for academic staff KE activity?</b>	<b>--%</b>
	Facilitating the research and exploitation process (non TT)	--%
	Commercialisation (technology transfer)	--%
	Skills and human capital development	--%
	Knowledge sharing and diffusion	--%
	Supporting the community/public engagement	--%
	Enterprise and entrepreneurship	--%
	Exploiting the HEI's physical assets	--%
	<b>Total academic KE activity (should sum to 100%)</b>	<b>100%</b>
<b>D. Other costs and initiatives</b>	<b>Approximate overall proportion of HEIF funds expected to be used for other costs and initiatives</b>	<b>--%</b>
	Facilitating the research and exploitation process (non TT)	--%
	Commercialisation (technology transfer)	--%
	Skills and human capital development	--%
	Knowledge sharing and diffusion	--%
	Supporting the community/public engagement	--%
	Enterprise and entrepreneurship	--%
	Exploiting the HEI's physical assets	--%
	<b>Total other costs and initiatives (should sum to 100%)</b>	<b>100%</b>
<b>Total</b>		<b>100%</b>

Source: Adapted from Table A of HEIF Accountability Statement return

#### 4.2.1 Overall HEIF expenditure by expenditure type

There are three main types of HEIF spend for the period 2015/16 to 2019/20. The highest proportional area of spend is "Dedicated KE staff", to which more than 52% of the funding in each year was allocated. "Other costs and initiatives" received between 28%-33% of the total expenditure over the same period, and "Academic staff KE activity" received 15% or less over the period (see Figure 6). All expenditure categories display a largely constant trend over the time span.

Figure 6 Average annual HEIF expenditure by expenditure types



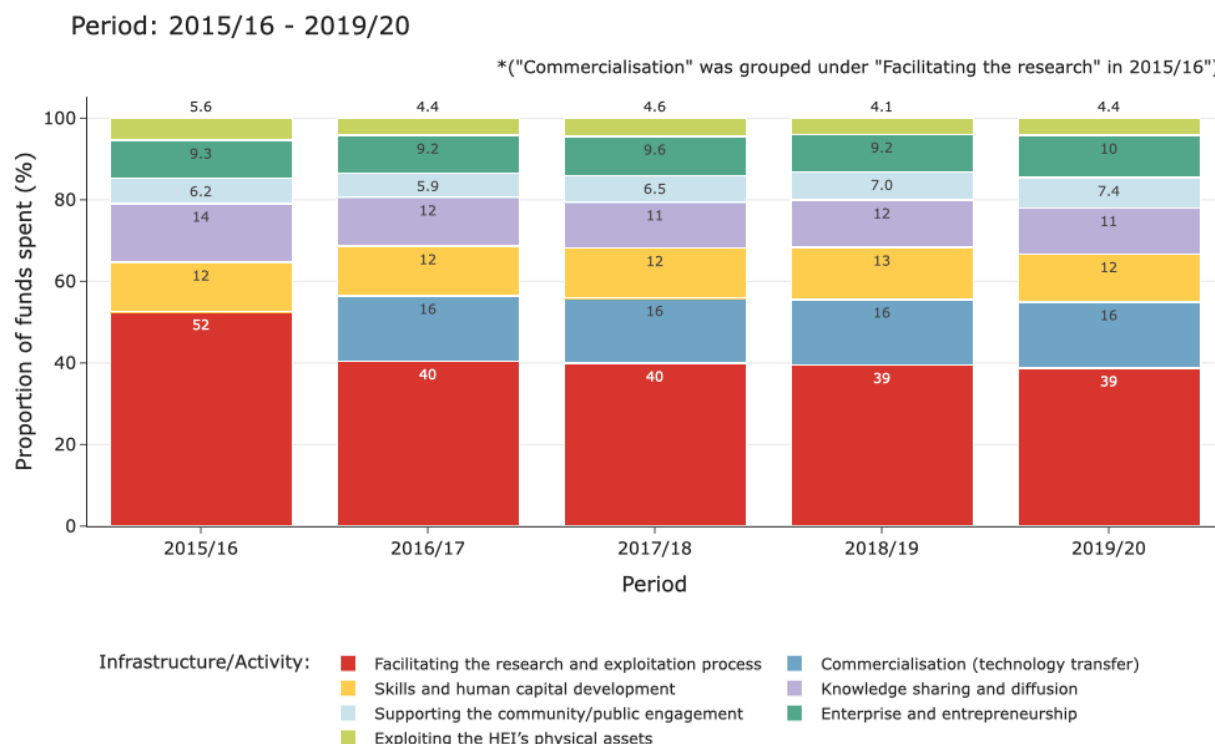
Source: analysis based on provided HEIF returns

Regarding specific infrastructure/activity categories, over the five-year period 2015/16-2019/20:

- Over 39% of HEIF funds were spent on “Facilitating the research and exploitation process”, and this was higher in 2015/16 when “Commercialisation” expenditure was grouped in
- 16% was spent on commercialisation each year, once split out from “Facilitating the research and exploitation process” in 2016/17
- Between 11%-14% of expenditure was on “Knowledge sharing and diffusion”
- Between 12%–13% of expenditure was on “Skills and human capital development”
- Between 9%-10% of expenditure was on “Enterprise and entrepreneurship”
- Between 6%-7% of expenditure was on “Supporting the community/public engagement”
- Between 4-6% of expenditure was on “Exploiting the HEI’s physical assets”

Each of “Supporting the community/public engagement” and “Enterprise and entrepreneurship” show a slight increasing trend over the period, while “Knowledge sharing and diffusion” and “Exploiting the HEI’s physical assets” show slightly decreasing trends (see Figure 7).

Figure 7 HEIF expenditure by infrastructure / activity categories\*



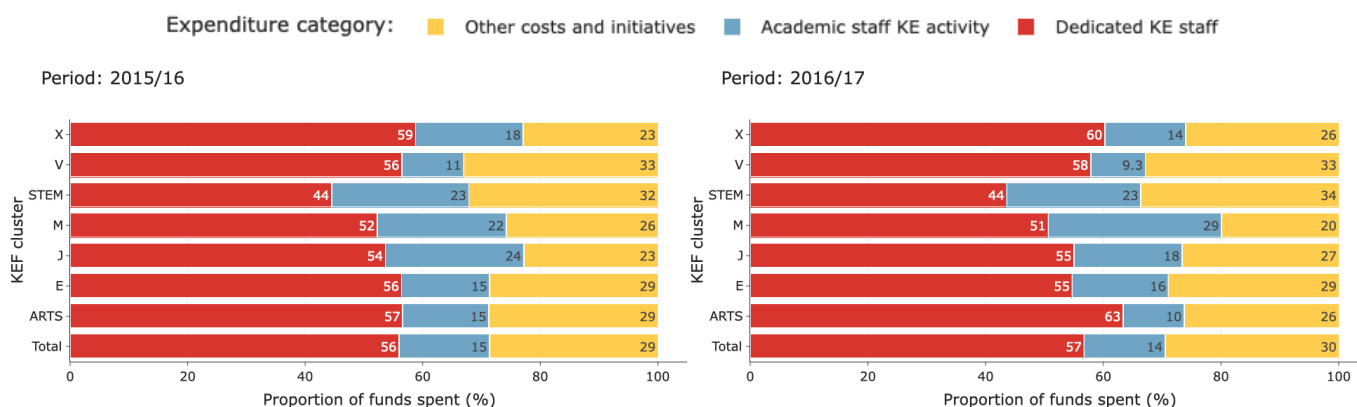
\* "Commercialisation" and "Facilitating the research and exploitation process" is displayed from 2016 onwards as these were combined in one category in 2015

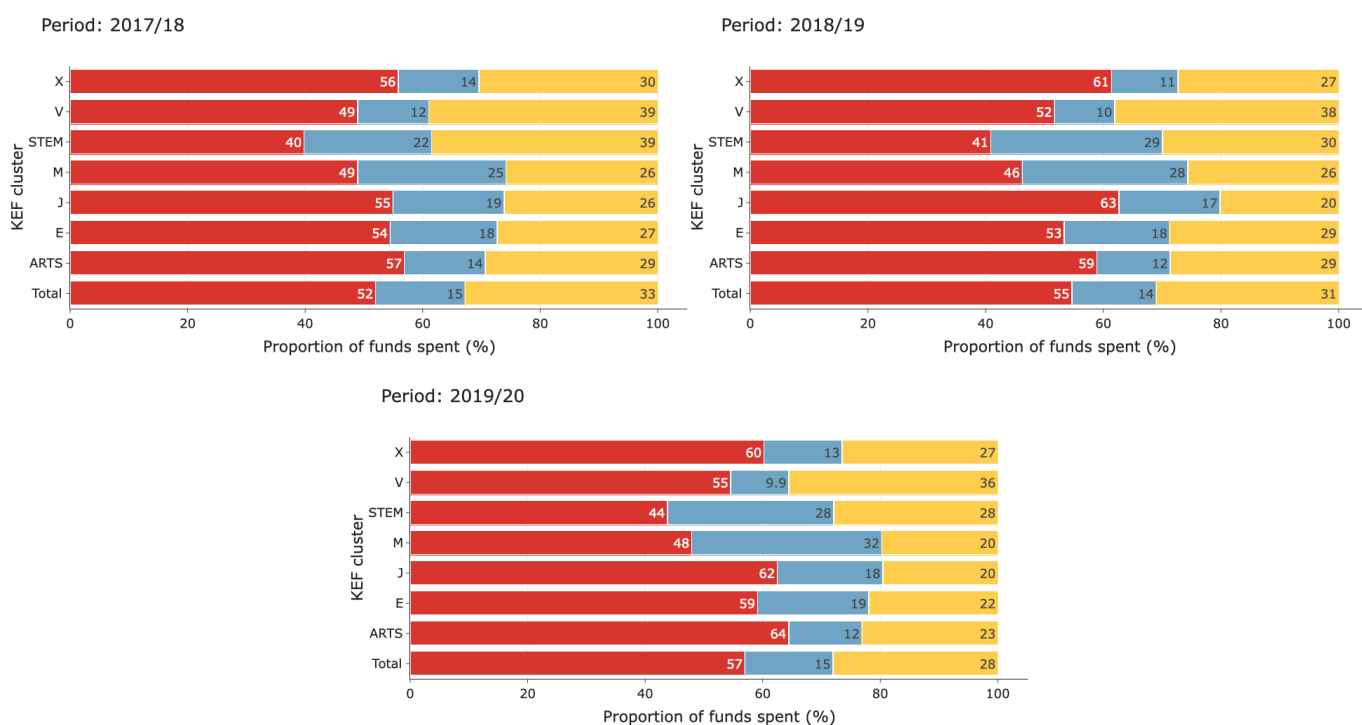
Source: analysis based on provided HEIF returns

#### 4.2.2 HEIF expenditure by expenditure type for each KEF cluster

The analysis also examined expenditure types within each KEF cluster. This breakdown analysis shows that the highest proportion of HEIF expenditure is generally assigned to "Dedicated KE staff" followed by "Other costs and initiatives" across the period. Differences can be observed, however. The STEM cluster spends relatively less on "Dedicated KE Staff" than other clusters, while Cluster M spends proportionally more on "Academic staff KE activity" than "Other costs and initiatives". Over the 2015/16 - 2019/20 period, clusters M, V, and STEM show a decreasing trend in "Dedicated KE staff" while clusters J, V, and X show a decreasing trend in "Academic KE staff over this period (see Appendix E.1 for detailed trends per category per cluster).

Figure 8 HEIF expenditure by expenditure type for each KEF cluster, by year



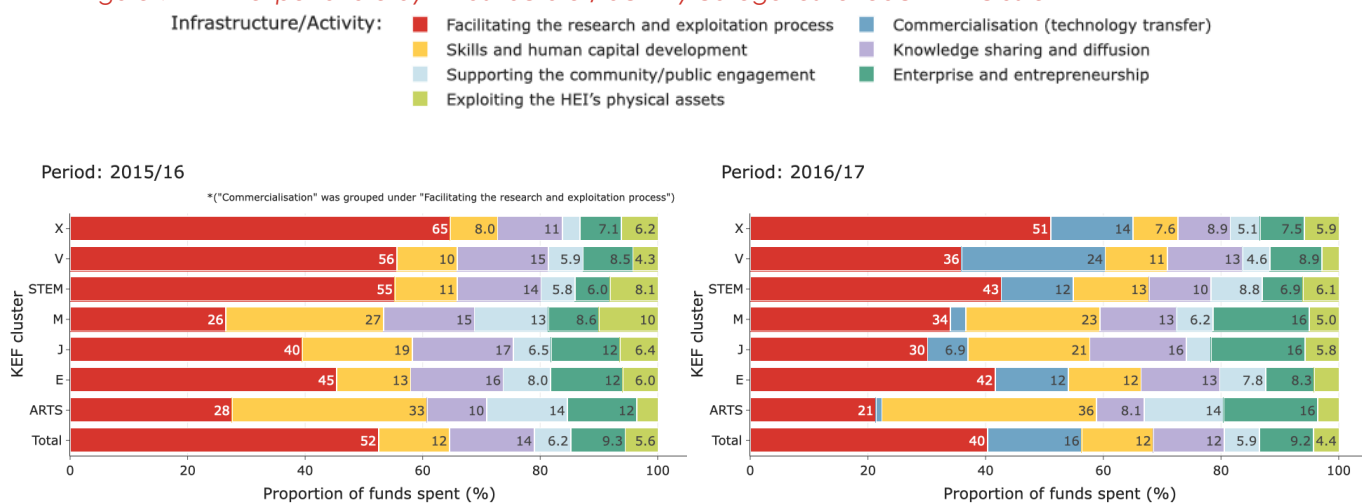


Source: analysis based on provided HEIF returns

#### 4.2.3 HEIF expenditure by infrastructure / activity categories for each KEF cluster

The figures below correspond to the analysis of spend by infrastructure/activity categories for each KEF cluster. There are a number of notable differences in proportions of HEIF expenditure between clusters. Taking into account that “Facilitating the research and exploitation process” also included “Commercialisation” in 2015/16, cluster X shows a higher proportion of expenditure in “Facilitating the research and exploitation process”, while clusters M and Arts have relatively higher expenditure on “Skills and human capital development”. See Appendix E.2 for further details regarding trends.

Figure 9 HEIF expenditure by infrastructure / activity categories for each KEF cluster\*



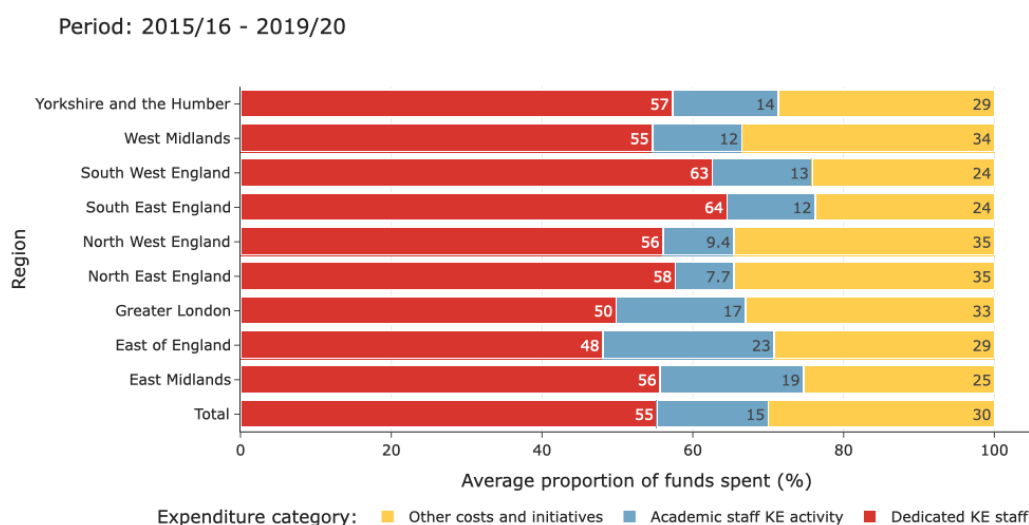


Source: analysis based on provided HEIF returns. NB: \* For 2015/16 the "Commercialisation" category is included in "Facilitating the research and exploitation process"

#### 4.2.4 HEIF expenditure by expenditure type for each region

We have also examined the overall expenditure types within each region. The results of this analysis are shown in Figure 10, where the expenditure is in line with the aggregate picture, with only minor differences in the proportions of expenditure (see Appendix E.3 for further details regarding trends).

Figure 10 HEIF expenditure by expenditure type for each region

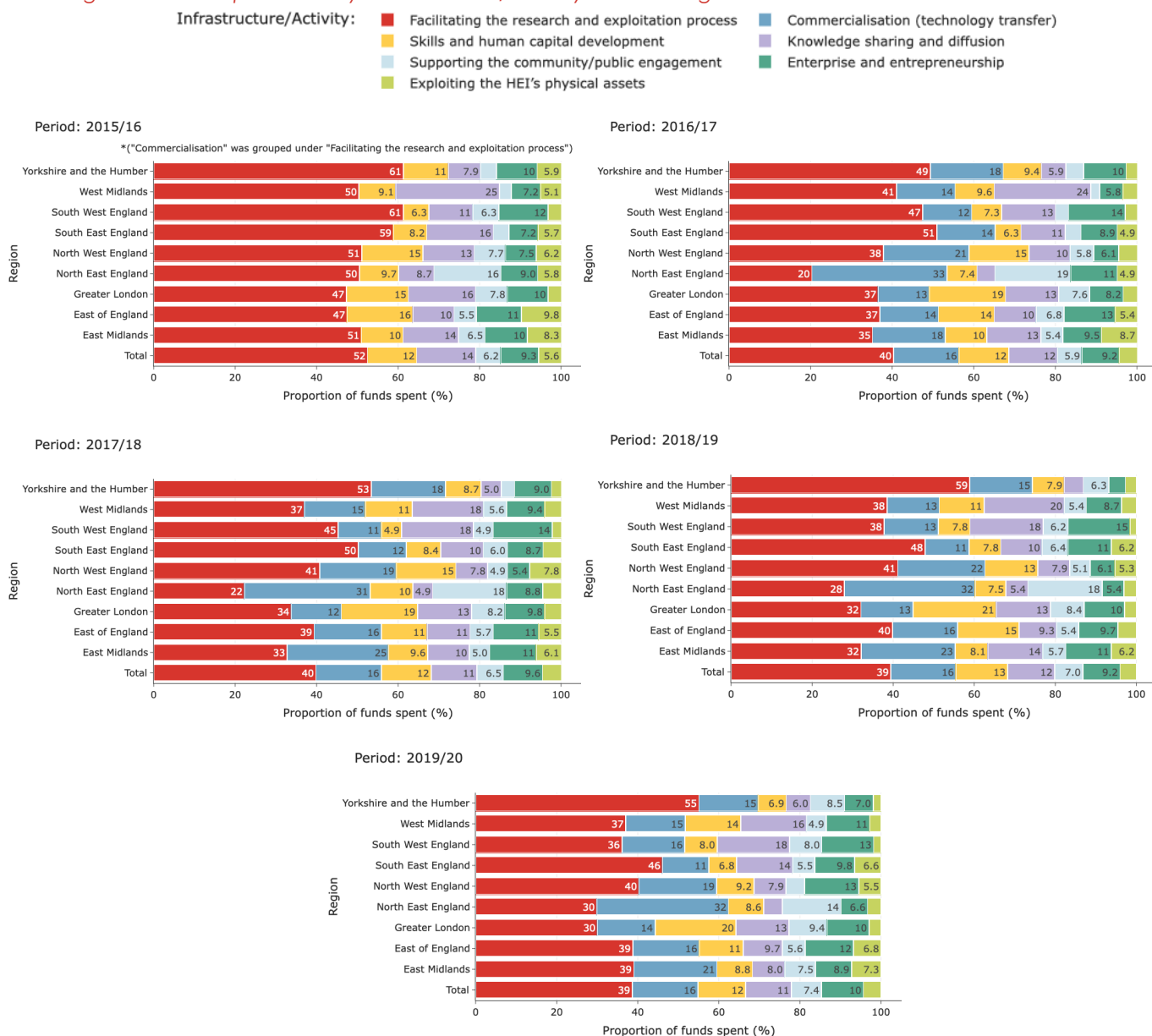


Source: analysis based on provided HEIF returns

#### 4.2.5 HEIF expenditure by infrastructure / activity for each region

When regional expenditure is broken down by infrastructure / activity (see Figure 11) some differences can be observed in expenditure. However, it should be noted that the type of knowledge exchange activity is driven largely by type of HEP rather than the location of the HEP.<sup>3</sup> More details on the trends within infrastructure categories per region are in Appendix E.4.

Figure 11 HEIF expenditure by infrastructure / activity for each region\*



\* For 2015/16 the “Commercialisation” category is included in “Facilitating the research and exploitation process”

Source: analysis based on provided HEIF returns

<sup>3</sup> This point links to a separate investigation of knowledge exchange and place, also conducted for Research England in 2021

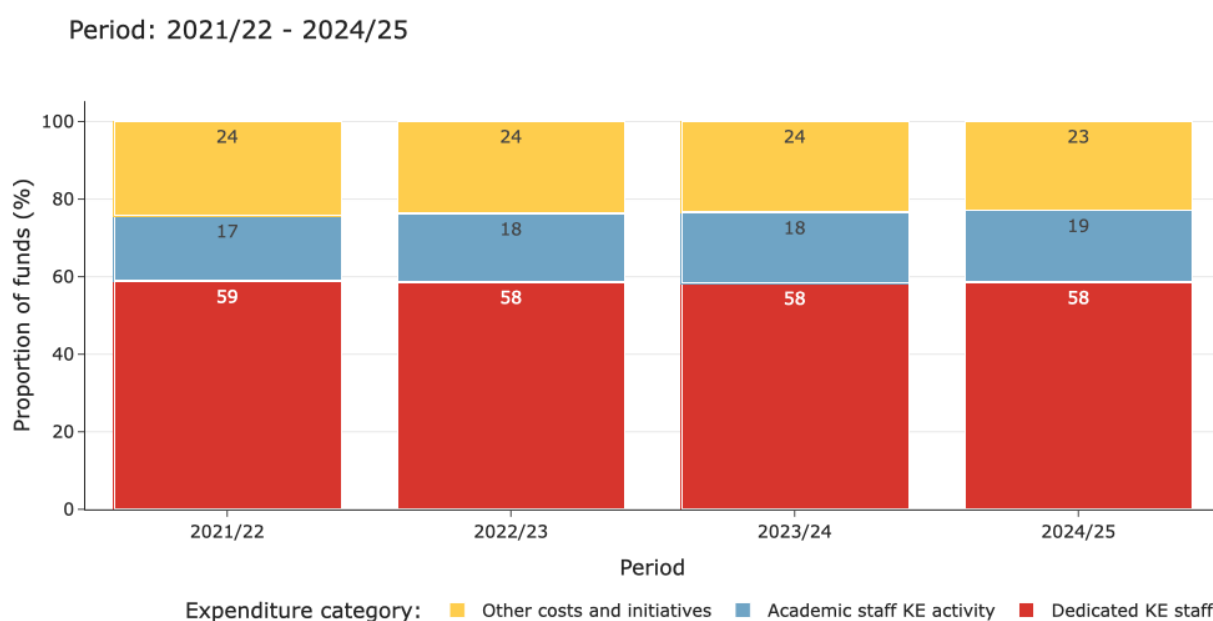
### 4.3 Planned expenditure of HEIF funds between 2021/22 – 2024/25

This section draws on planned HEIF expenditure as detailed in the accountability statements for academic years 2021/22 to 2024/25. As per the methodology (see Chapter 3), numerical data was extracted and placed into a single data frame for each year to enable quantitative analysis. To allow for the comparison between past and future spending, all results from the financial analysis are reported in percentages. Forward-looking expenditure uses proportions only, as there is no information available on the value of planned expenditure.

#### 4.3.1 Planned HEIF expenditure by expenditure type and infrastructure/activity category

We find that “Dedicated KE staff” remains the highest proportional expenditure type, accounting for between 58%-59% of all planned HEIF spend over the period. Similarly, “Other costs and initiatives” is second highest with a relative expenditure of between 23%-24%, and “Academic staff KE activity” remains lowest with 17%-19% of planned expenditure over the coming period (see Figure 12). Unlike the trend evident in past expenditure, where the proportion was constant, “Academic staff KE activity” displays a slight positive trend (see Figure 12).

Figure 12 Planned HEIF expenditure by expenditure types

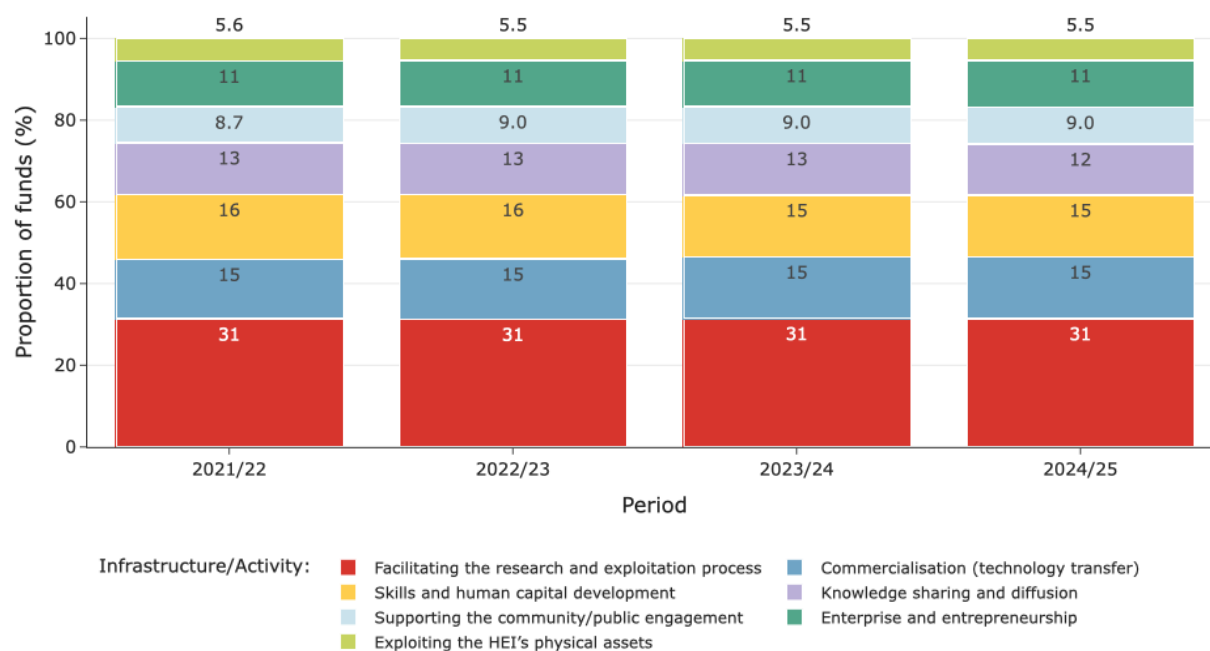


Source: analysis based on provided HEIF returns

“Facilitating the research and exploitation process” remains infrastructure/activity category with the largest relative planned expenditure, with around 31% of HEIF funding planned to be spent on this category each year over the period of analysis.

The next highest proportion of planned spend corresponds to the “Skills and human capital development” (15%-16%), “Commercialisation (technology transfer)” (15%), “Knowledge sharing and diffusion” (12%-13%), “Enterprise and entrepreneurship” (11%) categories, with plans to allocate between 12%-16% of funds to each of them over the period of analysis. “Supporting the community/public engagement” and “Exploiting the HEI’s physical assets” each have less than 10% of planned expenditure for period of analysis (see Figure 13).

Figure 13 Planned HEIF fund use by infrastructure / activity categories  
Period: 2021/22 - 2024/25

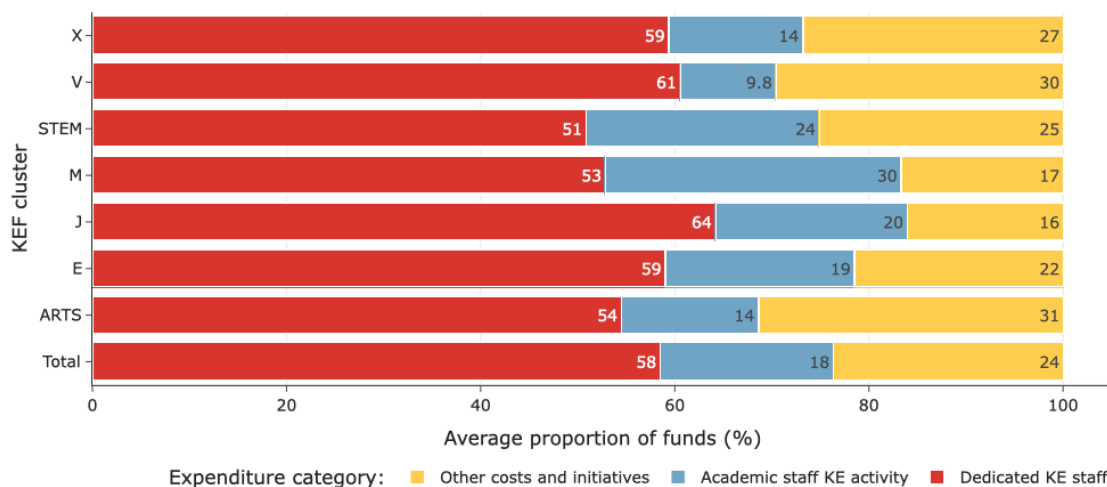


Source: analysis based on provided HEIF returns

#### 4.3.2 Planned HEIF expenditure by expenditure type for each KEF cluster

As with the breakdown of past expenditure above, we have examined the planned spending of each KEF cluster by expenditure type (see Figure 14). As with past expenditure, cluster M has more planned expenditure allocated for "Academic staff KE activity" than for "Other costs and initiatives". Cluster J also shows this, albeit with closer proportions. See Appendix E.5 for more detail.

Figure 14 Planned HEIF expenditure by expenditure type for each KEF cluster  
Period: 2021/22 - 2024/25

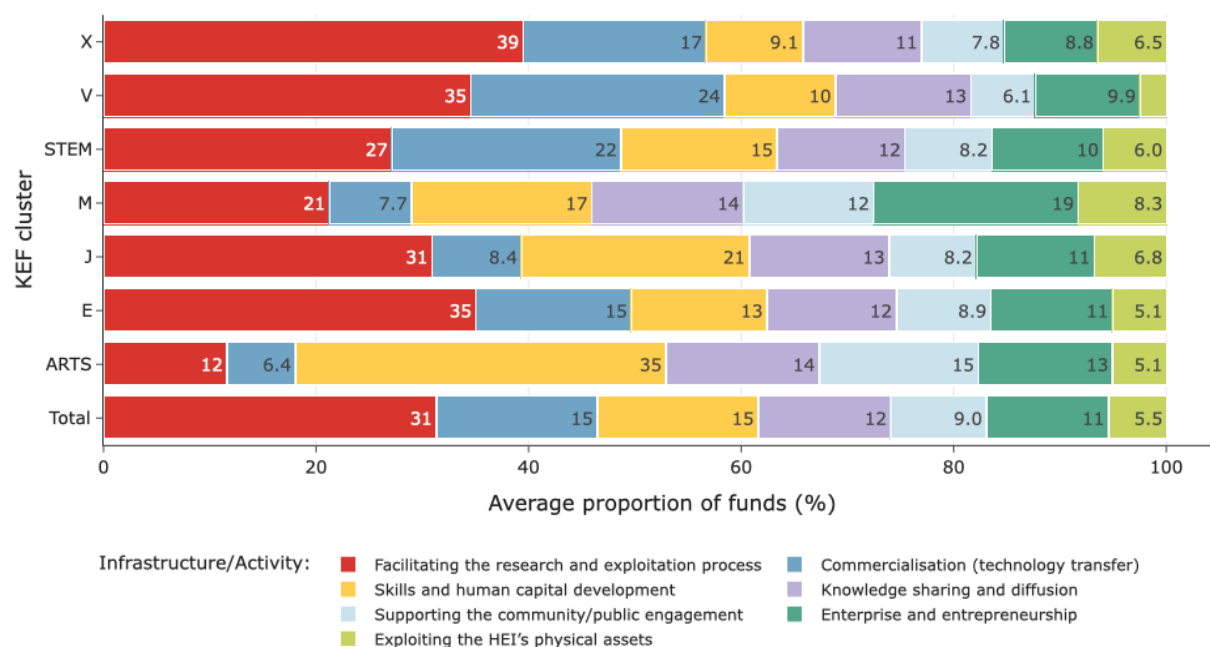


Source: analysis based on provided HEIF returns

#### 4.3.3 Planned HEIF expenditure by infrastructure / activity categories for each KEF cluster

The figure below shows that the planned expenditure by infrastructure / activity categories for each KEF cluster is varied in each case. Again, “Facilitating the research and exploitation process” remains the infrastructure / activity with the highest proportional planned expenditure, apart from within the Arts cluster. It is followed by “Commercialisation (technology transfer)” for which clusters E, V, X, and STEM plan a higher amount of expenditure in comparison to other infrastructure / activity categories. On the other side, “Exploiting the HEI’s physical assets” is the infrastructure / activity with the least amount of funds allocated in all clusters. Other infrastructure / activity categories show fairly evenly planned expenditure levels. Appendix E.6 contains further details about the trending behaviour of planned HEIF expenditure over the 2021/22 – 2024/25 period.

Figure 15 Planned HEIF expenditure by infrastructure / activity categories for each KEF cluster  
Period: 2021/22 - 2024/25

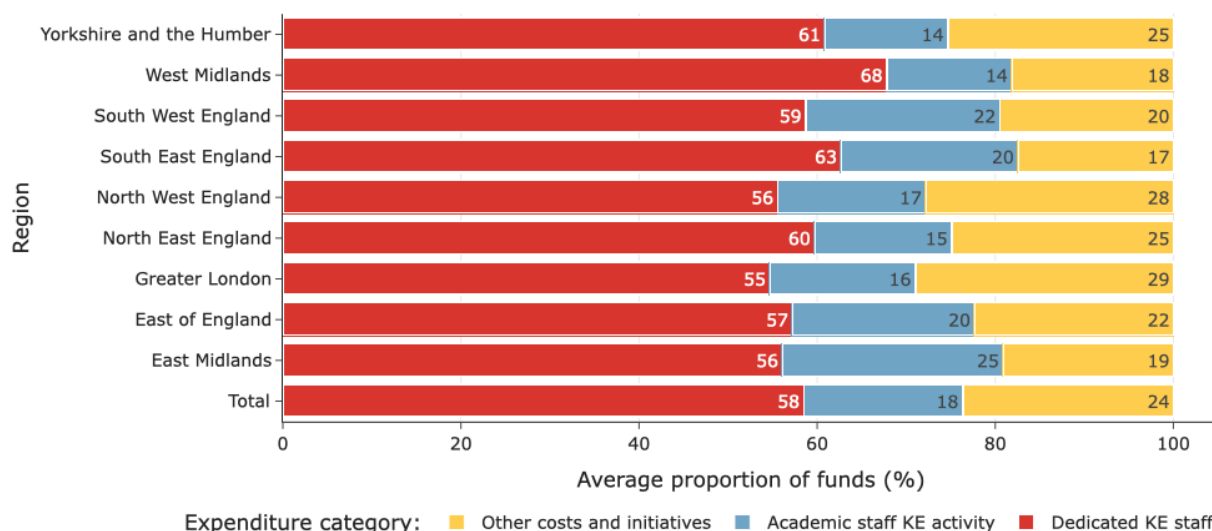


Source: analysis based on provided HEIF returns

#### 4.3.4 Planned HEIF expenditure by expenditure for each region

When examining the planned expenditure of each region by expenditure type, the East Midlands, the South East, and the South West each display higher proportions of planned expenditure on “Academic staff KE activity” than on “Other costs and initiatives funds” than other regions (see Figure 16). However, all regions show an increasing trend of planned expenditure on “Academic staff KE activity” (see Appendix E.7).

Figure 16 Planned HEIF expenditure by expenditure for each region  
Period: 2021/22 - 2023/24

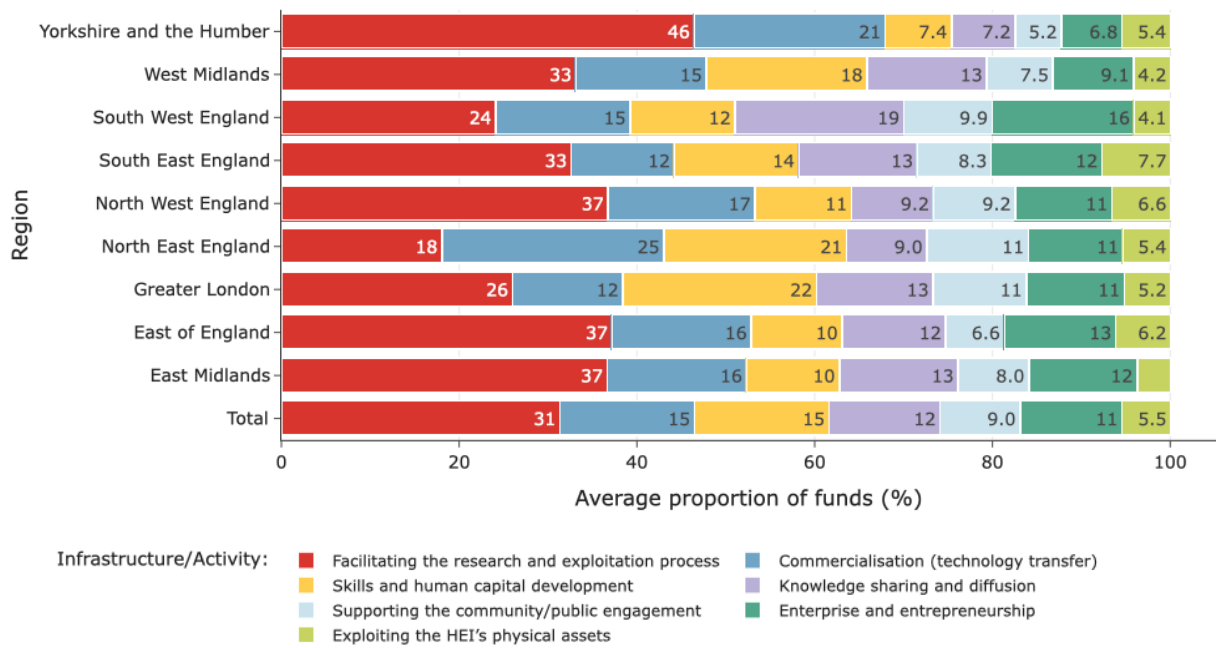


Source: analysis based on provided HEIF returns

#### 4.3.5 Planned HEIF expenditure by infrastructure / activity categories for each region

The analysis by infrastructure / activity categories by region in Figure 17 (below) shows different planned expenditure patterns for each region. As above, "Facilitating the research and exploitation process" remains the infrastructure / activity with highest planned proportional expenditure, apart from in the North East. "Commercialisation (technology transfer)" is next highest in the East Midlands, East of England, North West England, and Yorkshire and the Humber. "Skills and human capital development" is the second highest planned proportional expenditure in the Greater London, North East England, South East England, and West Midlands regions. "Exploiting the HEI's physical assets" is the infrastructure / activity category with the lowest planned proportional expenditure in all regions. Appendix E.8 contains further details about the trending behaviour of planned HEIF expenditure over the 2021/22 – 2024/25 period.

Figure 17 Planned HEIF expenditure by infrastructure / activity categories for each region  
Period: 2021/22 - 2024/25



Source: analysis based on provided HEIF returns

## 5 Analysis of themes within HEIF returns

### 5.1 Introduction

This section sets out the analysis of narrative data extracted from HEIF interim accountability statements (2020/21), accountability statements (2020/21 – 2024/25), and Covid statements. Data has been extracted as described in Chapter 3 and coded using a list of predetermined themes and sub-themes (see Table 2 in Chapter 3). The analysis of each of these themes is set out in the following sub-sections, including geographical and KEF cluster splits. To provide further context to the presented findings, relevant (anonymised) extracts from HEP statements are presented throughout the analysis in separate text boxes in blue.

### 5.2 Impact of Covid-19

The impact of Covid-19 on HEPs and the allocation of HEIF is analysed from different perspectives. A bottom-up approach was used to identify the challenges and opportunities presented by HEPs in their Covid statements and interim accountability statements. The following types of pressures and challenges emerging due to Covid-19 were considered:

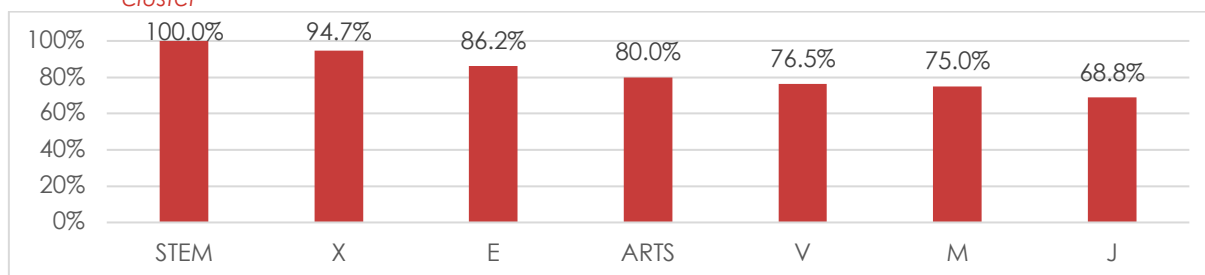
- Students
- Staff workload
- Skills and expertise
- Collaborations and partnerships with SMEs
- Collaborations and partnerships with local and/or community partners
- Changing ways of working
- Funding
- Project cancellations and suspensions

Approximately 83% of HEPs describe at least one of the aforementioned challenges and pressures in their Covid and interim accountability statements.

*"Covid-19 has presented challenges across many areas – project development and scoping, project delivery, academic participation/access to labs and SME capacity to take on innovation projects and their ability to commit to match funding."*

While a considerable proportion of HEPs in each cluster cite Covid-related pressures, these are especially common in KEF clusters STEM and X (Figure 18). There is also some geographical variation with the Western regions of England having comparatively high proportions of HEPs citing Covid-related pressures. Specifically, around 90% of HEPs situated in the North West, South West and West Midlands describe such pressures and challenges while in most other regions this proportion lies closer to 80% or 75%.

**Figure 18** Proportion of HEPs discussing general pressures emerging from Covid-19, normalised by KEF cluster

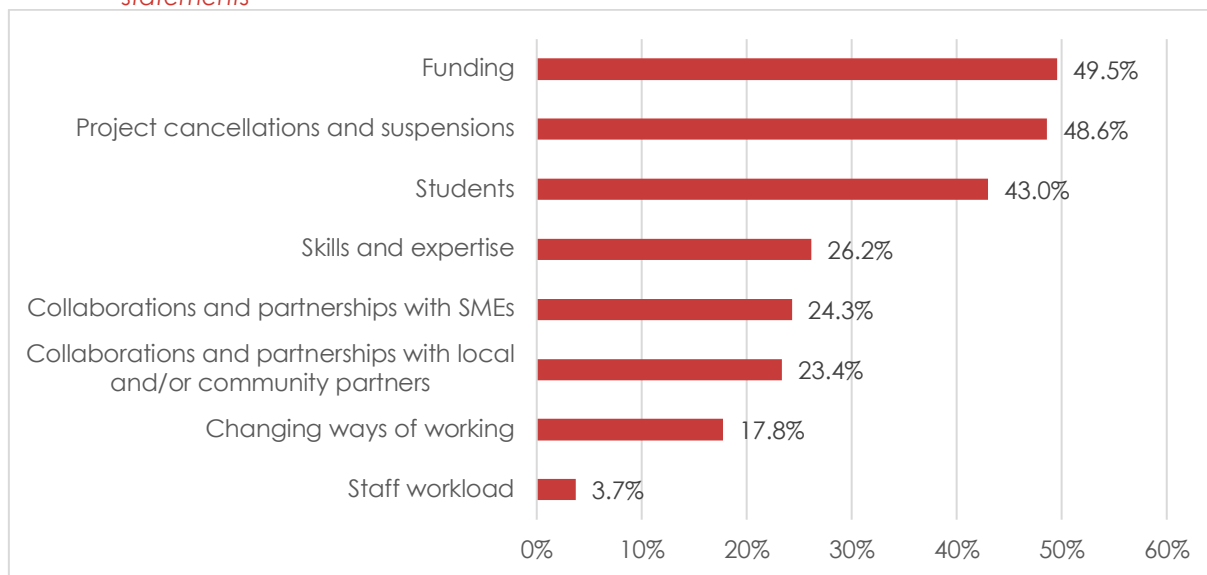


Source: analysis based on provided HEIF returns

Figure 19 shows the degree to which specific types of Covid-related pressures are cited by institutions in their Covid and Interim accountability statements.

The chart clearly shows that Covid-related pressures on funding, project cancellations and suspensions as well as students are reported by the highest proportions of analysed institutions (all over 40%). Pressures on staff workloads, on the other hand, appear the least common as they are cited by less than 4% of institutions in their statements. The most predominant pressures are discussed in more detail below.

*Figure 19 Overview of the coverage of specific emerging pressures related to Covid in HEIF Covid statements*

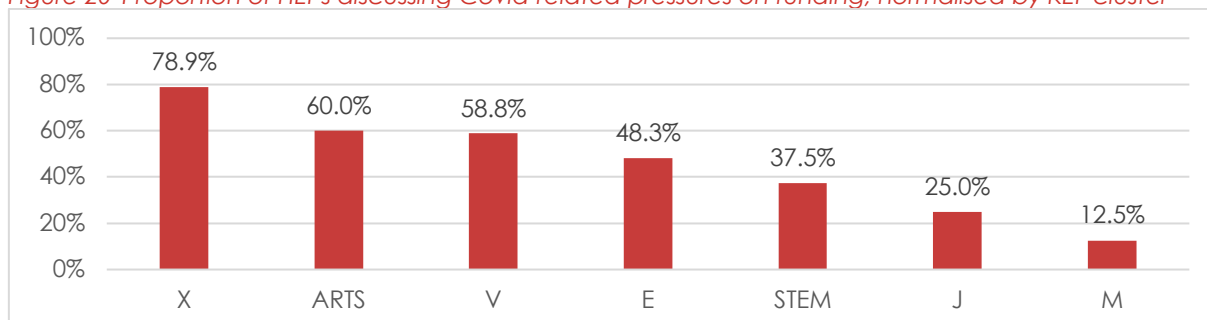


Source: analysis based on provided HEIF returns

In terms of funding pressures due to Covid, these are mentioned in particular by institutions from KEF cluster X (see Figure 20). Interestingly, the KEF clusters with small to mid-sized universities, M and J respectively, have lower proportions of HEPs describing pressures in funding in their Covid and interim accountability statements.

*"Unfortunately, this has led to significant loss of income generated from the facility in terms of office and space rental (the main source of income), which has placed even greater importance on the HEIF funding to enable us to maintain support to early-stage ventures."*

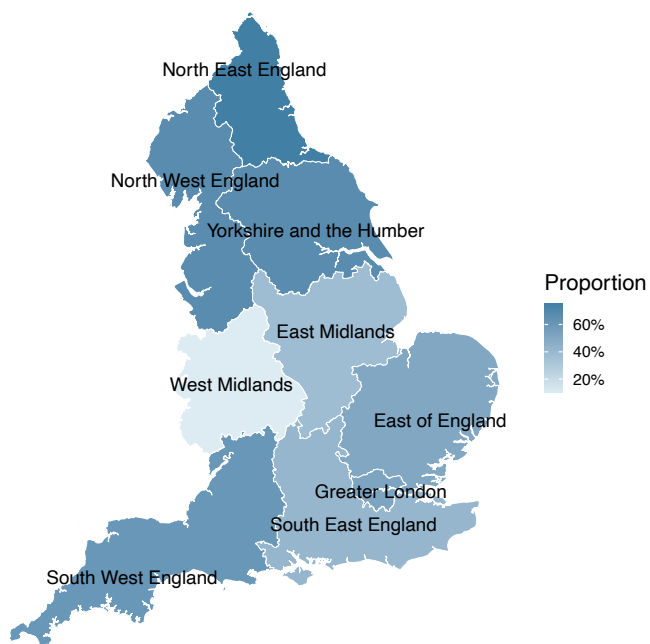
*Figure 20 Proportion of HEPs discussing Covid-related pressures on funding, normalised by KEF cluster*



Source: analysis based on provided HEIF returns

Moreover, fund-related pressures due to Covid are described particularly by HEPs situated in the Northern regions of England. This may be a consequence of the introduction of regional Covid-related restrictions, other structural differences between regions, the nature of the HEPs' external partnerships, the nature of HEPs in the North of England, and concentration of HEPs per region (see Table 1 for an overview of the number of HEPs per region).

Figure 21 Proportion of HEPs discussing Covid-related pressures on funding, normalised by NUTS1 region



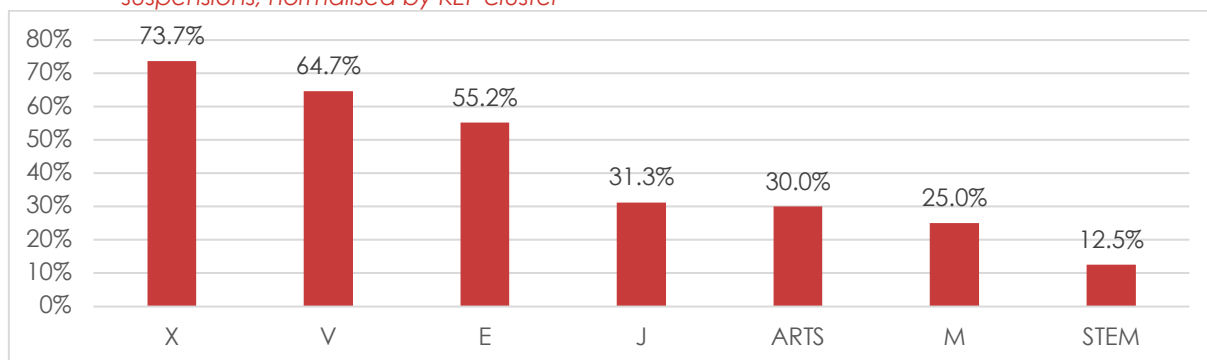
Source: analysis based on provided HEIF returns

Close to half of all HEPs analysed cited project cancellations or suspensions in their statements and these are found to especially concentrated in KEF clusters that consist of large to very large institutions, i.e., cluster E, X and V (see Figure 22).

*"Significant attention has been spent on "firefighting" in relation to research projects, for example mitigating negative impact on research and enterprise projects, including assisting with requesting extensions with funders and partners, rescopeing projects and deliverables, seeking different modalities of collaboration, and cancellation of travel booking and claiming refund, and extension of contracts."*

The apparent association with institutional size largely holds true across clusters as those with the lowest proportion of institutions mentioning project cancellations and suspensions in their statements are M as well as the two specialised clusters. As noted in Table 3, smaller providers such as those in cluster M had a lower average word count. Regionally, the East of England had by far the highest proportion of institutions (83%), referring to cancellations and suspensions.

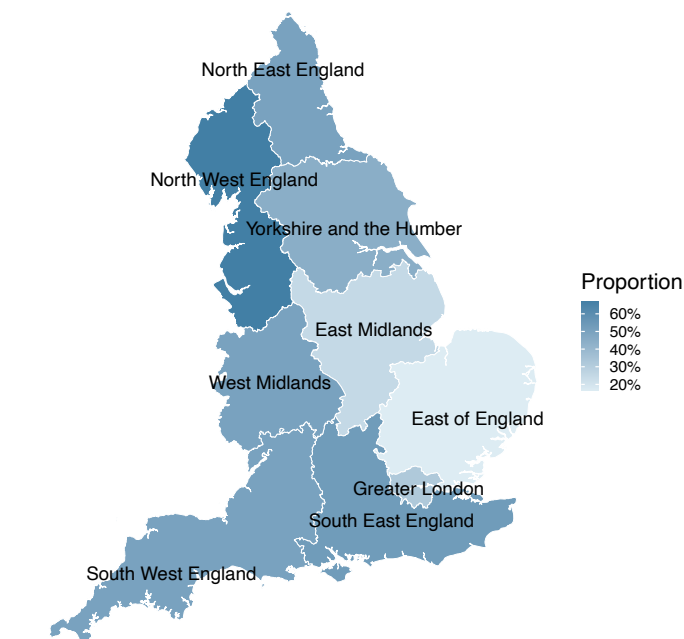
Figure 22 Proportion of HEPs discussing Covid-related pressures on project cancellations and suspensions, normalised by KEF cluster



Source: analysis based on provided HEIF returns

The third most commonly described pressure from Covid is related to students and is mentioned by approximately 43% of institutions. Variation across the KEF clusters is less pronounced compared to the previous two pressures (ranging between 25% of HEPs in the STEM cluster to 53% of HEPs in the X cluster). Geographically, however, pressures on students were more frequently described by HEPs located in North West England, and least by HEPs in the East of England and East Midlands (Figure 23).

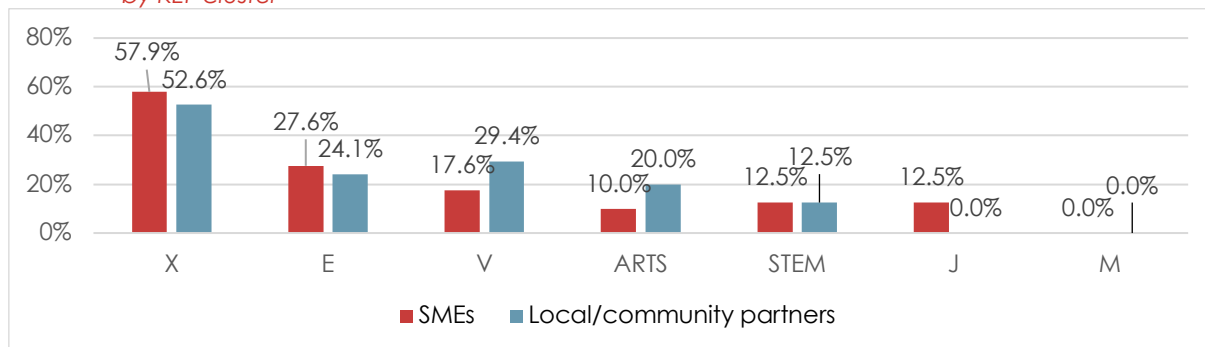
Figure 23 Proportion of HEPs discussing Covid-related pressures on students, normalised by NUTS1 region



Source: analysis based on provided HEIF returns

While Covid-related pressures on collaborations with SMEs as well as local and community partners were described by less than a quarter of HEPs in their statements, these are somewhat concentrated in particular clusters. Cluster X, in particular, stands out as one with a higher proportion of HEPs mentioning pressures on both types of collaborations than any of the other KEF clusters (see Figure 24).

Figure 24 Proportion of HEPs discussing pressures on collaborations emerging from Covid-19, normalised by KEF cluster



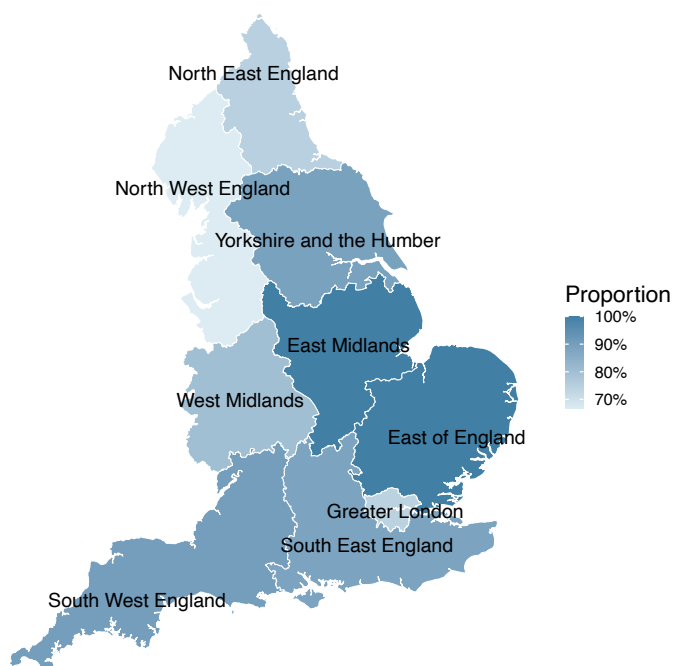
Source: analysis based on provided HEIF returns

The methodology also extracted information regarding opportunities that arose due to the pandemic. Regarding opportunities to help, around 82% of HEPs discussed instances of SME support and outcomes such as resilience, survival, and recovery in the context of Covid-19 specifically. Opportunities for business support were especially referenced by HEPs in KEF cluster X (100% of HEPs in this cluster). In the more specialised STEM and ARTS clusters, however, 50-60% of institutions discussed business support opportunities in their Covid and interim accountability statements.

*“As a response to different recovery and resilience grants being offered to SMEs, the university established a range of flexible support offers for business communities across the county and beyond during these challenging economic circumstances, including a recovery, resilience and accelerator package of targeted CPD and consultancy opportunities.”*

Geographically, business support in response to Covid-19 appears to be most prevalent amongst institutions in the East Midlands and East of England (see Figure 25).

Figure 25 Proportion of HEPs describing opportunities to help from Covid 19, normalised by NUTS1 region



Source: analysis based on provided HEIF returns

Few institutions (around 38%) reported furthering opportunities arising from Covid-19 such as the organisation of virtual events or development around continued professional development (CPD).

### 5.3 References to Government priorities

Regarding the references to government priorities, accountability statements were analysed in terms of their coverage of the UK Innovation Strategy<sup>4</sup>, the Industrial Strategy<sup>5</sup> (and their respective pillars), as well as related concepts such as grand challenges, net zero, clean growth, and so forth. Before presenting the results of this analysis, it is important to note that the recent Innovation Strategy was published *after* the accountability statements were submitted (see Figure 26). Explicit mentions of 'Innovation Strategy' were therefore unlikely, consequently our methodology also coded for related aspects such as technology areas that were public at the time of submission to identify some of the underlying topics that appear in the Innovation Strategy.

Figure 26 Timeline of the publication of main government strategies against the submission of HEIF accountability statements



The findings show that all HEPs covered by the analysis make reference to the Innovation Strategy, the Industrial Strategy or related concepts. To disentangle this finding further, we have considered the frequencies of relevant terminology relative to the overall length of the accountability statements, as a measure of the level of referencing per HEP (and, to some extent, the relative importance of related themes within the statements). Out of the 109 institutions included, around 39% have an above average degree of referencing to the Innovation Strategy and Industrial Strategy. Most of these (10) can be found in KEF cluster X. The latter consists of research-intensive HEPs and consequently are able to secure significant levels of research funding from government bodies such as UKRI. It is interesting to note, however, that in relative terms, the ARTS cluster has the highest proportion of institutions with above average referencing to the Innovation and Industrial Strategies (60%). Regionally, no major differences are observed.

*"[Name omitted] continues to use its HEIF funding to deliver and enhance these overriding objectives, through initiatives and programmes which align to and support the industrial strategy in the development of skills, creative industry growth, partnership with business and the community, and supporting the overall wellbeing of the UK, regardless of demographic or socio-economic background."*

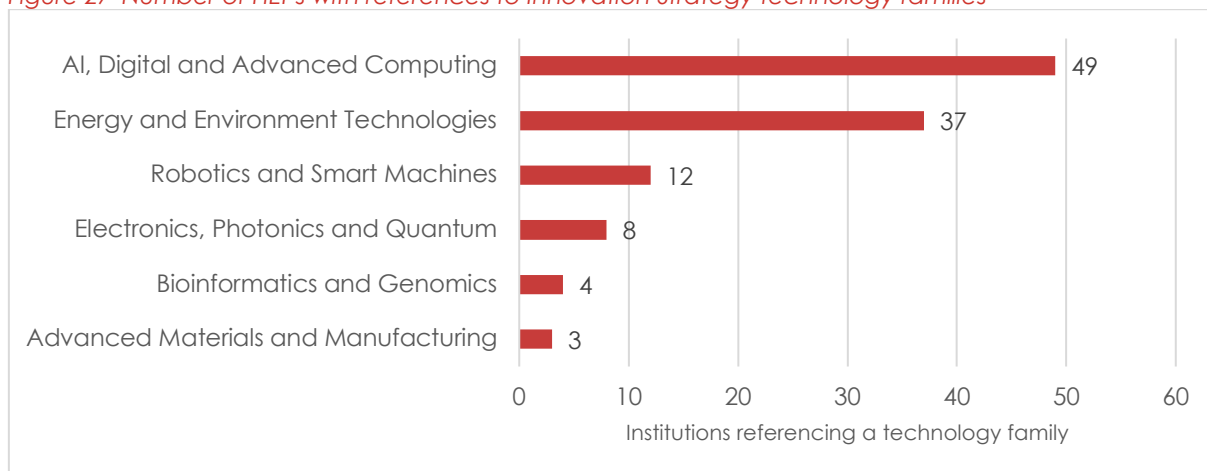
Within the current Innovation Strategy, coverage of the seven technology families within accountability statements was also assessed. Here, the "AI, Digital, and Advanced Computing" and "Energy and Environment Technologies" families are cited most frequently by HEPs (see Figure 27). Advanced Materials and Manufacturing, on the other hand, is only cited by three institutions. When interpreting these findings, it must be noted that some of the differences in the level of referencing to the technology families is related to the research

<sup>4</sup> See: <https://www.gov.uk/government/publications/uk-innovation-strategy-leading-the-future-by-creating-it>

<sup>5</sup> See: <https://www.gov.uk/government/topical-events/the-uks-industrial-strategy>

disciplines the HEPs are active in.<sup>6</sup> It is also worth reiterating that HEPs were not explicitly asked to discuss the technology families in their accountability statements and that the absence of references does not imply the absence of relevant activities or linkages.

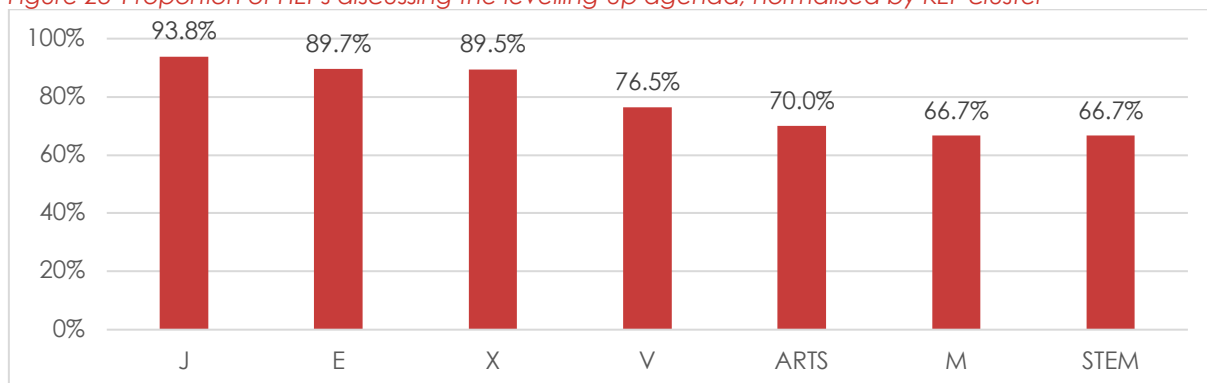
*Figure 27 Number of HEPs with references to Innovation Strategy technology families*



Source: analysis based on provided HEIF returns

The analysis also examined references to the government's levelling-up agenda. We find that the vast majority of institutions (82%) discuss levelling-up as well as related concepts including regional inequality, disparity, and development. Across KEF clusters, KEF cluster J has the highest proportion of HEPs referring to the levelling-up agenda in their accountability statements (see Figure 28).

*Figure 28 Proportion of HEPs discussing the levelling-up agenda, normalised by KEF cluster*



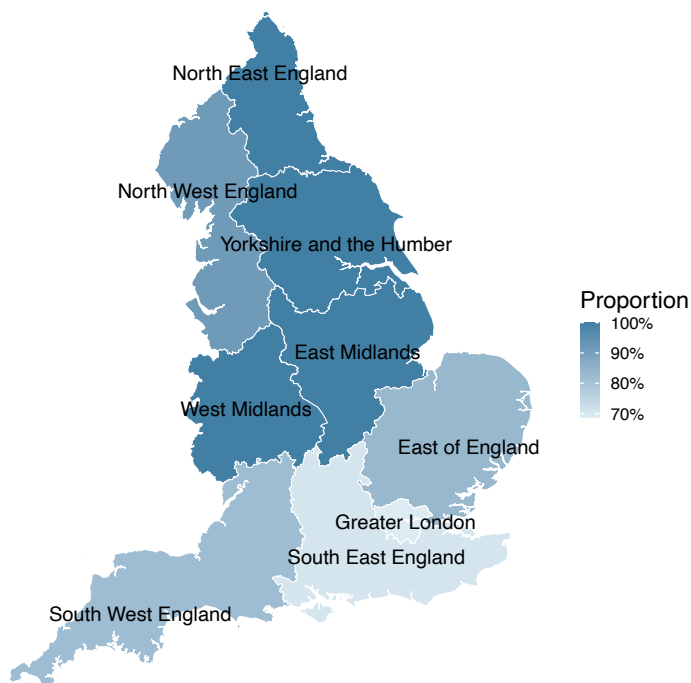
Source: analysis based on provided HEIF returns

When considering regional differences in the extent to which levelling-up is discussed, it is interesting to note that there is a distinct geographical pattern that can be observed. While levelling-up is cited by the majority of HEPs in all clusters, levelling-up is clearly discussed more

<sup>6</sup> In addition, we should consider that some technology families are less tied to specific research disciplines and thus may be incorporated into (and thus referenced in) multiple subject areas (e.g., digital and AI)

often by HEPs located in the northern regions of England as compared to the South East and Greater London (Figure 29).

Figure 29 Proportion of HEPs discussing the levelling-up agenda, normalised by NUTS1 region



Source: analysis based on provided HEIF returns

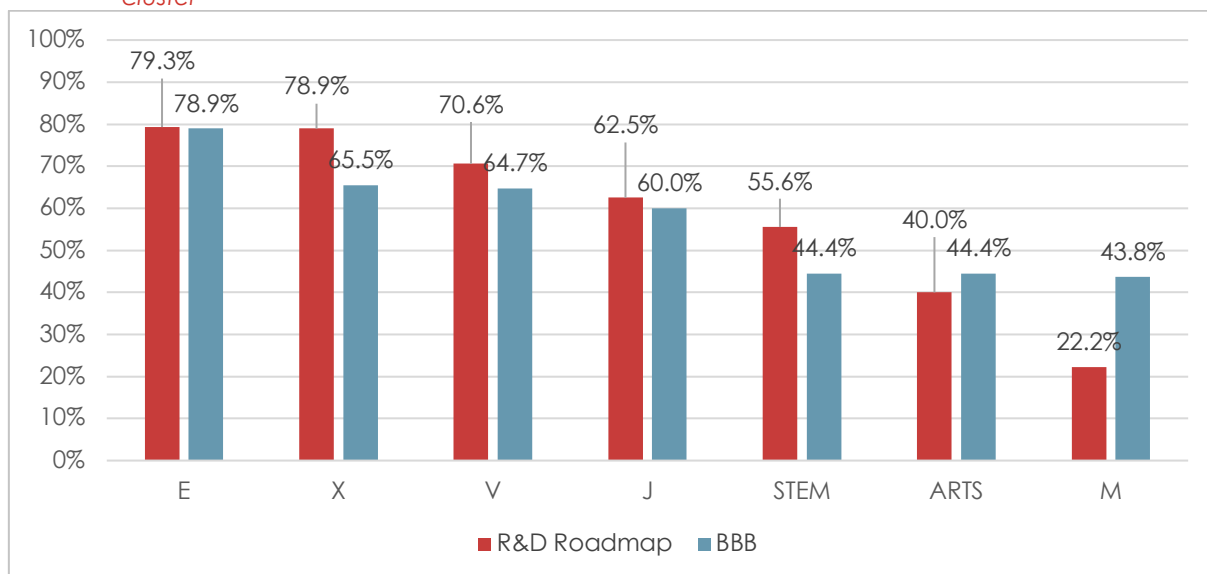
Furthermore, the analysis also examined references to the government's R&D Roadmap and Build Back Better (BBB) strategy. The results indicate that the majority of HEPs cite both plans (65% and 60% respectively) in their accountability statements.

*"This work has supported the government's 2020 plans for a green industrial revolution and the 2021 Build Back Better plan for growth by enabling SMEs to transition towards net zero and realise new opportunities for economic growth including meeting new demand for low carbon goods and services."*

*"Activity includes KE development support, facilitating co-working with partners and ensuring effective representation to enhance [name omitted] engagement and contributions to UK R&D Roadmap and competitiveness."*

For both priorities, KEF clusters E and X include the highest proportion of HEPs with references to them in their accountability statements (see Figure 30). This finding is not unsurprising given that both clusters include large and research-intensive universities. In a similar vein, one would expect HEPs with a disciplinary focus on the arts (ARTS) or teaching (M) to make fewer references in this regard. It is therefore surprising to find the STEM cluster with a relatively low proportion of HEPs citing Build Back Better and the R&D Roadmap. However, it must be pointed out that since HEPs were not explicitly asked to comment on the links between their (planned) activities and Build Back Better or the R&D Roadmap, the lack of references to them within accountability statements does not mean such links do not exist.

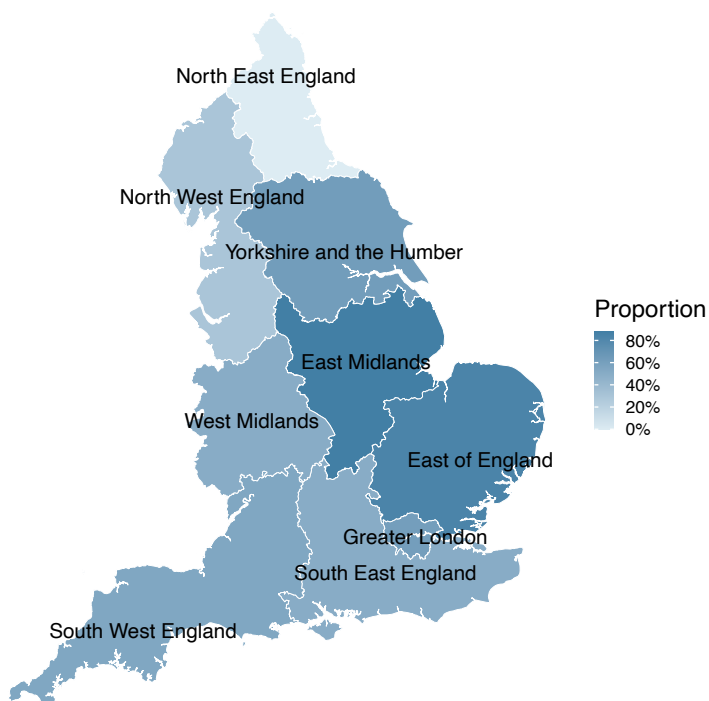
Figure 30 Proportion of HEPs referencing Build Back Better and the R&D Roadmap, normalised by KEF cluster



Source: analysis based on provided HEIF returns

While minor regional differences can be observed in the proportion of HEPs citing the R&D Roadmap (between 56% and 89%) there are more pronounced regional differences in the extent to which Build Back Better features in HEIF accountability statements. Specifically, over 80% of HEPs from the East Midlands and the East of England make reference to Build Back Better while only 33% of HEPs from the North West do so, and none from the North East (see Figure 31).

Figure 31 Proportion of HEPs referencing Build Back Better, normalised by NUTS1 region



Source: analysis based on provided HEIF returns

#### 5.4 References to other UKRI-funded KE activity

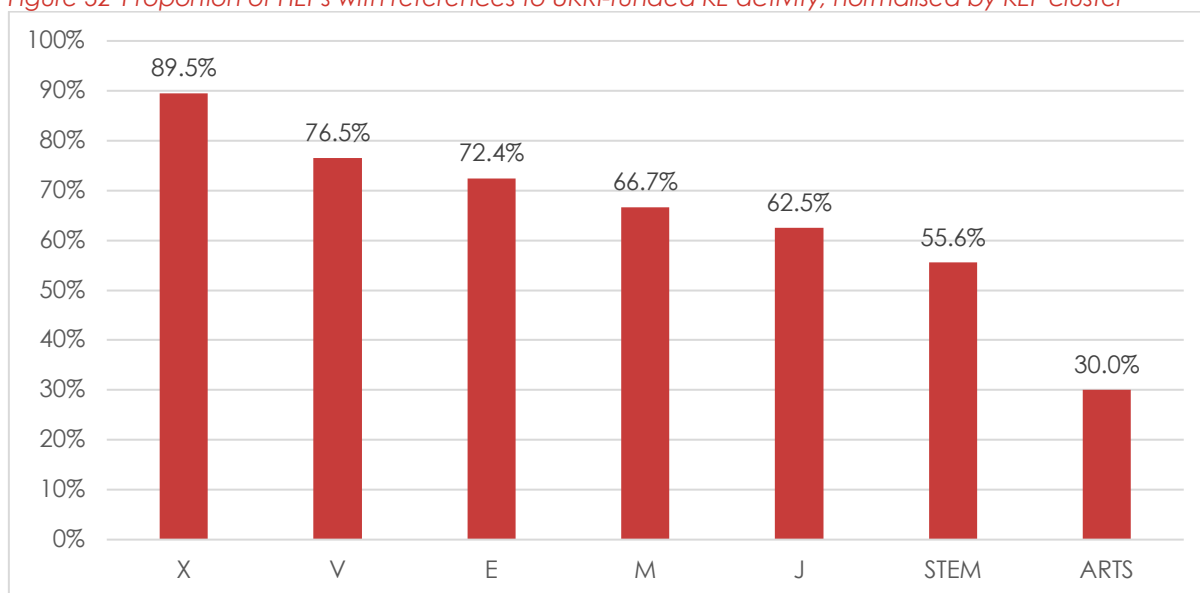
The analysis of narrative data also assesses the degree to which HEPs make reference to a variety of other UKRI-funded activities that are relevant to knowledge exchange (KE). This includes schemes such as Knowledge Transfer Partnerships, ICURe, Connecting Capability Fund (CCF), the Strategic Priorities Fund, but also other funding streams such as the European Regional Development Fund (ERDF), the European Fund for Sustainable Development (EFSD), and the UK Shared Prosperity Fund. Overall, 69% of analysed HEPs include descriptions of these activities in their accountability statements.

*“Further leverage of external Research Commercialisation funding schemes including ICURe NxNW and InnovateUK (such as the Cyber ASAP).”*

*“For example, in 2019 we undertook a survey of IAA funded projects using the EPSRC quantitative report as a basis, but supplemented these questions based on prior work by NCUB and the Judge Business School, University of Cambridge and our learning from our 2012-2017 EPSRC IAA.”*

Across KEF clusters, the proportion of these HEPs is relatively consistent (between 56% and 89% of universities), with the exception of the ARTS clusters where only 30% of HEPs referred to other UKRI-funded activities in their statements (see Figure 32). Clusters X and V have the highest proportion of HEPs in this regard which is intuitive given their inclusion of large to very large research-intensive universities undertaking a significant amount of excellent research.

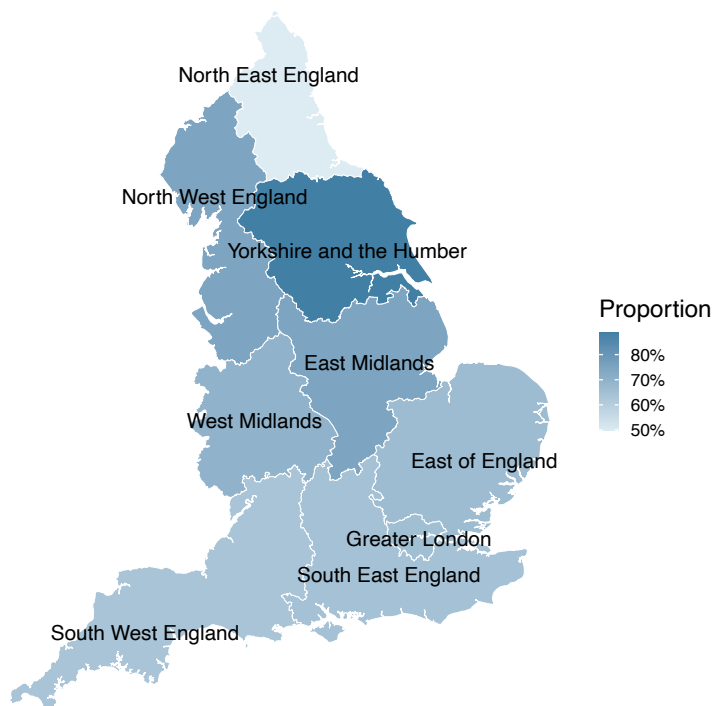
Figure 32 Proportion of HEPs with references to UKRI-funded KE activity, normalised by KEF cluster



Source: analysis based on provided HEIF returns

A relatively small amount of regional variation can be observed in favour of HEPs from Yorkshire and the Humber, the East Midlands, and the North West where between 75% and 89% of institutions make reference to the aforementioned activities.

Figure 33 Proportion of HEPs with references to UKRI-funded KE activity, normalised by NUTS1 region



Source: analysis based on provided HEIF returns

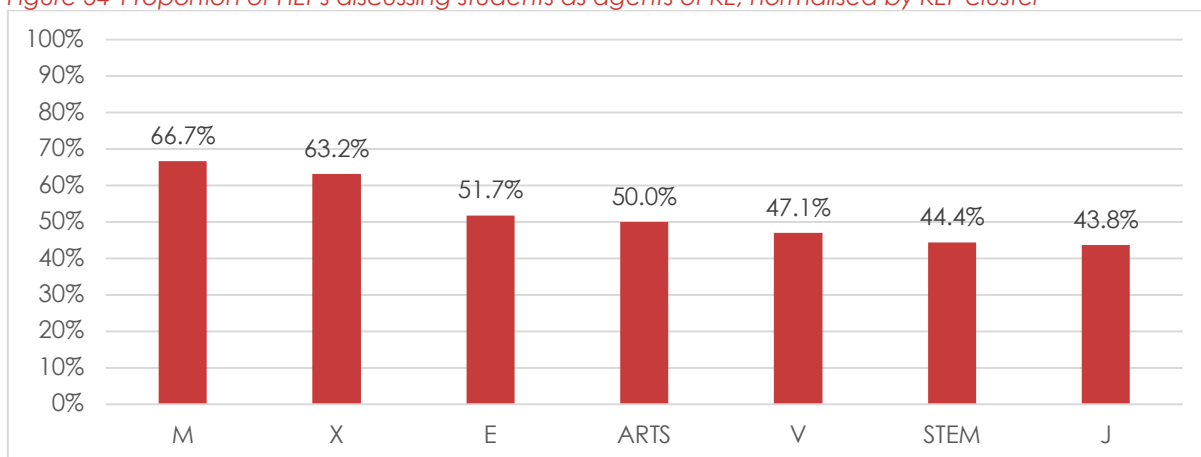
### 5.5 Student involvement in KE activity

The level of student involvement in knowledge exchange was analysed from two different angles. First, information regarding student benefits was extracted from HEIF accountability statements. Specifically, the analysis focussed on references of student benefits in terms of skills and employability as well as student enterprise. We found that all HEPs make reference to at least one form of student benefits in their accountability statements.

*"In delivering objective 2, we aim to: (a) reposition our highly successful creative enterprise centre into a student enterprise centre (SEC) to support students from across the university to develop enterprise skills for employment, self-employment and business start-up."*

Secondly, the analysis also identified instances where students can act as 'agents' of knowledge exchange. Specifically, this includes student enterprise as well as student placements and student involvement in curriculum development. Over half of the HEPs included in the analysis (52%) report such instances. These are most common in KEF cluster M and X with over 60% of institutions each (see Figure 34). The finding therefore resonates with their characteristics of, respectively, small teaching-focussed universities and large universities with significant bodies of taught postgraduates.

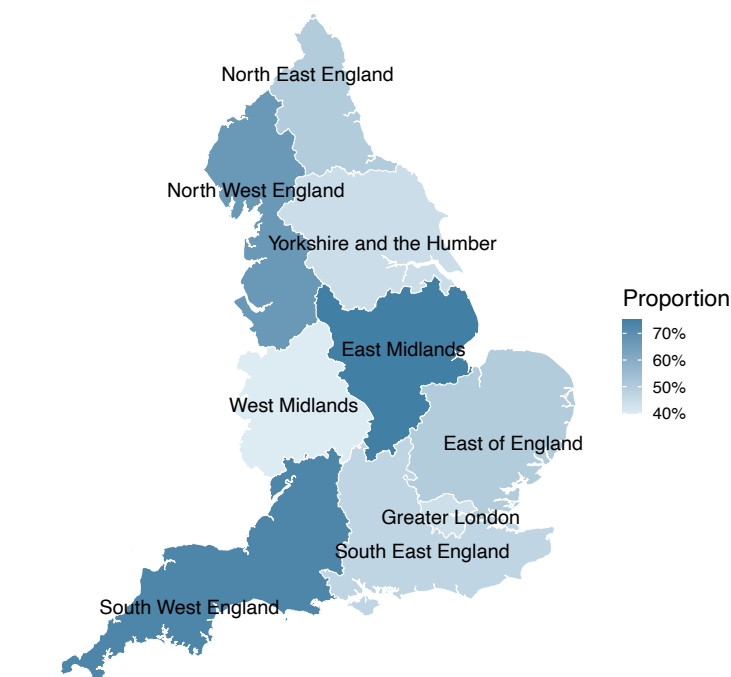
Figure 34 Proportion of HEPs discussing students as agents of KE, normalised by KEF cluster



Source: analysis based on provided HEIF returns

Geographically, HEPs describing instances where students act as agents of knowledge exchange are predominantly found in the East Midlands as well as the South West (see Figure 35).

Figure 35 Proportion of HEPs discussing students as agents of KE, normalised by NUTS1 region



Source: analysis based on provided HEIF returns

## 5.6 Place as a driver of KE objectives and activities

The importance of place was analysed as a key driver of strategic objectives of knowledge exchange. The former includes concepts such as Local Enterprise Partnerships (LEPs), Growth Hubs, Strategic Economic Plans (SEPs) as well as spill-overs and various forms of local government. The overwhelming majority of institutions (95%) discuss the importance of place in

their accountability statements. As a result, the distribution of these HEPs across both KEF clusters and regions is also very even with little variation. The only cluster with relatively fewer HEPs discussing the importance of place is the STEM cluster (78%). Furthermore, Greater London is the only region where fewer than 90% of institutions reference the importance of place (87%).

*"Our pervasive approach addresses the interactions between research, innovation and deployment, and regional sector alignment addresses the placed-based and levelling up agendas."*

*"The Strategic Plan for 2018-23 outlines the university's commitment to local growth and regeneration, to creating new knowledge, and to supporting transformation initiatives in line with the Government's R&D Roadmap, and regional challenges identified by partners such as the Leicester and Leicestershire Economic Partnership (LLEP)."*

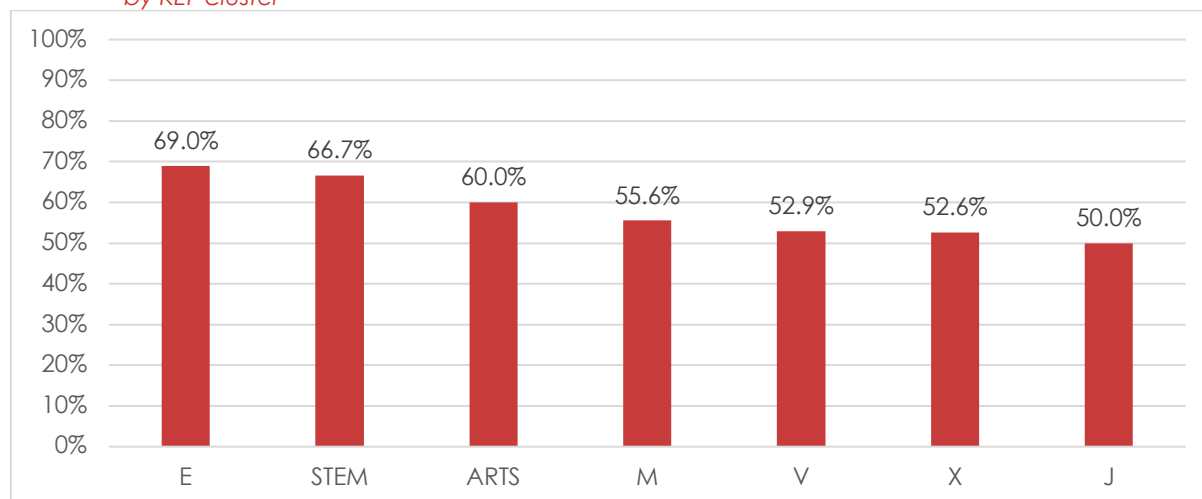
## 5.7 Collaborations between HEPs

One area of interest within the analysis is the identification of collaborations between HEPs. This was divided into (i) collaborations with HEPs from the home nations, and (ii) (in the case of English HEPs) collaborations with those eligible and not eligible for HEIF. We found that 59% of institutions describe collaborations with English HEPs that are eligible for HEIF.

*"For example, [Name omitted] has engaged in KE activity with Imperial College around the theme of creative collaboration with science and tech and are developing opportunities to bring students from both institutions together to explore enterprise initiatives."*

As can be seen in Figure 36, the E and STEM clusters stand out as those with a relatively higher proportion of HEPs describing collaborations with English HEPs that are eligible for HEIF.

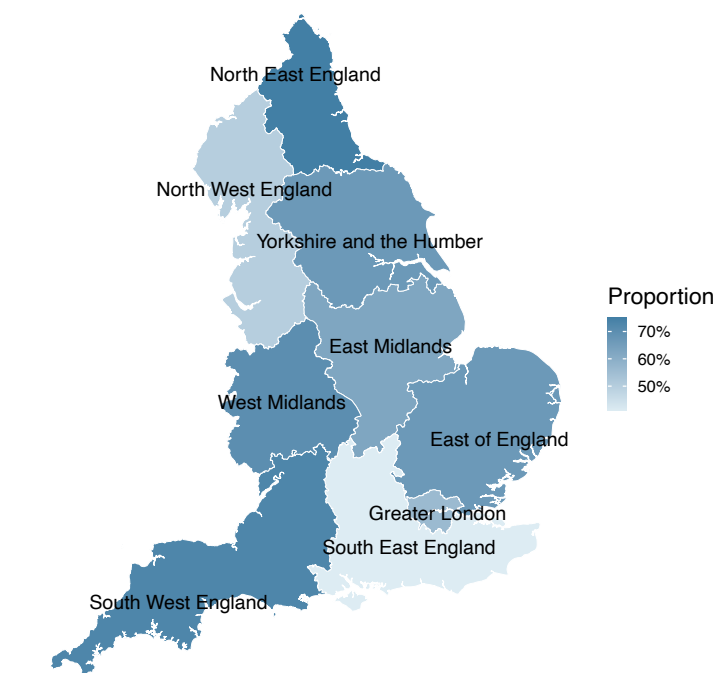
*Figure 36 Proportion of HEPs indicating collaborations with other English HEPs eligible for HEIF, normalised by KEF cluster*



Source: analysis based on provided HEIF returns

Regarding regional patterns, the North West, South West and Midlands have the highest proportion of HEPs collaborating with other English HEPs eligible for HEIF (70% or over, see Figure 37). Fewer HEPs located in the North West and South East describe collaborations with HEIF-eligible English HEPs.

Figure 37 Proportion of HEPs indicating collaboration with other English HEPs, normalised by NUTS1 region



Source: analysis based on provided HEIF returns

The analysis did not identify any collaborations with English HEPs not eligible for HEIF within the accountability statements. Similarly, no collaborations with HEPs from Wales or Northern Ireland were described in the analysed accountability statements. In the case of Scottish HEPs, only seven HEPs included mentions of collaborations in their statements. Although as noted in section 3.3, Research England did not specifically ask HEPs about collaborations supported by HEIF.

## 5.8 Value for money, efficiency, and effectiveness

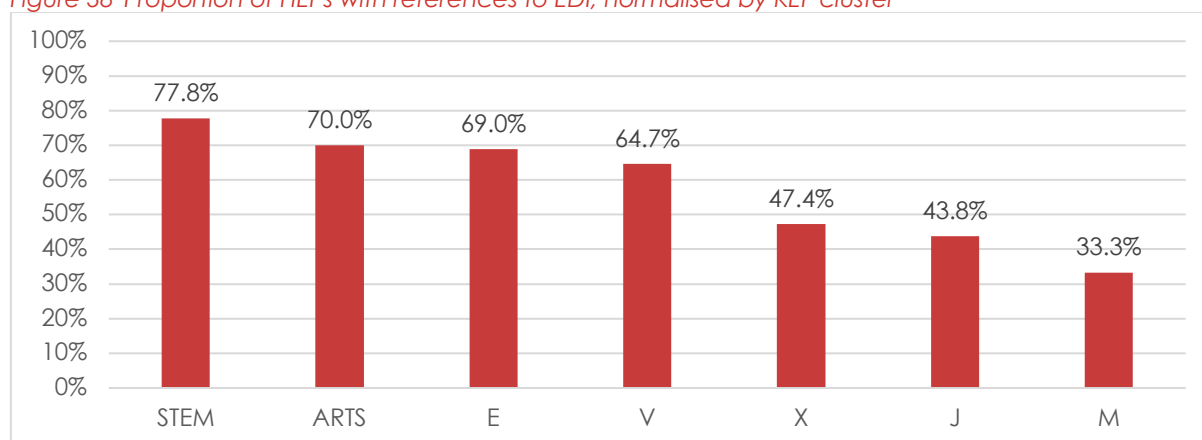
Next, the analysis explored various ways in which HEPs described methods to achieve value for money, efficiency, and effectiveness. In order to address this cluster of themes, the analysis explored i) equality, diversity and inclusion (EDI), ii) knowledge exchange policy improvements, iii) institutional/organisational innovation(s), iv) broad efficiency and effectiveness, and v) improvements to academic staff engagement in KE. It is important to note that HEPs were not explicitly asked to report on ways to achieve value for money, efficiency, effectiveness or EDI in any HEIF accountability statements. Furthermore, the coding methodology was relatively limited in its capacity to identify the broad achievement value for money, efficiency, and effectiveness due to the lack of specificity in the terminology used to describe these in the accountability statements. Moreover, efficiency and effectiveness are both supported through the Knowledge Exchange Concordat (KEC) and Framework (KEF).

*"Activity have been selected that deliver to specific ambitions within our EDI plans, for example, with our commitments to our Race Equality Charter, Athena Swan and emergent KE Concordat."*

Results related to discussions of EDI featured in the accountability statements of well over half of included HEPs (59%). This is noteworthy as EDI did not feature explicitly in any of the reporting questions. Moreover, it is interesting to note that, proportionally, EDI-related issues are more

often referenced by STEM or ARTS universities in comparison to other KEF clusters, as can be seen in Figure 38.

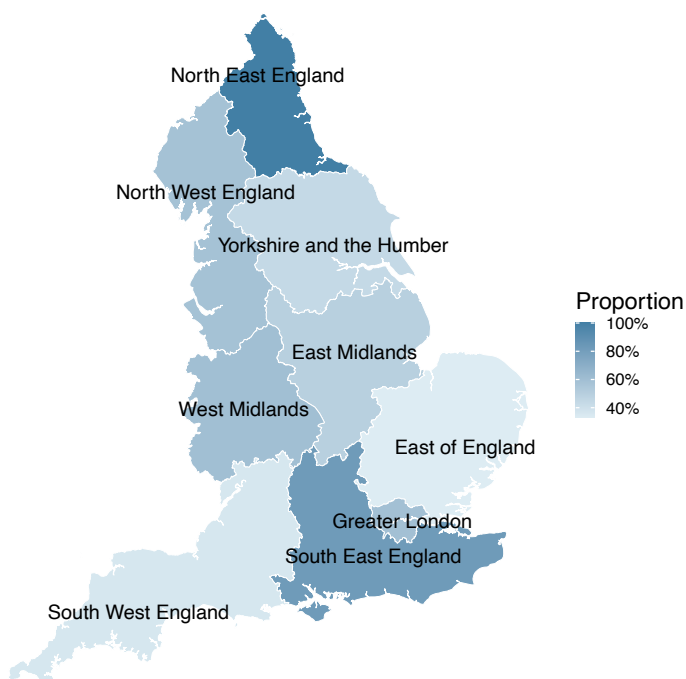
Figure 38 Proportion of HEPs with references to EDI, normalised by KEF cluster



Source: analysis based on provided HEIF returns

The results also indicate a distinct geographical dimension to the location HEPs citing EDI in the descriptions of their activities. Proportionally more HEPs situated in the North East and South East refer to EDI in their descriptions of their activities (see Figure 39).

Figure 39 Proportion of HEPs with references to EDI, normalised by NUTS1 region



Source: analysis based on provided HEIF returns

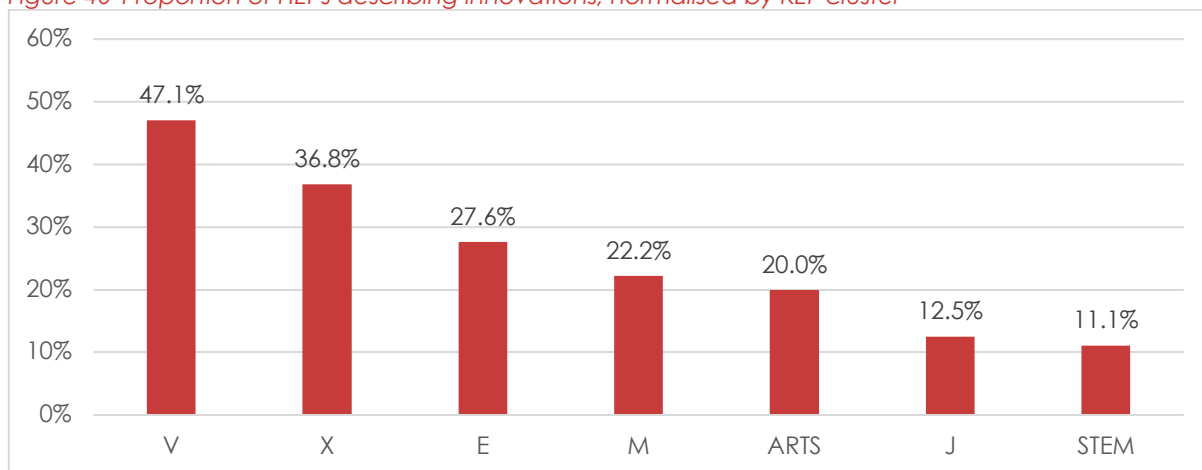
Second, references to improvements in knowledge exchange policy (for example regarding spinouts and intellectual property) were analysed. We find that 42% of HEPs covered by the analysis refer to improvements in such policies. As a result, their concentration in KEF clusters is also relatively low with X and V being the only clusters where a weak majority of institutions refer

to improvements in knowledge exchange policies in their statements. No distinct geographical pattern could be identified although the North West and North East respectively appear to have the lowest proportion of institutions (25%) citing improved KE policy.

*“Following significant investment in research over the last seven years of the REF cycle, the university group will embark on a continuous improvement programme to drive the development of new/updated IP policies, procedures, and processes, data platforms and asset management systems.”*

Third, the specification of institutional innovation(s) was assessed, including mention of innovative ideas, research, technology, companies, products, and so forth by HEPs. The analysis suggests that this is relatively uncommon within HEIF accountability statements, as under a third (28%) of HEPs make references to related terminology. Relatively speaking, such institutions tend to be large research-intensive universities in KEF clusters V and X (see Figure 40). The results show no pronounced geographical pattern.

Figure 40 Proportion of HEPs describing innovations, normalised by KEF cluster



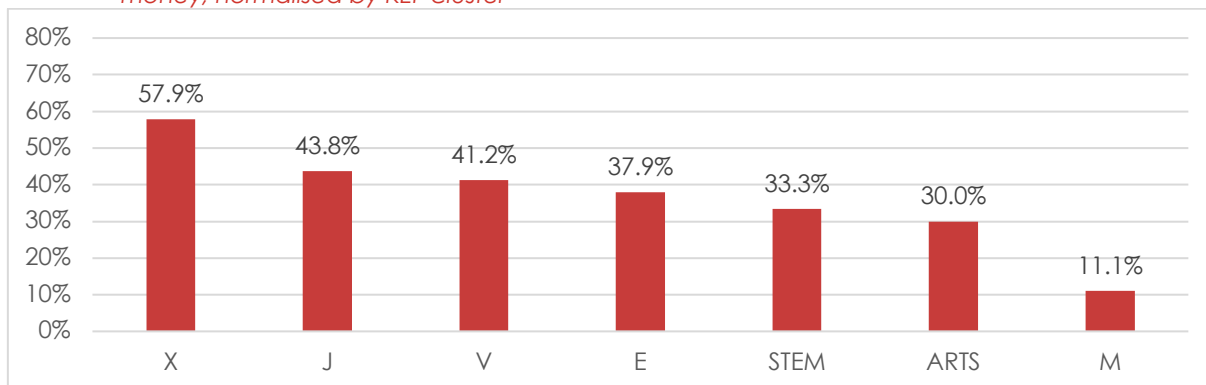
Source: analysis based on provided HEIF returns

Fourth, analysis of instances where HEIF has supported broader means of achieving efficiency, effectiveness, or value for money found that approximately 39% of institutions have cited these.

*“Separately, monthly financial reviews of HEIF expenditure and regular quarterly reviews of progress take place to ensure both efficiencies in operational performance are achieved and programme delivery channels are continually improved and enhanced.”*

As a results thereof, coverage across KEF cluster is relatively low, ranging from 11% of institutions in the cluster M to 58% in cluster X (see Figure 41).

Figure 41 Proportion of HEPs describing the contribution of HEIF to efficiency, effectiveness, and value for money, normalised by KEF cluster



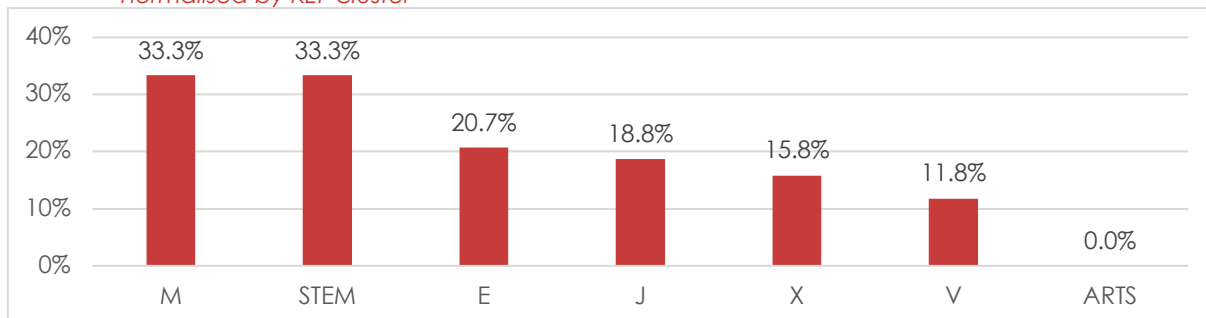
Source: analysis based on provided HEIF returns

Lastly, the methodology identified instances where HEPs describe the engagement of academic staff in improvements around knowledge exchange.

*"We have invested significantly and strategically in the enterprise and innovation team over recent years, and have created incentives to support academic staff involvement in knowledge exchange activity, which has increased levels of activity and the profile of KE within the university."*

The analysis finds that 18% of institutions mention these instances, of which most (6 institutions) are found in KEF cluster E, and none are observed in the ARTS cluster. In relative terms, however, clusters M and STEM have the highest proportion of institutions citing involvement of academic staff in knowledge exchange in their statements (see Figure 42).

Figure 42 Proportion of HEPs describing academic staff engagement in improved knowledge exchange, normalised by KEF cluster

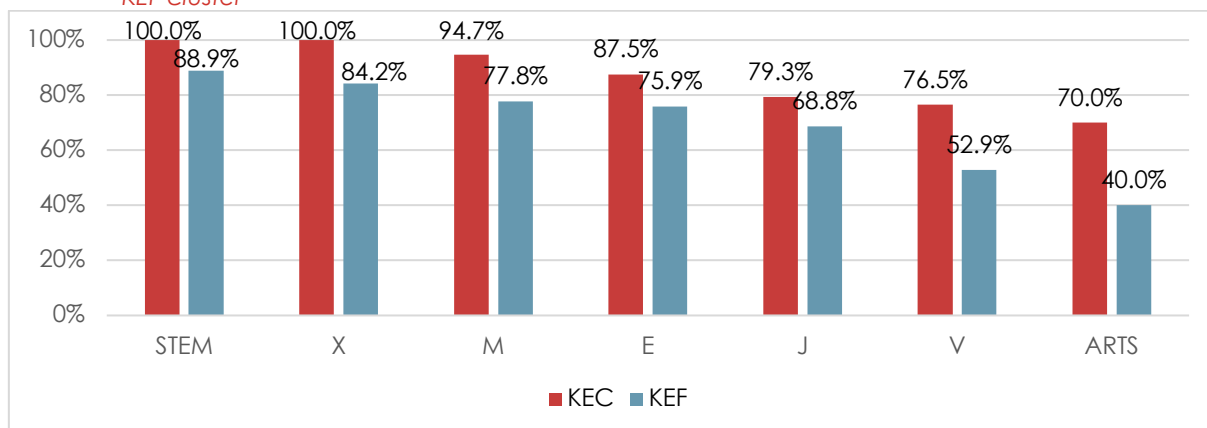


Source: analysis based on provided HEIF returns

## 5.9 References to other policy areas

Finally, the analysis assessed references to the Knowledge Exchange Framework (KEF) and the Knowledge Exchange Concordat (KEC). Neither were explicitly included in the reporting questions of the accountability statements, yet both are referenced by a high proportion of HEPs, while the KEF is mentioned to a slightly higher degree than KEC. Disaggregating by KEF clusters, we find that both follow the same pattern with regards to the proportion of institutions with references. As is displayed in Figure 43, the STEM cluster has the highest proportion of HEPs referencing both the KEF and KEC in their statements, while ARTS cluster has the lowest proportion for both.

Figure 43 Proportion of HEPs citing the Knowledge Exchange Framework and Concordat, normalised by KEF cluster



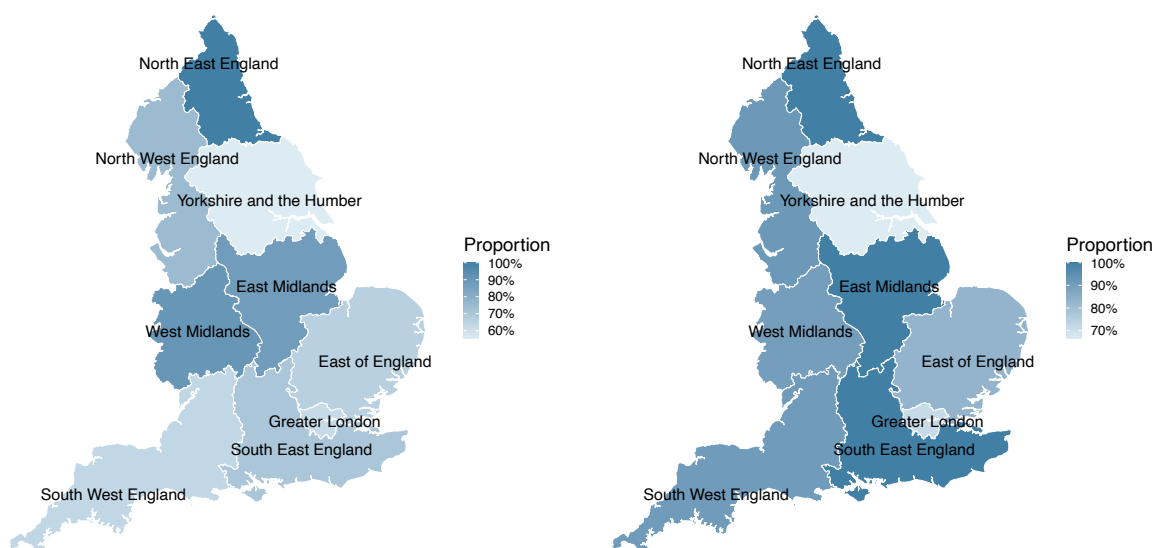
Source: analysis based on provided HEIF returns

"The role of the KESG is to also have oversight of the development of strategy and policy, monitoring of their implementation, to ensure efficacy and learning for performance enhancement in knowledge exchange as defined in the Knowledge Exchange Concordat, activity across [name omitted], as aligned with delivery of the Strategic Plan and the targets therein."

"The core activities facilitated under the KEF "Research Partnerships" perspective will include support for academic staff to exploit collaborative research opportunities and engage with external organisations and strategic partners through a wide range of professional networks, conferences, workshops, seminars, and events."

While regional differences are relatively minor for KEF (ranging between 100% and 67% of HEPs), KEC exhibits more pronounced regional variation. As can be seen in Figure 44, Yorkshire and the Humber and the Humber has the lowest proportion of HEPs that refer to the KEC and KEF in their accountability statements (55% and 67% respectively).

Figure 44 Proportion of HEPs citing the Knowledge Exchange Concordat (left) and Framework (right), normalised by NUTS1 region



Source: analysis based on provided HEIF returns

## 6 Conclusion

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This study was commissioned to yield insights into the use of HEIF as described by HEPs in their submitted accountability statements in order to contribute to Research England's evidence base and to future HEIF policy development. In support of these aims, the study objectives included the development of a methodology that would enable detailed analysis of HEIF accountability documents. The methodology used has enabled the structuring and analysis of extracted data to produce headline findings regarding the use of HEIF funding in HEPs, as well as the activities and priorities that are supported by it.

The analysis of financial data reveals fairly consistent expenditure across expenditure types and infrastructure / activity categories over the period 2015/16 – 2019/20, though some differences were found when examining expenditure by KEF cluster and geographical region. Comparing past expenditure and future planned expenditure by expenditure type shows that proportions will be largely maintained, albeit with some evident convergence. The same analysis of the infrastructure / activity categories shows a similar picture, albeit with more steady trends. Where significant differences across KEF clusters or regions do exist, these could largely be attributed to specific cluster characteristics or the structural distribution of HEPs in England.

Analysis of narrative data has confirmed that HEPs have responded to areas of interest to Research England as well as the Office for Students, the objectives of HEIF, and knowledge exchange more broadly. With regards to the UK government agenda, all providers covered by this analysis cite the Industrial Strategy and Innovation Strategy in their statements, and the majority of providers discuss other government policy areas such as the levelling-up agenda, the R&D Roadmap, and Build Back Better. In addition, student benefits featured in all of the analysed accountability statements with approximately half of HEPs describing instances where students act as agents of knowledge exchange. The importance of place was described by a significant majority of institutions in their statements.

In addition to these strongly featured thematic areas, referencing to a set of topics that HEPs were not explicitly asked to report on was also observed. Specifically, the analysis has found this to be the case for discussions around the Knowledge Exchange Concordat and Framework as well as equality, diversity, and inclusion (EDI). All three areas were referred to by most providers at their own initiative. Positive results were also observed for collaborations between English HEPs eligible for HEIF as well as references to a range UKRI-funded knowledge exchange activities including but not limited to Knowledge Transfer Partnerships (KTPs), the Strategic Priorities Fund (SPF), and the Connecting Capability Fund (CCF).

The analysis has also yielded insight into the impact on the Covid-19 pandemic on HEPs. Within their Covid and interim accountability statements, a large proportion of providers specified pressures emerging from Covid of which funding-related challenges, project cancellations and suspensions, and pressures on students were the most common. On a positive note, however, an equally large portion of HEPs described opportunities to help emerging from the pandemic, including support to the survival, recovery, and resilience of SMEs.

Finally, areas where results were mixed or limited include references to improvements in knowledge exchange policies, collaborations with HEPs from Wales, Northern Ireland, and Scotland, specifications of institutional innovations, and the engagement of academic staff in broader improvements around knowledge exchange. However, given that these were areas not covered explicitly in reporting requirements and the limited use of specific terminology used by HEPs to describe these in their statements, these findings cannot be extrapolated to the full scale of institutional activities.

## Appendix A Thematic dictionaries

The following tables report the full list of key words and phrases included in the dictionary for every sub-theme covered in the analysis. Asterisks are used to cover variations of the same word stem, i.e., 'collaborat\*' would capture 'collaborate', 'collaborating', 'collaboration', etc.

Broad theme	Sub-theme	Dictionary
<b>Impact of COVID 19</b>	Opportunities to help	Co-occurrence of: sme*, business*, enterpris*, small and medium sized enterpris*, small and medium-sized enterpris* with:
	Other opportunities arising from the pandemic	Virtual event*, cpd
<i>Emerging pressures in HEPs and partners on:</i>	Students	Co-occurrence of: issue, issues, pressure*, response*, pivot*, risk*, challeng*, threat*, suspend*, loss, lost, cancel*, pause*, postpone* with: student*
	Staff workload	Co-occurrence of: issue, issues, pressure*, response*, pivot*, risk*, challeng*, threat*, suspend*, loss, lost, cancel*, pause*, postpone* with: staff, staff workload*
	Skills & expertise	Co-occurrence of: issue, issues, pressure*, response*, pivot*, risk*, challeng*, threat*, suspend*, loss, lost, cancel*, pause*, postpone* with: skill*, expertise
	Collaboration with SMEs	Co-occurrence of: issue, issues, pressure*, response*, pivot*, risk*, challeng*, threat*, suspend*, loss, lost, cancel*, pause*, postpone* & collaboration*, partner* with: business*, enterprise*, company, companies, sme*
	Collaboration with local/community partners	Co-occurrence of: issue, issues, pressure*, response*, pivot*, risk*, challeng*, threat*, suspend*, loss, lost, cancel*, pause*, postpone* with: local, community, public sector, nhs
	Changing ways of working	Co-occurrence of: issue, issues, pressure*, response*, pivot*, risk*, challeng*, threat*, suspend*, loss, lost, cancel*, pause*, postpone* with: way* of working, diversif*, practice*
	Funding	Co-occurrence of: issue, issues, pressure*, response*, pivot*, risk*, challeng*, threat*, suspend*, loss, lost, cancel*, pause*, postpone* with: funding, income, funds
	Project cancellations and suspensions	Co-occurrence of: issue, issues, pressure*, response*, pivot*, risk*, challeng*, threat*, suspend*, loss, lost, cancel*, pause*, postpone* with: project*, suspension*
<b>References to government priorities</b>	Industrial & Innovation strategy	innovation strategy, industrial strategy, ideas, people, place, 0.024, grand challenge*, net zero, supporting SME business performance, supporting SME performance, resilience, growth, tackling local issues, developing skills and talent, innovation hub, tackling UK challenges, science superpower, offshore wind, energy reduction, unicorn*, innovation ecosystem*, accelerator*, ageing society, clean

		growth, future of mobility, unleashing business, institutions and places, institutions & places, missions and technologies, missions & technologies
	Levelling up	levelling up, lu, regional inequality, regional disparity, regeneration, regional development, levelling-up, regional economic disparat*
	Research and Development Roadmap	research and development roadmap, R&D roadmap, R& D roadmap, D roadmap
	Build Back Better	Co-occurrence of: build back better, bbb with: skills, innovation, levelling up, net zero, levelling-up, local industrial strategy, lep
<i>Innovation Strategy technology areas</i>	<i>Advanced materials and manufacturing</i>	innovation strategy, industrial strategy, ideas, people, place, 0.024, grand challenge*, advanced material*, metamaterial*, meta material*, self-healing material*, animate material*, composite structure*, corrosion resistance
	<i>AI, digital and advanced computing</i>	artificial intelligence, ai, augmented reality, ar, virtual reality, vr, cyber security, high performance computing, hp
	<i>Bioinformatics and genomics</i>	bioinformatic*, bio informatic*, genomic*
	<i>Engineering biology</i>	engineering biology
	<i>Electronics, photonics and quantum</i>	power electronic*, photonic*, micro electric chip*, microelectric chip*, semi conductor*, semiconductor*, quantum, national quantum technologies programme, nqtp
	<i>Energy and environment technologies</i>	net zero, low carbon energy generation, wind energy, solar energy, bioenergy, bio energy, hydrogen, energy storage and management solution*, modular reactor*, fusion energy
	<i>Robotics and Smart Machines</i>	robotic*, complex interconnected system*, smart machine*, self driving car*, unmanned aerial vehicle*, uav*, robot submarine*, aerial drone*, automated warehouse logistic*, modularity, reconfigurability, autonomy, human machine interface*, soft robotic*
<b>References other UKRI funded KE activity</b>	References to other UKRI funded KE activity	ktp, knowledge transfer partnership*, icure, connecting capability fund, ccf, impact acceleration account, iaa, industrial strategy challenge fund, iscf, innovate uk, iuk, arts and humanities research council, ahrc, biotechnology and biological sciences research council, bbsrc, economic and social research council, esrc, engineering and physical sciences research council, epsrc, medical research council, mrc, natural environment research council, nerc, science and technology facilities council, stfc, research england development fund, red, e3 fund, catapult*, strength in places, sipf, quality related funding, qr funding, covid 19 research funding, global challenges research fund, gcrf, strategic priorities fund, spf, fund for international collaboration , fic, european fund for sustainable development, efsd, uk share prosperity fund
<b>Student involvement in KE activity</b>	Student benefits of knowledge exchange	Co-occurrence of: student* with: student benefit*, skills, enterprise, employability, enterpren*

	Students as agents of knowledge exchange	Co-occurrence of: student* with: student* enterprise*, student* placement*, industrial curriculum development, enterpren*
<b>Drivers for strategic objectives of KE</b>	Importance of place	local enterprise paternship*, lep*, local growth hub, leveraged, spillover*, spill over*, local authorit*, council*, regional, regional plan, town, city, combined authorit*, local government*, local govt, civic authorit*, civic agreement*, strategic economic plan*, sep, regeneration
<b>Collaboration between HEPs</b>	Collaboration between HEPs (HEIF eligible)	Co-occurrence of: collaborat*, collaborative, partnership* with: connecting capability fund, ccf, royal agricultural university, university of winchester, edge hill university, national film and television school, buckinghamshire new university, royal college of music, hartpury university, university of chichester, university of east london, royal northern college of music, royal college of art, liverpool hope university, trinity laban conservatoire of music and dance, university of west london, harper adams university, university of worcester, kingston university, conservatoire for dance and drama, st mary's university, university of gloucestershire, roehampton university, bournemouth university, goldsmiths' college, guildhall school of music & drama, guildhall school of music and drama, school of oriental and african studies, canterbury christ church university, st. george's hospital medical school, university of bedfordshire, university of bradford, london south bank university, university of sunderland, northumbria university, university of northampton, royal academy of dramatic art, london metropolitan university, royal holloway, university of london, de montfort university, university of westminster, university of chester, staffordshire university, birmingham city university, open university, manchester metropolitan university, teesside university, sheffield hallam university, university of derby, liverpool john moores university, brunel university , university of brighton, university of wolverhampton, oxford brookes university, university of lincoln, university of huddersfield, university of hull, university of keele, lamda, university of kent, solent university, aston university, university of bath, university of salford, london school of hygiene and tropical medicine, university of west of england, bristol, city, university of london, middlesex university, royal veterinary college, nottingham trent university, university of plymouth, university of portsmouth, university of greenwich, coventry university, university of central lancashire, leeds beckett university, university of east anglia, university of reading, anglia ruskin university , university of durham, institute of cancer research: royal cancer hospital, institute of cancer research, royal cancer hospital, university of essex, university of sussex, liverpool school of tropical medicine, university of hertfordshire, university of lancaster, university of arts, london, university of exeter, loughborough university, cranfield university, university of surrey, university of york, queen mary university of london, university of leicester, london business school, university of warwick, newcastle university, london school of economics and political science, university of liverpool, imperial college london, king's college london, university of birmingham, university of nottingham, university of sheffield, university of southampton, university of oxford, university college london, university of bristol, university of cambridge, university of leeds, university of manchester, setsquared, oxford-cambridge arc, oxford cambridge arc, cambridge-oxford arc, cambridge oxford arc, eastern arc, gw4, london higher, midlands enterprise, midlands innovation, n8 research partnership, white rose university consotrium, yorkshire universities, anglia ruskin university, bournemouth university , brunel university london, university of northumbria at newcastle, goldsmiths college, imperial college, london school of economics, lse, university of portsmouth , university of the arts, london, university of the arts london, university of the west of england, lshtm, soas, st. george's, university of london, university of newcastle upon tyne, falmouth university, aecc university college, arts university bournemouth, bath spa university, university college birmingham, university college of osteopathy, leeds arts university, leeds trinity university,

		liverpool institute for performing arts, norwich university of the arts, plymouth college of art, ravensbourne university london, rose bruford college of theatre and performance, university for the creative arts, university of bolton, writtle university college, york st john university, birkbeck college, courtauld institute of art, university of london, bishop grosseteste university, royal central school of speech and drama, newman university, royal academy of music, university of cumbria, university of suffolk, leeds conservatoire, university of st mark & st john, plymouth marjon university
	Collaboration between HEPs (HEIF ineligible)	Co-occurrence of: collaborat*, collaborative, partnership* with: the chicken shed theatre trust, icon college of technology and management, london film school, london school of theology, the metanoia institute, nazarene theological college, arden university, spurgeon's college, cwr, sae education, cliff college, university college of estate management, the london institute of banking and finance, rtc education, luther king house educational trust, london bridge business academy, point blank, kaplan open learning, futureworks training, london school of management education, moorlands college, mont rose college of management and sciences, central film school london, nelson college london, st mellitus college trust, amity global education, the queen's foundation for ecumenical theological education, the queen's foundation, court theatre training company, icmp management, backstage academy, bimm, british academy of jewellery, the university of law, pearson college, nch at northeastern, the london school of architecture, new model institute for technology and engineering, the london interdisciplinary school, the academy of contemporary music, university centre peterborough, kaplan international colleges
	Collaboration with HEPs from Northern Ireland	queen's university belfast, qub, ulster university, uu, connecting capabilities in advanced therapies
	Collaboration with HEPs from Scotland	university of st andrews, university of glasgow, university of aberdeen, university of edinburgh, university of strathclyde, heriot-watt university, university of dundee, university of stirling, edinburgh napier university, robert gordon university, glasgow caledonian university, university of abertay dundee, queen margaret university, university of the west of scotland, university of the highlands and islands, connecting capabilities in advanced therapies, uk spine, sprint
	Collaboration with HEPs from Wales	cardiff university, university of south wales, swansea university, bangor university, cardiff metropolitan university, university of wales trinity saint david, aberystwyth university, wrexham glyndwr university, connecting capabilities in advanced therapies
<b>Value for money, efficiency, and effectiveness</b>	Engagement of academic staff in improved knowledge exchange	Co-occurrence of: academic staff, academics, improve* with: ke, knowledge exchange
	Equality, diversity and inclusion	edi, bame, gender, female, male, protected characteristic*, equality, diversity, inclusion
	KE policy improvements e.g., IP policies	Co-occurrence o: policy, policies, improve*, better with: spin-out*, spinout*, ip, intellectual property, equity, founder*, patent*, knowledge exchange, ke
	Innovation in KE	Co-occurrence of: novel, new, innovative with: idea*, solution*, compan*, business*, product*, service*, approach*, research*, technique*, technolog*

	HEIF contributions to improved VfM, effectiveness, and efficiency	Co-occurrence of improve*, support*, heif with: effective*, efficien*, value for money, vfm
<b>Other policy areas</b>	KE Concordat	ke concordat, knowledge exchange concordat, kec
	Knowledge Exchange Framework	knowledge exchange framework, kef, kef cluster

## Appendix B Average wordcounts per document type

The tables below report the average wordcount per type of accountability document broken down by KEF cluster and NUTS1 regions of England respectively.

*Table 6 Average word count per type of document, by KEF cluster*

KEF cluster	Accountability Statements	Accountability Statement Case Studies	Covid Statements	Interim Accountability Statements
ARTS	21,186	4,570	4,553	4,521
E	23,905	5,709	5,422	5,070
J	20,754	4,443	3,958	3,607
M	18,045	4,031	2,941	3,460
STEM	25,673	6,006	4,186	5,363
V	24,903	6,304	6,001	4,468
X	28,869	6,119	6,756	5,100

*Table 7 Average word count per type of document, by NUTS1 region*

Region	Accountability Statements	Accountability Statement Case Studies	Covid Statements	Interim Accountability Statements
East Midlands	22,341	6,305	5,740	3,356
East of England	30,052	5,921	7,579	5,589
Greater London	24,202	4,948	4,894	5,106
North East England	19,768	6,717	4,266	3,573
North West England	23,572	5,505	6,680	4,689
South East England	24,936	4,827	3,940	4,428
South West England	22,164	5,763	4,730	4,633
West Midlands	23,382	5,127	4,913	3,933
Yorkshire and the Humber	22,836	6,413	5,529	4,801

## Appendix C Spot checks and tagged extracts

As part of internal validation, random spot checks were carried out in order to minimise the inclusion of false positives in the results. The latter is mostly applicable to the coding and analysis of narrative data using keywords. A random sample of 5% of each of different types of documents was taken where the scores for each of the themes under investigation were inspected manually with a focus on the identification of false positives. The conducted spot checks revealed no themes with significant numbers of false positives.

In support of external validation, we present tagged extracts for each of the sub-themes included in the analysis below. All extracts are random and unedited snapshots of how thematic keywords are used in context.

Sub-theme	Extract 1	Extract 2
Opportunities to help SMEs*	As part of the ERDF funded Digital Innovation Fund, we refocused a grant funding call planned for May 2020 into a £1m Covid Recovery Fund. This supported the region's businesses in pivoting and sustaining their businesses through innovation and growth. Our engaged and expert Business Development professionals worked with the businesses in developing their ideas and submitting high quality funding applications.	Strategically, the University implemented a research bounce back strategy that covers Knowledge Exchange as part of our activity, monthly monitoring has allowed Essex to identify areas of development and take quick action. A series of business resilience seminars were delivered early in April to support the business community and understand the funding landscape in relation to addressing Covid-19.
Emerging pressures in HEPs and partners	We are acutely aware of the immediate pressures faced by both established creative enterprises and professional artists, and by new graduates entering the creative industries at this time, including our own alumni.	To this end, we have established the Kingston Innovation Network (KIN) in partnership with RBK and the KTN. KIN provides a platform to share key funding opportunities and to discuss issues facing companies during the pandemic, supported by a programme of events and a dedicated LinkedIn group.
Collaborations with partners	This includes realising the impact of research beyond the institution, generating income from discoveries and inputting into public policy and media discussions on areas of expertise.	Our support for Enterprise Solutions as the primary mechanism for external engagement has continued through 2020-21, with a notable investment in fostering new R&D collaborations – the R&D Solutions Fund – which was established to meet the demand for small pump priming investments to seed new collaborations between researchers and businesses, in particular at a time when investing in R&D is proving challenging for small companies.
Project cancellation and suspensions	A strategic Impact Award was made in 2020 for a project on the impact of aircraft noise on sleep, co-funded with Heathrow Airport. Though currently suspended due to Covid, HEIF funding is allocated pending the project re-start.	Two laboratory-based life sciences projects to validate the diagnostic assay and an oral drug formulation which were suspended due to Covid are now planned to resume with HEIF support.
Changing ways of working	[Name redacted] (Psychology) is delivering the second phase of his rapid-response research into mental health among frontline NHS staff during the pandemic. Working with [redacted] NHS Trust, [they] will follow up with participants to understand the second pandemic wave	The pandemic shock is significant and it will accelerate some changes, including working behaviours and practices and increasing demand in the digital economy.

	impacts and develop guidance and best practice recommendations.	
Loss of income/funding	unfortunately, this has led to significant loss of income generated from the facility in terms of office and space rental (the main source of income), which has placed even greater importance on the HEIF funding to enable us to maintain support to early-stage ventures.	the nature of conservatoire knowledge exchange, with its participant and audience-based focus, means it is likely to face a disproportionate loss of third-stream income in comparison to larger HEIs with broader KE profiles and income streams.
Other opportunities arising from the pandemic	Covid has not altered our fundamental mission or strategy for knowledge exchange, our target groups and objectives, or the kinds of activity funded through HEIF. It has prompted adaptations to delivery modes to accommodate remote working, some of which have had positive impacts and may be incorporated into our future practice. For example, the pandemic has led to rapid advance in our understanding and use of online and digital tools for artist development and other CPD provision, and for community and audience engagement.	For the remaining part of the academic year 2019/2020 the majority of planned business and KE events were cancelled. This was inevitable as the world dealt with the immediate crisis. This had an effect on our business pipeline for KE. This academic year the demand for events both collaborative KE and business focused has dramatically increased as the practicalities and benefits of delivering large conferences and workshops online are being realised. We suspect this change to virtual events as a delivery model will remain as it promotes inclusivity and provides a clear method of disseminating and collaborating research and knowledge exchange.
Industrial and Innovation Strategies, and related concepts	This programme will support the Ideas pillar by assisting commercialisation of "moonshot" projects and will align with the grand challenges of artificial intelligence and data, clean growth and future of mobility plus transition to net zero.	Our Civic University approach to developing ideas with people for mutual benefit in our locality means that, for instance, all of the P&CE Hub activity is firmly in the spirit of the Industrial Strategy
Innovation Strategy technology areas: Advanced materials and manufacturing	Manufacturing - we will support manufacturers in the adoption of advanced manufacturing techniques, technologies and innovations, development of prototypes and improving their productivity outputs through automation.	NA
AI, Digital and Advanced Computing	This programme will also support the Ideas pillar by assisting commercialisation of projects and aligning with the grand challenges of artificial intelligence and data, clean growth and future of mobility plus transition to net zero.	Capitalise on the full potential of flagship opportunities including: Eden North; our cross-disciplinary Research Institutes and Centres including our Centre for Global Eco-Innovation's £14M Eco-I Northwest programme supporting the region's SMEs to develop new clean growth technologies and services for global markets; Security Lancaster and our recent accreditation by the National Cyber Security Centre as a nationally-leading centre of excellence in both cyber research and education; our work with the Chartered Association of Business Schools on the Help to Grow programme.
Bioinformatics and Genomics	Proof-of-concept (PoC) studies involving analysis of large data sets (e.g. genomic sequencing data) by machine learning algorithms, leading to new analytical models.	Building on the KE activities described under "high quality relevant research" we are strengthening our translational research base in emerging areas of innovation including big data, bioinformatics and machine learning and other digital innovation. Translation of research is supported by dedicated training on the pathway to impact, with external experts providing insight across different modalities, as

		well as initial funding to enable the progression from idea to innovation.
Engineering Biology	NA	NA
Electronics, Photonics and Quantum	Since opening our world-class university cleanroom Superfab 18 months ago, we have driven new research through the UK Centre for Superconducting and Hybrid Quantum Systems and created new opportunities for facilitates access and collaboration generating £175k.	Using an internal competitive process, HEIF funding will be awarded to selected projects in the field of Photonics and Instrumentation. This may include professional KE support, technical support, events, consultancy services, co-fund staff placements.
Energy and Environment Technologies	Assess and progress as appropriate, opportunities in fields that cross disciplines and sectors, private and public organisations, including net zero and clean growth, cyber security and resilient digitalisation, health and care, innovation leadership and talent development and regional retention.	Supports the Build Back Better Innovation and Net Zero objectives through helping the development of new ideas, products and processes. In the Agri-Tech sector most start-ups are developing business ideas that contribute to achieving Net Zero
Robotics and Smart Machines	design for digital economy - it is predicted that 24.3% of global economy will be digital by 2025 ("Digital Spillover", Oxford Economics, 2017) and the world already witnessed the acceleration of digital disruption during the recent covid-19 pandemic. The design will play an ever-increasing role in humanising technology and facilitating new value creation. The RCA's research centres in intelligent mobility design (IMDC), computer science (CSRC) and Robotics Laboratory generate new insights and applications	In 20/21, HEIF supported several KE activities within the AAIP, including the development and delivery of bespoke CPD for NHS Digital and supporting staff to develop a robotic demonstrator to support knowledge exchange. We have worked with industry, academic and regulatory partners, and the activities of AAIP are now a cornerstone of the University's new Institute for Safe Autonomy.
Levelling-up	Achieved through strategic relationships with key regional and national partners supporting economic development and growth, regional development and the levelling up agenda.	Our strategy is closely aligned with the "UK Research and Development Roadmap." Our pervasive approach addresses the interactions between research, innovation and deployment, and regional sector alignment addresses the placed-based and levelling up agendas.
Research and Development Roadmap	Engagement and Partnerships with National Institutes - Facilitating KE through academic to academic and academic to industry collaborations involving UK National Institutes (including Henry Royce, Alan Turing Institute, Centre for Innovation and Excellence in Livestock, Rosalind Franklin and the Met Office). Activity includes KE development support, facilitating co-working with partners and ensuring effective representation to enhance Leeds engagement and contributions to UK R&D Roadmap and competitiveness.	This KEES will support the Institutional response to the KEF, KEC, HEIF Review, R+D Roadmap and post REF priorities. It is much broader in scope than the current HEIF strategy and RIS operational plan and is built on engagement with a much wider range of stakeholders and contributors. Some adjustments to team structures and remits are therefore being made in anticipation of full implementation from the 2021/22 reporting period.
Build Back Better*	Our cross-institution KE programmes support rural entrepreneurship acceleration, enabling wider and deeper stakeholder partnerships to deliver the national Build Back Better Agenda and place based on Gloucestershire's Local Enterprise Partnership (GFirst LEP) priorities.	Contributes to the Innovation pillar of Build Back Better (BBB) and the Driving Up Innovation and Productivity objective of the UK Research and Development Roadmap (UKRDR) by disseminating thought leadership to support innovation in the business world, the development of an effective infrastructure to underpin the UK economy, and the effective

		capture of the economic and social benefits of this work
References to other UKRI funded KE activity	These teams support the BBB "Skills" pillar by enabling CPD / in-work training projects, and through the people development inherent in most innovation projects, e.g., KTP.	We will invest in KE alongside research funding, ensuring KE activities begin early to maximise opportunity for commercial exploitation and knowledge dissemination throughout the research pathway to impact. We have successful approaches to using HEIF to leverage investment from industry, donors, and other innovation funding including our two Connecting Capability Funding programmes, four Impact Acceleration Accounts and licence income, and will continue these approaches to extend the public reach of, culture of investment in, and scale and impact of innovation activities.
Student benefits of knowledge exchange*	HEIF policies and priorities: student benefits - enhanced employability, student participation in KE, make place-based contributions to economic recovery.	Student enterprise is managed by the newly formed RIEPE. HEIF funding was used to enable partnerships with institutions such as Social Enterprise UK, the county's voice regarding non-profit maximising commercial initiatives. Following from lessons learned over previous years and feedback from students who chose not to participate in business skills sessions. A social-entrepreneurial ethos has become the focus of our student enterprise activities this year.
Students as 'agents' of knowledge exchange*	Responding to Covid by identifying opportunities for young people through degree apprenticeships and further opportunities for student placement and knowledge exchange. (45 SME based apprenticeships, 30 placements per year).	KE brings professional practice and insights into our teaching and offers students the opportunity to engage with real problems to enhance their experience, knowledge and skills. KE links to our employability strategy, as close business relationships and student enterprise deliver enhanced graduate outcomes.
Importance of place	All of the HEIF funded teams will support UEA's role as a Civic University and participate in the New Anglia LEP committees and numerous regional business Boards as appropriate.	De Montfort University Leicester (DMU) is committed to producing knowledge exchange which delivers public benefits. The Strategic Plan for 2018-23 outlines the university's commitment to local growth and regeneration, to creating new knowledge, and to supporting transformation initiatives in line with the Government's R&D Roadmap, and regional challenges identified by partners such as the Leicester and Leicestershire Economic Partnership (LLEP).
Collaboration between (English) HEPs*	Partnerships being formed include Imperial College, Creative Enterprise Zone (forging collaborations between industry and HE particularly within the film and screen sector), MetFilm School and Brunel University.	We will co-create Civic University Agreements and strategic collaborations with important regional organisations including Local authorities, NHS Trusts, FE Colleges, LEPs etc to strengthen the region's R&D and higher-level skills capacity working closely with GW4 and SETsquared and other Peninsula University partners.
Collaboration with HEPs from Northern Ireland	NA	NA
Collaboration with HEPs from Scotland	SPL will foster a dynamic innovation ecosystem via our portfolio of nationally important innovation programmes and infrastructure, including:	We also undertake an annual benchmarking exercise using a subset of our KPIs to compare UCL progress against our peers (Oxford, Cambridge, Imperial, Kings, Edinburgh and

	<ul style="list-style-type: none"> <li>•Space Research Innovation Network &amp; Technology (SPRINT): Research England funded CCF programme led by Leicester which delivers innovation support to 72 Space / Space Enabled SMEs.</li> </ul>	Manchester universities) with national benchmarking across the following areas:
Collaboration with HEPs from Wales	NA	NA
Organisation of KE staffing or administration arrangements	Project activities were facilitated by means of academic staff buy-out, salary support for research assistants and funding for dedicated KE staff located within the RVC's Research Office.	Increase the impact of existing and new research and development projects through active promotion of KE by our academic staff, supported by targeted advice and coaching from KE
Equality, diversity and inclusion (EDI)	All Committees work to ensure diversity of representation in their membership, and staff are required to complete equality and diversity training packages on unconscious bias, bullying and harassment and diversity in the workplace. All new policies are required to undergo an Equality Impact Assessment to ensure there is no detrimental impact to anyone with protected characteristics.	Our University culture is based on the values of Equality, Diversity, and Inclusivity (EDI) and we are committed to embedding EDI into our approach to delivering our KE strategy.
KE policy improvements e.g., IP policies	The contextualised analysis of KE/HEIF performance outcomes, including balance of KE activity between funders, grant contribution to KE activity, application submission and success rates; training need gap analysis, career development activity, national and international recognition of staff, products, and diagnostics (including patents); and uptake of research into policy. Publication datasets are monitored to ensure that the evidence base for analysis of outcome activity is available.	Embedding of the newly restructured and expanded IP & Licensing Team into a single operational unit. Increased resource and budgets for marketing and patenting
Efficiency and effectiveness	With investment of time this innovation has the potential to increase efficiency and, therefore, increase our University's agility to respond to external partners.	HEIF is supporting a joint PhD studentship, supervised by Julian Drewe and Lucy Brunton (both RVC), on reducing tuberculosis in cattle. The project, entitled 'Field approaches to identifying <i>M. bovis</i> infection in badger populations', aims to evaluate the effectiveness of current tests for TB in badgers, so as to identify better ways of using these tests to increase the accuracy of diagnosis at individual badger and social group level
KE Concordat (KEC)	The role of the KESG is to also have oversight of the development of strategy and policy, monitoring of their implementation, to ensure efficacy and learning for performance enhancement in knowledge exchange as defined in the Knowledge Exchange Concordat, activity across LSTM, as aligned with delivery of the Strategic Plan and the targets therein	Environment: We will improve our knowledge exchange culture and performance by developing and implementing a Knowledge Exchange Concordat. This will raise the profile of knowledge exchange activity, enhance academic engagement and enable us to optimise our performance across a wide range of aspects of knowledge exchange.
Knowledge Exchange framework (KEF)	Development or advising and oversight of strategy and policies required as signatories to the KEC and participants in the Knowledge Exchange Framework (KEF) (including strategies for consultancy, CPD,	Whilst continuing and growing many of the existing KE activities (with a critical focus on the KEF and requirements of the KE Concordat), HEIF funding will be utilised to drive forward KE from 2021-25, and will be combined with direct

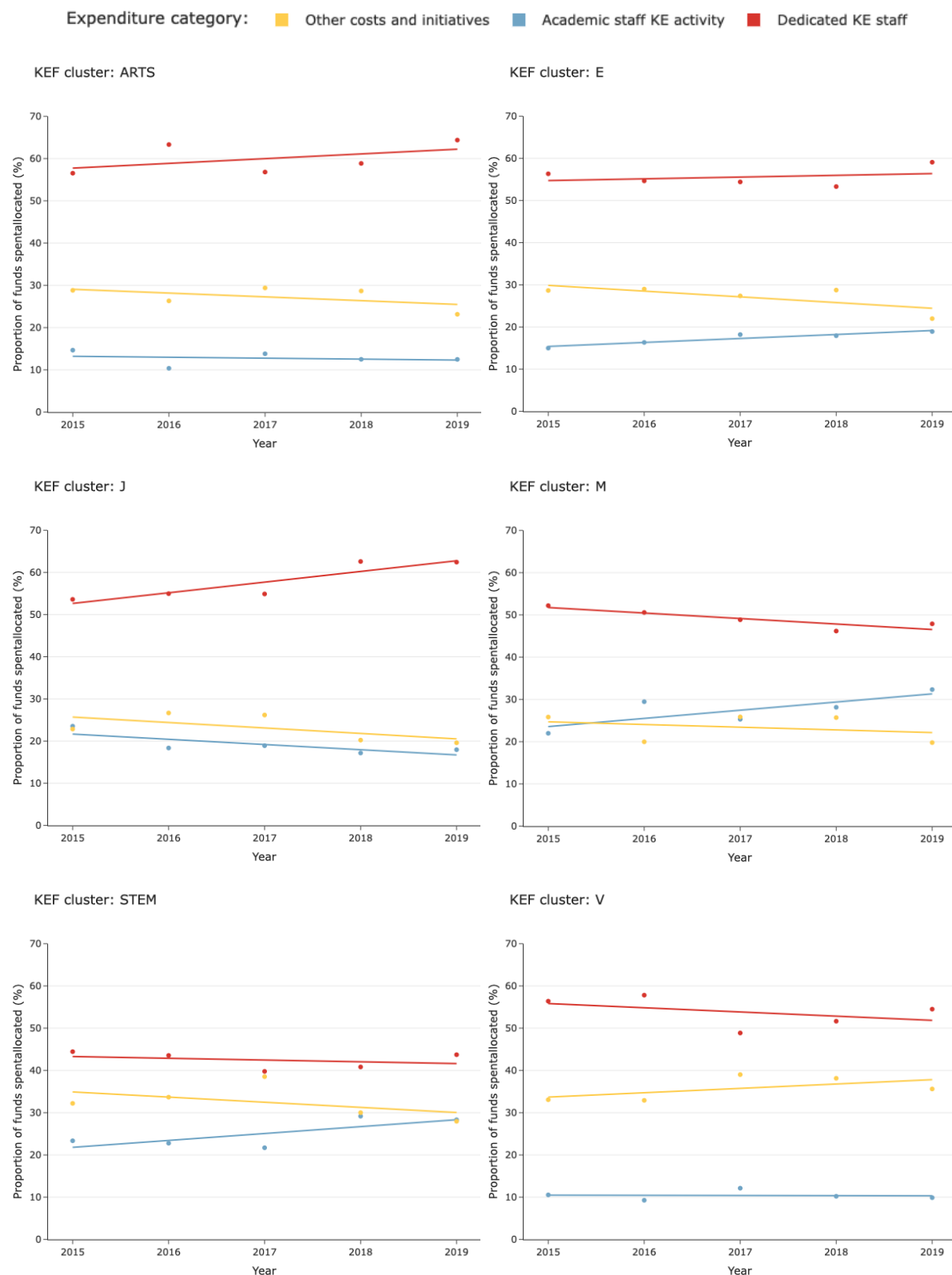
	technology transfer, community, and public engagement), and for proposing this to Management Committee in alignment with the delivery of LSTM's Strategic Plan.	investment from Coventry University, other grant funding, and commercial income to create the required step change in KE performance and impact.
Innovation in KE*	Our relationship with SureScreen Scientifics began in 2014 with a Knowledge Transfer Partnership (KTP). For this project, we joined forces to develop a new ecological surveying technique, which used environmental DNA (eDNA). Our University has an international reputation for using eDNA to monitor and quantify biodiversity in the natural environment. By sharing our research expertise in this area, we helped SureScreen to develop a new service and a new revenue stream. The collaboration also included:	WCRI plays a leading role in the Cyber Quarter - Midlands Centre for Cyber Security . Cyber Quarter's mission is to be a single hub for supporting and accelerating cybersecurity innovation and supporting industry by providing tailored security testing, training and R&D services. It supports the incubation and acceleration of cyber businesses and helps new innovative cyber products and services to be developed and tested.

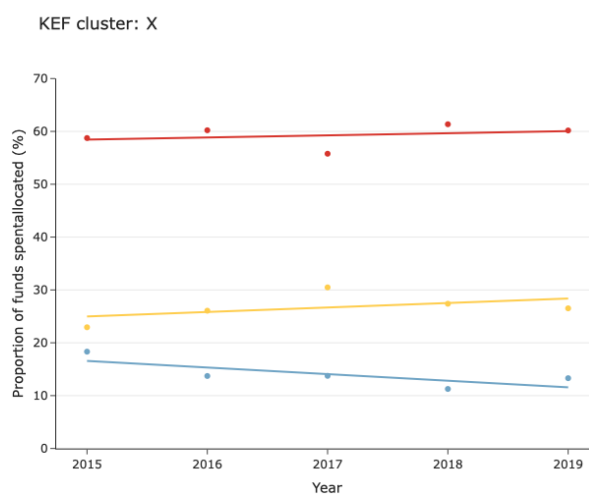
## Appendix D HEIF Reporting questions

Document	Reporting questions
Accountability Statements	<p>Question 1 – Strategic objectives. Summarise the institutional strategic objectives that relate to knowledge exchange and guide your plans for HEIF.</p> <p>Question 2 – Use of HEIF. How do you intend to use your 2021-22 to 24-25 HEIF allocations?</p> <p>Question 3 – Monitoring success. How do you manage your HEIF funding and monitor the success of your activities against the strategic objectives set out in question 1, and in line with delivering Government priorities?</p> <p>Case studies (optional)</p>
Interim Accountability Statements	<p>Question 4</p> <p>How are you using HEIF to support KE activities undertaken in 2020-21?</p> <p>Please take into account your previously approved 2016-21 KE strategies along with the new government priorities as set out in RE-P-2020-03 HEIF policies and priorities 2020-21 to 2024-25.</p>
Covid Statements	<p>How has Covid-19 impacted your use of HEIF, in both 2019-20 and 2020-21?</p> <p>Are there any exceptional uses of HEIF and variations from strategy – briefly describe these.</p> <p>What pressures i.e. impacts on KE/HEIF delivery for your institution do you anticipate in the long-term – briefly describe these.</p> <p>Is there anything additional you would like us to know about your response to Covid-19?</p>

## Appendix E Additional breakdowns of expenditure and planned expenditure

### E.1 HEIF expenditure by expenditure type for each KEF cluster (trending lines)





Source: analysis based on provided HEIF returns

## E.2 HEIF expenditure by infrastructure / activity categories for each KEF cluster (trending lines)

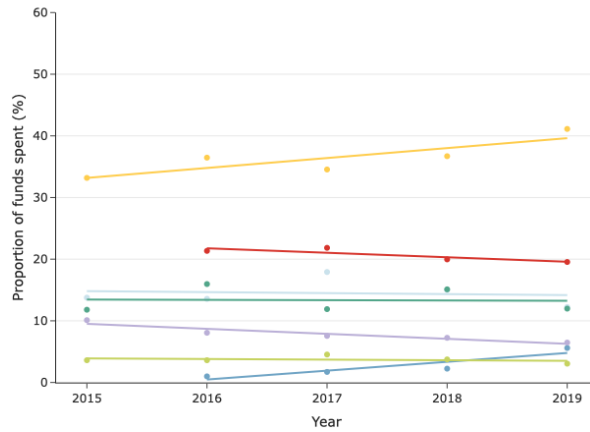
Infrastructure/Activity: ■ Facilitating the research and exploitation process ■ Commercialisation (technology transfer)

■ Skills and human capital development ■ Knowledge sharing and diffusion

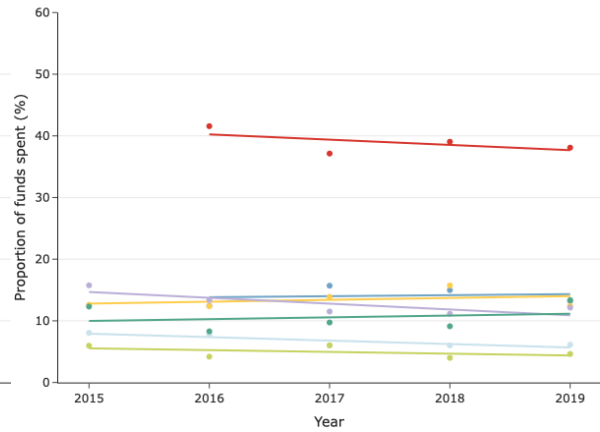
■ Supporting the community/public engagement ■ Enterprise and entrepreneurship

■ Exploiting the HEI's physical assets

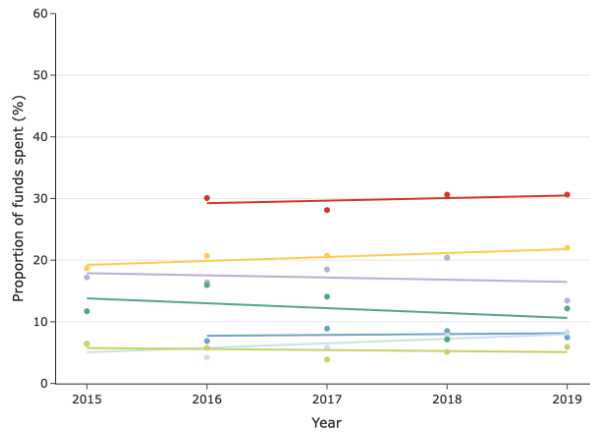
KEF cluster: ARTS



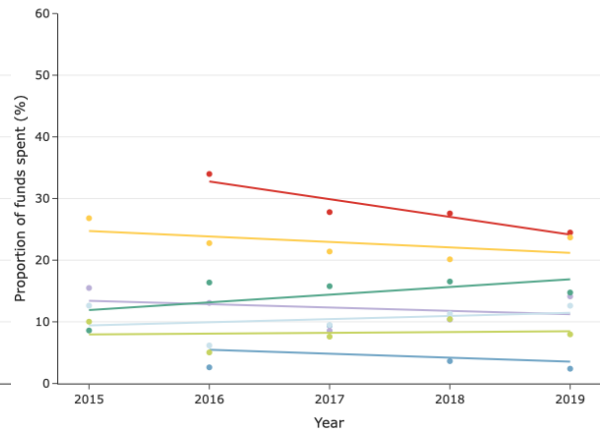
KEF cluster: E



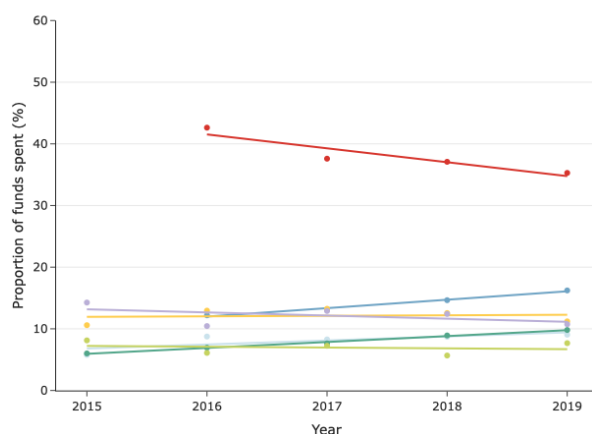
KEF cluster: J



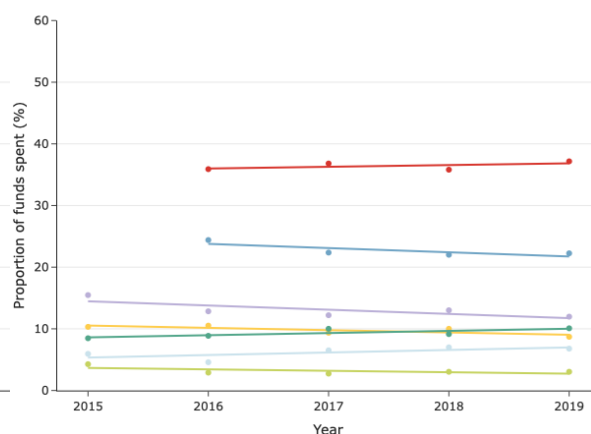
KEF cluster: M



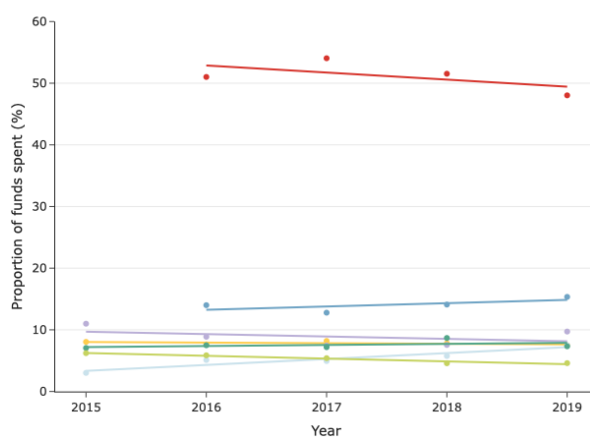
KEF cluster: STEM



KEF cluster: V

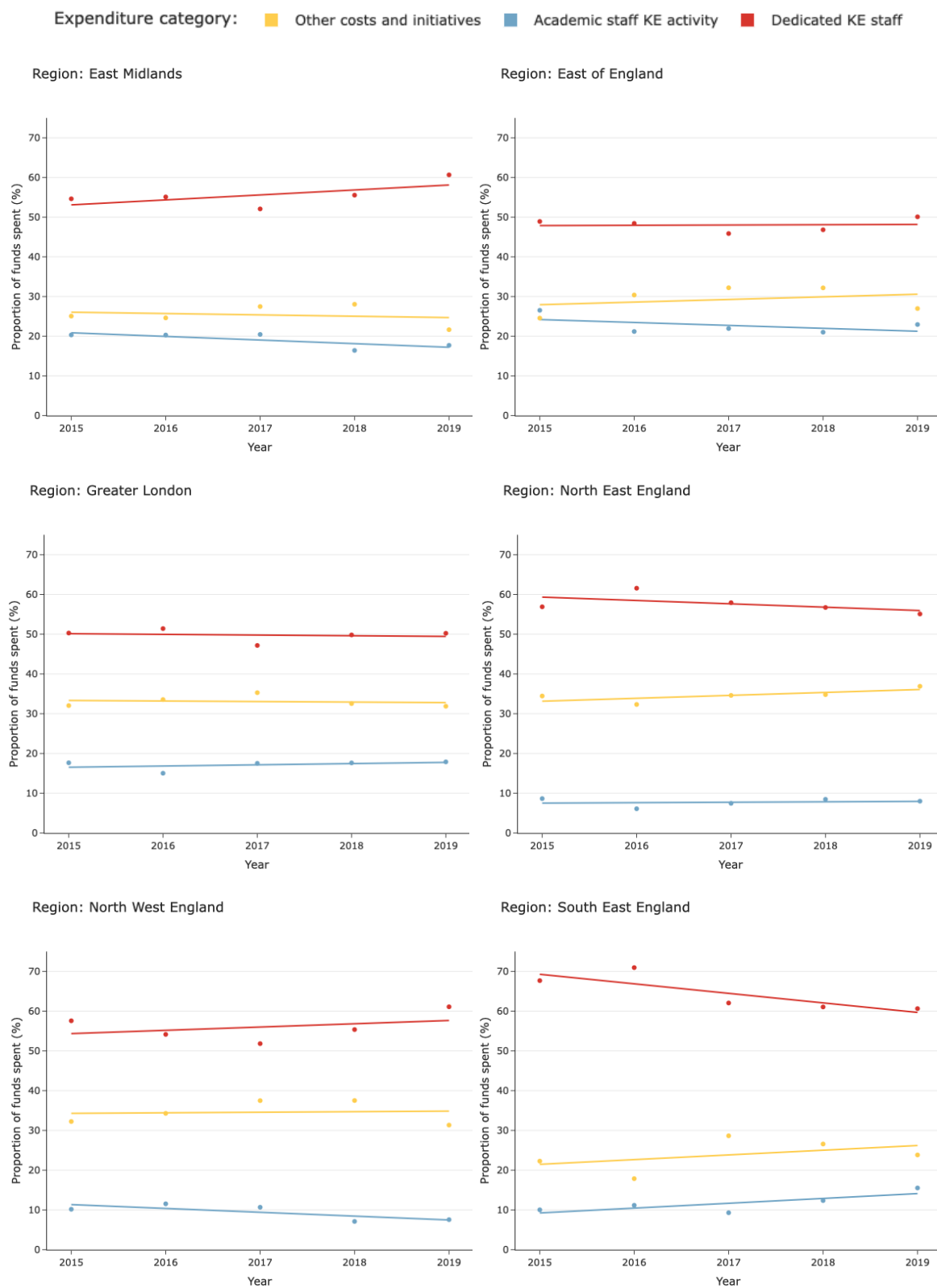


KEF cluster: X

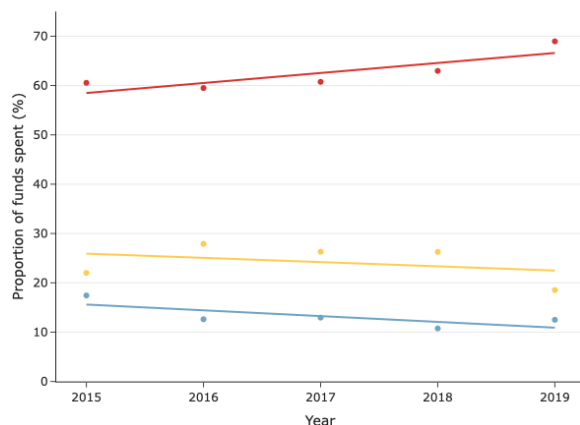


\* "Commercialisation" and "Facilitating the research and exploitation process" displayed from 2016 onwards as these were combined in one category in 2015  
Source: analysis based on provided HEIF returns

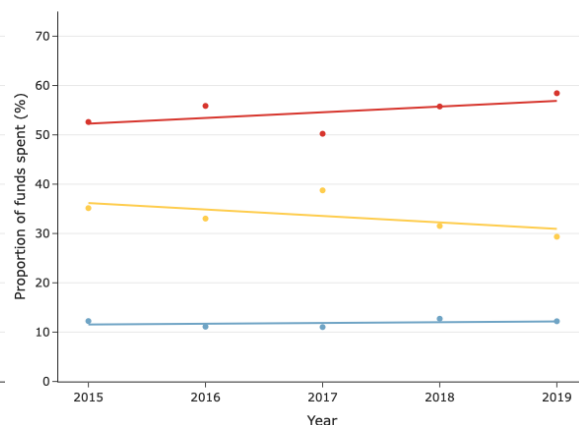
### E.3 HEIF expenditure by expenditure type for each region (trending lines)



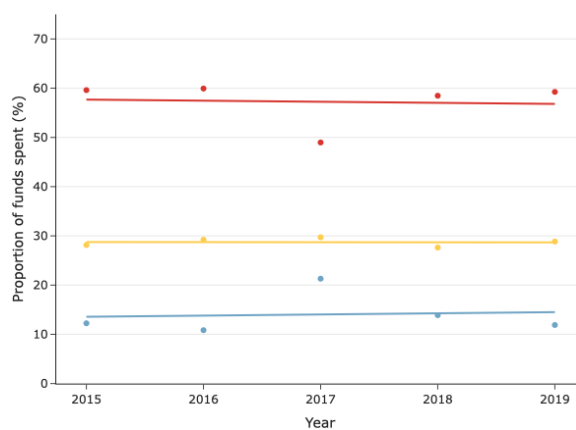
Region: South West England



Region: West Midlands



Region: Yorkshire and the Humber



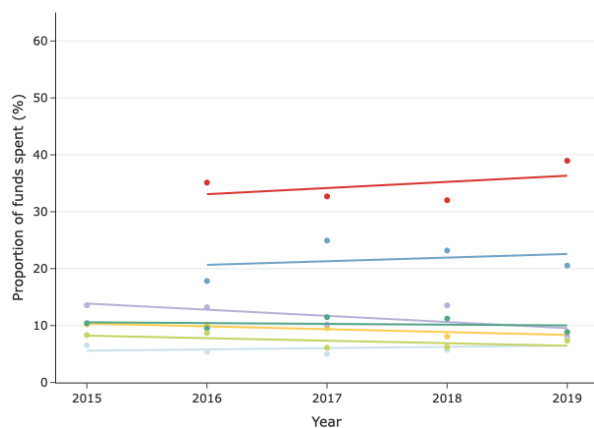
Source: analysis based on provided HEIF returns

## E.4 HEIF expenditure by infrastructure / activity categories for each region (trending lines)

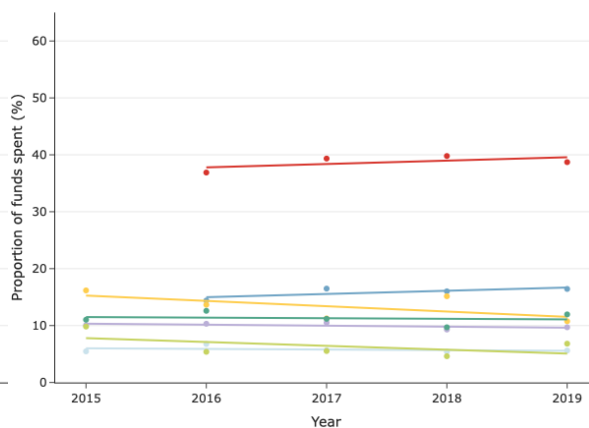
Infrastructure/Activity:

- Facilitating the research and exploitation process
- Skills and human capital development
- Supporting the community/public engagement
- Exploiting the HEI's physical assets
- Commercialisation (technology transfer)
- Knowledge sharing and diffusion
- Enterprise and entrepreneurship

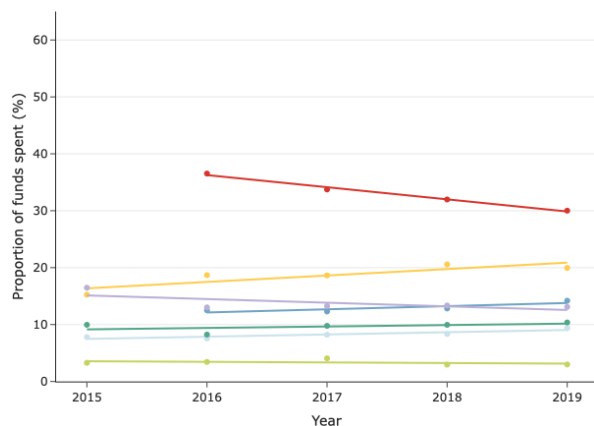
Region: East Midlands



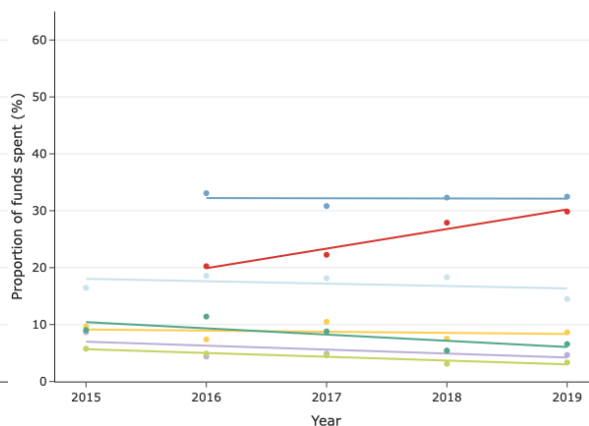
Region: East of England



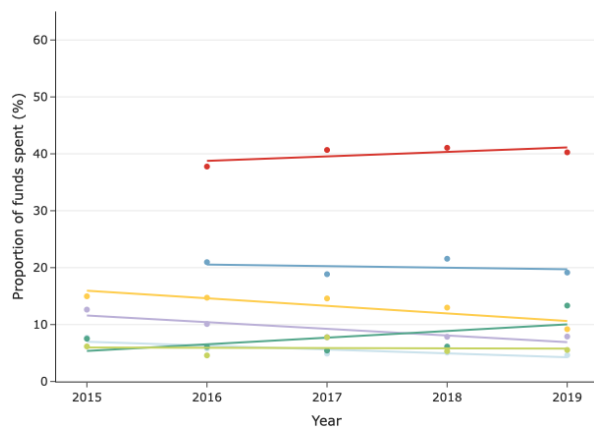
Region: Greater London



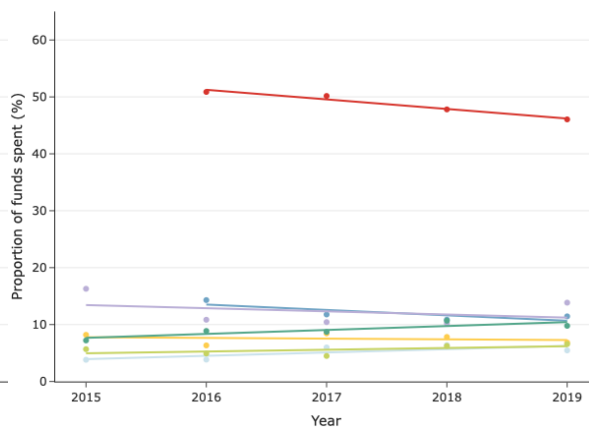
Region: North East England



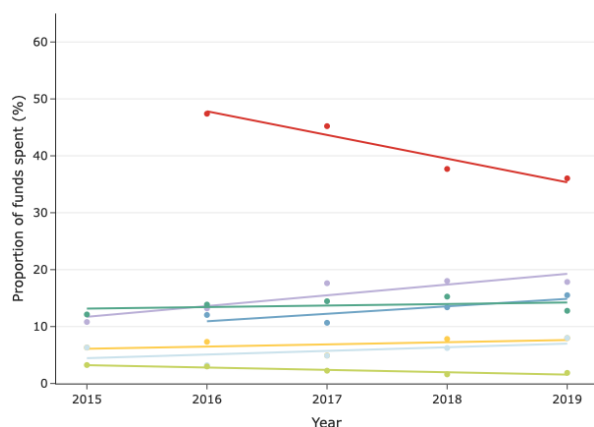
Region: North West England



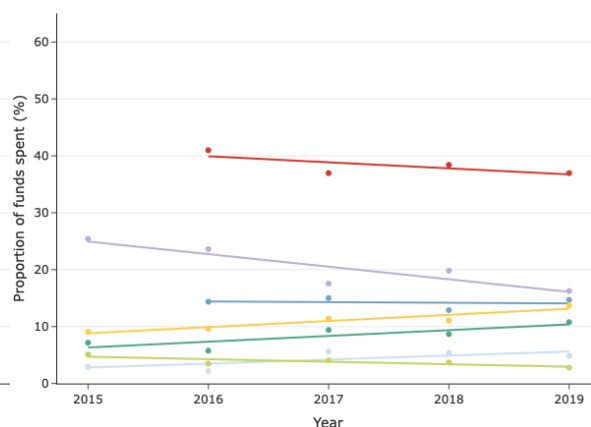
Region: South East England



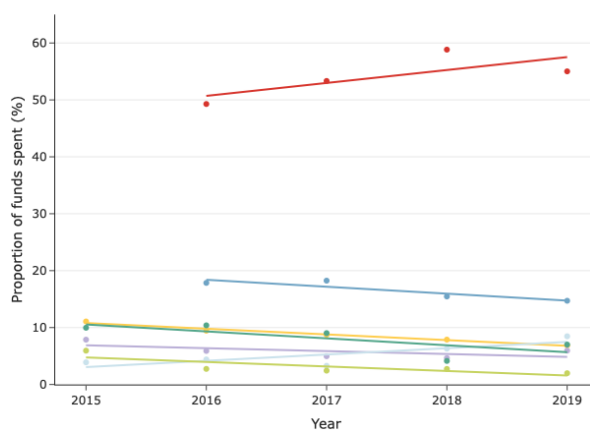
Region: South West England



Region: West Midlands



Region: Yorkshire and the Humber



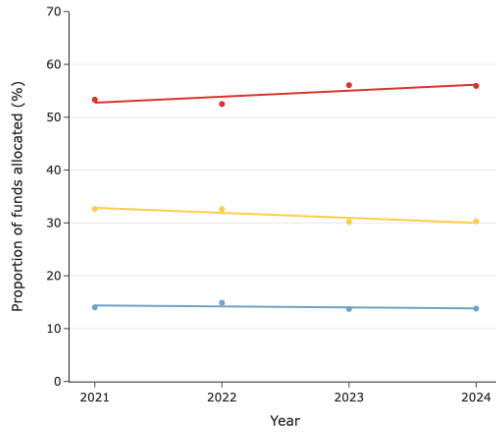
\* "Commercialisation" and "Facilitating the research and exploitation process" displayed from 2016 onwards as these were combined in one category in 2015

Source: analysis based on provided HEIF returns

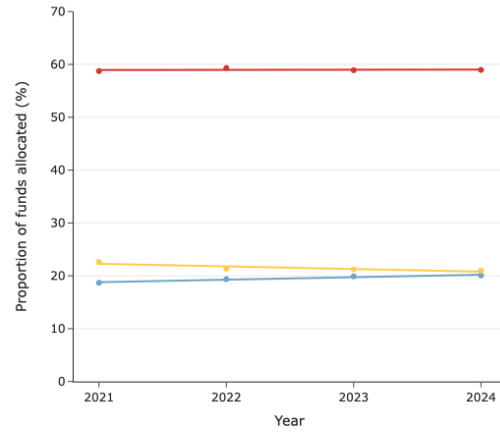
## E.5 Planned HEIF expenditure by expenditure type for each KEF cluster (trending lines)

Expenditure category: ■ Other costs and initiatives ■ Academic staff KE activity ■ Dedicated KE staff

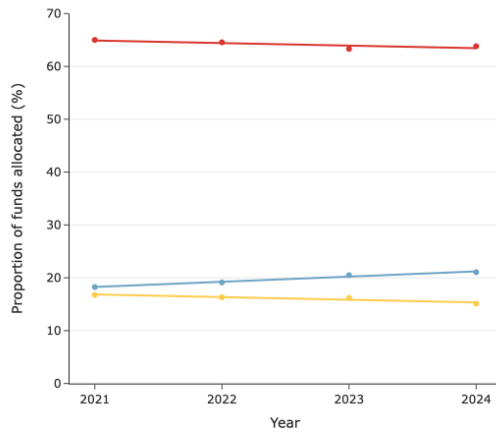
KEF cluster: ARTS



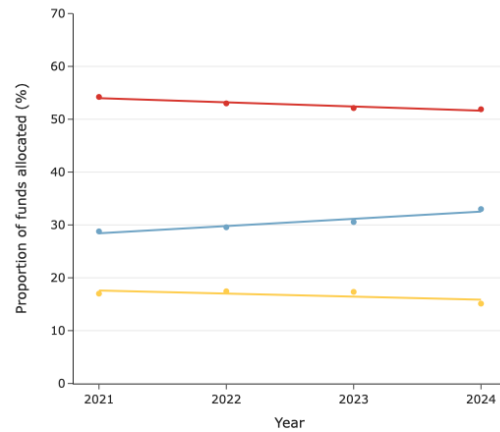
KEF cluster: E



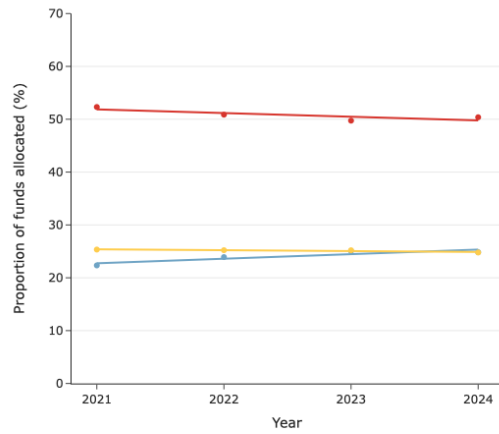
KEF cluster: J



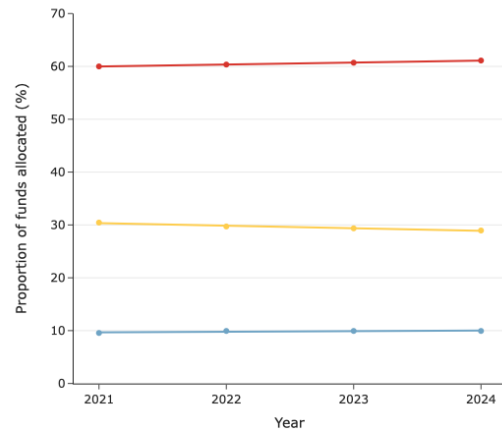
KEF cluster: M



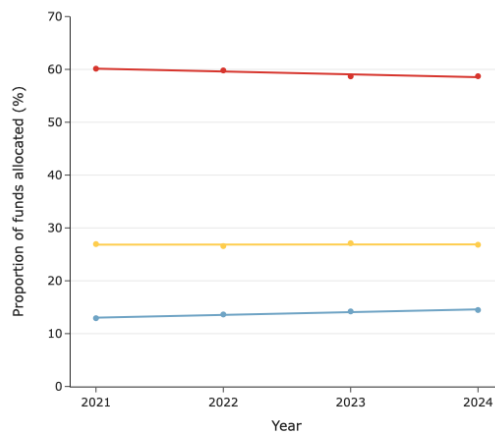
KEF cluster: STEM



KEF cluster: V



KEF cluster: X



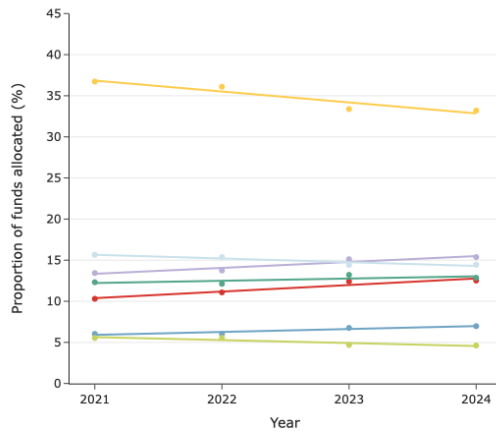
Source: analysis based on provided HEIF returns

## E.6 Planned HEIF expenditure by infrastructure / activity categories for each KEF cluster (trending lines)

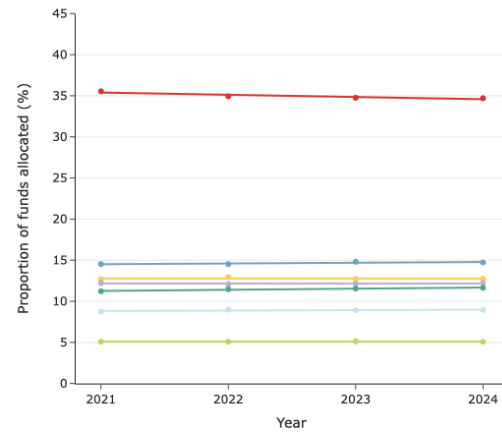
Infrastructure/Activity:

- Facilitating the research and exploitation process
- Skills and human capital development
- Supporting the community/public engagement
- Exploiting the HEI's physical assets
- Commercialisation (technology transfer)
- Knowledge sharing and diffusion
- Enterprise and entrepreneurship

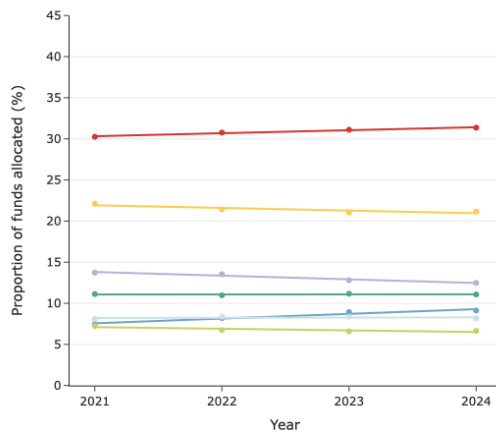
KEF cluster: ARTS



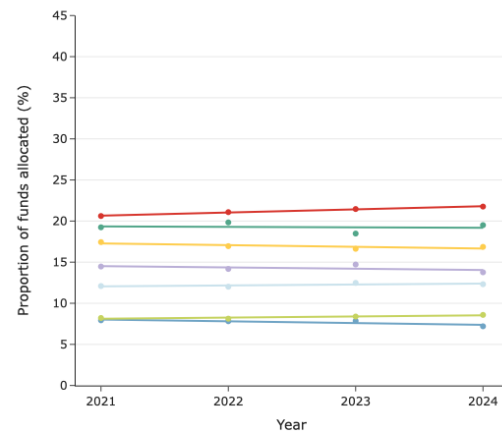
KEF cluster: E



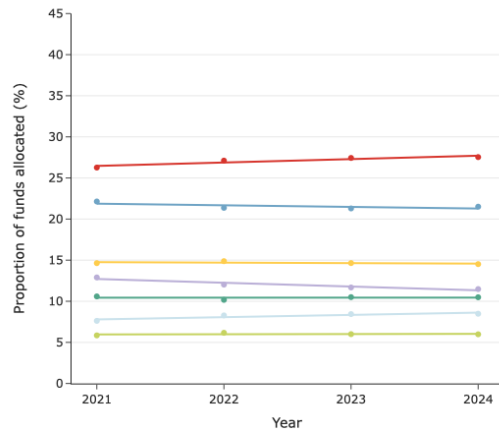
KEF cluster: J



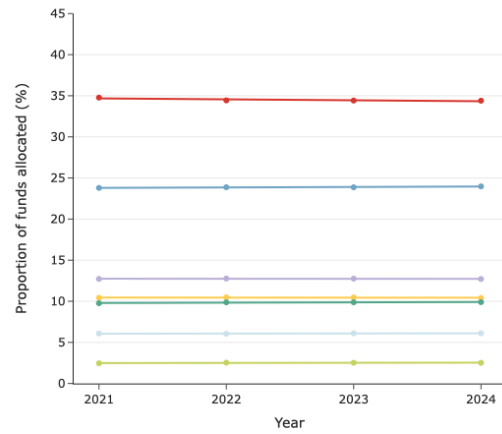
KEF cluster: M



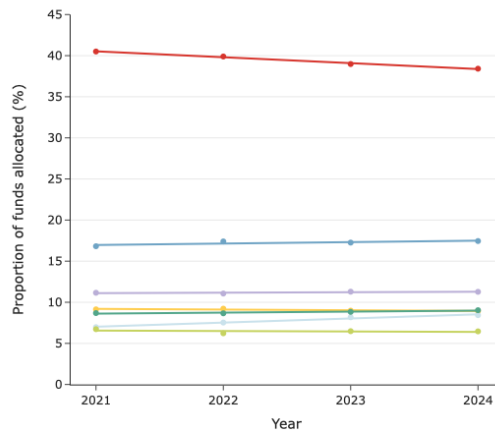
KEF cluster: STEM



KEF cluster: V



KEF cluster: X

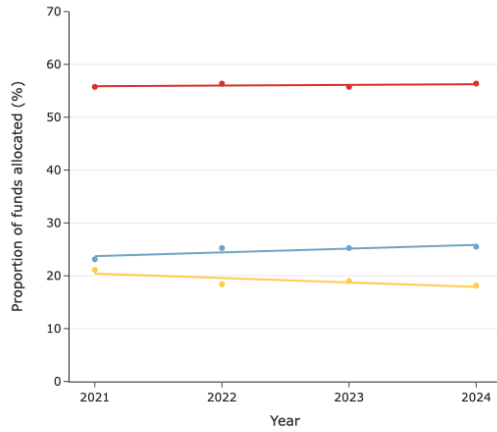


Source: analysis based on provided HEIF returns

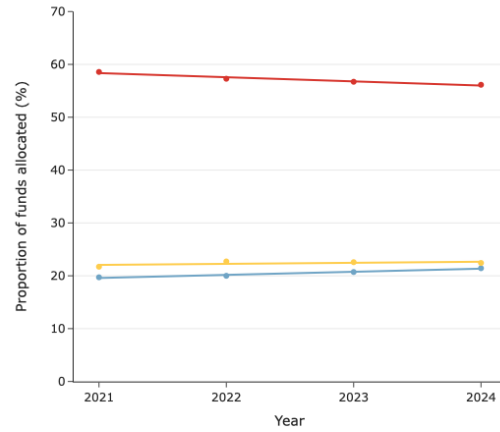
## E.7 Planned HEIF expenditure by expenditure type for each region (trending lines)

Expenditure category: ■ Other costs and initiatives ■ Academic staff KE activity ■ Dedicated KE staff

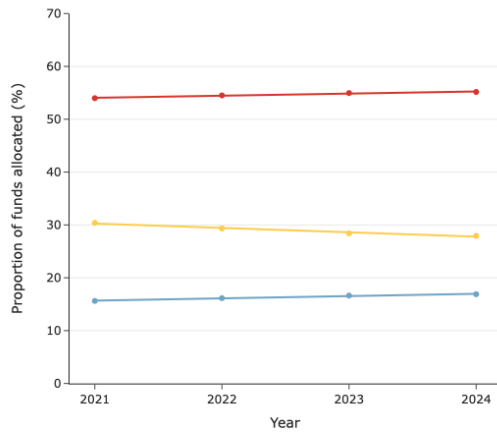
Region: East Midlands



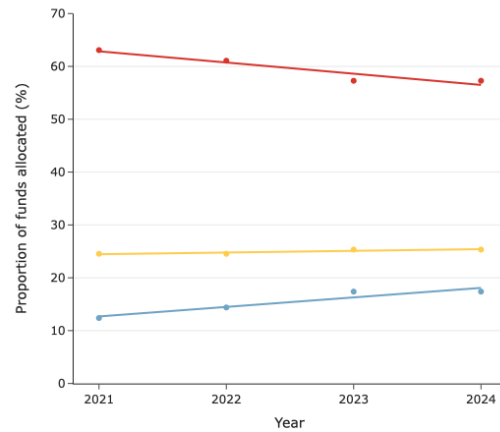
Region: East of England



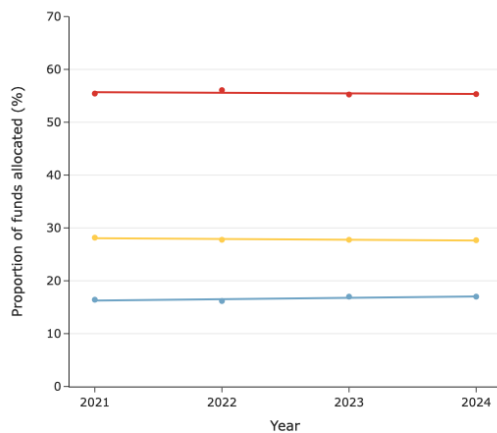
Region: Greater London



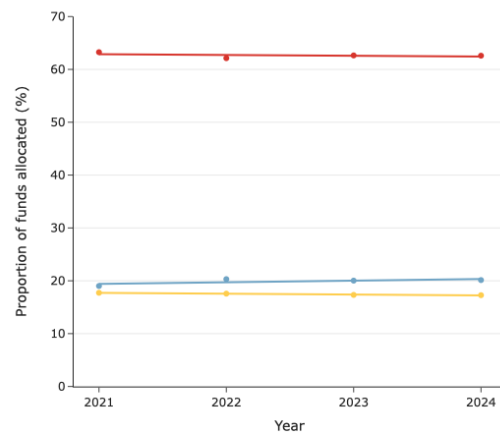
Region: North East England



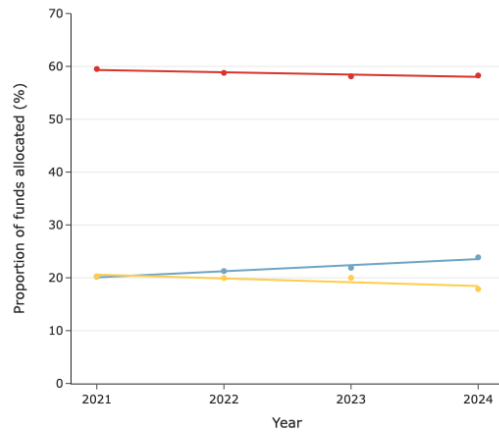
Region: North West England



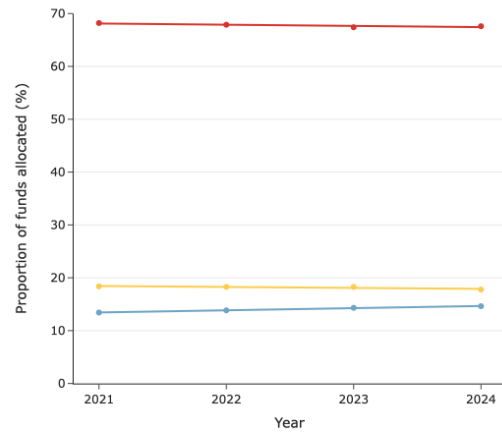
Region: South East England



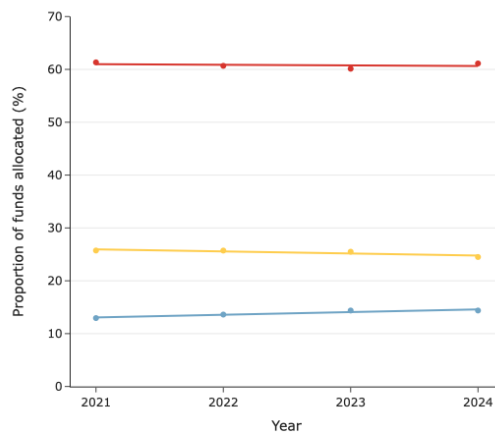
Region: South West England



Region: West Midlands



Region: Yorkshire and the Humber



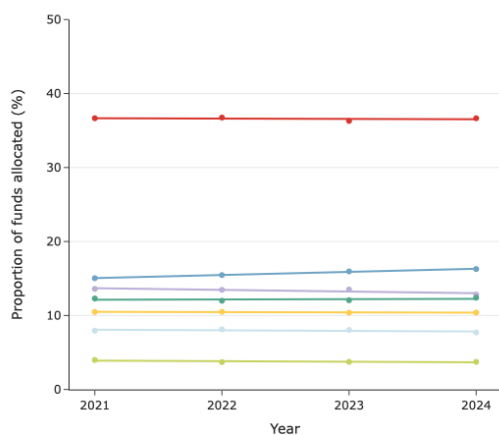
Source: analysis based on provided HEIF returns

## E.8 Planned HEIF expenditure by infrastructure / activity categories for each region (trending lines)

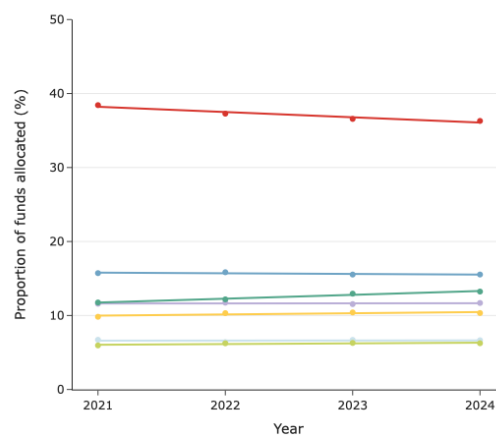
Infrastructure/Activity:

- Facilitating the research and exploitation process
- Skills and human capital development
- Supporting the community/public engagement
- Exploiting the HEI's physical assets
- Commercialisation (technology transfer)
- Knowledge sharing and diffusion
- Enterprise and entrepreneurship

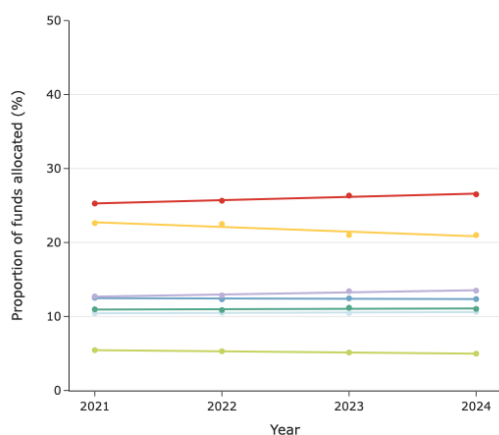
Region: East Midlands



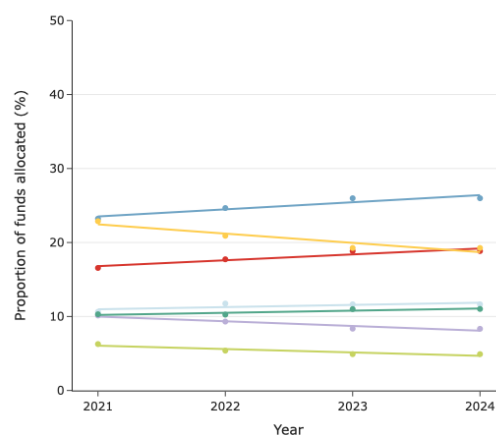
Region: East of England



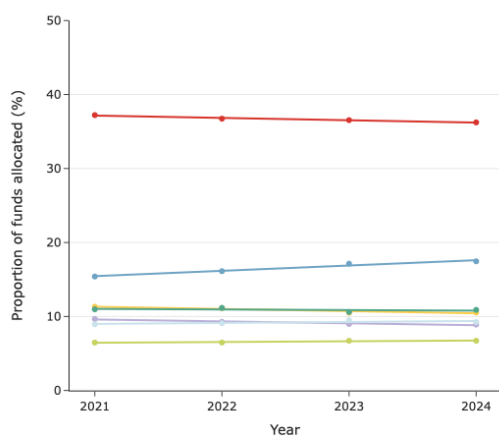
Region: Greater London



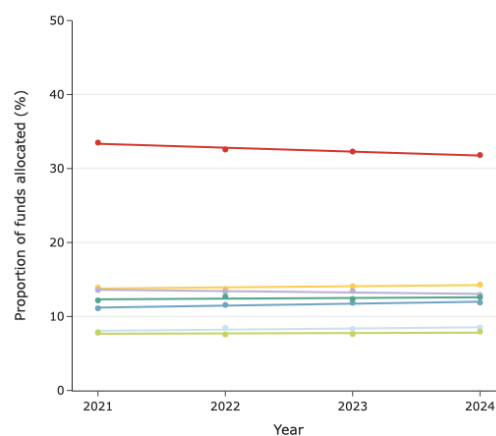
Region: North East England



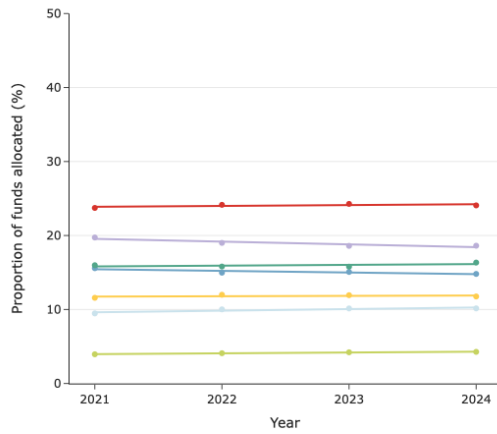
Region: North West England



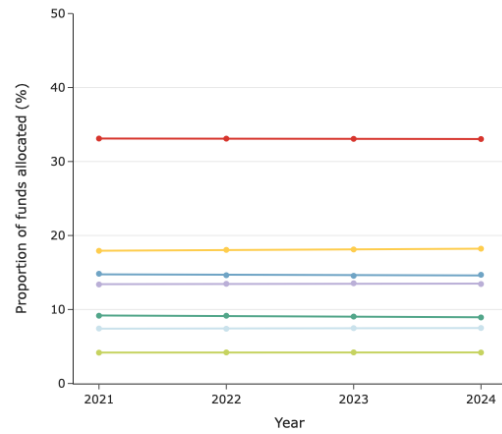
Region: South East England



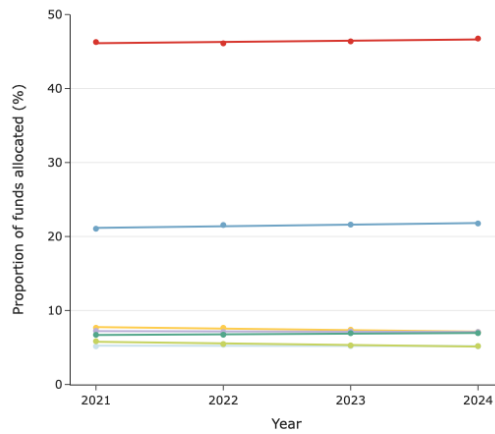
Region: South West England



Region: West Midlands



Region: Yorkshire and the Humber



Source: analysis based on provided HEIF returns

