

# EPSRC Review of Analytical Sciences

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*May 2015*

## Contents

1	Acknowledgements.....	1
2	Summary.....	2
3	Overview of review process.....	2
4	High Level Recommendations.....	6
4.1	Improving perceptions of the importance and value of Analytical Science.....	6
4.2	World class research and training.....	6
4.3	Enabling advances across sectors and disciplines.....	7
4.4	Effective community structure.....	7
5	Outcomes.....	<b>Error! Bookmark not defined.</b>
5.1	Panel Discussion & Recommendations.....	9
5.1.1	Question 1: To determine the health of Analytical Science research in the UK, considering national and international perspectives.....	9
5.1.2	Question 2: To determine how all Analytical science research enables other areas of research and what these areas are.....	11
5.1.3	Question 3: How is Analytical Sciences Research Meeting the User Community Needs?.....	12
5.1.4	Question 4: To determine the strengths of and challenges to Analytical science now and in the near future.....	16
6	Concluding remarks.....	19
7	Appendices.....	20
7.1	Appendix 1: EPSRC Data.....	20
7.2	Appendix 2: Questionnaire Responses.....	21

## 1 ACKNOWLEDGEMENTS

Martin Sweet , Ellie Gilvin and John Hand of EPSRC thank the members of the Panel for their hard work and enthusiasm under the chairmanship of Professor Alison Rodger (University of Warwick). These being Professor Gareth Brenton (University of Swansea), Professor Paul Raithby (University of Bath), Dr Cinzia Casiraghi (The University of Manchester), Mr Alan Handley (Past president, Royal Society of Chemistry, Analytical Division), Professor Ron Heeren (University of Maastricht). In addition, we thank the EPSRC grant holders, other researchers and other stakeholders who completed the questionnaire which was a major data contribution to the panel process.

## 2 PURPOSE, BACKGROUND AND DEFINITIONS

This document presents the results of a review of the state of the UK research area of Analytical Sciences. As defined by EPSRC, this covers:

*“The development of novel techniques, or the novel application of existing techniques, for the analysis of chemical or biological systems and entities.”*

A need for this review was identified by EPSRC’s [Monitoring Portfolio Evolution](#) exercise, with the resulting [action plan](#) for analytical sciences stipulating that a review of the research area is needed. This is an area which EPSRC has a large portfolio of investment, yet the research community is currently very diverse with many foci, inhibiting both EPSRC’s and the research community’s ability to have a robust strategic overview and direction for the research area.

This document presents the issues, concerns and opportunities identified in the course of this review as well as general recommendations for EPSRC as well as other stakeholders to consider, for the future management of this research area. EPSRC will respond to the recommendations in the autumn after:

- Consultation with the Physical Sciences Strategic Advisory Team
- Considering responses to the report from the analytical community, and
- Output from a Focus Group based on the report and feedback to it. The Focus group will consist of representatives from EPSRC’s Strategic Advisory Teams and other stakeholders from the community.

In this report, Analytical Sciences will be abbreviated in places to **AS**.

## 3 OVERVIEW OF REVIEW PROCESS

This review was conducted using EPSRC portfolio data along with results from a community consultation questionnaire to feed in to an expert panel discussion. In order to meet the objectives of the review, the panel were asked to consider (but not limit their discussion to) four specific questions:

1. To determine the health of Analytical Science research in the UK, considering national and international perspectives;
2. To determine how all Analytical science research enables other areas of research and what these areas are;
3. To determine how Analytical science is meeting the needs of the user community in the UK;
4. To determine the strengths of and challenges to Analytical science now and in the near future.

### *EPSRC Data*

EPSRC keeps track of grants with relevance to Analytical Sciences by coding a portion of funds the grant to note this. For this exercise, the panel were presented data (Appendix 1: EPSRC Data) on the balance of funding in analytical sciences from EPSRC since the published strategy for the research area was introduced in 2011.

### *Community Questionnaire*

A detailed questionnaire was published in order to gather input on the four main questions to complement panel expertise and EPSRC data. The questions are listed in Appendix 2. The questionnaire was sent out to the following groups, and recipients were invited to share the questionnaire with a wider group of relevant colleagues in order to capture the views of those who work in related areas:

- Researchers who have applied to EPSRC and whose proposals (whether successful or unsuccessful) were coded as relevant to Analytical Sciences
- University departments
- Relevant EPSRC Strategic Partner Organisations
- Industrial contacts (via RSC analytical division)

This questionnaire received 92 responses, though not all had completed all questions as these were optional fields.

### *Review Panel*

A panel of experts were selected in order provide perspectives from different aspects of the analytical community. The panel were:

- Chair: **Professor Alison Rodger**, Warwick (general analytical science expertise, Analytical CDT director)
- **Professor Gareth Brenton**, Swansea (EPSRC National Mass Spectrometry Facility)
- **Professor Paul Raithby**, Bath (expertise in solid state materials science, crystallography, spectroscopy, synchrotron use, previous EPSRC senior research fellowship)
- **Dr Cinzia Casiraghi**, Manchester (Early career researcher, expertise in Raman spectroscopy for 2-dimensional materials characterisation)
- **Mr Alan Handley**, LGC/RSC Analytical Division (RSC Fellow, Senior scientist & head of development and knowledge exchange at LGC)
- **Professor Ron Heeren**, Maastricht/AMOLF (International perspective, expertise in molecular imaging, mass spec, instrument development).

The panel were sent the terms of reference, questionnaire responses and EPSRC data in advance of the review date. On the day of the review, the panel were presented with the objectives of the review and were led in structured discussion by the panel chair to provide responses to the key questions of the review.

The panel chair, Alison Rodger, identified that the panel had three options of recommendations to make to EPSRC as part of the review. These options were:

- **Do Nothing**
- **Actively Embed** – Take action to ensure that Analytical Science is supported *only* as a discipline embedded in other areas of research.
- **Actively Strengthen** – Take action to promote Analytical Science as a core enabling discipline.

Figure 3-1 – Options identified for review recommendations

### *Agreement of Review Recommendations*

The review panel recommendations as presented in this document have been prepared following the outcomes of the review panel meeting, as a collaboration between EPSRC and the Review panel.

### *Limitations*

The panel recognised the value of EPSRC data and questionnaire perspectives were limited by the fact that they had not included information from many analytical science researchers working outside of EPSRC's academic community, for example in hospital labs. The questionnaire responses were also limited to academia, with a bias towards response from established career researcher as demonstrated in Figure 3-2.

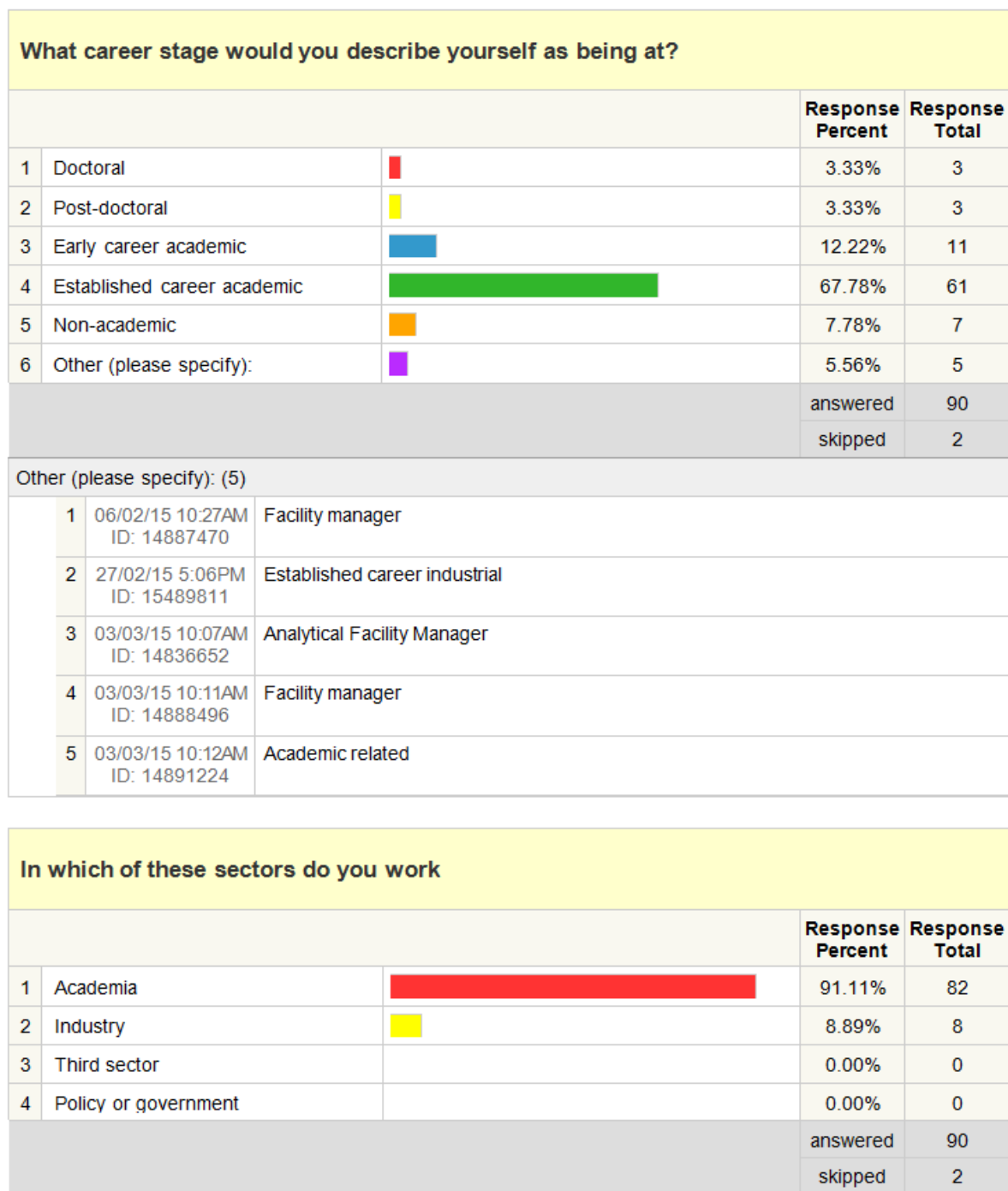


Figure 3-2 – Sources of questionnaire responses

## 4 HIGH LEVEL RECOMMENDATIONS

Of the 3 options highlighted as a recommendation to EPSRC (Figure 3-1), the panel were unanimous that action is needed to **Actively Strengthen** Analytical Sciences through the following aspects.

### 4.1 Improving perceptions of the importance and value of Analytical Science

- Why?
  - Perceptions are vital to the health of the discipline: there is a need for Analytical Scientists to view themselves as such in order to maximise their ability to influence a diverse range of disciplines, thus enabling academic and economic success.
  - This area of research is worth billions of pounds to the UK economy<sup>1</sup>. The community working in this area therefore needs to be united by a common strategy in order to ensure that the potential impact and opportunities in the area can be fully exploited.
  - Improved perceptions will attract students and high quality researchers to work in the area. This will allow the UK to capitalise on its academic strengths, encouraging participation of researchers who may otherwise have looked abroad to systems where the discipline of AS has a higher status.
  - If perceptions of the area are not improved, then there is a long-term risk to the quality of the UK research in the area, since without interest in the area there will be no demand for specific training and research into the analytical methods and techniques themselves. This then poses the risk of UK researchers becoming a generation of “button pushers”, with diminishing data quality.
- Future indicators of success
  - “Analytical Science” courses will be actively sought by students
  - Industry will see AS as a key skill and engages significantly to support research and training.
  - Viewed as a core discipline and not just a service.
  - Relevant future Nobel Prize winners and Royal Society fellows will refer to themselves as “Analytical Scientists”.
  - AS will be recognised by government and policy makers an area that strongly supports and generates economic development – currently aspects of AS are recognised as “Measurement Science”.

### 4.2 World class research and training

- Why?
  - In order to capitalise on existing UK strengths for societal and economic benefit.
  - There is an acknowledged gap in training in some areas of analytical science that needs to be addressed. Metrology and Surface Science have been

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<sup>1</sup>The top 5 UK or UK-based analytical companies have a combined annual turnover of £4.33 billion, see also Innovate UK statistics on measurement science and technology <https://connect.innovateuk.org/web/3346502>

highlighted in this review, but a more comprehensive gap analysis would be required in order to firmly quantify this.

- High quality measurement and Analytical Science enables most other areas of physical and biological science whether in academia or industry.
- Future indicators of success
  - UK leadership in AS will be internationally recognised.
  - Recognition of importance of effective training in AS.
  - Employment post-training for Analytical Scientists.
  - UK research will determine the direction and terms of international collaboration.

### 4.3 Enabling advances across sectors and disciplines

- Why?
  - The critical value of analytical sciences lies in its ability to enable scientific advances in other disciplines.
  - Analytical sciences research is relevant to a very broad range of disciplines, creating research outputs that will be relevant to more than one area. This potential for cross-disciplinary relevance should be fostered in order to achieve added value from one research idea.
- Future indicators of success
  - Industry will be engaged with AS at all stages, from training to research.
  - UK will be home to a thriving instrument manufacturing base
  - AS will be the go-to community for addressing current and future challenges in other areas of research
  - AS will be widely used at point of need (e.g. point of care diagnostic sensors)
  - As a discipline, AS will support sustainable development

### 4.4 Effective community structure

- Why?
  - In order to achieve the full potential of Analytical Sciences to enable cross-disciplinary advances, a coherent and recognised community is needed.
  - This community coherence is currently limited in the UK, meaning that opportunities are not being explored integrating different techniques and approaches across the full application space.
  - To ensure that Analytical Sciences is ready to respond to government initiatives.
  - To facilitate dialogue with industry.
  - To maintain the long-term health of the discipline thus creating the platform for UK's future needs in this space, rather than providing one-off focus (as would happen for example from more challenge-led approach).
- Indicators of success
  - There is a strong focus for Analytical Sciences in the UK with recognised champions, industry associations and a diverse community.
  - Community-owned leadership and clear focus (e.g. a prominent flagship or champions in the area)

- Community includes a strong presence by currently under-represented groups, specifically young ECRs and women.
- Scientists outside the AS community know where to go with their analytical and measurement science challenges.



## 5 PANEL DISCUSSION AND RECOMMENDATIONS

### 5.1 Question 1: To determine the health of Analytical Science research in the UK, considering national and international perspectives

*Are there any major areas of concern over the direction or quality of analytical sciences research in the UK?*

- Analytical Science is very often not recognised as an independent and important research area in its own right.
- Analytical Science seems to have often become a tool or service rather than an important area of research with its own standing. One of the contributory reasons for this is that large sections of the community do not have a voice or coherent organisation.
- Areas of AS, for example optical spectroscopy and lasers or sensors, may not identify with the label AS.
- There is a need for a focussed lead for the analytical community which will also take on the mantle of collaboration with the user community. This lack of focus and perspective is hindering the discipline.
- Analytical science is often almost invisible, being subsumed as an integrated part of other research where it is seen as worthy but not really research in its own right. Due to this dichotomy researchers who work in this area rarely see themselves as analytical researchers but rather as researchers in other areas who use Analytical Science. If this trend continues then Analytical science may become completely subsumed and no longer exist as a research area in its own right. The key problem with this is that transfer of new AS to other research areas will be hindered.
- Analytical science in the UK does have many areas of strength but a lot of this is becoming historic, based on research done 30 to 50 years ago. It is difficult to see where the pipeline of cross-discipline new ideas are likely to spring from within the UK unless the community becomes broader and more connected.
- Enabling Analytical research is patchy and other potentially enabling areas of research need to be encouraged. The situation is sometimes exacerbated by a lack of integration of experimentation and theory and a divide between people and kit in Analytical science.
- Undergraduates often identify with Analytical Science, but this identity seems to be lost later in the UK research culture.
- There is also a perception that the quality of education is not always good leading to a 'push button' approach which can lead to data not being properly checked or validated.
- There is a perception that universities often have a siloed approach to teaching Analytical Science.
- There is a danger that standards in Analytical Science are falling due to erosion in teaching and application of inadequate procedures.
- Demographically, early career and female researchers are under-represented in the analytical community.
- Major skills gaps identified – separation science/ chromatography , metrology ,electro analytical which are urgently needed by both academia and industry.

### *What are the main strengths of UK Analytical Sciences?*

- There are certainly areas that are strong and enabling in the UK, Mass Spectrometry, NMR and imaging being prime examples.
- The UK has a number of Mid-range facilities which are largely analytical in nature and which serve the academic community. These are seen as an excellent resource for training and expertise.
- Analytical science is seen as underpinning, that is, as a research area it is almost ubiquitous in its presence in huge swathes of other areas of research in physical sciences and beyond.
- It is also as enabling in so much as it an essential part of other areas of research without which the research would not be possible.
- At a university level undergraduates are taught analytical science and often identify with it.
- The recent tranche of new CDTs has included several with strong Analytical Science elements which is seen as positive and should help to improve the quality of future research and increase the identity of analytical as a research area in its own right.
- Funding of Analytical Science as a research area is generally perceived as reasonable but EPSRC should try and do more to encourage focussed research in this area and to foster industrial collaboration.

### *How does this compare internationally?*

- In terms of the international perspective there is a considerable loss of UK identity in AS. For instance many RSC Analytical awards are now being won and held by researchers outside of the UK pointing to expertise being out of the country or to a loss of recognition of Analytical Science inside the country. There is a perception that this lack of recognition may be contributing to corrosion of the quality of research in AS and AS-dependent work in the UK, particularly where there is poor understanding and application of techniques.
- Other countries do not seem to have the same problems of identity and focus that appears to be the case within the UK. For example there is an organisation in the Netherlands called TI-COAST, which is a foundation that currently unites 60 private companies, universities, vocational colleges and research institutes, which aims to advance Dutch excellence in Analytical Science. TI-COAST has developed a vision for Analytical Science in the Netherlands, a mission and objectives as well as a Strategic Agenda to realize its goals. It is worth examining such enterprises to ascertain what can be learnt and applied to the UK situation. One particular area that COAST has developed is strong links with industry which has encouraged collaboration particularly at the pre-competitive stage of research. This is an area lacking in the UK which needs to be developed. Such collaboration would increase the levels of funding available to the research area.

### *Recommendations:*

- Research organisations external to the UK should be examined to ascertain best practice in:
  - o Identity and focus;
  - o Industrial relations.

- Any future action in the area should be taken with a view to strengthen presence of currently under-represented groups e.g. young early career researchers and women.

## 5.2 Question 2: To determine how all Analytical Science research enables other areas of research and what these areas are

*To what extent is Analytical Science viewed as a service rather than a subject in its own right?*

- It is important that Analytical Science is not seen as simply underpinning of other areas of research, but that it is also recognised as enabling. The emphasis being that Analytical Science is more than just a service for other research but that it is an area of research in its own right the outputs of which are the stimulus for growth and innovation in a wide variety of diverse research areas.
- The research areas that Analytical Science enables includes (but is not restricted to):
  - o Forensics
  - o Life sciences and Health
  - o Nano and Smart Materials
  - o Regenerative Medicine
  - o High Technology Systems
  - o Energy
  - o Omics
  - o Regulatory areas
  - o Provenance
  - o Pharmaceutical development & discovery
- However, the prevailing mind-set in the UK fails to recognise this vital role for Analytical Science. This is both an internal and external problem in that those within Analytical Science and those who use it fail to recognise it as more than underpinning. This is an unsatisfactory situation and is likely to lead to the UK falling behind other countries where Analytical Science is properly recognised.

*How can the 'enabling' potential of analytical sciences be maximised?*

- Analytical Science could be made more enabling by better representation on EPSRC's Strategic Advisory Network (SAN) by analytical researchers.
- The research community as a whole could be made to consider Analytical Science more formally if there were a section on grant applications asking for a plan of how analytical work would be carried out within a proposal, when appropriate.
- Enabling could also be enhanced by better Data Stewardship within the UK, in that data from analytical research should be made widely available so that researchers in other areas are made aware of what is available which might enable their work.
- Create mechanisms/activities/systems for developments in one area to be translated into different areas of technique or application.
- Encourage scientists to dual badge themselves.

### What is needed for this perception to be overcome?

- A change of mind-set is necessary within the UK for the research area to recognise its potential and become enabling rather than just a service. This will require intervention and leadership
- EPSRC may be able to help with this through liaising with Learned Societies such as the RSC and by innovative or high profile ways of funding Analytical Science.
- Models that have achieved focus within Analytical Science communities abroad should be investigated to see whether good practice can be learnt and applied to the UK situation.

### Recommendations

- Consider making the research area higher profile within EPSRC and together with the Learned Societies, raise the profile across the UK.
- Data stewarding should be introduced to ensure that data is available more widely to the community and beyond.

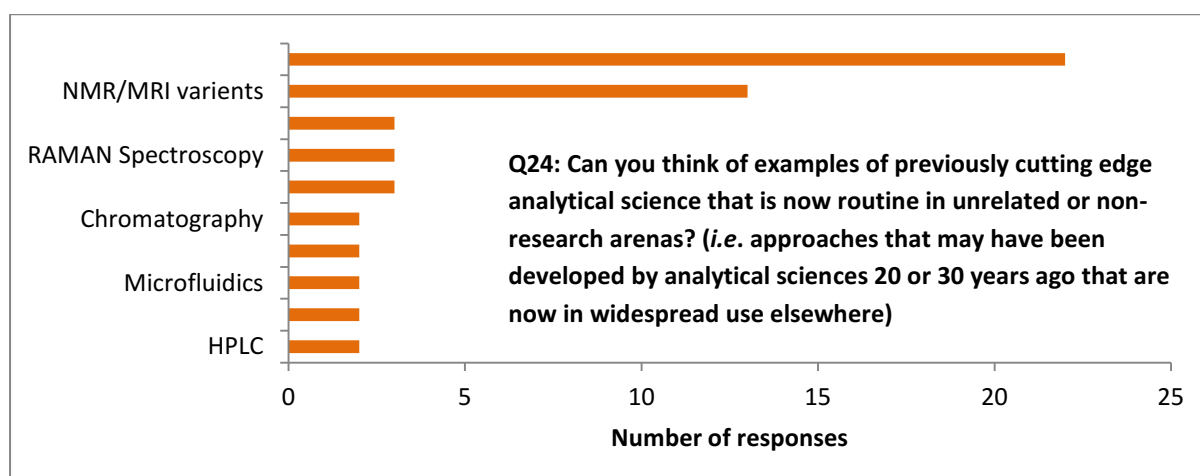


Figure 5-1 – Questionnaire responses: Past successes of AS research

### 5.3 Question 3: How is Analytical Sciences Research Meeting the User Community Needs?

This question comes from the need identified as a result of the [Analytical Sciences Action Plan](#) to understand the place of Analytical Sciences in the wider research and technology landscape. In this question, we are defining the user community as any user of the outcomes of Analytical Sciences research, including academic and industrial users, in the context of wider national priorities.

Overall, the panel felt that although AS appears to be successful in meeting the needs of a diverse user community, the contribution of the discipline was somewhat anonymous. This anonymity stems from the ubiquity of some of the uses of AS, and from the fact that many AS researchers would primarily consider themselves belonging to other research communities (such as photovoltaics, life sciences, forensics etc.) that have a stronger direction and focus. The panel felt that this is something that needs urgent attention.

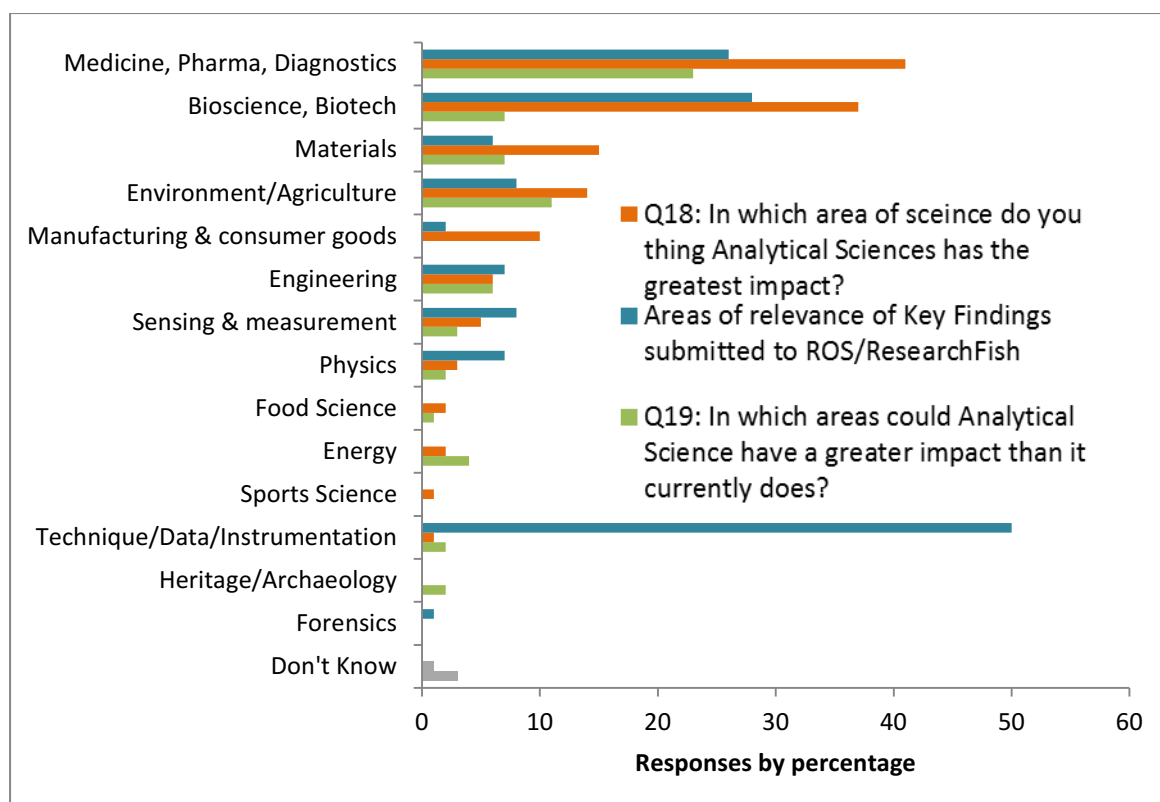


Figure 5-2 – Areas of relevance of Analytical Science, as determined by questionnaire and Research Fish evidence. The number of responses for each category are expressed as a percentage of total responses,

### How and by whom is Analytical Sciences research currently used?

The panel identified the following points:

- The data confirms that there is a **technology driven need** – AS has a broadly ranging user community, and the majority of projects funded by EPSRC featuring AS research do this jointly with other research areas.
- This question is perhaps the one most restricted by the perspectives available for this review, which have limited industrial representation and do not include responses from hospital labs, institutions and AS research communities linked primarily to other research councils, thus missing potential user drives from these groups.
  - **Recommendation:** There is a need for EPSRC to link up further with these sectors of the AS community when preparing their response to this review, and ensure that these sectors are integrated in any community focussed activity in the area.
- This research addresses a broad range of user needs, with the clearest links to the **life sciences**.
- The requirements of users will be vastly different across AS research, despite the fact that many techniques are applicable across disciplines. There is a **leadership gap** here for

addressing these user requirements in a unified way; however the question exists over who in the AS community has the responsibility to fill this gap.

- The root of this gap in leadership and direction for the community is likely to be linked again to the issue of perceptions of the importance of AS, stemming from the fact that many AS researchers would primarily identify themselves with another discipline.
- Linked to this, user drive and motivation will primarily arise from work associated with this other discipline, where users are (in general) more clearly aware of the importance and relevance of the research.






Think about how the work you do relates to your definition. What proportion of your work would you primarily categorise as Analytical Sciences (i.e. before labelling it as another discipline)?			Response Percent	Response Total
1	0-20%,		18.60%	16
2	20-40%,		23.26%	20
3	40-60%,		19.77%	17
4	60-80%		19.77%	17
5	80-100%		18.60%	16
			answered	86
			skipped	6

Figure 5-3 – Questionnaire responses

*Are there any areas in which Analytical Sciences should be having a greater impact?*

The panel identified that AS has a highly cross-disciplinary impact in many areas. Areas in which greater contributions were identified as:

- **Nanoscience and nanotechnology** – relevance of AS work across size scales.
- **Big data** – AS community can contribute to data quality assurance, without which big datasets are meaningless.
- Relevance to use in **data curation** – such as chemical reactions database
- **Single molecule analysis (vs. statistical analysis)** – AS can contribute to relevance and context of appropriate techniques.
- Opportunities for further impact in **life sciences**, for example specific applications such as **E-BioBanks**.
- Information Technology, pathways & network analysis for whole system sciences.
- **Manufacturing** – the current UK focus on high value manufacturing will place an increased demand on analytical innovation and analytical/measurement skills.
- **Instrumentation Sector** – EP sponsored research has a high relevance to the instrumentation sector (refer to figure), however there is a lack of perceived importance attached to this sector.

### *What are the barriers to and challenges involved in achieving this?*

*“Often users don’t know or understand the expertise and analytical techniques that are out there that can help them. This is at least in part because they don’t see analytical science as a real area of research.”*

*“Analytical Scientists do not show very often their impact outside their own community.”*

– Quotes from panel members: EPSRC Analytical Sciences Review Panel  
31<sup>st</sup> March 2015

Barriers to AS achieving a greater impact within the user community are intrinsically linked with the previously identified issues over **community cohesion and perceptions of importance** (which are a more universal issue for AS). This is the primary factor affecting the AS community’s interaction with users of their research, however secondary practical issues of **access to infrastructure** and **support for multidisciplinary research** still need to be overcome in some cases.

Both cohesion and perception are also more general issues for the research area, and have consequent impacts on user interactions through making the process less straightforward. The issue of infrastructure provision is currently being investigated further by EPSRC in a wider context, involving the development of [roadmaps for future UK capability](#). The panel also identified that even though the UK research councils provide mechanisms for supporting with proposals at the interface of different council remits, this is not always straightforward and means more work for researchers and users of research working at these interface.

Another specific challenge facing AS in this area is the **sustainability of support** for meeting user needs through the translation of AS. In some cases it may be that users of AS are only interested in collaboration in a specific element of the process, thereby restricting the positive benefits to one specific need, and limiting the impact of AS. Since increasing user support to cover the full process will require increased and sustained effort from the user, skill will be needed to “pick winners” and identify the most important areas to apply this effort to. This is a **high-risk, high-reward** activity and a **responsibility/opportunity for SMEs**.

### *Relevance to National Priorities*

The panel identified that national priorities are likely to have a greater impact in AS than in other areas, since the enabling nature of the discipline means that researchers are easily able to apply their field to fit a particular strategic national priority. Such behaviour has been observed already within the community, with researchers “rebranding” parts of their research and proposals in response to EPSRC’s Shaping Capability strategy. However this ability to “rebrand” is often more than a formality, with researchers not only changing the way they label their research, but also their techniques and collaborators.

**Recommendation:** Therefore a strong community and recognition of AS itself as a “National Priority” is crucial in order to maintain the research quality of the discipline in its own right, and thereby its ability to provide a strong enabling research resource to the user community.

### *Key Conclusions – How is AS research meeting the user community need?*

- The AS research community is contributing to meeting the user community need in a broad range of areas.
- However in many cases, this need will be perceived as being met through the work of other more coherent communities.
- There are clear suggestions that AS can be making more of an impact in some areas.
- To identify and exploit these possibilities, SMEs will need to play a key role in supporting the translation of these possibilities in application-relevant areas.
- Opportunity for greater work with instrumentation sector in EP sponsored research, given the high response from ResearchFish data

## **5.4 Question 4: To determine the strengths of and challenges to Analytical science now and in the near future**

### *What are the barriers preventing analytical sciences from receiving due credit/achieving the full potential of its impact in other areas?*

- The Analytical Science community is in a generally fairly good position but there is a pressing need to coalesce the community and focus it. It also needs to become far more self-aware and aware of itself as a discipline. As such many of the barriers to the future improvement of the research area are not analytical as such but are rooted in public relations.
- The community needs to market itself to other research communities so that they recognise Analytical Science and what it can offer them as so much other research will rely on it as both underpinning and enabling.
- This extends to marketing itself to other research communities so that they recognise Analytical Science and what it can offer them; since so much other research will rely on it as both underpinning and enabling.



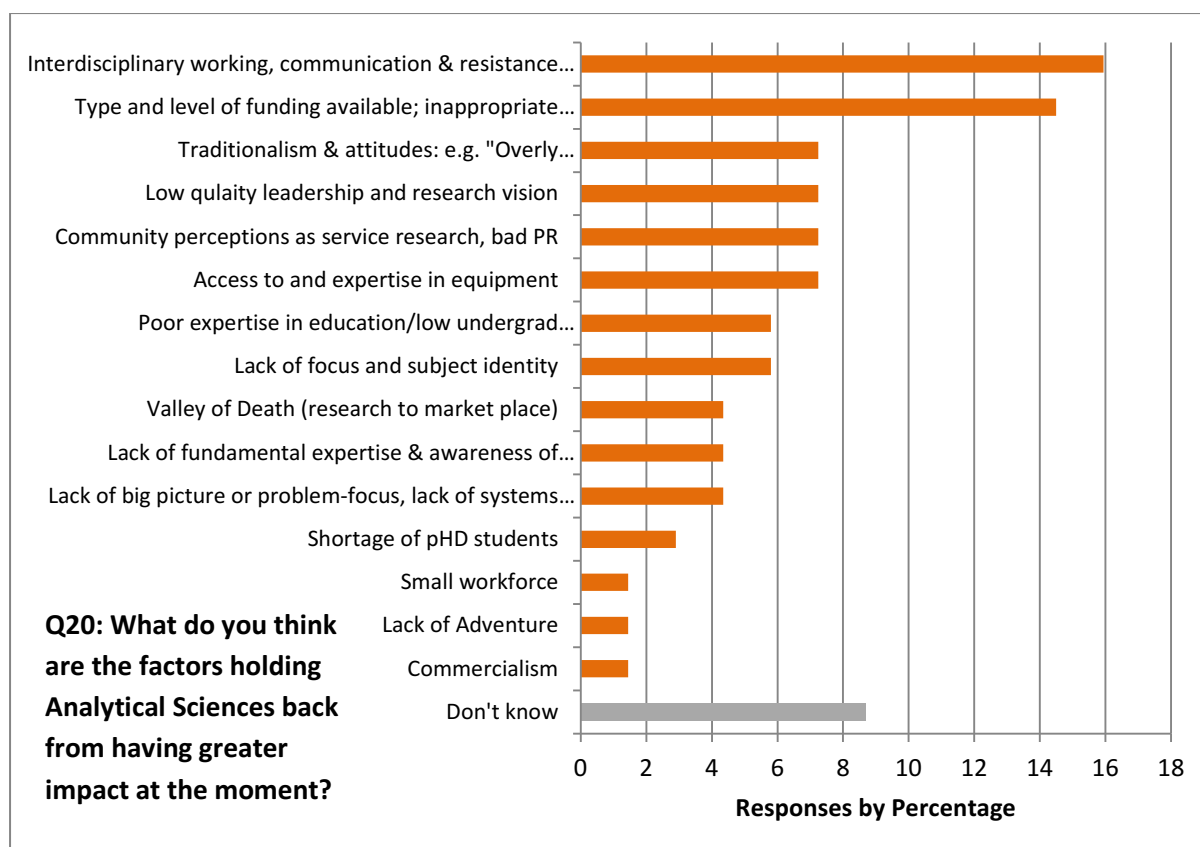


Figure 5-4 – Perceptions on factors affecting impact of AS from community questionnaire

*How can these barriers be overcome? By what sort of approach could EPSRC and other strategies best respond to this?*

- The community, with EPSRC taking the lead, should consider current models used in other countries to advance the research area (also see Aim 1), the Dutch example being IT-COAST. It will be important to get community buy-in to such a scheme.
- EPSRC could address this in part by focussed funding of Analytical Science to draw attention to the area.
- EPSRC’s CDTs and Mid Range Facilities should be involved in addressing this.
- Skills gaps could be identified and further understood by undertaking a comprehensive gap analysis

*Are there any areas in which new opportunities are arising?*

- Focus could be improved within Analytical Sciences by considering what the ‘Grand Challenges’ of Analytical Science are and how they can be addressed. Some possibilities might include:
  - o Multi-functional techniques (such as two or more techniques combined into one instrument)
  - o Pushing resolution
  - o Nano-analytical

- Sub-light limits
- Deciphering complexity
- Miniaturisation and Point-of-use technology
- Time resolution – slow and fast

*Recommendations:*

- Examine current models for marketing and PR from outside the UK.
- Possibility of focussed (rather than extra) funding, to raise the profile of the research area.
- Consideration could be given to projects led by non-AS researchers – how does the PI's academic badging influence perceptions of AS?

## 6 CONCLUDING REMARKS

- This review has emphasised the importance of Analytical Sciences as a **critical enabler** of research and innovation in the UK.
- The impact of analytical science is **vastly interdisciplinary**, affecting science, society and the economy.
- The panel recommended that action is needed to **actively strengthen** Analytical Sciences in the UK in order to maintain current strengths and maximise the potential of AS research.
- There is a recognised **risk associated with inaction**; with adverse consequences that would be felt across disciplines in UK science.
- **Recognition by key stakeholders** of the critical importance of Analytical Sciences is seen as a key factor holding the discipline back from achieving its full potential.
- There is an urgent need for a **centralised lead** to address this risk.

## 7 APPENDICES

### 7.1 Appendix 1: EPSRC Data

These data are intended to complement the information provided elsewhere in this report, providing further background on EPSRC's portfolio. This information is from a sample of EPSRC's grant applications received in the window between April 2011 and October 2014, and therefore absolute figures and values will be lower than those quoted in other EPSRC sources, such as Grants on the Web and Visualising our Portfolio which include all currently active grants.

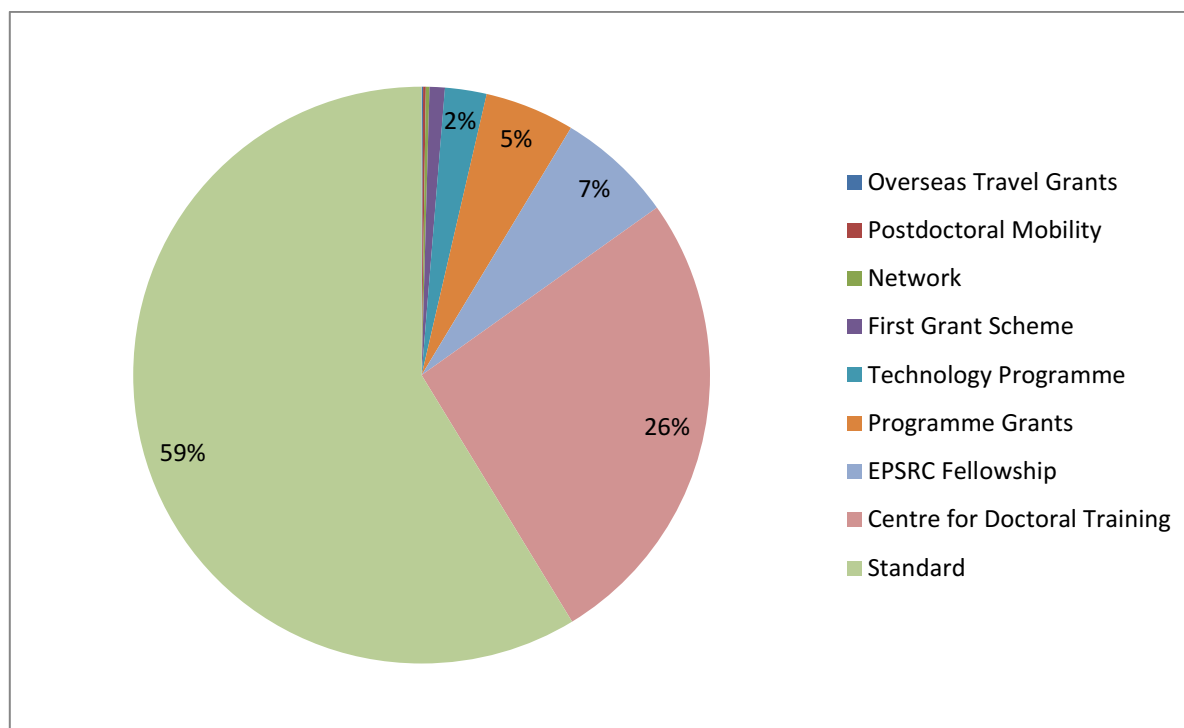
#### *Portfolio overview statistics*

<b>Value of grants in portfolio awarded since 2011:</b>	£92.77 Million
<b>Level of this figure coded to Analytical Sciences:</b>	£45.55 Million
<b>Number of grants funded since 2011:</b>	93

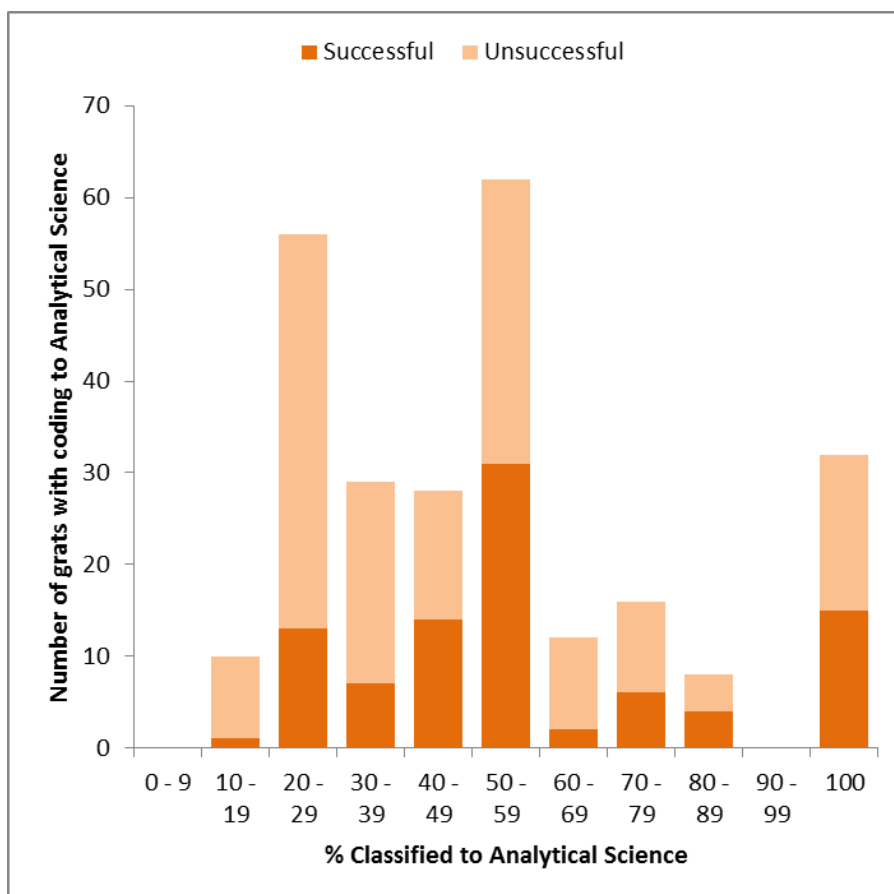
<b>Success rate for Standard Grant proposals coded (all or in part) to Analytical Sciences:</b>	42 %*
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\*Compared to EPSRC overall success rates for this period of 37%

#### *Value of EPSRC Grants by scheme:*



#### *Level of joint-coded research proposals in Analytical Sciences*



This data shows the proportion of a proposal that is classified as of primary relevance to the Analytical Sciences research area. Grants coded to Analytical Sciences are collectively joint-coded to **40** distinct research areas, indicating relevance to **36%** of EPSRC's entire funding remit.

## 7.2 Appendix 2: Questionnaire Responses

An overview of quantitative responses to EPSRC's questionnaire can be found on the same page as this report (<https://www.epsrc.ac.uk/research/ourportfolio/researchareas/analytical/>). If you require access to qualitative responses please contact EPSRC directly.