

ESRC application and success rate data

This analysis accompanies the data on ESRC applications and success rates which were released in June 2017 (<http://www.esrc.ac.uk/about-us/strategy-and-priorities/application-and-award-data/>). We are sharing it externally to invite comment, discussion and further analysis. Our aim is to use its conclusions to help us to work effectively with research organisations (ROs) on key issues such as success rates, demand management and research strategy.

We have included some ‘Notes on the data’ at the end of the document. These explain the choices we have made in selection and analysis of the data, and also some of the uncertainties associated with it.

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If you have any questions or comments about this analysis please contact the head of ESRC’s Insights team, alex.hulkes@esrc.ac.uk, or telephone 01793 413039.

Key findings

Application volumes, and demand for ESRC funding, fluctuate considerably across years, though they are in general reduced from their pre-2012-13 levels. The average number of funding decisions made per year over the last five financial years is around 1400, but with a range of around ± 200 .

Success rates are, unsurprisingly, inversely related to demand for funding. 2016-17 saw a decrease in decision volumes, causing success rates to rise to about 24% from 2015-16's figure of 18%.

In general, median proposal sizes continue to increase across all areas of ESRC activity.

Few research organisations have success rates which differ meaningfully from the ESRC average, either within the 2016-17 year or across longer time periods.

Some disciplines appear to have success rates which are systematically lower than others, and some consistently outperform the rest, in the sense of having meaningfully higher success rates. But the great majority of proposals on which a decision was made related to disciplines which have success rates near the average.

Success rate, grant size and demand trends

Over the last six years our annual success rate for funding decisions relating to research and Fellowship grants has ranged between 18% and 33% (Figure 1), with the overall proportion funded in that period being 24%.

In the same period our responsive mode has seen success rates vary between 12% and 25%, with 17% being funded overall.

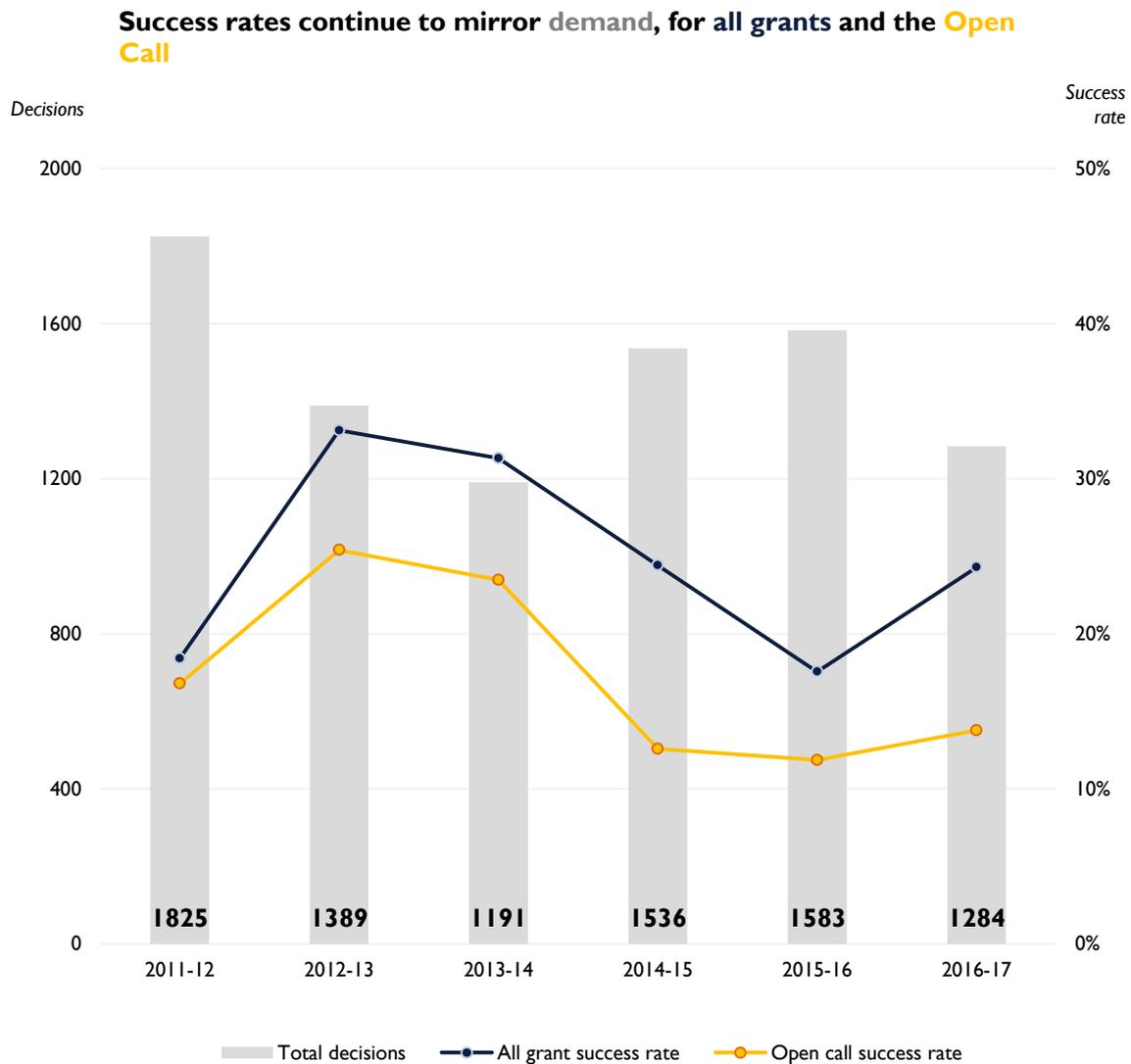


Figure 1: success rates (lines) in financial years 2011-12 to 2016-17, and total decisions made (columns) in those years

While there is some variability in application volume, as indicated by the total number of decisions made in each year, there is no obvious trend¹. In terms of decisions made 2016-17 was the quietest year since 2013-14, but it was still within what appears to be a normal range.

Given the static level of funding over the last six financial years, it is no surprise to find that success rates are inversely related to demand. This pattern is seen both in the overall picture and in responsive mode.

There have been noticeable increases in the median amount requested by proposals over the last six years (Figure 2.) There is not a consistent difference between the average values of authorised and rejected grants.

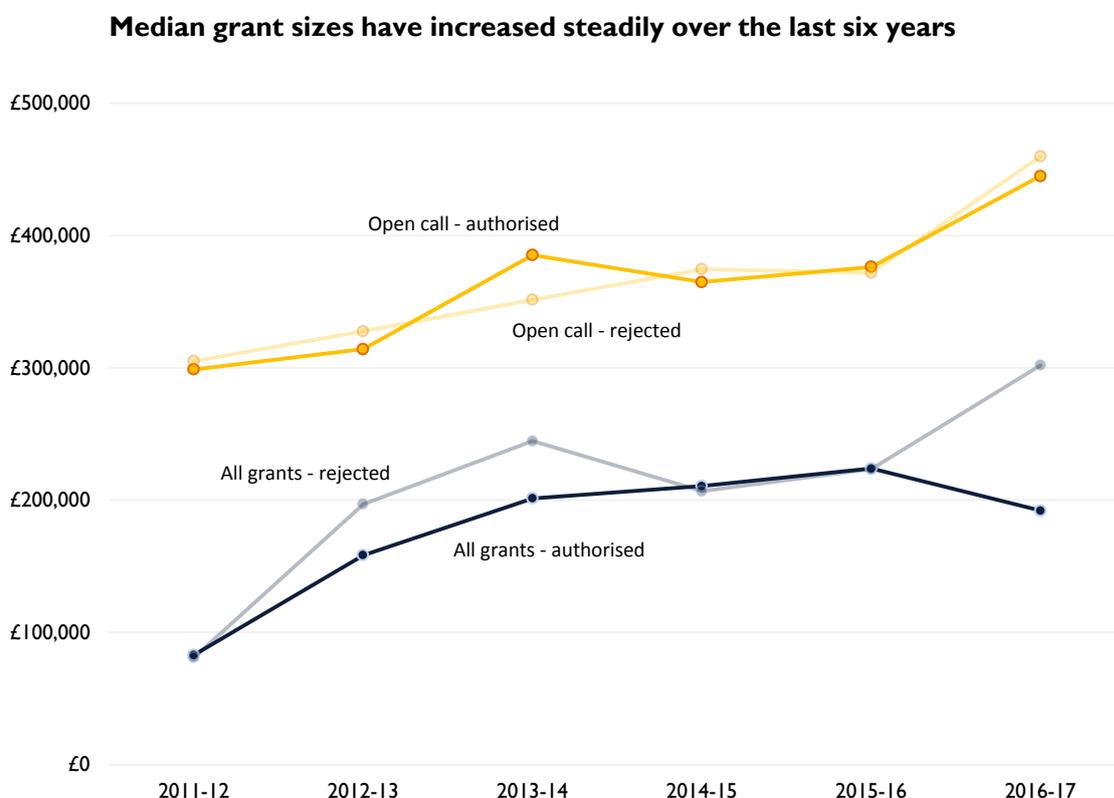


Figure 2: median average grant size changes over the period 2011-12 to 2016-17. Scheme limits for Open call grants changed in July 2015, and are now £350,000 to £1 million.

¹ 2011-12 is something of an outlier. It was the last year in which the availability of a large number of small grant schemes (subsequently closed) is manifested, and so it shows a particularly high decision volume.

The noticeable divergence between the median size of authorised and rejected grants in 2016-17 can be traced to the award of 23 relatively small GCRF Impact Acceleration Account grants (which depressed the median awarded value in that year²) and competitions for Large Grants and GCRF Centres which together acted to increase the median size of unfunded grants.

Around 30% of all funding decisions in 2016-17 were made in relation to responsive mode (Figure 3.) This proportion is broadly independent of the actual level of demand and seems to have tended to increase in recent years:

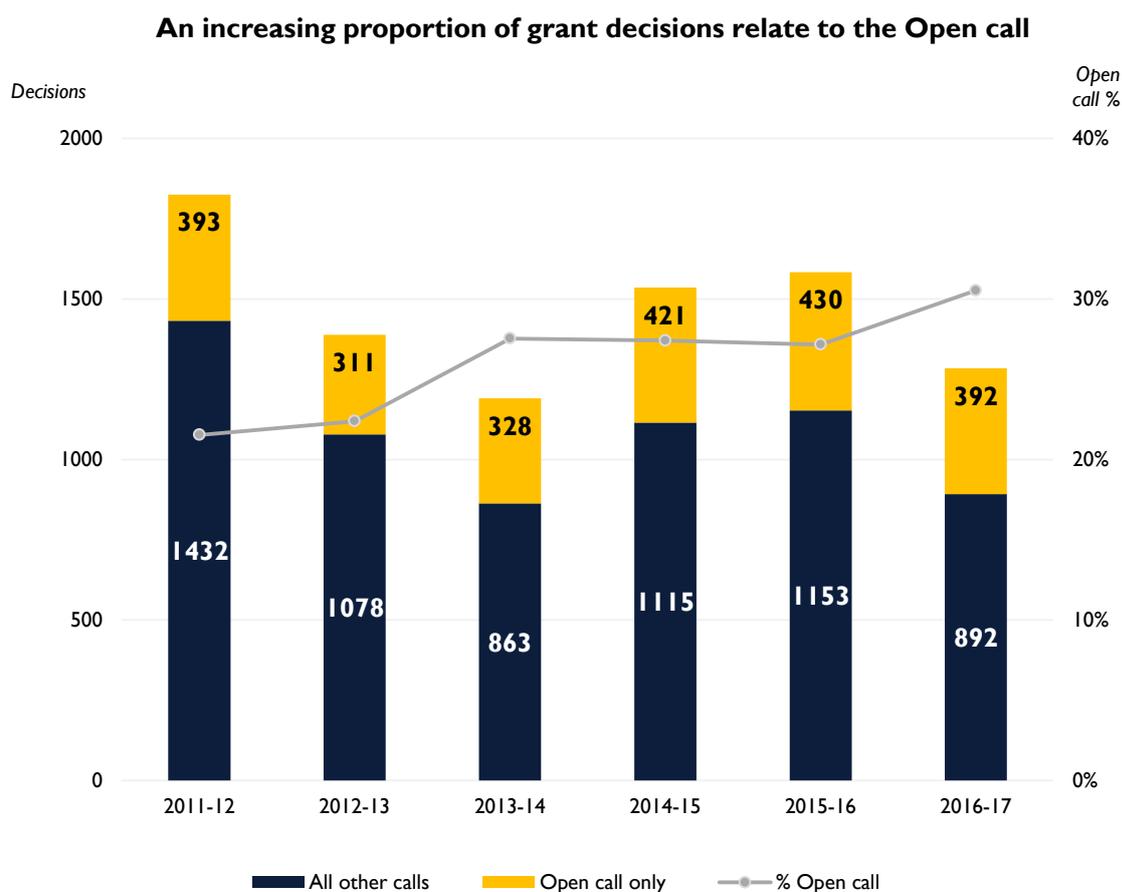


Figure 3: total number of decisions made by financial year, for responsive mode and all other funding routes combined. Grey line shows % of decisions made in year that relate to the Open call.

² We also awarded 30 GCRF-related postdoctoral Fellowship grants through ESRC DTPs, each with a nominal value of £1 (that's 80p fEC.) These would have a similar effect, but have been excluded from the calculation of median values as they are clearly unrepresentative of normal business for ESRC grants. If they are also excluded from the calculation of the 2016/2017 success rate figure it drops to 23%.

Success rates by Research Organisation

Funnel plots³ are a simple way of interpreting success rate data. They compare the performance of all applicant ROs simultaneously while not implying a ranking. Figure 4 summarises all RO funding decisions made in the 2016-17 financial year⁴.

Not many ROs experienced particularly high success rates in 2016/2017

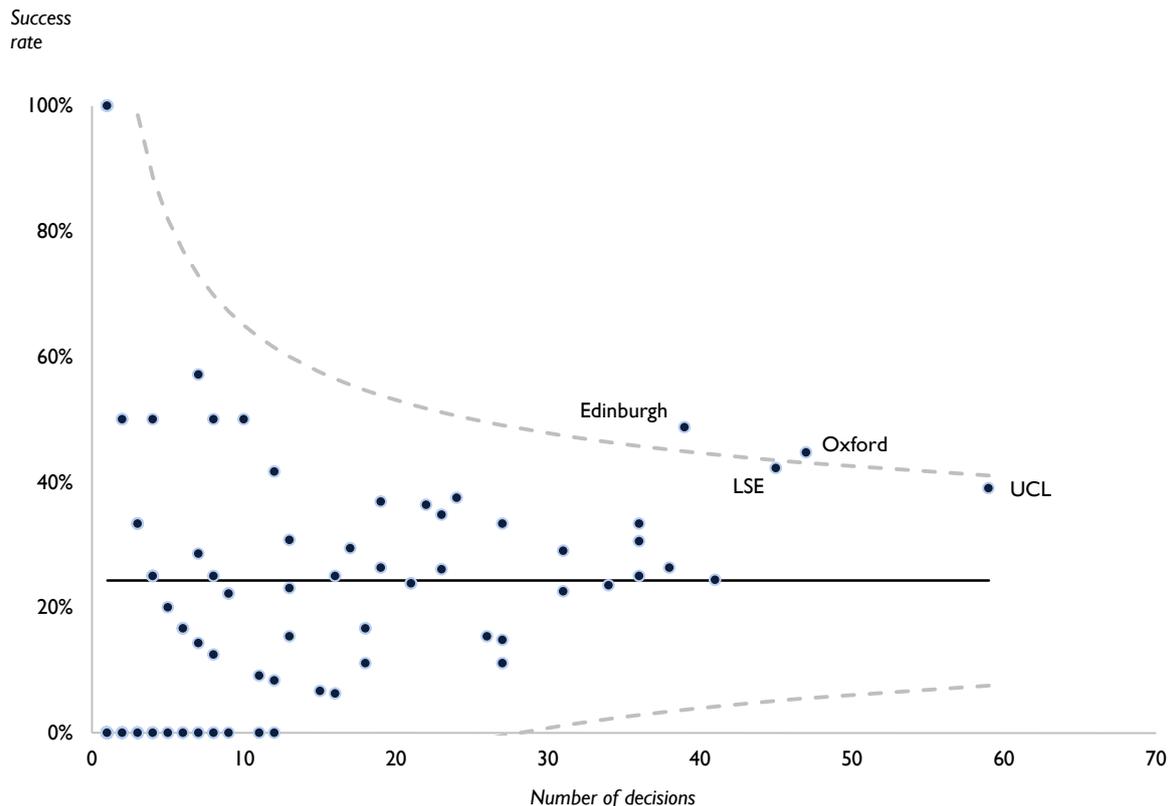


Figure 4: funnel plot for ROs having at least one funding decision made in relation to them in 2016-17. Control line set at a 3 standard error/99+ % limit. We have around 150 data points so a less strict limit would be too prone to generating false alarms.

³ For example see <http://qualitysafety.bmj.com/content/11/4/390.2.full.pdf+html> or <http://www.apho.org.uk/resource/item.aspx?RID=39445>.

⁴ There is a slight correlation between number of decisions and overall success rate ($R^2 = .07$, $p < .001$) driven by the relatively high success rates of Edinburgh, LSE, Oxford and UCL. On balance the broader comparison with the overall success rate, and the funnel plot as a device, is still appropriate in this case.

Aside from Edinburgh, LSE, Oxford and UCL, no ROs are found near or beyond the funnel limit⁵ suggesting that most of the observed deviation from the average success rate in 2016-17 can best be understood as normal variability.

The most recent three-year cumulative success rates are shown in Figure 5:

The last three financial years' decisions saw a broader range of particularly successful ROs

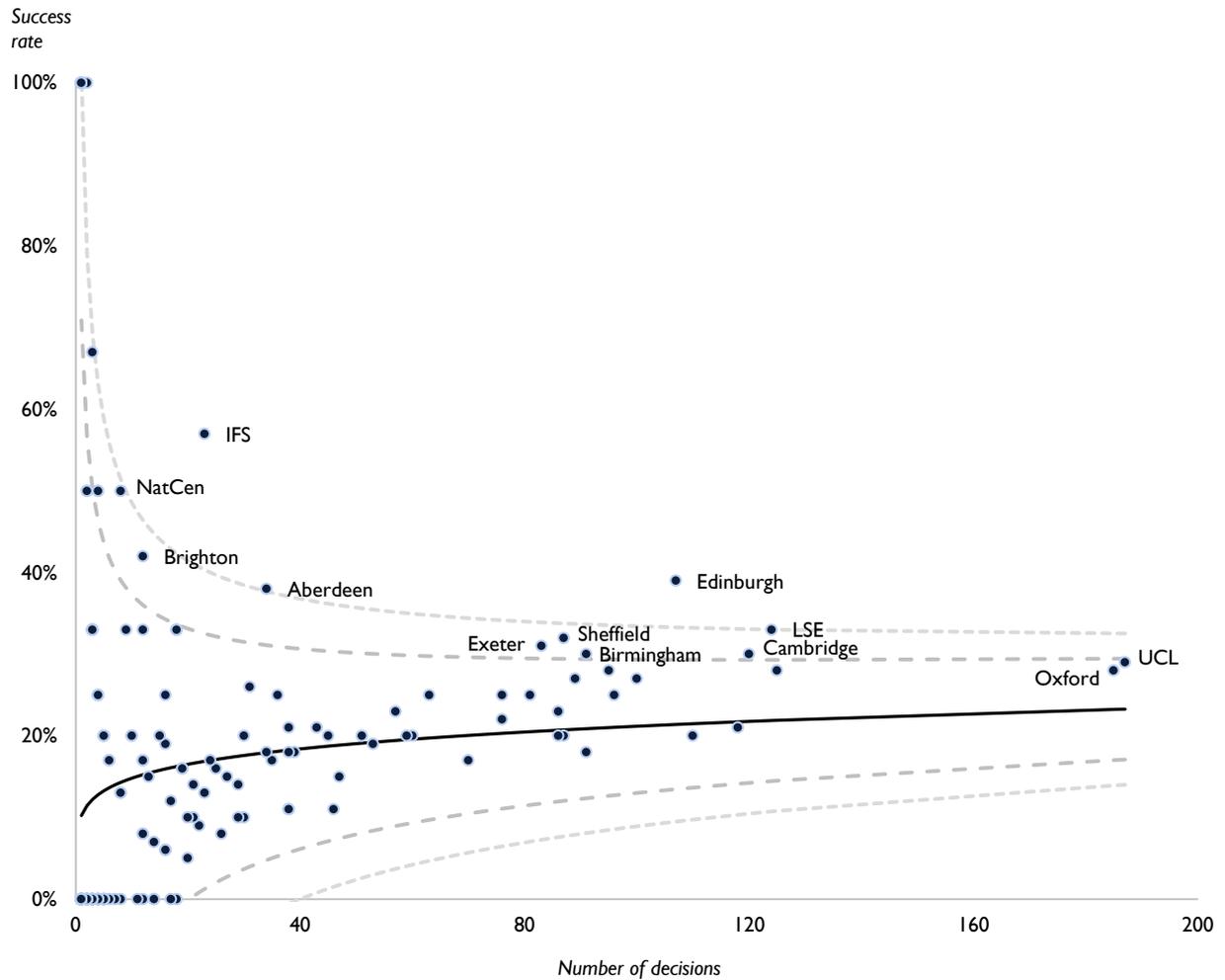


Figure 5: funnel plot over financial years 2014-15 to 2016-17. Funnels drawn at approximate 95% (inner) and 99+% (outer) control limits. Note that the average figure plotted varies by the number of decisions, as explained in the annex. The overall average rate across this period was 22%.

⁵ And in fact there is clearly a 'funnel within a funnel' in which all other ROs sit.

Even adjusting for the observed relationship between success rate and number of decisions, several ROs have success rates which appear to be meaningfully higher than might be expected. In particular, and continuing with last year's trend, Edinburgh, the IFS and LSE have particularly high rates. No ROs appear below the limits in this period.

The pattern for decisions relating to grants submitted to responsive mode over the last three financial years (Figure 6) is similar to the overall ESRC picture in terms of its scatter, but suggests an absence of consistently high- or low-performing ROs⁶:

No one excelled or underperformed in responsive mode over the last three years

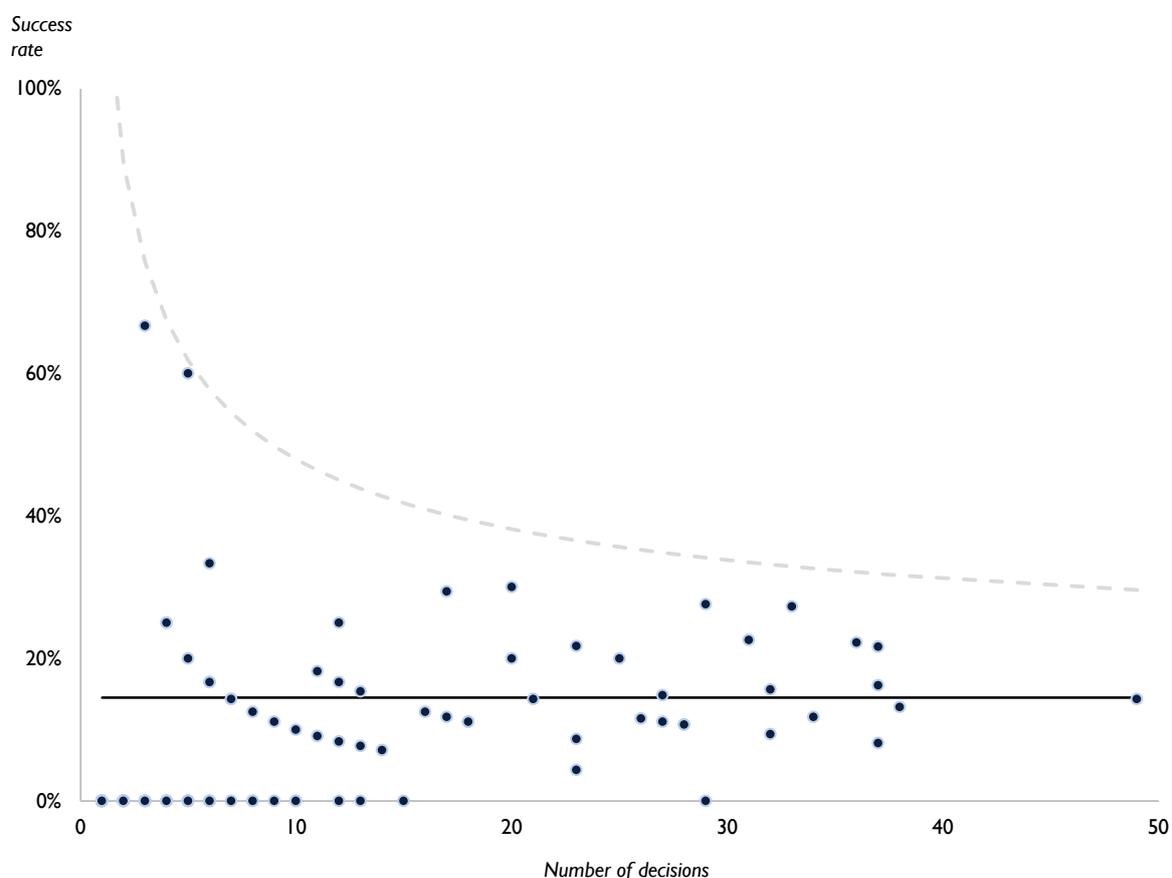


Figure 6: funnel plot for ROs applying to responsive mode in financial years 2014-15 to 2016-17. The lower limit coincides with the x axis due to the small number of applications and strict limits (around three standard errors) applied.

⁶ One RO made 29 applications to the Open call with no decision to award in this period. With the overall success rate being about 15%, the probability of receiving no grants at all after submitting that many applications is about 1%, assuming no special cause variability.

Success rates by discipline

Data relating decisions to core disciplines can also be analysed using funnel plots.⁷ The 19 core disciplines used to describe ESRC proposals⁸ are:

- Area Studies
- Demography
- Development studies
- Economics
- Education
- Environmental planning
- History
- Human Geography
- Law & legal studies
- Linguistics
- Management & business studies
- Political science & international studies
- Psychology
- Science and Technology Studies
- Social anthropology
- Social policy
- Social work
- Sociology
- Tools, technologies & methods

Figure 7 shows success rates by discipline across financial years 2014-15 to 2016-17 for all grants, while Figure 8 shows the same but for decisions relating to responsive mode only. Disciplines with unusually high or low success rates are labelled directly on the charts. Full details on numbers of applications and success rates by discipline are in the associated data release available from the ESRC website.

⁷ The plots for success rate by core discipline are drawn with control limits at approximately the 95% confidence level. With fewer data points in each plot, the issue of false positives is less a concern here.

⁸ Reliable core discipline data are only available on grants for which a decision has been made since FY 2012-13. There are two other core disciplines available – ‘Not classified’ and ‘Other’ – but they are rarely used and grants coded with them have not been included in this analysis. This means that the figures for number and value of grants by core discipline will not be exactly the same as those in the RO data.

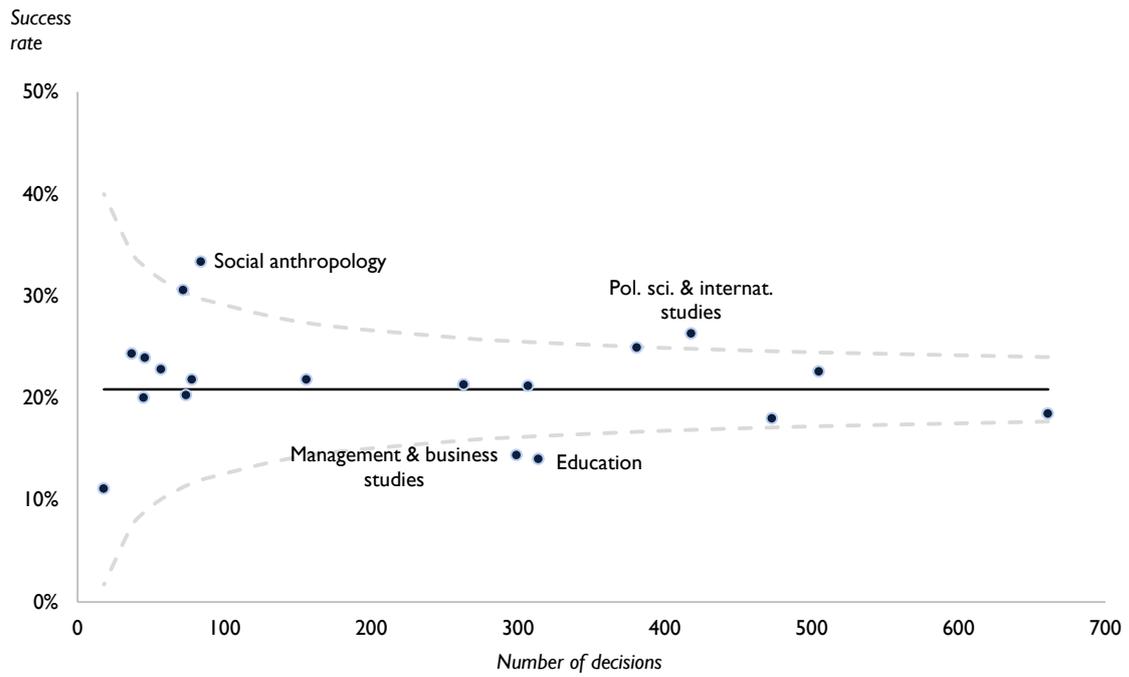


Figure 7: funnel plot by discipline for decisions across financial years 2014-15 to 2016-17

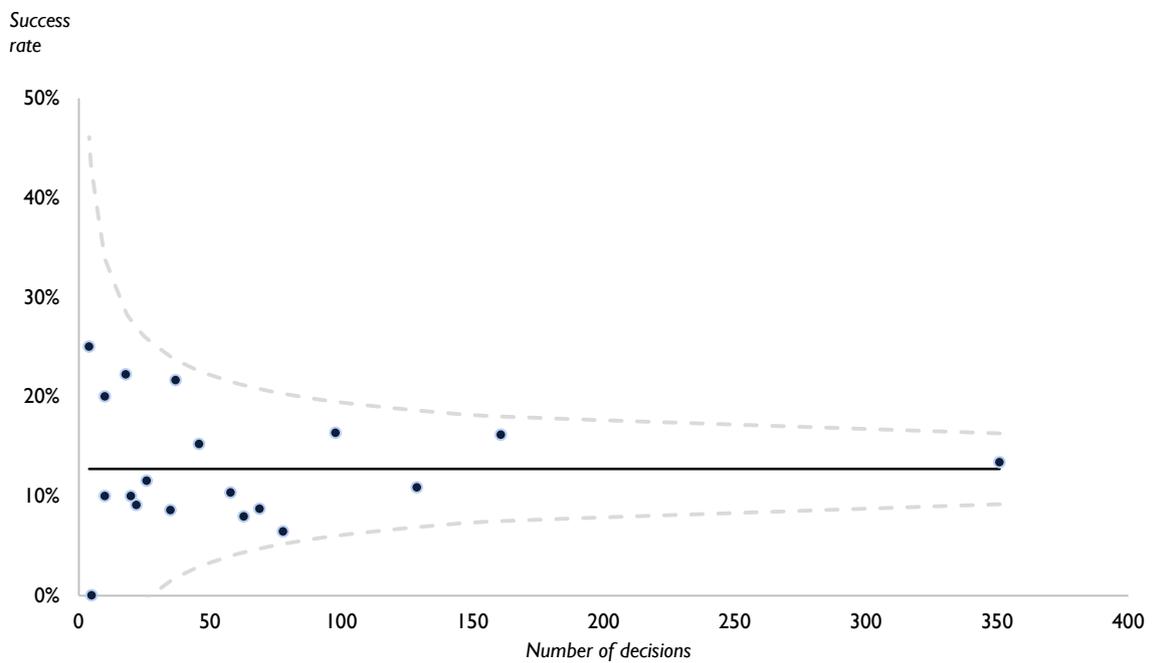


Figure 8: funnel plot by discipline for decisions across financial years 2014-15 to 2016-17, Open call only

Meaningful differences from the average are found only when looking at all grants. No disciplines fare particularly badly or well when looking at responsive mode only.

Across all grants both 'Political science and international studies' and 'Social anthropology' have success rates which appear to be meaningfully higher than the overall average in this period. 'Education' and 'Management & business studies' have unusually low success rates across all grants.

Conclusions

Of all the observed trends and patterns, the inverse relationship between decision volumes and success rates is the most striking. For a given amount of money, the more proposals we receive the lower the proportion of applications that we can fund. Demand is central to discussions of success rates.

The march of the medians is also apparent. Over the last six years, taken across all proposals whether funded or not, the average grant size has more than trebled from just over £80,000 to its most recent value of just under £250,000. The 2011-12 figure came before the closure of many schemes for smaller awards, but even if we take a baseline in 2012-13 the increase in median grant size is still about 50% over five years. This trend helps drive a longer-term decrease in success rates.

For the first time, in 2016-17 more than 30% of decisions made related to the Open call, our main responsive mode scheme. If the Secondary Data Analysis Initiative is also included in the definition of responsive mode we find that a third of decisions are now taken in relation to responsive mode. But Open call applications are chasing less than a quarter of the funding available for new grants, and they cost about twice as much as the average proposal received by ESRC. As a result responsive mode success rates, while they have increased slightly thanks to a very slight decrease in decision volumes, are still low.

Some stronger signals have appeared in the data on success rates by RO and discipline. Edinburgh and the IFS continue to be standout cases in terms of their abilities to pitch a proposal to their peers effectively. A few other ROs are not far behind, but in general ROs perform as you might expect given their individual circumstances. Interestingly, no ROs are consistently underperforming.

That's not what we see when looking at disciplines. 'Political science and international studies' continues to have a high success rate, while both 'Education' and 'Management & business studies' have low rates across all grants. This isn't what we see when looking at responsive mode only, suggesting that the causes are likely to be found by looking at where these PIs are applying, not what they are applying to do.

Notes on the data

While we have taken care to ensure that the data are as complete and accurate as they can be, like many data sets they are best thought of as approximating reality rather than describing it precisely. In particular it is worth remembering that the process of creating these success rate data rests on a specific set of assumptions about what data to include, time windows for reporting and other (frankly somewhat arcane) decisions which reflect the internal workings of the current RCUK grants system. In light of this, reported success rates should be viewed as being within around one to two % of the 'actual' figure. Grant volume data are similarly likely to be accurate to $\pm 2\%$, or within around 30 to 50 grants of the true total count in each year.

Data are reported in relation to decisions made in financial years (the period 1 April to 31 March) 2011-12 to 2016-17. To be included grants need to be either 'Authorised', meaning that a grant offer has been made, or 'Rejected', meaning that a proposal has been received and assessed, and a decision not to fund has been made. Only research grant and Fellowship data are included. Training, impact and other grant types are in general excluded, though some grants with these aims may be found in the data as the categories are often not mutually exclusive.

Success rates by both number and value are reported in the accompanying data, which can be downloaded from the ESRC website: <http://www.esrc.ac.uk/about-us/strategy-and-priorities/application-and-award-data/>

The success rate is the ratio of the number or value of grants whose decision is 'Authorised' to the total number/value of grants on which a decision has been made. In general, success rates by number are lower than those by value, as the latter are often skewed by the award of a small number of sometimes extremely large grants in each year⁹. In the main this analysis reports on success rates by number as they approximate the experience of the applicant community, and the fate of 'the average proposal', better than do figures by value. Analyses tend to lead to the same conclusions whether by number or value.

We are including separate results for both the full set of grants and the ESRC's 'Research Grants (Open call)', which is at the heart of our responsive mode processes. We use the terms synonymously through the document, although the SDAI call is also responsive in nature. The extra complexity in presentation is justified as responsive mode funding is known to be very important to researchers.

Grant proposals are classified by the applicant submitting them, using one or more disciplines. Discipline classifications are on occasion modified after receipt. For analyses based on disciplines we have used only the primary discipline classification to describe each grant. The actual picture is of course nothing like as black-and-white as the analysis suggests.

⁹ Though interestingly in 2016-17 we see for the first time the opposite situation. The overall success rate by number is actually 9% higher than that for value, probably due to the effects of GCRF Centres and Large Grants calls already noted.

Appendix – funnel plots

Funnel plots allow the comparison of RO success rates without implying a ranking.

They indicate the overall average success rate and, centred on this, a range of success rates (the space within the funnel) which is compatible with a belief that observed deviations from the average are best understood as being down to nothing more than chance variability.

If all ROs were to have the same underlying chance of each of their applications being funded, their outcomes would tend to fall within the funnel with a probability approximated by the control limit given. There is little to be gained by trying to establish reasons for apparent under- or over-performance of any ROs whose data points fall within the funnel.

Where an RO's data point falls outside the funnel, there may be some justification for believing that particular RO was or is displaying atypical behaviour. ROs falling outside the limits may have success rates which differ from the average in a way that is incompatible with chance variation, and this may justify further analysis.

It is sensible to approach these plots with some caution. As the number of data points increases, the number of points that fall outside the funnel can be expected to increase even if each RO does in fact have the same underlying average success rate. It is not safe to conclude automatically that 'outside the funnel = unusual'.

That said, success rates which are consistently above or below the average, but which never actually fall outside the funnel limits, may still be a sign of abnormal variation and this pattern too may indicate unusual behaviour.

Figure 5, while still a funnel plot, is centred on a different average success rate. In this case the average is calculated based on measured variation in success rates related to variation in decision volumes. Our data suggest that success rates follow a power law relationship of this kind:

$$\log(odds + 1) = an^b$$

where the odds are the odds of an RO which had n decisions made in a period receiving at least one award. a and b are derived from the data, usually a is around 0.05 and b is slightly over 1. When $b = 1$ this model produces a flat success rate – the standard funnel plot used in other figures.

Adjusting for the varying success rate gives more discriminating power when inspecting the funnel plot. It allows better identification of over-performing ROs and reduces the potential for false alarms for under-performing ROs. This adjustment can only be made when the data are available to do it reliably, and this is why it is only applied in this case to multi-year data.