# Applicants to ESRC – volume and trends

This analysis summarises key information on patterns of application of individuals applying for ESRC grant submissions and awards.

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 on future demand management and research strategy.

## Key findings

Each year, between 1,200 and 1,800 individuals might apply for ESRC funding as Principal Investigator. The total number of people who currently might in principle apply for ESRC funding is probably somewhere between 16,000 and 20,000.

The probability of any potential applicant submitting a proposal for ESRC funding in a given year is very low. The average number of applications per year for any individual is always one, and applicants apply once every six or seven years on average.

ESRC applications are distributed evenly across the population of potential applicants, and perhaps more evenly than is found with other Research Councils.

## Number of unique applicants

Over 6,000 unique applicants submitted at least one application to be Principal Investigator (PI) on an ESRC research, Fellowship or training grant in the financial years 2011-12 to 2015-16.

In each year the number of unique PIs varies (Table 1):

| Year of application | Number of applicants as PI |
|:---:|:---:|
| 2011-12 | 1786 |
| 2012-13 | 1327 |
| 2013-14 | 1165 |
| 2014-15 | 1475 |
| 2015-16 | 1568 |

Table 1:    number of unique applicants requesting ESRC funding as PI in the last five financial years.

## How many potential applicants are there?

The pool of potential applicants to ESRC consists of all people who:

1. are eligible to apply for our funding; and
2. are able to propose work in our remit; and
3. consider themselves as 'someone who might apply to ESRC'.

This last condition is what differentiates the pool of potential ESRC applicants, as estimated here, from the total number of academic social scientists in the UK. Estimates of the ESRC applicant population based on four different 'mark and recapture' approaches[1], are in Table 2:

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[1] https://en.wikipedia.org/wiki/Mark_and_recapture. These were originally developed for ecological studies but have been used in human contexts also.

| Method | Estimate and approximate 95% confidence interval |
|---|---|
| Lincoln-Petersen[2] | 14,300 ± 2,300 (2014 to 2015 estimate)<br><br>14,900 ± 2,100 (2015 to 2016 estimate) |
| Schnabel[3] | 15,900 ± 1,000 |
| Huggins[4] | 17,700 (no CI calculated) |
| Chao[5] | 21,400 ± 700 |

Table 2: mark-recapture based estimates of potential ESRC applicant population

On balance a reasonable estimate for the size of the pool of potential applicants to ESRC is somewhere between 16,000 and 20,000.

From this it follows that the probability of an individual applying in any year is around 0.1 (this is the sort of figure found in Table 1 divided by the population estimate) and the average time between applications is likely to be somewhere around six to seven years[6].

## Distribution of unique applicants

Taken together, Figure 1 (below) and Table 3 suggest that applicant behaviour is quite homogenous. Almost all PIs in a financial year will submit between one and five applications. The maximum number of applications by any individual over the period was seven, and just two of the 6000 applicants did this.

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[2] See http://oak.snr.missouri.edu/nr3110/topics/peterson.php for an explanation of the method
[3] See http://oak.snr.missouri.edu/nr3110/topics/schnabel.php for an explanation of the method.
[4] See http://people.oregonstate.edu/~peterjam/CapRecap/Closed%20capture%20methods%20review.ppt
[5] From http://chao.stat.nthu.edu.tw/wordpress/paper/1987_biometrics_43_P783.pdf. The Chao method is perhaps the best suited to the data we have: it adjusts for variable submission probability and also works well for low probabilities. However, in one form it also gives an improbably high estimate (42,000 or so) which means that it is probably over-estimating to include literally anyone who might apply, whether they meet the third condition or not.
[6] If the probability of applying in any year is 0.1, the probability of not applying is 0.9. The cumulative probability of a potential PI not applying at all drops to less than 0.5 after seven years [that is $1-(0.9^7) = 0.52$, meaning that after seven years on average more than half of potential applicants will have applied.]
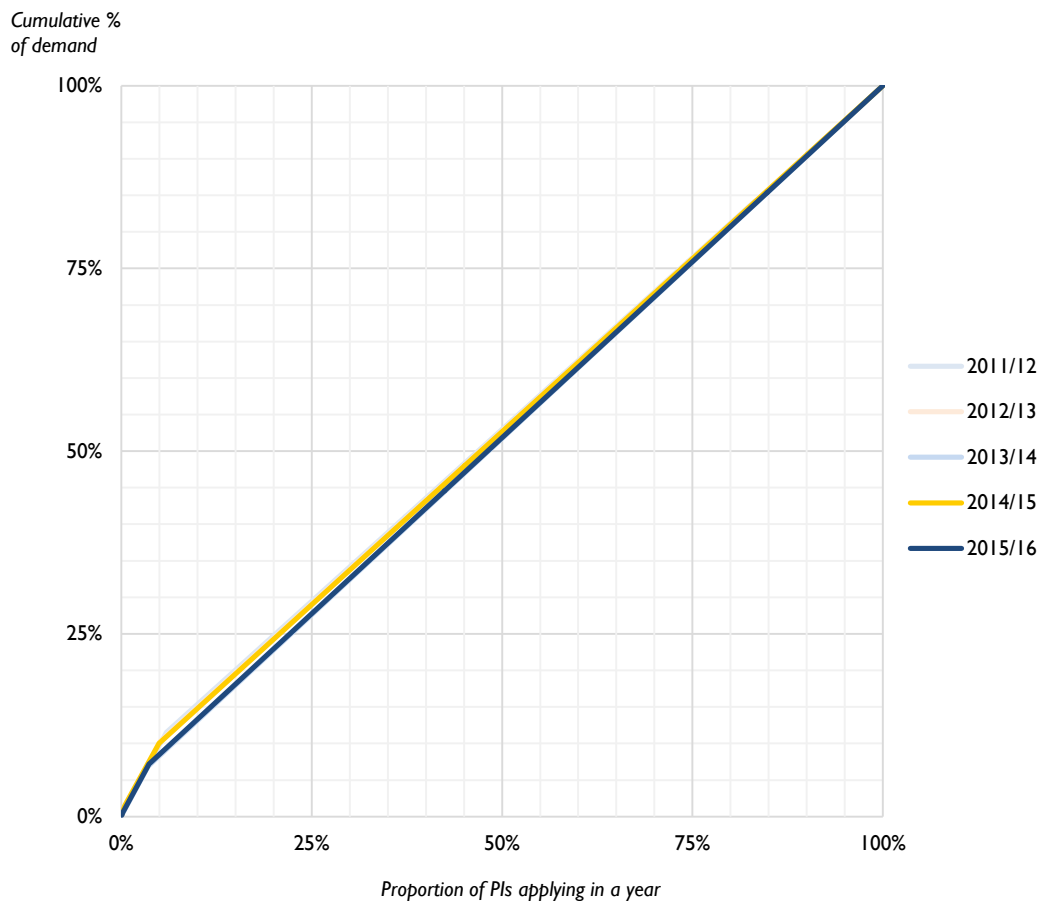
Figure 1: demand by proportion of unique applicants when applicants are ordered according to the number of times they applied. The five lines overlap substantially.

| Year | Mode | Median |
|---------|------|--------|
| 2011-12 | 1 | 1 |
| 2012-13 | 1 | 1 |
| 2013-14 | 1 | 1 |
| 2014-15 | 1 | 1 |
| 2015-16 | 1 | 1 |

Table 3: mode and median of applicants each financial year.

Over the last five years, almost all demand has come from PIs applying just once in that year, and PIs applying just once in any given year will comprise around 95% of applicants in that year.

## Trends in distribution of applications

The Gini coefficient[7] can be used to summarise the degree of 'inequality'[8] in the numbers of proposals submitted by individuals. Greater homogeneity of applicant behaviour will be reflected in lower values of the Gini coefficient.

Figure 2 summarises Gini coefficients based on applicants submitting proposals to ESRC in the financial years 2011-12 to 2015-16.
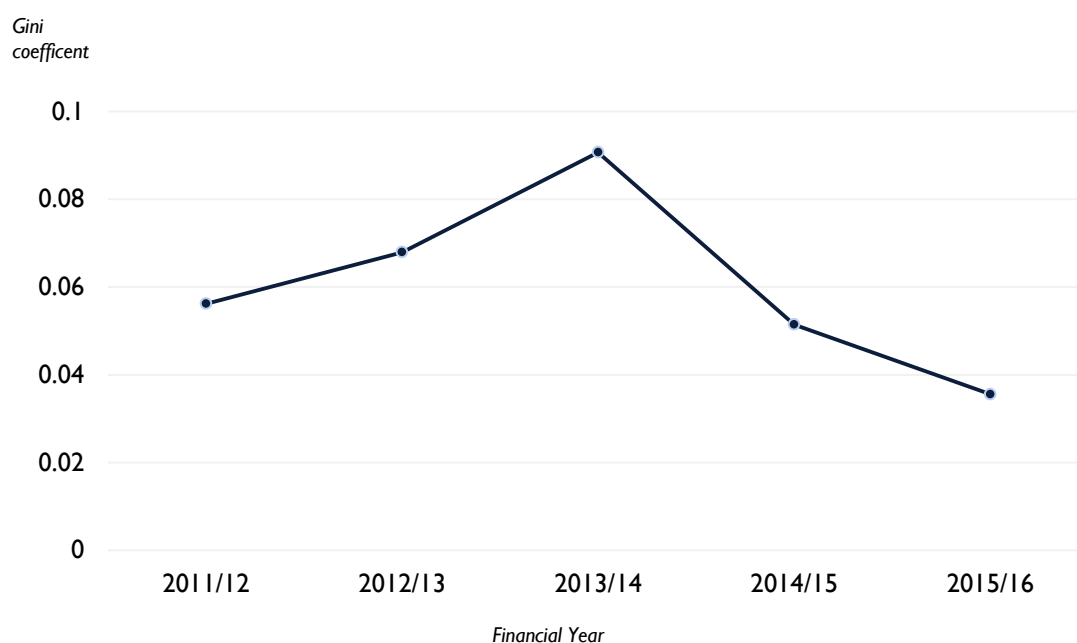


Figure 2:          Gini coefficients for distribution of unique applicants applying to ESRC in the five financial years 2011/2012 to 2015/2016.

The Gini coefficient reached a peak of 0.09 in 2013-14, but in general it is low throughout the period and never rises above 0.1. Frequent ESRC applicants are very rare.

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[7] https://en.wikipedia.org/wiki/Gini_coefficient. Gini coefficients are most commonly used to summarise income distributions, but they can describe the distribution of any resource, in this case grant applications.

[8] In this usage 'inequality' refers to observed applicant behaviour and does not imply any kind of value judgement or assumption that 'inequality' in applicant behaviour is a bad thing.

## Comparing application distributions across Research Councils

It's interesting to ask whether potential and actual applicants to ESRC behave differently to those in other disciplines. EPSRC have made available equivalent data over the same period, allowing a direct comparison to be made.

EPSRC identified over 8,000 unique applicants submitting at least one application as PI over the relevant five financial years[9]. There is perhaps slightly less year-on-year variability in EPSRC data (Table 4):

| Year | Number of Applicants |
|---|---|
| 2011-12 | 2102 |
| 2012-13 | 2937 |
| 2013-14 | 2250 |
| 2014-15 | 2436 |
| 2015-16 | 2700 |

Table 4:    number of unique applicants to EPSRC in each of the last five financial years.

Figure 3 shows the difference between the behaviour of applicants to the two Councils.

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[9] Which is more than ESRC's total of 6000, but EPSRC has around four times the budget of ESRC.

*Cumulative %
of demand*
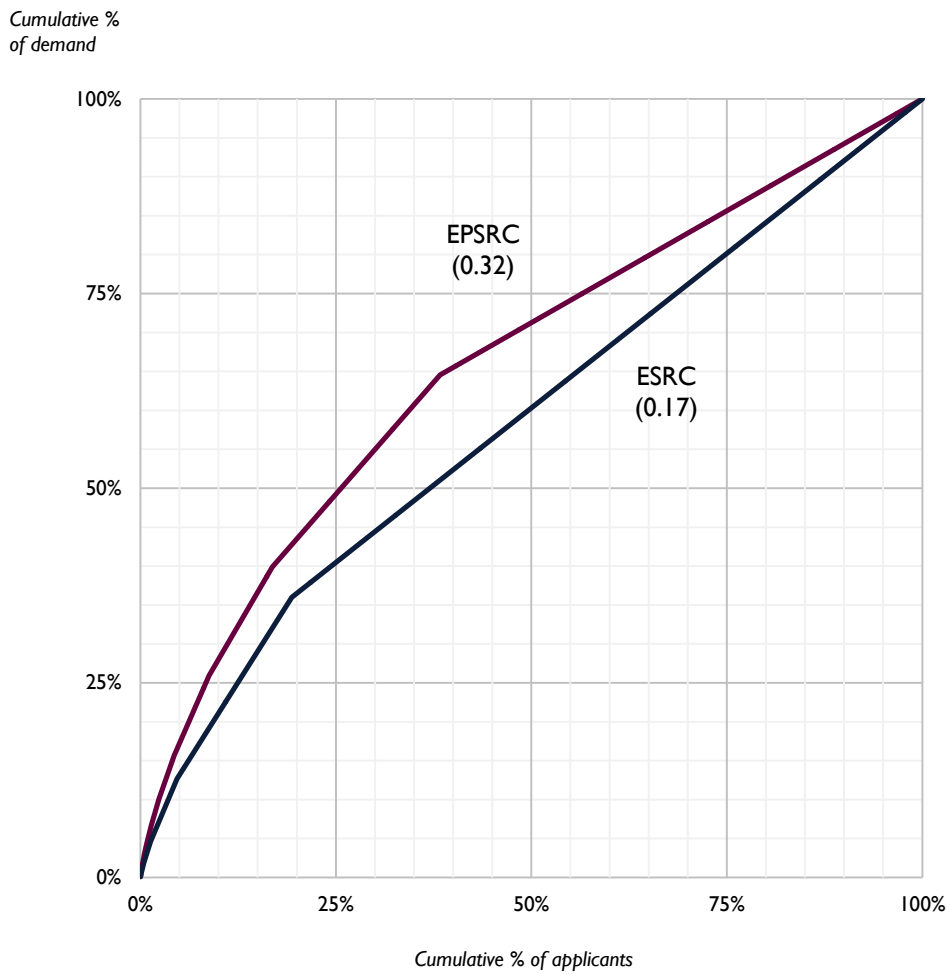
*Cumulative % of applicants*

Figure 3: demand by cumulative percent of unique applicants applying to the ESRC and EPSRC across five financial years 2011-12 to 2015-16. Gini coefficients are in parentheses.

Demand for EPSRC funding is more concentrated than that for ESRC. This is apparent both in Figure 3 and in the Gini coefficients for the five-year period combined. ESRC's is relatively low at 0.17, whilst EPSRC's is higher at 0.32.

## Conclusions

Despite being the second smallest of the seven Research Councils, ESRC has one of the larger pools of potential applicants. This mismatch leads to particular patterns of applicant behaviour.

There is not really such thing as a frequent applicant to ESRC. Even the most 'frequent applicants' do not actually generate much demand between them. The average ESRC applicant applies once in any given year of applying, and they apply every six or seven years. Success rates being what they are, the average applicant will be funded even less frequently than that.

So what role does ESRC play in the UK social science landscape? ESRC funding is clearly not a 'must have' for the great majority of active social science researchers. This is likely to reflect the perceived difficulty of actually securing funding more, probably far more, than any lack of desirability of funding in itself. For most people, most of the time, the likely return from receiving funding is not enough to compensate for the effort required to secure it.

That's ESRC funding as currently constituted. The story might be different if we funded in different ways. But attractiveness of funding is not a metric of our success.

There are activities – large longitudinal studies, national data storage, advanced training, novel methodological developments – which only a funder with the form and mission of ESRC can realistically support. If we didn't do them, no one would. And they appear to be things that must be done, so we have to do them. Necessary specialisation means that there are things that we don't do.

Even viewed solely through application numbers, the difference between ESRC and EPSRC (a Council with which we have much in common) is striking. One area of difference is demand management. The EPSRC approach focuses on individual applicants. That makes sense for them as their demand is much more concentrated. For ESRC, broader interventions rather than individual sanctions are probably the only viable option.