The 2019 Researchfish Submission Period

Key findings

- Award holder compliance rates continue to improve
- Studentship compliance rates are lower than for award holders
- Publications and engagement activities are the most common output types
- There has been a slow fall in the proportion of outputs reported that are publications
- Award value is not the only factor associated with the number of outputs reported, award type matters too
- Between 22,000 and 35,000 new outputs are reported each year
- More outputs are reported in an award's second submission period than any other year, but outputs are reported throughout the lifetime of an award and beyond.

Introduction

This report summaries the 2019 ESRC researchfish submission period and explores how our submissions have changed over the five years that we have asked our award holders to make a submission. It finds that compliance rates continue to improve and that the type of outputs reported has diversified. It finds evidence that the factors associated with output generation are complex and not only related to the size of awards, and that different types of outputs may be realised over different time frames.

The analysis begins to answer questions in four key areas. It starts with exploring when submissions are made, reviewing who is asked to submit and their compliance rates. Following this it investigates what outputs are submitted, including the volume of different output types and how this has changed over time. It then examines how reporting is spread across our portfolio, including the relationship between award value and the number of outputs reported, and how this varies across output types. Finally, it explores when outputs are reported.

When are submissions made?

As well as requiring our grant holders and fellows (here defined as 'award holders') to make a submission, we also ask the students we fund to make a submission too. In total there are around 12,400 ESRC awards and studentships in researchfish. As Figure 1 shows, almost half are research grants, 10% are fellowships, with the remainder being studentships.

Figure 1. Type of award in researchfish

Legend:
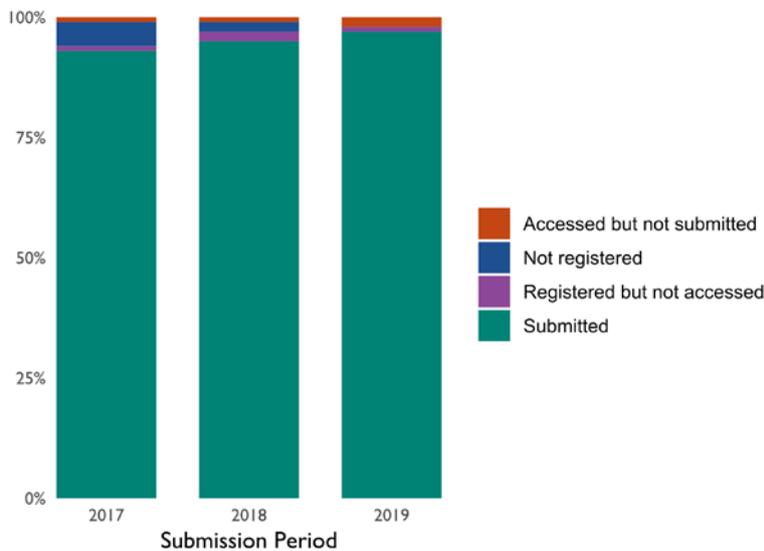- Fellowship
- Research Grant
- Studentship
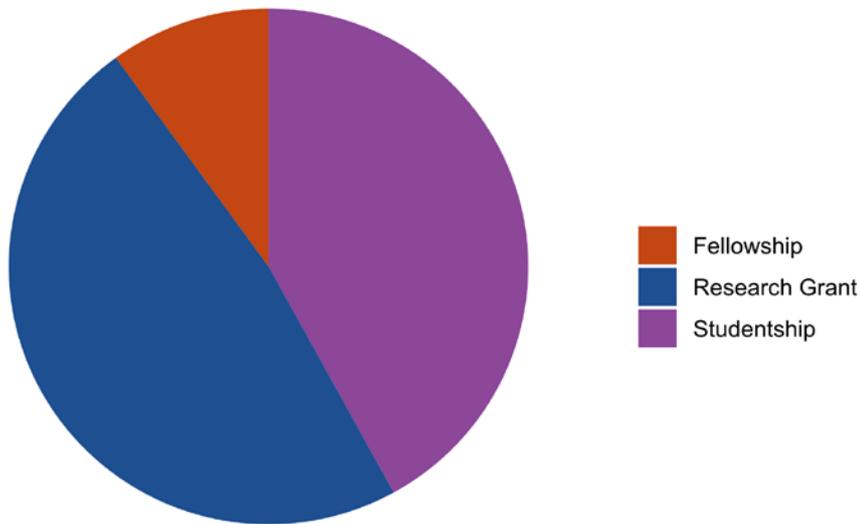
Awards are allocated a response code in researchfish. This determines whether a submission is required. Awards that are response code 1 or 4 are expected to make a submission. When looking at our researchfish portfolio this way, students make up the majority of those we ask to submit (Figure 2). This is because many of the grants and fellowships in researchfish completed a long time ago and have since been closed in researchfish, whereas we didn't add studentships until 2016, and many of these are still active or recently finished.

Figure 2. Type of award in researchfish, those expected to submit

Legend:
- Fellowship
- Research Grant
- Studentship
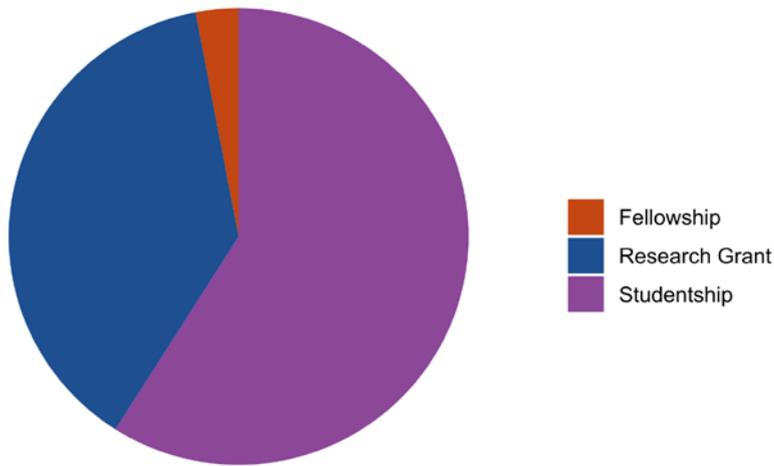
Each year we compile compliance rates for awards and studentships. This analysis uses our 'final adjusted compliance' figures, which take account of any exemptions we made during the submission period as well as award holders who made an optional submission. As can be seen from Figure 3, our already very high compliance rate for award holders has continued to improve over the past three years, with almost all users now registered and accessing their award in researchfish. There continues to be a very small number of users who access their award but do not go on to make a submission. Our compliance rate now sits at 96.7%, up from 92.8% in 2017.

Figure 3. Submission status of award holders

Legend:
- Accessed but not submitted
- Not registered
- Registered but not accessed
- Submitted

x-axis: Submission Period (2017, 2018, 2019)

Response code 1 and 4 award holders are required to make a submission. The response code 1 submission rate has been static at a very high 98% for the past three years (see Figure 4). The response code 4 rate is lower than the code 1 rate in each year. While it improved in 2018, it fell slightly in 2019.

**Figure 4. Response code 1 and 4 submission rates**
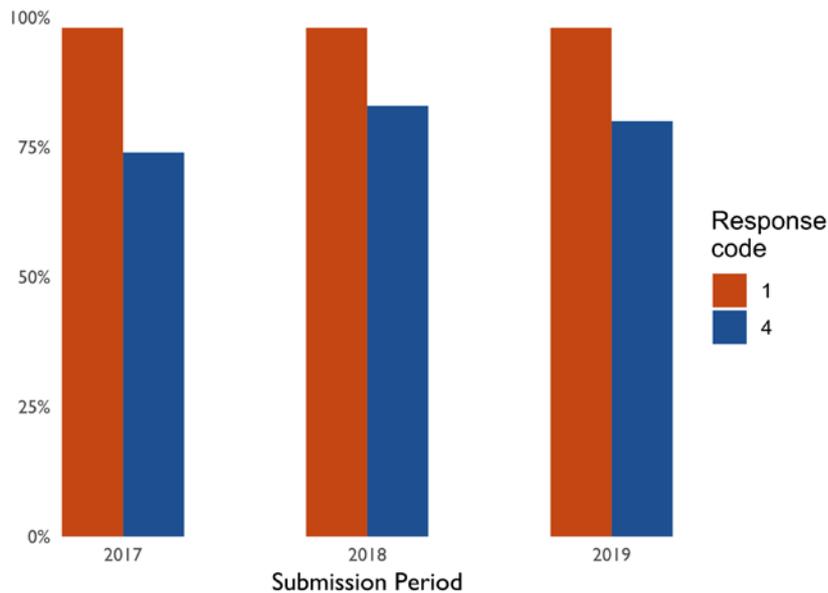
This would at first seem to contradict the improvement in the overall compliance rate in 2019. The explanation is that the share of awards that are response code 4 fell in 2019 and so their lower compliance rate had a smaller impact on the overall compliance rate (Figure 5).

Figure 5. Number of response code 1 and 4 awards
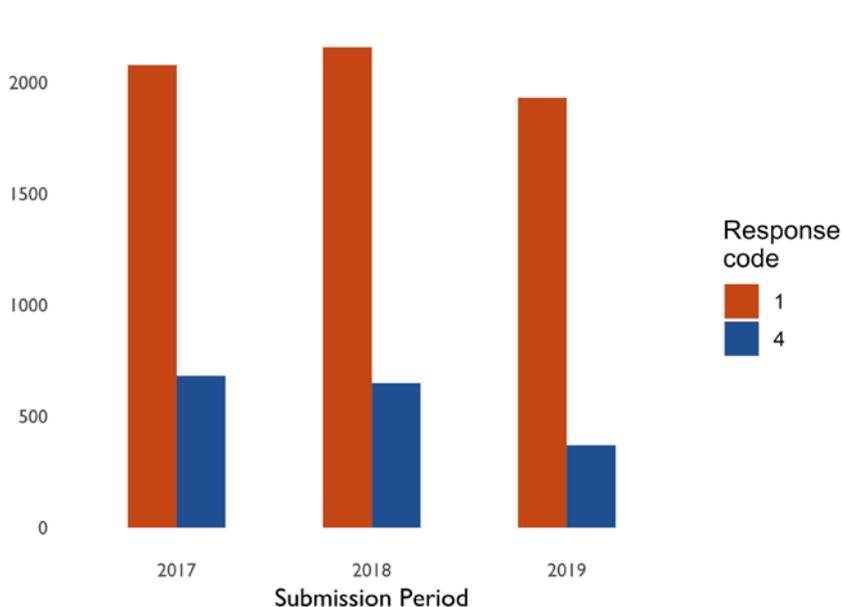
In each of the past three years a clear majority of research organisations (ROs) achieved 100% compliance rates for their response code 1 awards (Figure 6). 2019 saw an improvement, and there are now very few ROs that do not see all their awards submitted.

Figure 6. Submission status for research organisations (awards)
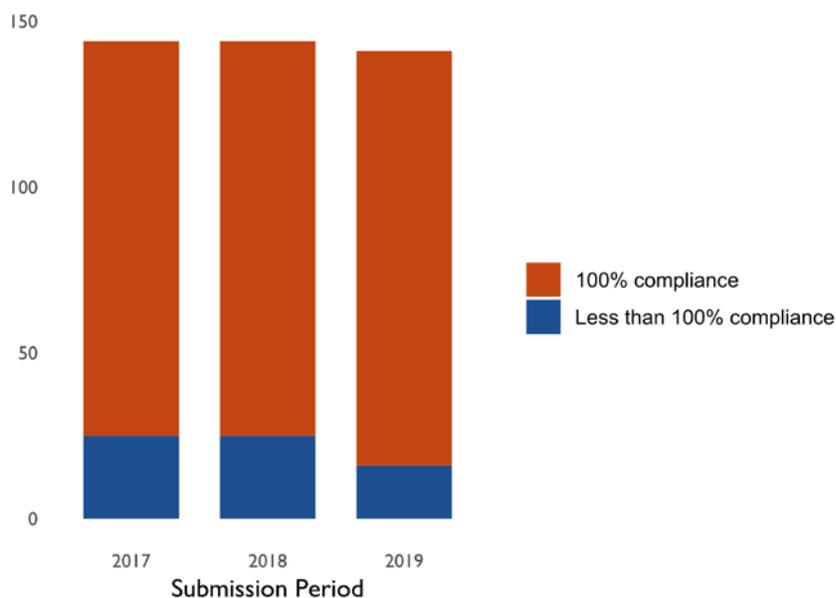
It is also possible to look at when exactly submissions are made. The heat map in Figure 7 shows that submissions followed a similar pattern over the past three years. In 2017, the median award was submitted 8.8 days before the end of the submission period. In 2018 this had risen to 9.1 days. In 2019 it was 9 days.

There a notable number of award holders submitting on the first day of the submission period, although this appears to be falling slowly. As expected, weekends see fewer submissions than week days. There is a quiet period for the first three weeks of the submission period (in terms of submissions made, users will be spending this time creating output records), before activity picks up again in the final three weeks, reaching a peak in the four days before the end of the submission period. Submission rates are no higher on the final day of the submission period than they are at any point during the final week.

Figure 7. Number of submissions made each day

Past three submission periods
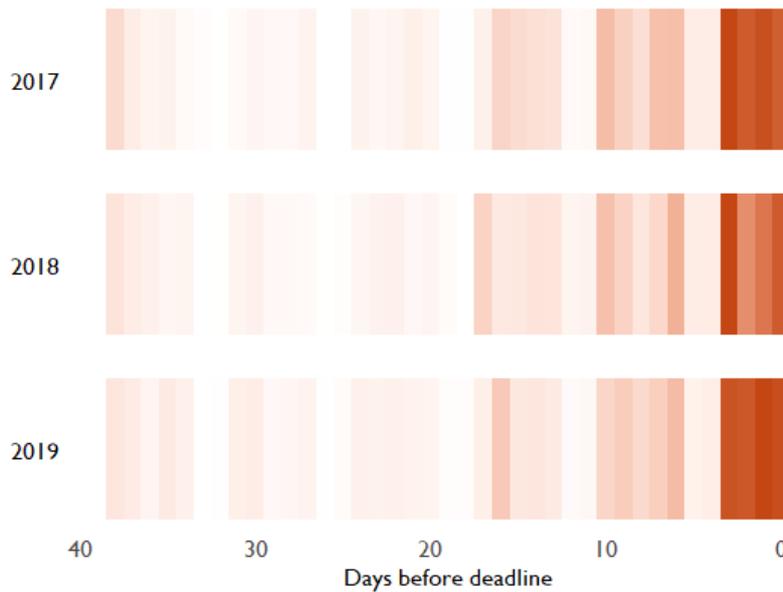
So far, submission rates for award holders have been discussed, but we also measure studentship compliance rates. Figures 8 and 9 summarise the compliance rates for students. The most obvious point is that rates are significantly lower than for award holders, but this is not a fair comparison to make. We do not require students to make a submission in the same way in which we require award holders to and ultimately studentship and award compliance rates are not directly comparable. Due to the lower compliance rate, fewer ROs see 100% of their students making a submission.
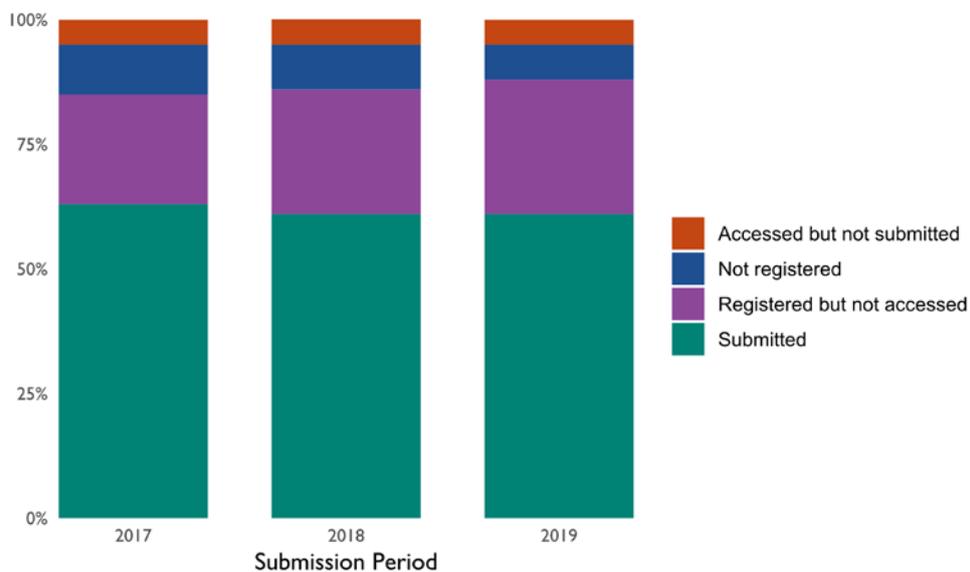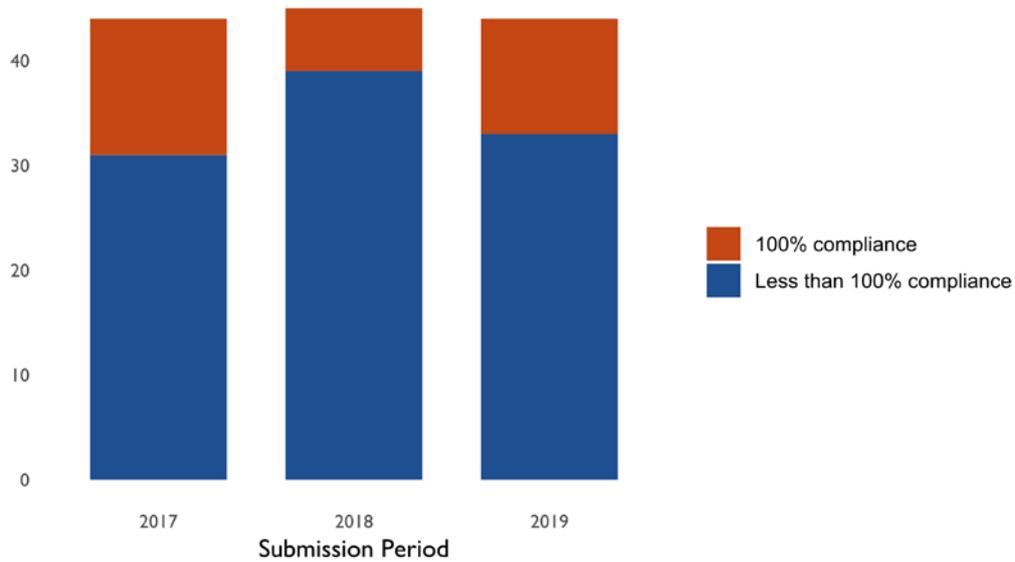
**Figure 8. Submission status of studentships**

Figure 9. Submission status for research organisations (studentships)


What outputs are reported?

The previous section focussed on who has submitted. This section examines what has been submitted. Our award holders have reported just over 200,000 outputs. The main types are recorded in Figure 10. Most are either publications (92,500) or engagement activities (75,500).

**Figure 10. Most common outputs in researchfish**
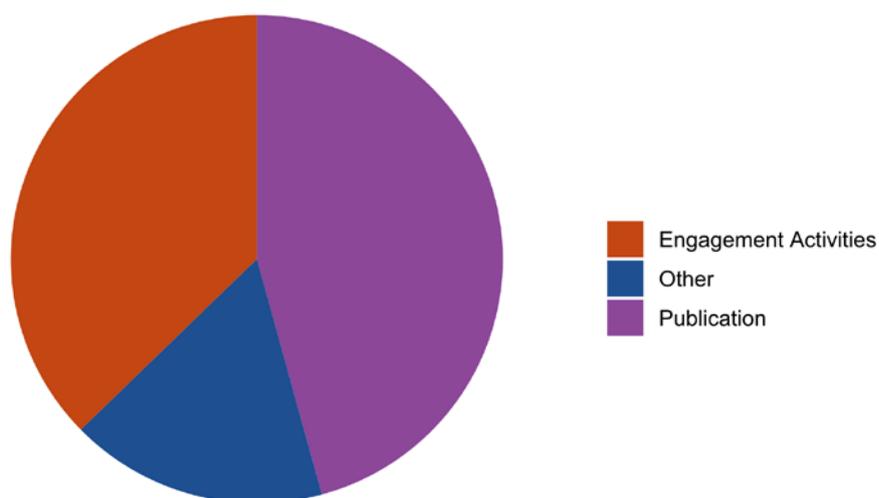
Other output types account for around 17% of all outputs, and four output types account for the majority of these (Figure 11). As reported previously, these are people focussed, rather than product focussed, outputs. The most common other outputs reported are collaborators (around 8100, part of 6600 collaborations) and policy influences (7000). Awards and recognitions (5900) and further funding (5700) are also also reported in high numbers. The most common product-focussed output is databases and models (2000).

**Figure 11. Number of 'other' outputs**
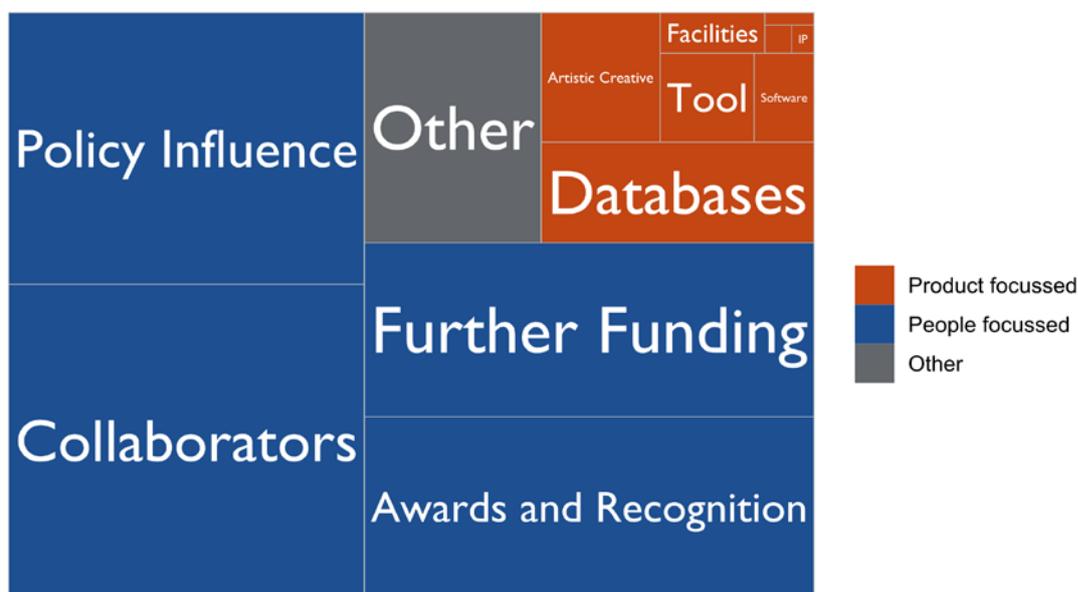
2019 saw 15% more outputs submitted overall compared to 2018, but this varies significantly by output type, as shown in Figure 12. Publications saw a very modest increase of 10% compared to a 33% jump in the number of tools and methods reported.

Figure 12. Percentage change in number of outputs in 2019
10 most common output types
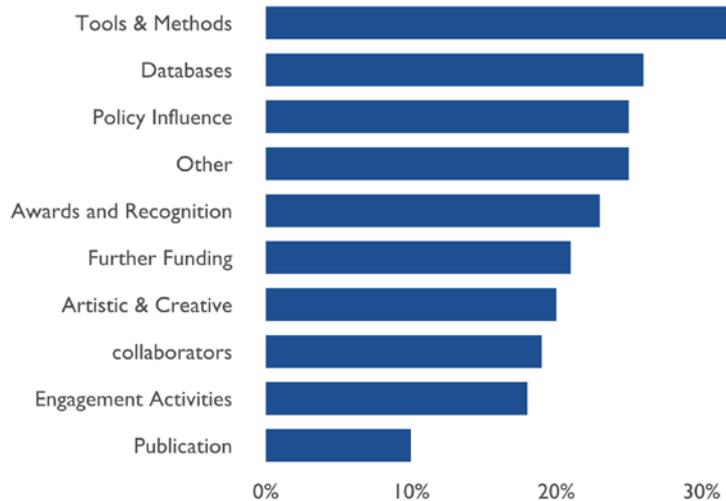

This is part of a slow but notable trend over the past several years towards a more diverse reporting picture (see Figure 13). In 2014 44% of new outputs were publications, in 2019 this had fallen to 31%. Over this period, engagement activities have grown from 37% to 44% and other outputs from 19% to 24%.

Figure 13. Change in type of outputs submitted
Past five submission periods

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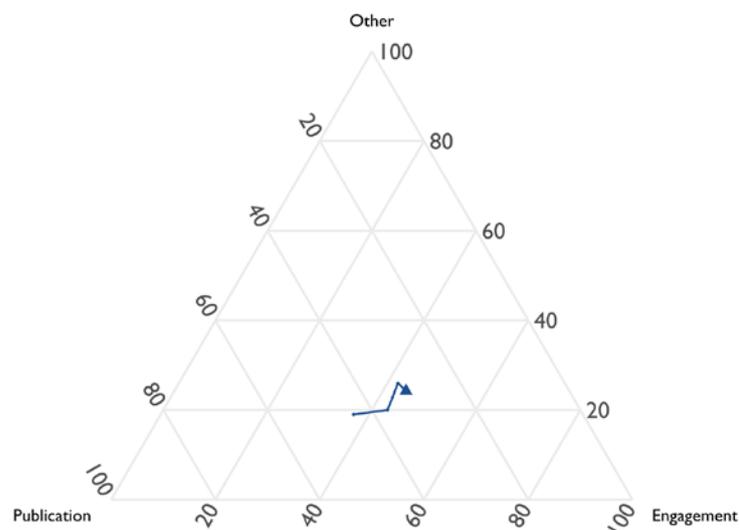
How is reporting spread across our portfolio?

There is a median of 10 and a mean of 34 outputs reported per award. The large difference in the mean and median suggests that a small number of awards report a very high number of outputs. This is confirmed in Figure 14. While there is a positive relationship between the number of outputs reported, there are several moderately sized awards that reported a very high number of outputs.

Figure 14. Plot of award value and number of outputs reported
With least-squares regression line
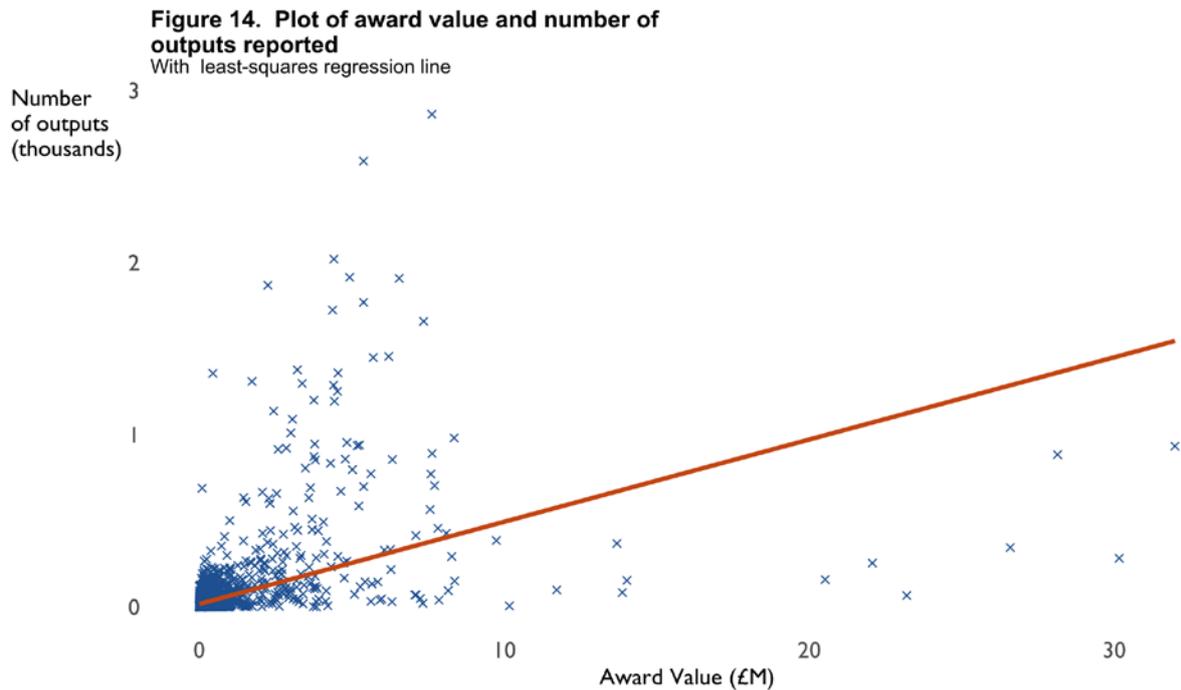
This is, of course, because award value is not the only predictor of the number of outputs an award will generate. We have funded many output focussed awards, such as seminars, over the years. These are often small awards that generate far more outputs per pound than standard research grants.

We can remove the effect of award value by using the output rate, defined as the number of outputs reported per £100,000 of award value. The mean output rate is 33.6 and the median is 12.9. Figure 15 gives this rate over a selection of ESRC funding schemes. As can be seen, the rate varies substantially across the schemes, with two of our output focused schemes, knowledge exchange opportunities and seminars, having very high output rates whereas our largest investments, centres, and the bulk of our funding, research grants, having much lower output rates.

Figure 15. Average output rate by select award types
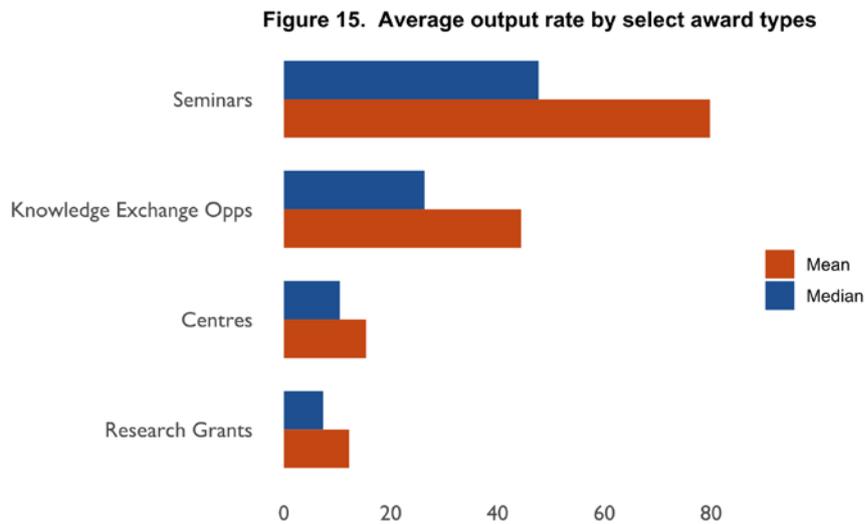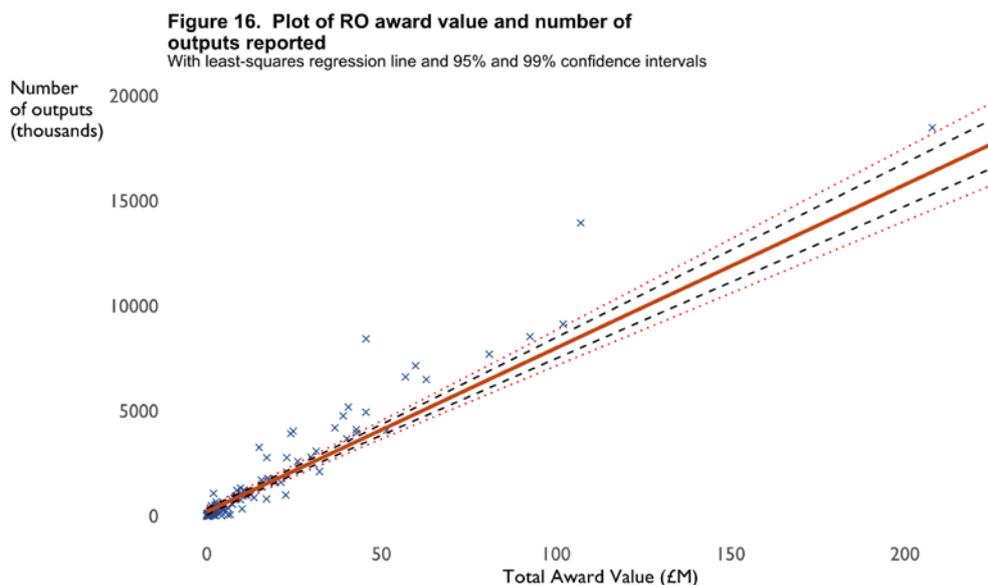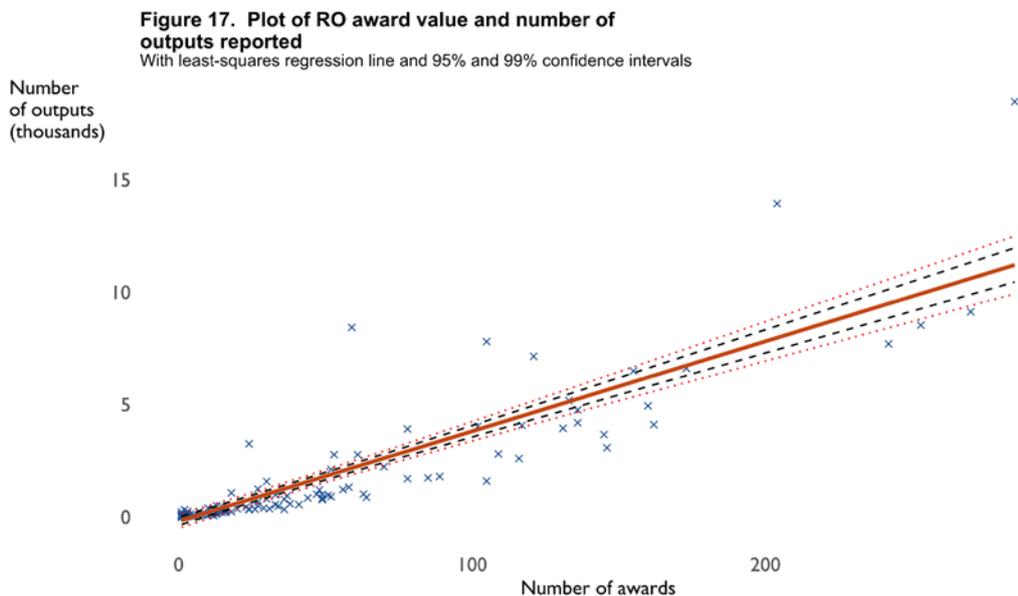

Figure 16 groups awards by RO. This will somewhat mitigate the effects of the type of award on the number of outputs reported, as ROs will generally have been funded in a range of award types. Indeed, the relationship between award value and number of outputs becomes highly correlated at the RO level. Notable outliers are ROs that hold specialist awards, for example ROs that specialise in running high value centres have a lower output rate than total award value would predict, in line with the findings in Figure 15.

Figure 16. Plot of RO award value and number of outputs reported
With least-squares regression line and 95% and 99% confidence intervals

There is a slightly weaker relationship between number of awards held by an RO and number of outputs reported, with several ROs reporting many more outputs than their number of awards would predict (Figure 17).

Figure 17. Plot of RO award value and number of outputs reported
With least-squares regression line and 95% and 99% confidence intervals

Not all awards report all output types. Figure 18 indicates that most awards report publications, and over half report engagement activities. No other output type is reported by more than a quarter of awards.

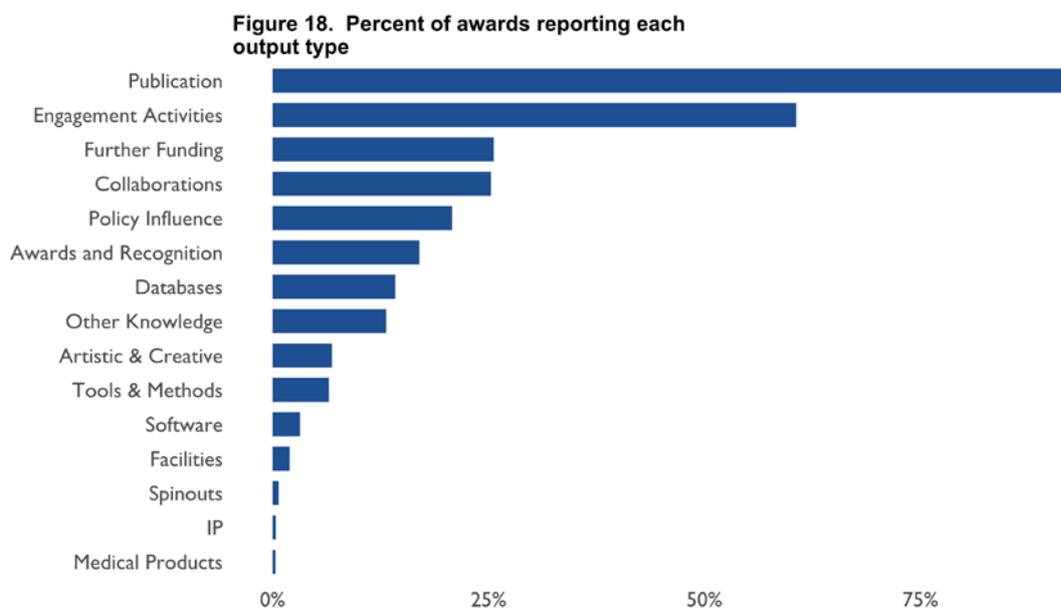**Figure 18. Percent of awards reporting each output type**

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Figure 19 provides the average number of outputs reported, for all awards reporting that output type. Awards reporting publications and engagement activities report these outputs in higher volumes than is the case for other output types, and the average number reported is very similar for engagement activities and publications.


Figure 19. Average output rate by output type
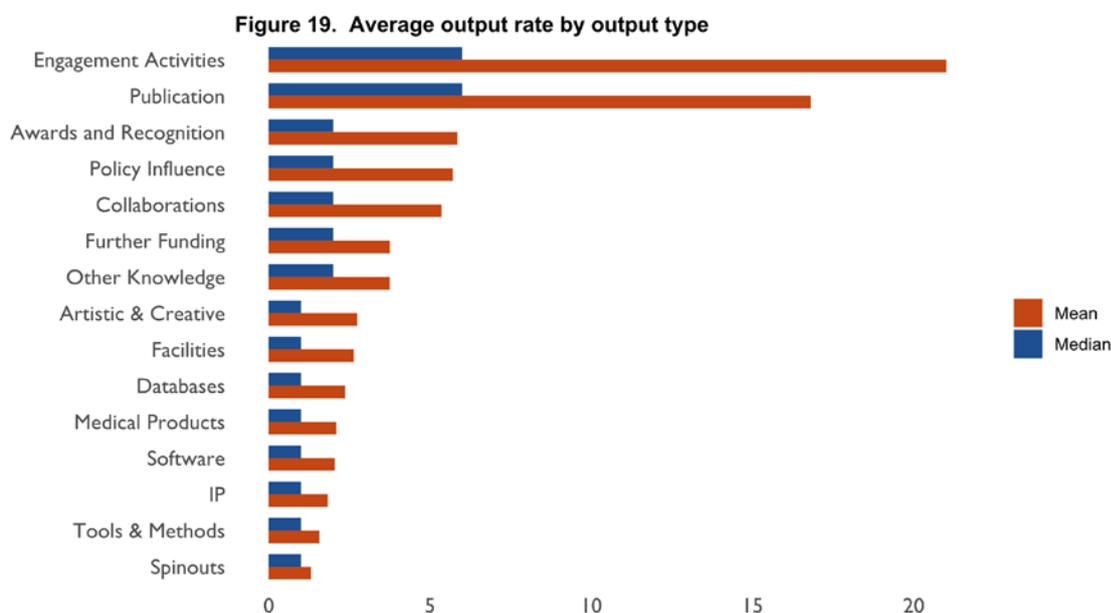
All output types have a higher mean than median value. This suggests that a small number of awards must report a much higher number of outputs than the median award, skewing the average. This concentration of reporting can be summarised with Gini coefficients, found in Figure 20. It is our highest volume outputs, engagement activities and publications, that have the highest Gini coefficients. This means that, while these outputs are reported by the widest number of awards, their reporting is also more highly concentrated within a small number of awards.

Figure 20. Gini coefficients for the concentration of output reporting by type
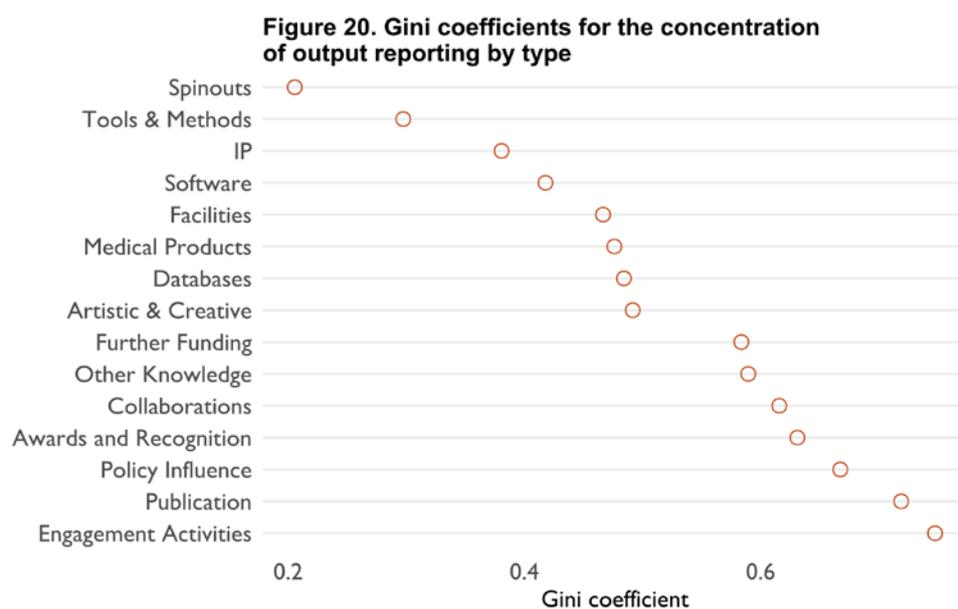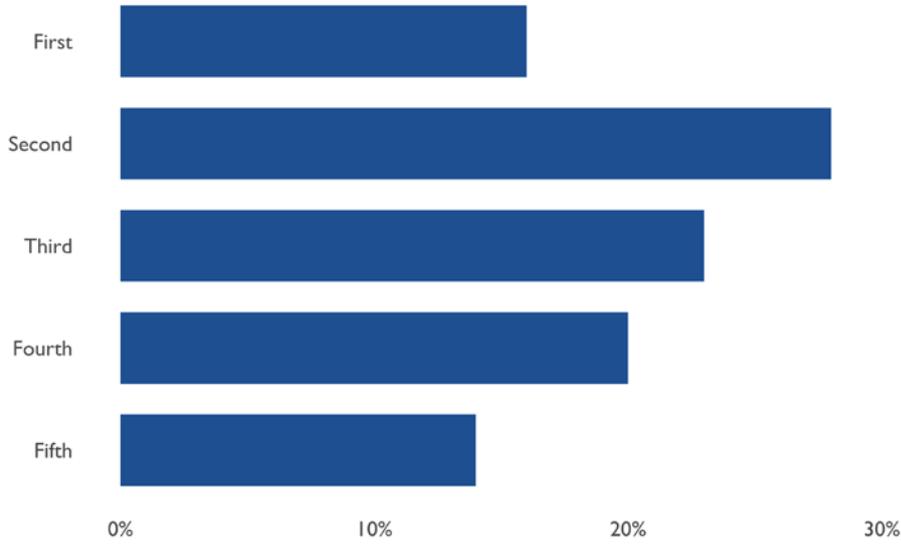
When are outputs reported?

Figure 21 illustrates that a significant number of outputs reported in researchfish were originally imported into researchfish from our previous reporting system, more than has been added in any single submission period since. This makes sense, as these imported outputs covered a long period before researchfish was in use. Since then there has been no trend in the number of new outputs reported in each submission period, varying from 22,000 to 35,000 new outputs each year.

Figure 21. Number of new outputs reported in each submission period
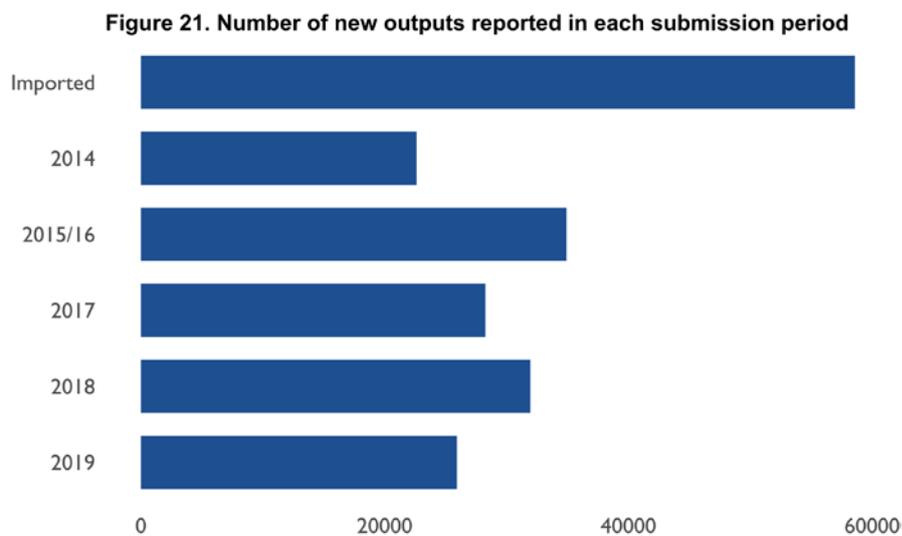
Another way to examine trends over time is whether an award is reporting an output in its first submission period or not. To make this a meaningful measure, Figure 22 takes a subset of the data; the 573 awards that were first added to researchfish in 2014 (not imported from the previous system) and made submissions each year from 2014 to 2019. These awards have reported 28,525 outputs in total.

As can be seen, a clear trend emerges. Awards report fewer outputs in the first submission period, when their research is just getting going. This increases dramatically in the second submission period before slowly falling in each year after that.

Figure 22. Award's submission period in which output is first reported

This reporting behaviour varies across output types. Artistic and creative products are the most likely to be reported in the first submission period (30%) whereas less than 10% of awards and recognitions are.

Figure 23. Percentage of outputs reported in first submission period
10 most common output types
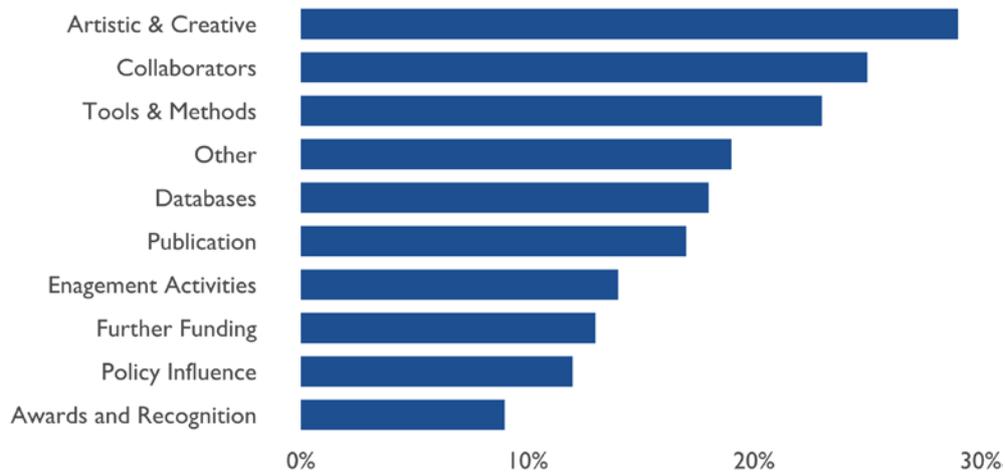
Conclusion

This analysis has built upon our previous researchfish analysis, both to provide an update following the 2019 submission period and to give further insights into the ways in each our community reports outputs to us.

It has highlighted that students make up a significant proportion of the people we ask to make a submission to researchfish, alongside our principal investigators and fellows. Our award holder compliance rates continue to improve and nearly 97% of those required to make a submission do so. Nearly all ROs achieve 100% compliance rates. Studentships have a lower compliance rate, but this reflects the fact that we have different reporting requirement for students compared to our award holders.

Most of the outputs reported are either publications or engagement activities, but a steadily increasing proportion of outputs are reported in other categories. These other outputs are usually in people focussed categories such as collaborations and policy influence rather than physical products, an expected finding for our social science community.

Award value is related to the number of outputs reported, but there are clearly other factors at play which means that this relationship is not strong or straight forward. Further investigation is required into what factors influence the number of outputs reported.

Finally, with five researchfish submission periods now complete, we are starting to see trends in the reporting of outputs, with award holders reporting more outputs during their second submission than any other, but with output generation from the offset and lasting well into the fifth year. Further insights are expected at the individual output type level, with this report hinting at different reporting timeframes for different output types.