Prison population projections: November 2023 edition

Scottish Government
Riaghaltas na h-Alba

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This report presents short term prison population projections for the six month period from October 2023 to March 2024. This is the second issue of projections to be published since the COVID-19 pandemic. They have been produced using 'microsimulation' scenario modelling which simulates prison arrivals and departures, to estimate the number of individuals in prison on a particular date in the future. The first issue of the Scottish prison population projections[1] provided a detailed overview of the modelling technique used.

The projections are produced to help inform decision making, planning and policy development. These projections do not take account of the complexity of the prison population (as this is not the intention) and are meant for high level policy development rather than for day to day management of those in prison.

1 Key Points

The latest prison population projections to March 2024 show that:

- The overall prison population in Scotland is most likely to either remain stable or rise slightly between October 2023 and March 2024, with a projected range of between 7,500 and 8,650 for the average daily prison population in March 2024. On 1st October 2023, the prison population was around 7,950.

- It is most likely that the remand population will remain stable but it may increase or decrease between October 2023 and March 2024. If it decreases because of enhanced monthly case conclusions, this may contribute to an increased sentenced population as more individuals transition from remand.

- It is most likely that the sentenced population will either remain stable or rise slightly; it may rise if the overall rate of transition from remand to the sentenced population increases or if there is a greater inflow of individuals directly from the community into the sentenced population.

There is uncertainty in the prison population projections over the next six months due to several factors, especially around the turn of the year when the population historically

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[1] For more information, refer to https://www.gov.scot/publications/scottish-prison-population-projections/.

has tended to fluctuate rapidly during the months of December and January[2], and variability in both court case registrations and throughput.

2 Background

The 'microsimulation' scenario modelling approach adopted for producing the projections, simulates arrivals and departures of individuals to and from the prison population and then estimates the number of individuals in prison on a particular date in the future. The microsimulation model uses individual-level data to construct a representation of the population of interest. The model can simulate, using known probabilities, changes in individuals' status over time[1].

To produce outputs, the model draws on particular court activity data, for example, levels of court hearings at different stages (pre-trial/trial) in High Court, Sheriff Court Summary and Sheriff Court Solemn. This data is used to estimate levels of remand arrivals in the coming months. The model includes assumptions on future court capacity, as these are currently the most important factor that is likely to impact on prison population changes in the short/medium term. The model does not currently simulate flows for different crime-types, so crime-based trends are not explicitly modelled. As the model can be validated against historical data and can reflect a wide variety of dynamics, it is suitable for forecasting both in the short and medium term. However, due to uncertainty underlying the justice system's recovery (e.g., the rate at which court backlogs can be tackled) which impacts the model's assumptions and longer-term predictive power, currently only a 6-month projection is provided.

The rest of this report is organised as follows. Section 3 provides a brief overview of the prison population from 2020 to 2023 and court demand trends from 2014-15 to 2022-23. Section 4 provides an overview of the assumptions used to project the prison population and explains how the model's previous projections are validated for robustness against actual prison population figures in recent months. Section 5 summarises the population projection results for the period from October 2023 to March 2024. Section 6 concludes the report and briefly discusses factors which may influence the size of the prison population in the longer term.

3 Overview of Scottish Prison Population and Court Demand Trends

Figure 1 shows that since 2020 there have been substantial changes to the total, remand, and sentenced populations during and after the pandemic. The prison population was relatively stable (within the range 7,350 to 7,650) from September 2020

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[2] Seasonal trends for the prison population since the COVID-19 pandemic indicate some very general similarities at the turn of the year. The sentenced population around late November/early December tends to increase, then between Christmas and the first week of January steeply decrease. The remand population tends to reduce from late November/early December, then tends to increase sharply before stabilising between Christmas and New Year. The total population tends to fall slightly in late November/early December, then falls more sharply in late December before recovering somewhat by early February.

until late 2022. Subsequently it rose substantially; between 1st Feb 2023 and 1st October 2023 it increased by over 500 from 7,400 to almost 7,950. The remand population increased at the beginning of 2022, reaching a high of nearly 2,300 on 1st February 2022, then decreased gradually (other than around December 2022/January 2023), reaching just over 2,100 on 1st April 2023. Between April and May 2023 the remand population increased, to just over 2,250 on 1st June 2023. From June the remand population remained relatively stable, and was around 2,200 on 1st October 2023. The sentenced population decreased gradually throughout 2022, from around 5,350 in January 2022 to around 5,250 in December 2022. The sentenced population has increased during 2023 from 5,250 on January 1st 2023 to 5,750 on October 1st 2023.
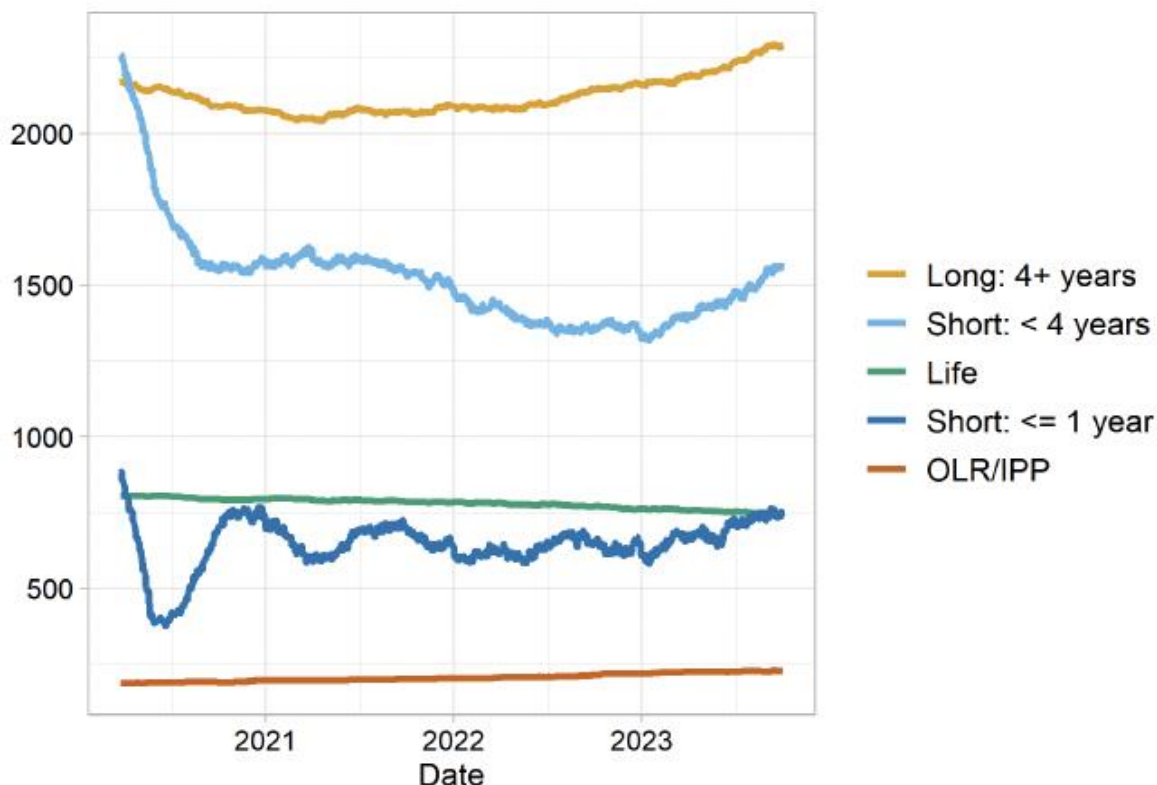
Figure 1. Prison population (total, remand and sentenced), between 26th March 2020 and 1st October 2023[3].

Total population

Sentenced population
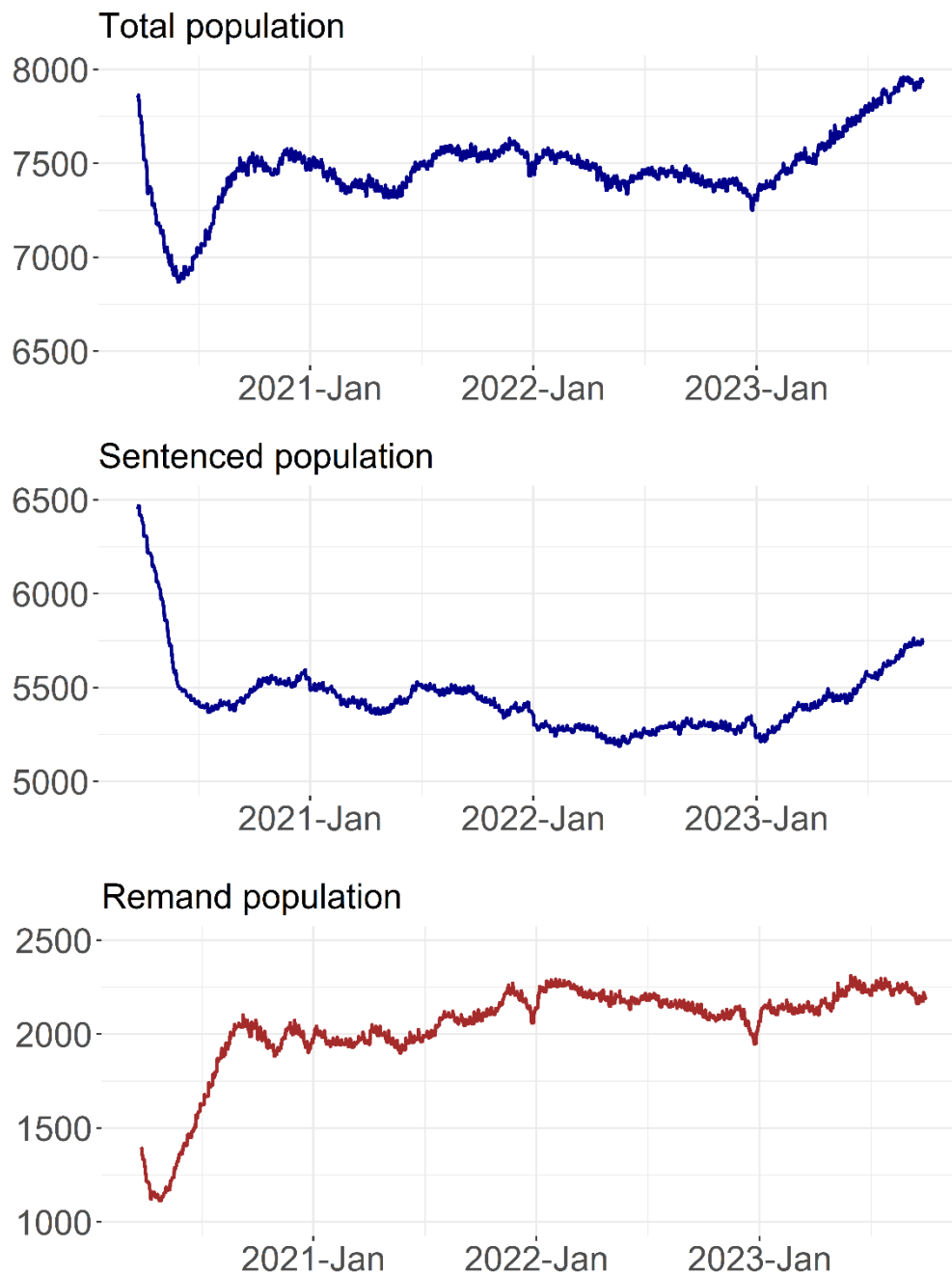
Remand population

[3] Breakdown of total, remand and sentenced prison population, Justice Analytical Services: safer communities and justice statistics monthly reports - gov.scot (www.gov.scot).

Growth in the sentenced prison population during 2023 varies by sentence length, as shown in the chart below. The population serving sentences of less than or equal to one year increased in the first months of 2023; although more recently that population has started to fall[4]. The population serving sentences of one to four years has increased during 2023. The population serving overall sentences of more than four years, as well as those serving Orders of Lifelong Restriction, have seen continuous increases over a longer period and now exceed pre-pandemic levels. The population serving life sentences has seen a small gradual decline since 2020 (which has continued in 2023).

Figure 2. Prison populations by overall sentence, 26th March 2020 to 1st October 2023[5].

The growth in the total prison population has been driven by a rise in both remand and sentenced arrivals to custody[4]. The rate of remand arrivals is influenced by the level of new cases registered and cases concluded in Scottish Courts[6]. The level of court throughput (case conclusions) also has implications for the flow into the sentenced population. The Scottish Courts and Tribunals Service (SCTS) frequently publish

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[4] Prison population monthly report, October 2023, Justice Analytical Services: safer communities and justice statistics monthly reports - gov.scot (www.gov.scot).
[5] Prison population by sentence, October 2023, Prisons - Justice Analytical Services (JAS) Safer Communities and Justice Statistics Monthly Data Report : October 2023 edition - gov.scot (www.gov.scot)
[6] Management Information from the Scottish Court and Tribunal Service (SCTS Official Published Statistics (scotcourts.gov.uk)) includes information about the arrival and liberty status for criminal case new business. This information includes the proportion who are on remand following Sheriff Court Summary First Calling (First Appearance), which have been broadly stable, ranging between 5.7 and 6.0% respectively during the past three years.

information on the level of registrations and conclusions across all courts[7]; the charts below show registrations and conclusions for High Court, Sheriff Court Solemn and Sheriff Court Summary. Figure 3 shows the number of High Court indictment registrations between 2014/15 Q1 and 2022/23 Q1. There were 939 High Court indictments in 2022/23, which was an increase of 26% compared to 745 in 2021/22. As shown in figure 4 the introduction of a further 2 additional High Court trial rooms in April 2023[8] has coincided with the highest level of conclusions in any quarter since at least 2014/15 Q1. Similarly, as shown in figure 6, following the introduction of 6 further Sheriff Court Solemn trial courts from April 2023 conclusions in 2023/24 Q1 were elevated to become higher than at any time since at least 2014/15 Q1. Case registrations (see figure 5) in Sheriff Solemn have also been high recently; the level in 2023/24 Q1 of over 1,900 indictments was the highest of any 3 month period since at least 2014/15 Q1.

Figure 3. High Court Indictments registered[9].

High Court - Indictments Registered

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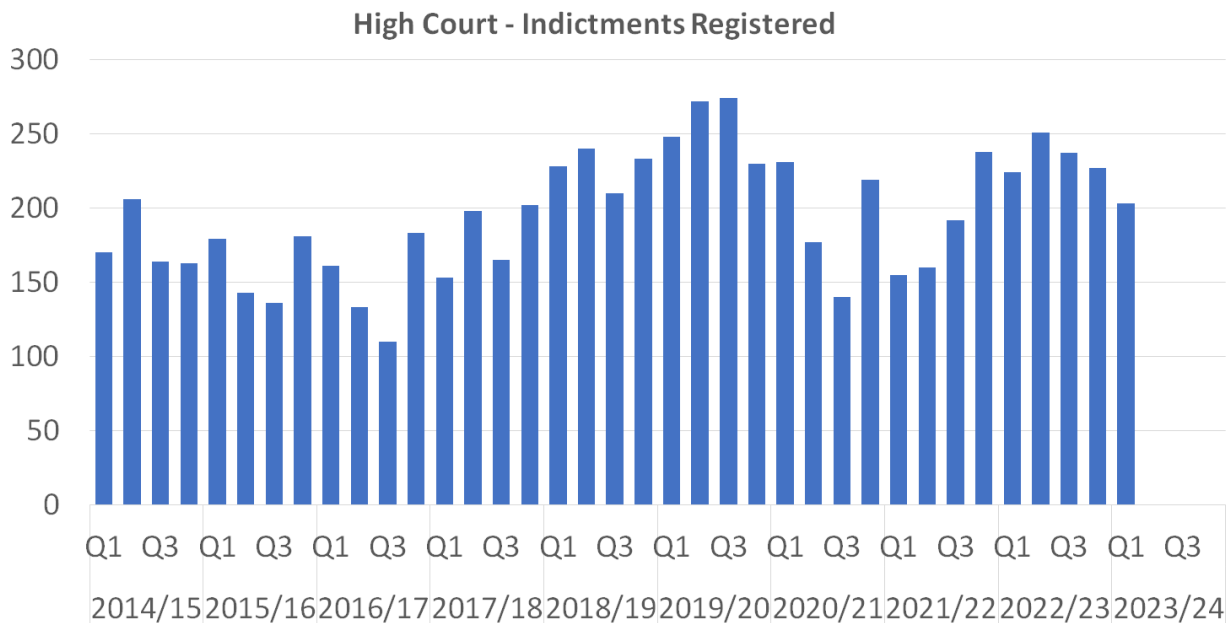
[7] SCTS official statistics, MI and analysis, SCTS Official Published Statistics (scotcourts.gov.uk).
[8] April 2023 SCTS switch of court recovery resources from summary to solemn, 25th April 2023, Monthly information on Criminal Case Throughput for March 2023 (scotcourts.gov.uk).
[9] SCTS QCC bulletin, 7th September 2023, High Court (QCC 2b), SCTS Official Published Statistics (scotcourts.gov.uk).

Figure 4. High Court Indictments concluded[10].
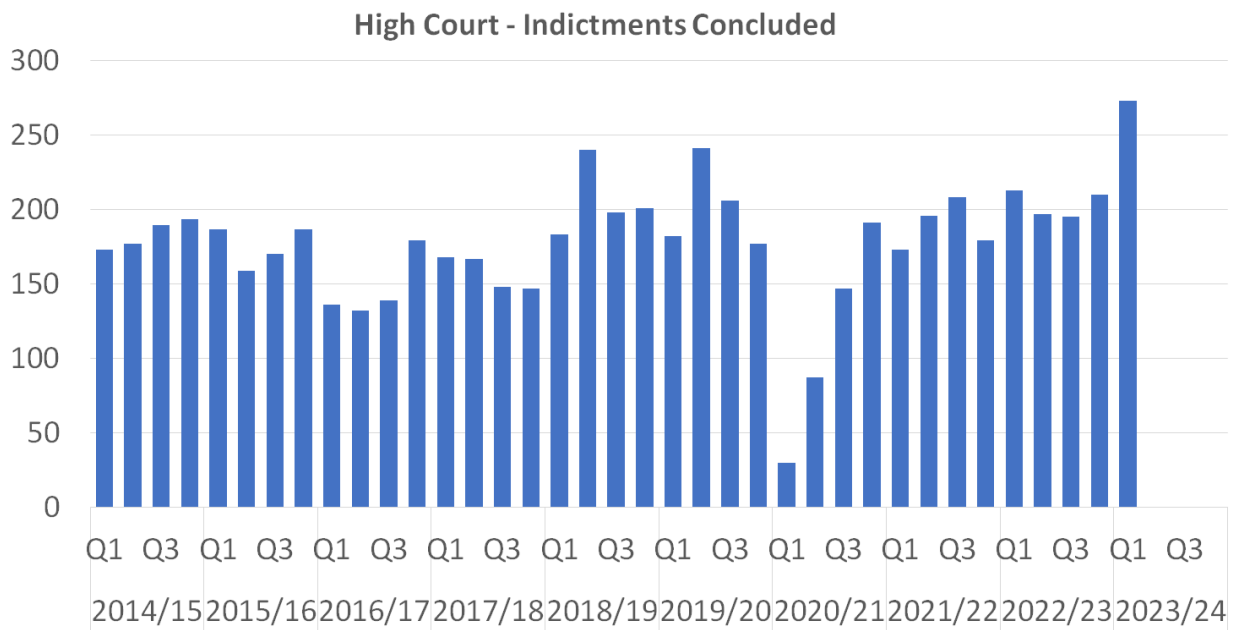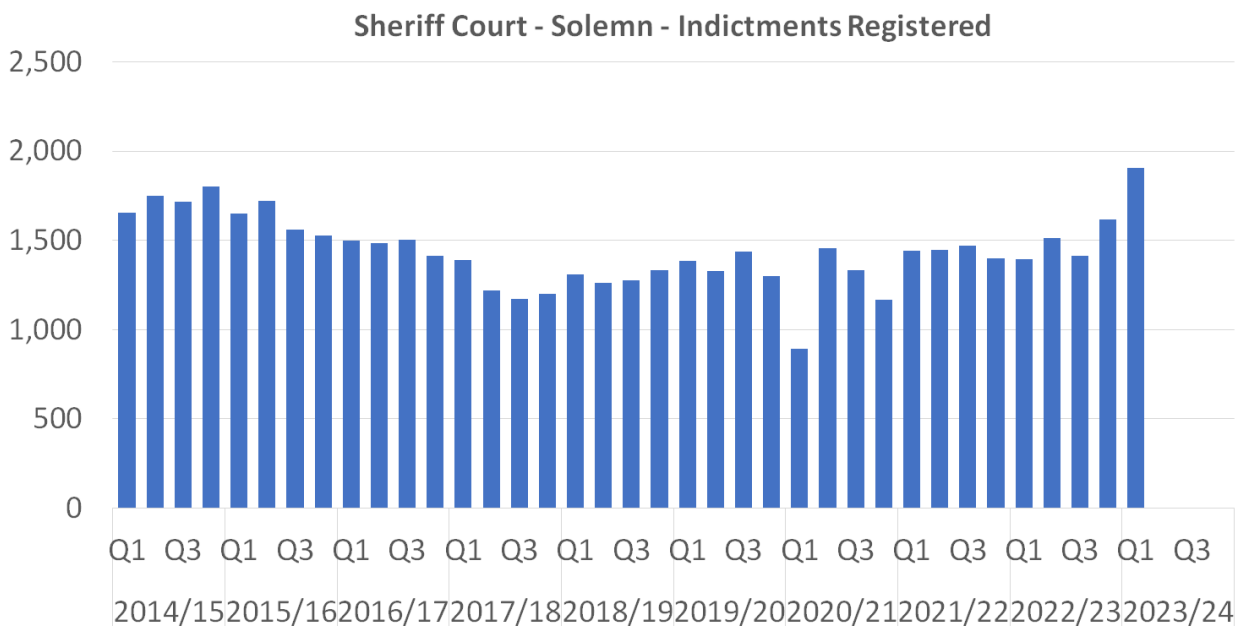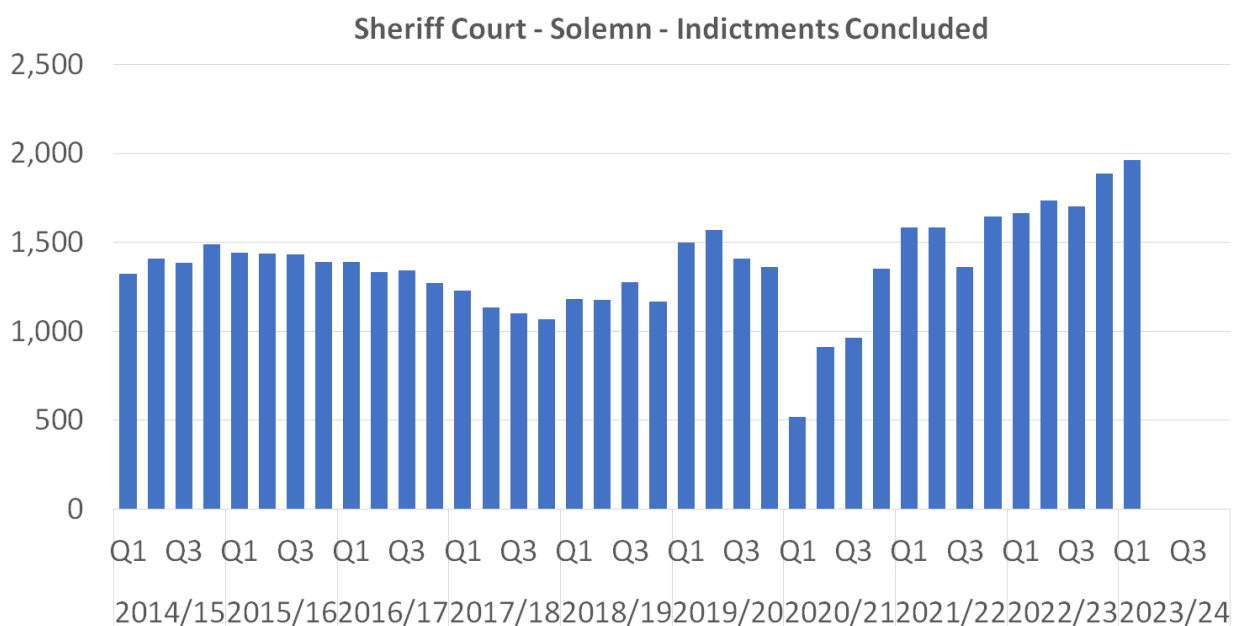

Figure 5. Sheriff Court Solemn indictments registered[11].

[10] SCTS QCC bulletin, 7th September 2023, High Court (QCC 2b), SCTS Official Published Statistics (scotcourts.gov.uk).
[11] SCTS QCC bulletin, 7th September 2023, Sheriff Court Solemn (QCC 3b), SCTS Official Published Statistics (scotcourts.gov.uk).

Figure 6. Sheriff Court Solemn indictments concluded[12].

Sheriff Court - Solemn - Indictments Concluded

The level of complaints registered in Sheriff Summary Courts has been increasing in recent quarters (see figure 7), and was at its highest level in 2023/24 Q1 since 2020/21 Q2. At 15,184, the number of Sheriff Summary complaint conclusions (see figure 8) was just over 10% lower in 2023/24 Q1 than 2022/23 Q1 (16,970).

Figure 7. Sheriff Court Summary complaints registered[13].

Sheriff Court - Summary - Complaints Registered

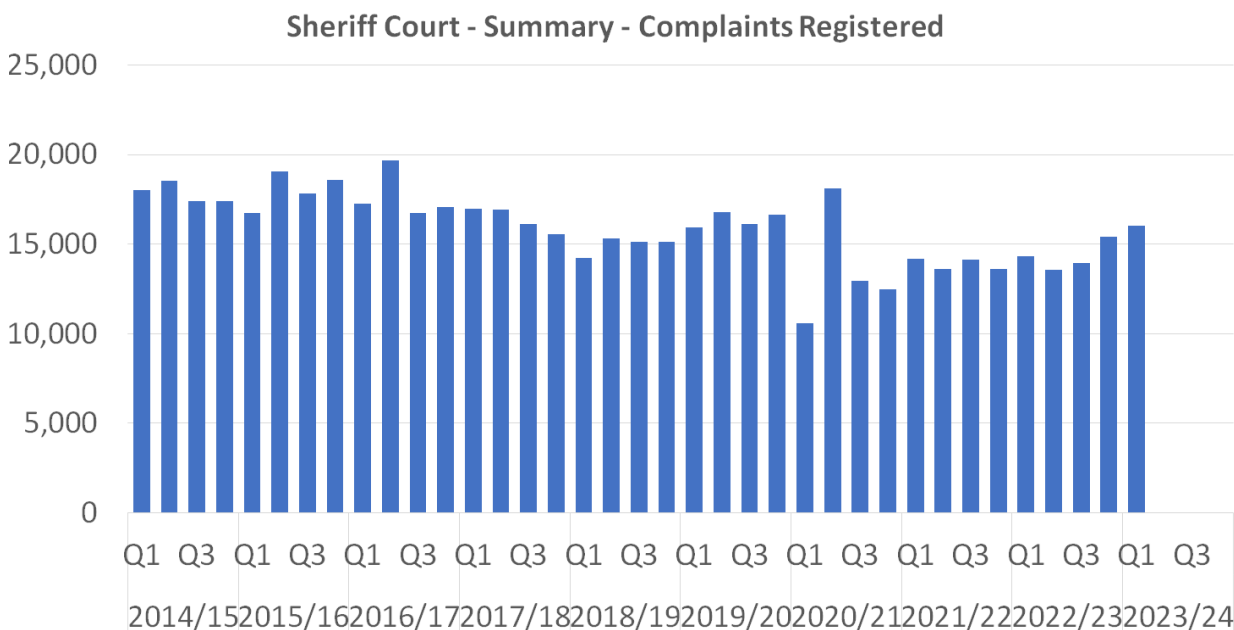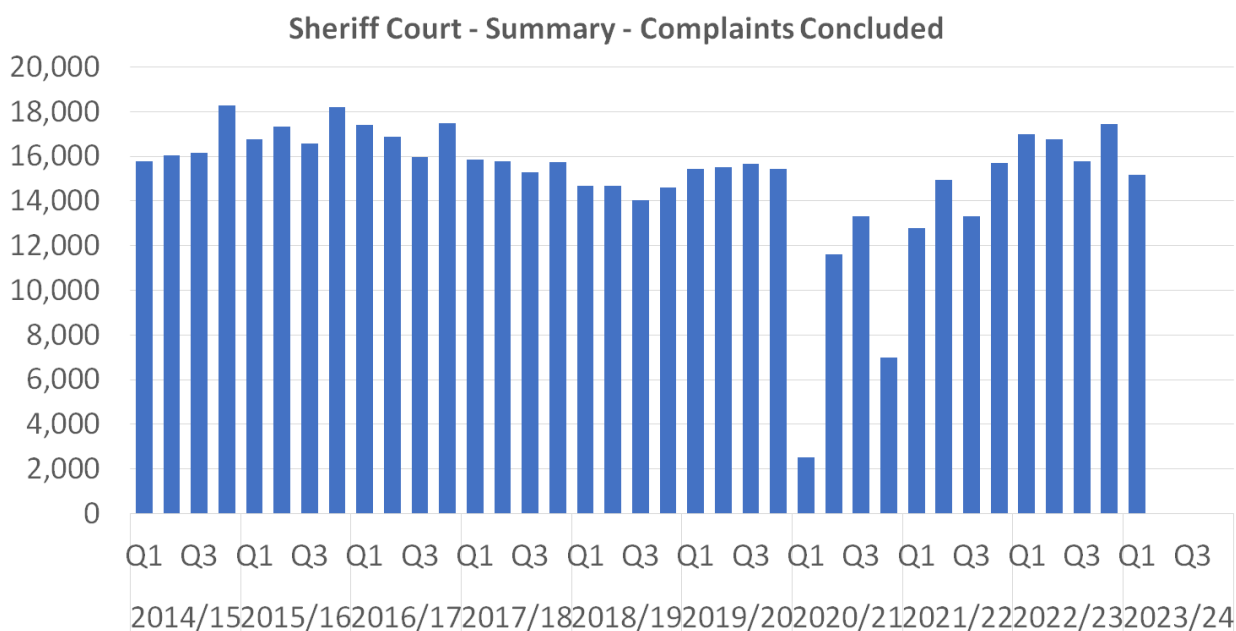[12] SCTS QCC bulletin, 7th September 2023, Sheriff Court Solemn (QCC 3b), SCTS Official Published Statistics (scotcourts.gov.uk).
[13] SCTS QCC bulletin, 7th September 2023, Sheriff Court Summary (QCC 4b), SCTS Official Published Statistics (scotcourts.gov.uk).

Figure 8. Sheriff Court Summary complaints concluded[14].

Sheriff Court - Summary - Complaints Concluded

Taking all courts into consideration case registrations and throughput have contributed to an elevated level of remand and sentenced arrivals in the early part of 2023/24.

SCTS monthly management information[15] shows that the national total trials scheduled across all criminal courts increased steeply, due to the effects of the COVID-19 pandemic, by around 140% from 18,100 in April 2020 to over 43,600 at its peak in January 2022. By the end of March 2023 it had fallen to less than 28,000. Recently, the number of outstanding trials in High Court (see figure 9) decreased by 5% from 687 to 654 during 2023/24 Q1. Similarly, the number of Sheriff Solemn outstanding trials (figure 10) decreased 7% during 2023/24 Q1. As figure 11 shows, the number of Sheriff Summary trials outstanding increased slightly between the end of 2022/23 Q3 and the end of 2023/24 Q1.

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[14] Sheriff Court Summary (QCC 4b), SCTS Official Published Statistics (scotcourts.gov.uk).
[15] SCTS QCC bulletin, 7th September 2023, National Overview of criminal court cases in Scotland (QCC 1a), SCTS Management Information, SCTS Official Published Statistics (scotcourts.gov.uk).

Figure 9. High Court scheduled trials at end of period[16].
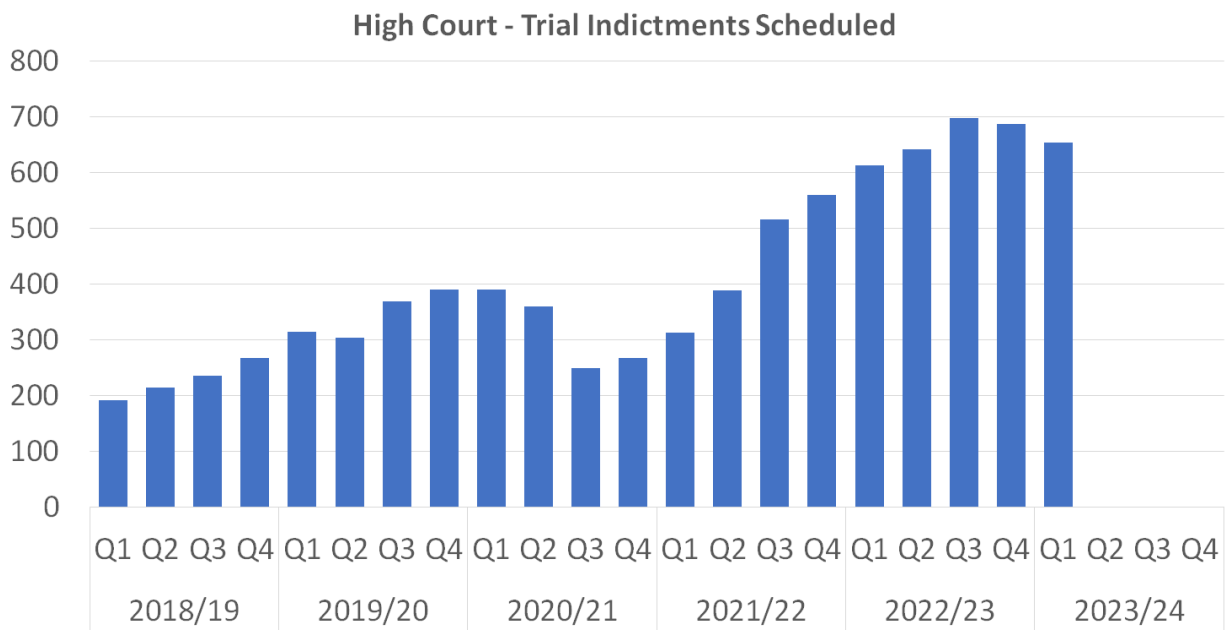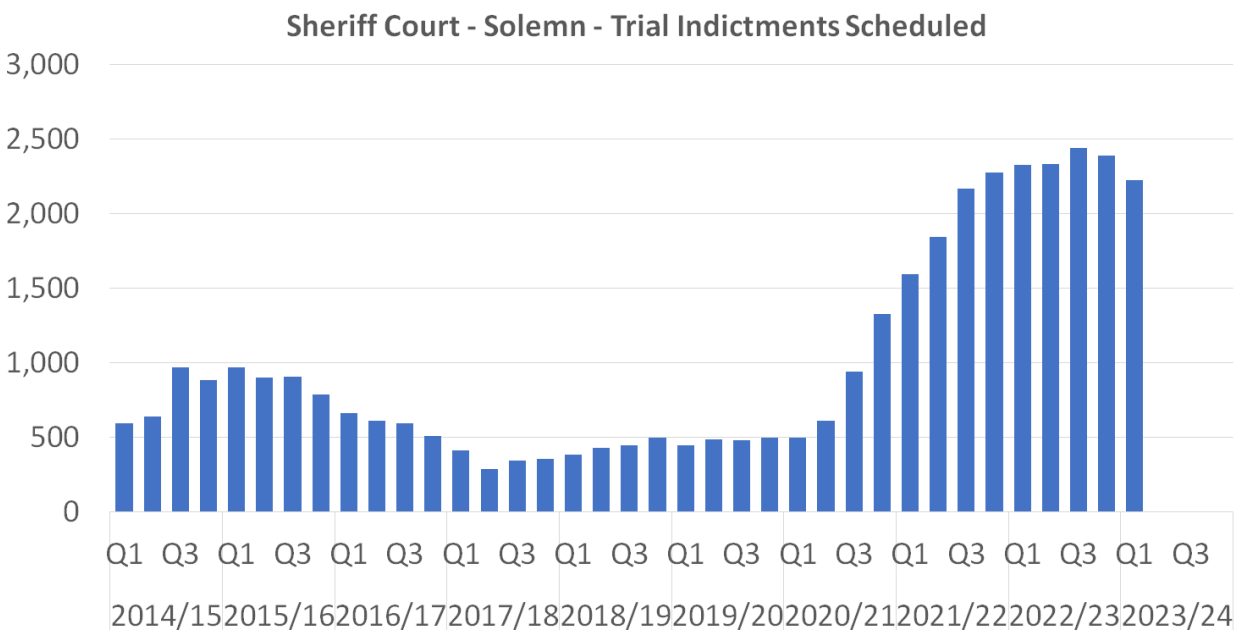

Figure 10. Sheriff Court Solemn scheduled trials at end of period[17].

[16] SCTS QCC bulletin, 7th September 2023, High Court trial indictments scheduled (QCC 2b), SCTS Official Published Statistics (scotcourts.gov.uk).
[17] SCTS QCC bulletin, 7th September 2023, Sheriff Court Solemn trial indictments scheduled (QCC 3b), SCTS Official Published Statistics (scotcourts.gov.uk).

Figure 11. Sheriff Court Summary scheduled trials at end of period[18].

Sheriff Court - Summary - Trial Complaints Scheduled

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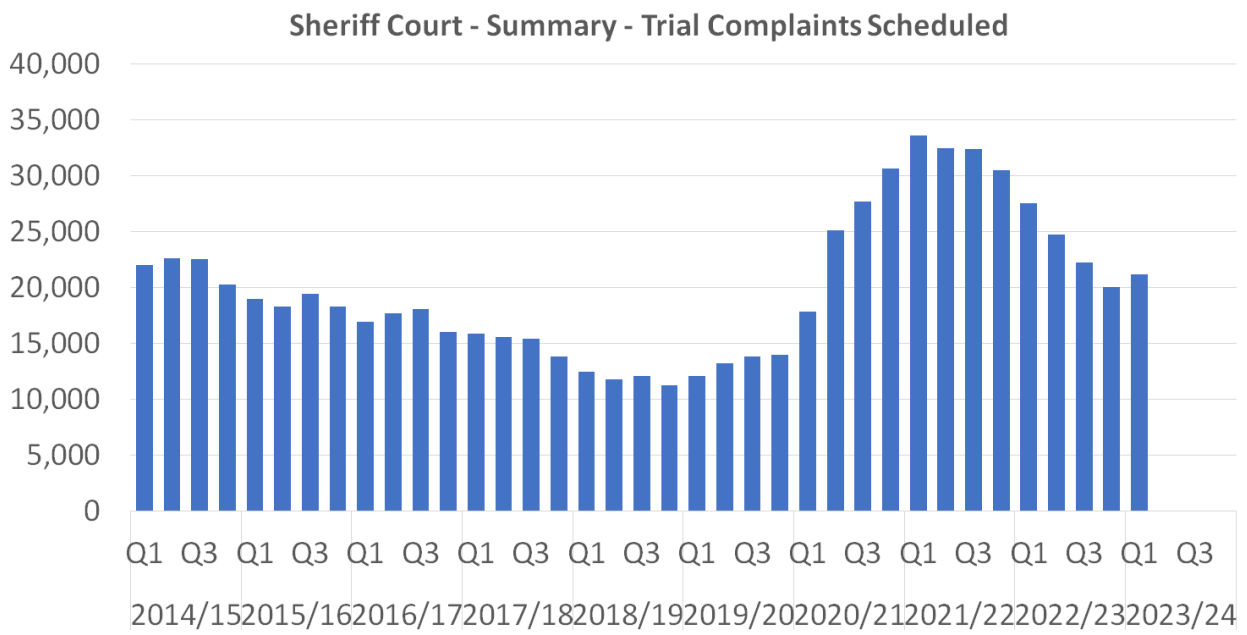
[18] SCTS QCC bulletin, 7th September 2023, Sheriff Court Summary trial indictments scheduled (QCC 4b), SCTS Official Published Statistics (scotcourts.gov.uk).

4 Introduction to Prison Population Projections

This section provides an overview of the assumptions and scenarios developed to project the prison population and explains how the model's previous projections are validated for robustness against actual prison population figures in recent months. The first issue of the Scottish prison population projections[19] provides a more detailed overview on the modelling technique used.

Model Assumptions and Scenarios

The scenarios on which the projections are based rely on a variety of assumptions about how the rate of transitions into and out of the prison population might change. These can be influenced by trends and planned changes to the court system, including: court capacity changes, increased court conclusions rate, increased remand arrivals, remand/bail mix and prioritisation of remand case progression through courts. Departures from the sentenced population are estimated using a combination of court disposal data and snapshots of the prison population.

Due to the level of the flows which have contributed to growth in the sentenced and remand populations since early 2023, and the abrupt seasonal population changes which are likely around the end of December 2023 and the beginning of January 2024[20], additional scenarios have been developed. In the previous publication only low, central and high court throughput scenarios were considered. In addition to these three court throughput scenarios, there are now six new scenarios featuring varying remand arrivals (low, central and high) combined with court throughput variation. A full breakdown of all nine scenarios is given in table 1. These additional scenarios are intended to account for uncertainty in future remand arrivals, especially in early 2024. This is because unlike during 2022 when it decreased, the remand population has increased over the course of 2023 so far. Additionally, case registrations in Sheriff Summary and Sheriff Solemn were higher in Q1 2023/24 than during Q1 2022/23[6].
Three variations of remand arrivals have been used for the scenarios: central, higher and lower. The central remand arrivals scenario assumes remand arrivals will be similar over the next few months to what they were between October 2022 and September 2023. The higher remand arrivals scenario assumes the rate will be similar to the levels from March 2023 to August 2023, and the lower scenario assumes remand arrivals around the lower levels between October 2022 and March 2023.

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[19] Scottish Government Prison Population projections, 1st June 2023, Scottish prison population projections - gov.scot (www.gov.scot).
[20] Seasonal trends for the prison population since the pandemic feature some general similarities around the turn of the year. The sentenced population around late November/early December tends to increase and then between Christmas and the first week of January decrease steeply. The remand population tends to reduce from late November/early December, tends to increase sharply and then stabilise between Christmas and the New Year. The total population tends to fall slightly in late November/early December, then falls more sharply in late December before recovering somewhat by early February.

Furthermore, to help with understanding how sensitive the prison population may be to variations in court case conclusion rate, three variants have again been included in the modelling - central, higher, and lower. The "central" court throughput scenario variant assumes that the conclusion rate per court will be similar over the next few months as it has been between October 2022 to September 2023. The "higher" scenario assumes the average case throughput per court will be slightly greater than it has been over the same period, and the "lower" scenario assumes that the average case throughput per court will be slightly smaller. The nine scenario variants shown in table 1 include all the possible combinations of the above variations of court throughput and remand arrivals.

Table 1. Prison population scenario variants.

| Scenario		Remand Arrival Rate		
		Central	Higher	Lower
Conclusion rate	Central	1. Sc1a Central Conclusions & Central Remand Arrivals	4. Sc2a Central Conclusions & Higher Remand Arrivals	7. Sc3a Central Conclusions and Lower Remand Arrivals
	Higher	2. Sc1b Higher Conclusions and Central Remand Arrivals	5. Sc2b Higher Conclusions & Higher Remand Arrivals	8. Sc3b Higher Conclusions and Lower Remand Arrivals
	Lower	3. Sc1c Lower Conclusions & Central Remand Arrivals	6. Sc2c Lower Conclusions & Higher Remand Arrivals	9. Sc3c Lower Conclusions and Lower Remand Arrivals

Since the progression of the justice system's recovery (e.g., rate of reduction of scheduled trials) impacts the model's assumptions and longer-term predictive power, the projections cover a limited period, from October 2023 to March 2024.

A review of previous trends shows that a general seasonal pattern tends to occur at the end of the year. This results in irregular court throughput and remand arrivals during the months of December and January. To account for this, in the latest projections the assumptions for the month of December 2023 are sampled from December 2022 and January 2024 from January 2023.

Model Quality Assurance

The modelling scenarios from the previous publication can be compared against the actual population data to check the accuracy of the projections and confirm the model's suitability for providing reliable projections. Figure 12 shows the April 2023 central, high and low court throughput projections from the microsimulation, based on prison population and courts data up to the end of March 2023. Even after accounting for a wide variety of uncertain dynamics in the system, it may be seen in Figure 12 that the projected levels of remand, sentenced and total populations reasonably accurately aligned with the actual population.

Figure 12. Central, high and low court throughput projections and the actual prison population beginning on 1st April 2023, based on courts and prison population data up to end of March 2023 (showing 50%, 75% and 95% confidence intervals). The actual population is shown as a series of black points.
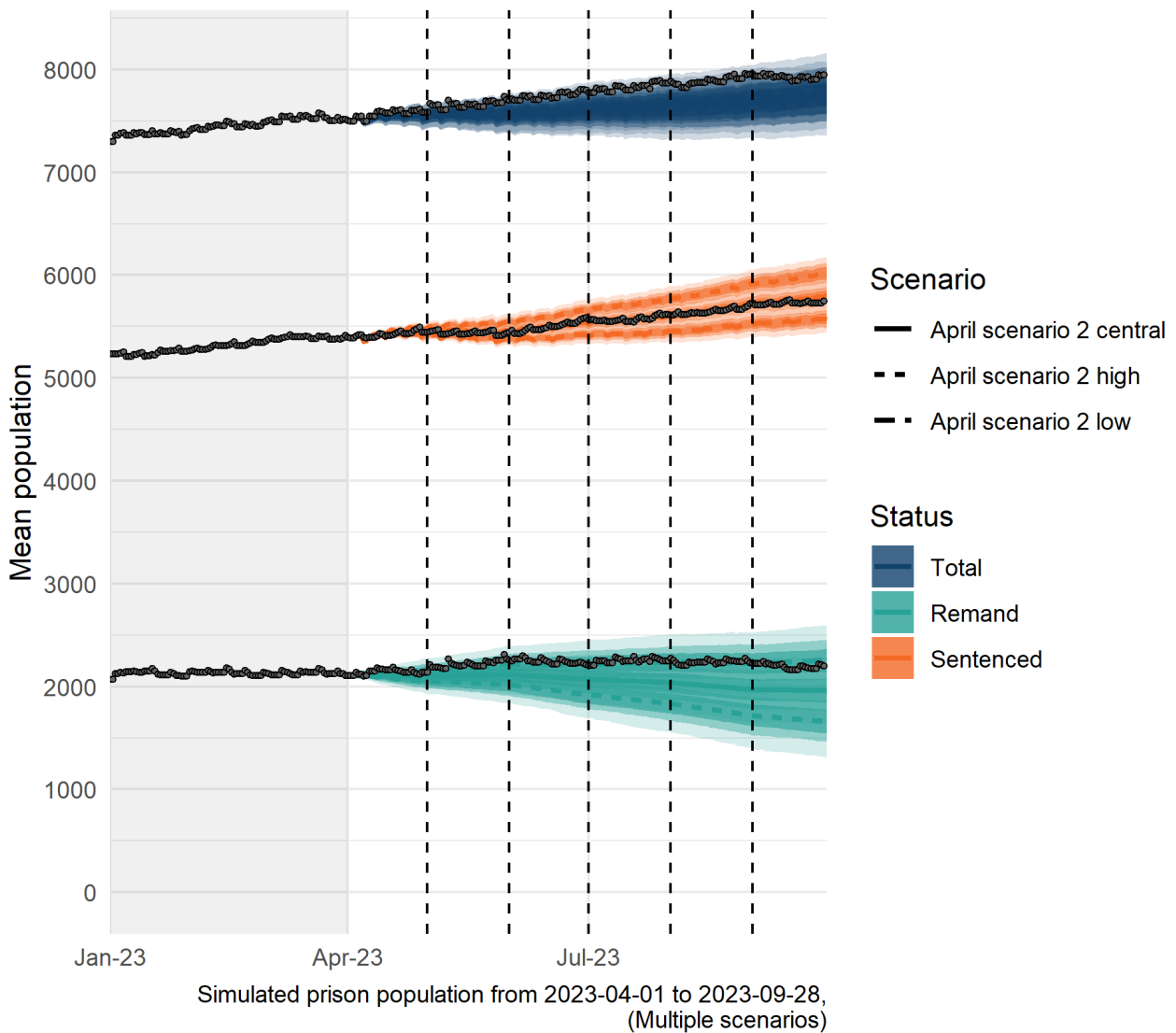
To check the model further, back-casting is used to retrospectively compare the actual prison population for the past few months against a projection generated by the model based on actual monthly court throughput data. The back-cast eliminates uncertainty

about the majority of the assumptions, so if there was a difference between the back-cast and the actuals it may indicate technical deficiencies in the model. The recent back-cast projections presented in Figure 13, show that the back-cast from April 2023 to September 2023 is largely accurate.

Figure 13. The back-cast based on remand arrival and courts throughput data up to September 2023 (showing 50%, 75% and 95% confidence intervals). The actual population is shown as a series of black points.

Simulated prison population from 2023-04-01 to 2023-09-28, (Multiple scenarios)
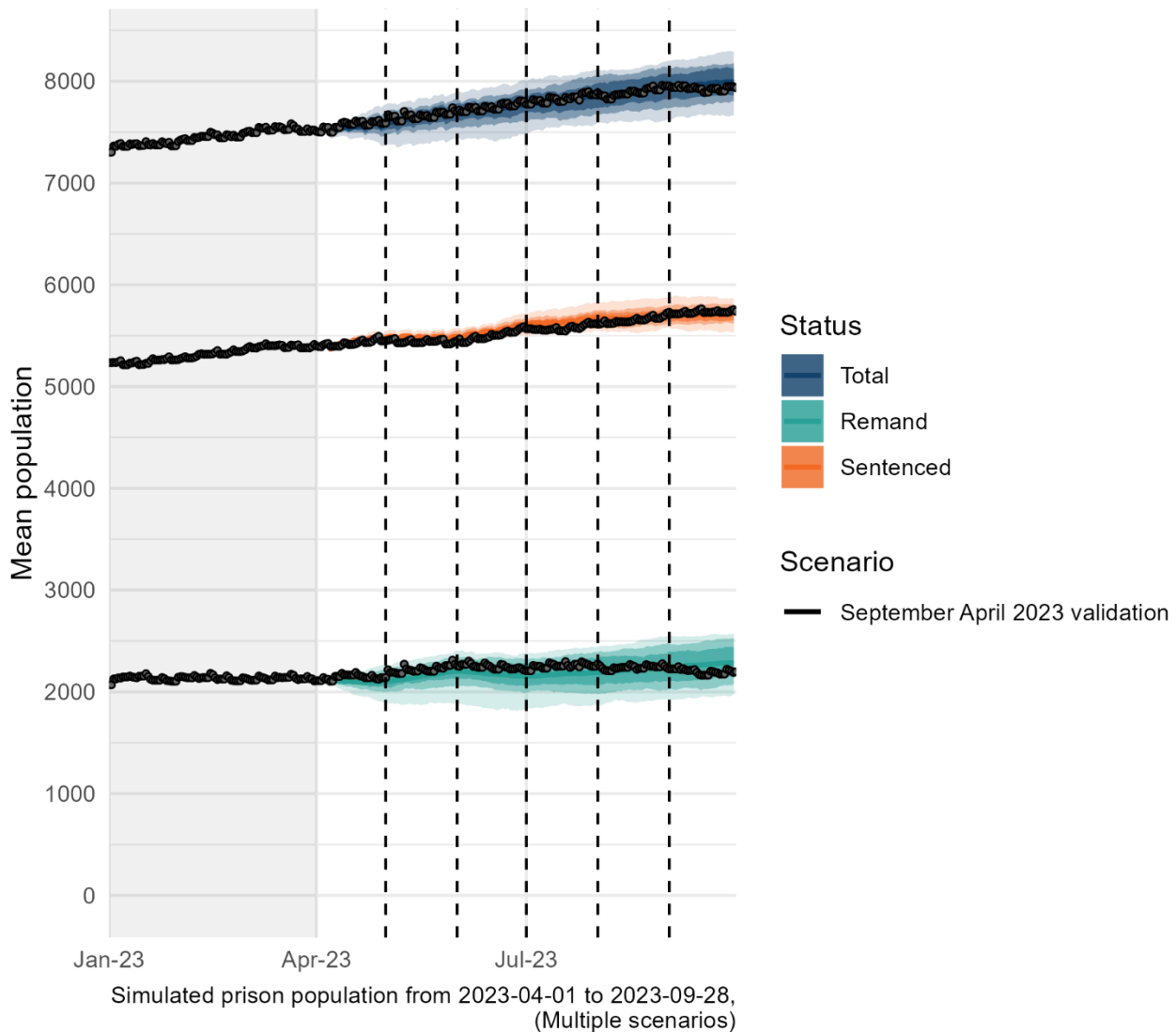
Microsimulation Model Limitations

The model relies on the availability of a large amount of frequently refreshed high-quality data about court activity and prison populations, some of which can be resource intensive to obtain and process.

The model does not currently simulate flows for different crime-types, so crime-based trends are not explicitly modelled. However, there are plans to develop the model further and include case-mix in future modelling.

5 Microsimulation Model Results: October 2023 to March 2024

The latest prison population projections are shown in figure 14 and table 2 below. These indicate that it is most likely that the overall prison population in Scotland will either remain stable or rise slightly between October 2023 and March 2024.

The results also show that it is most likely that the remand population will remain stable, but it could increase or decrease. If it decreases, primarily because of enhanced monthly case conclusions, this could contribute to an increased sentenced population as people transition from remand to the sentenced population. It is projected that the sentenced population will either remain stable or rise slightly; it may rise if the overall rate of transition from remand to the sentenced population increases or if there is a greater inflow of individuals directly from the community to the sentenced population.

Figure 14. Prison population projections for October 2023 to March 2024. Includes 50%, 75% and 95% confidence intervals for all scenario variants given in table 1. The actual population is shown as a series of black points.
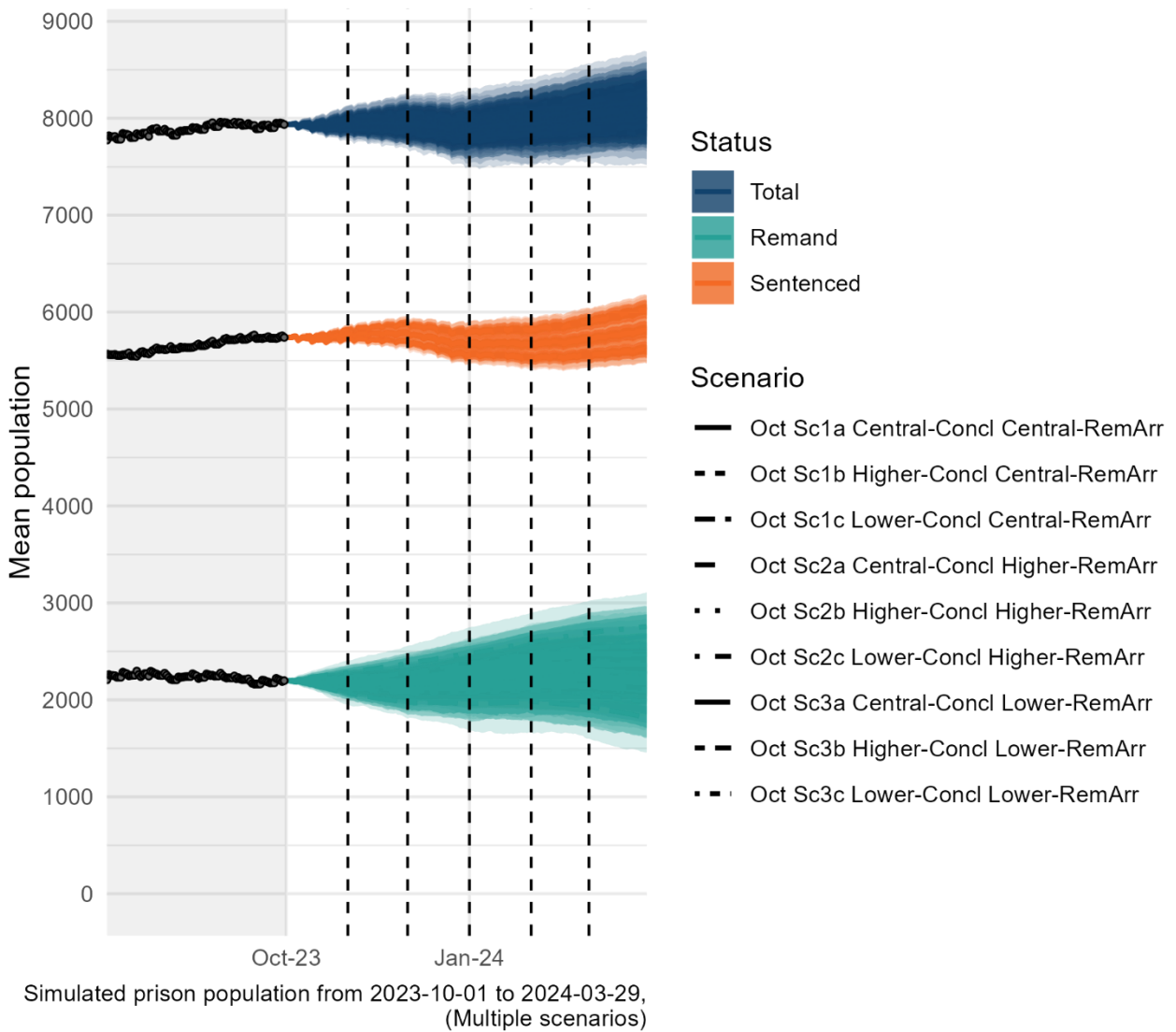
Table 2. Prison population projections upper/lower estimates for October 2023 to March 2024[21]. These ranges are based on the 95% confidence intervals across all scenario variants given in table 1.

Month	Remand		Sentenced		Total	
	Average Daily Population by Month - Lower estimate	Average Daily Population by Month - Upper estimate	Average Daily Population by Month - Lower estimate	Average Daily Population by Month - Upper estimate	Average Daily Population by Month - Lower estimate	Average Daily Population by Month - Upper estimate
Oct-23	2,100	2,300	5,700	5,800	7,850	8,050
Nov-23	1,900	2,450	5,650	5,900	7,750	8,200
Dec-23	1,750	2,650	5,550	5,900	7,600	8,250
Jan-23	1,650	2,800	5,450	5,950	7,500	8,350
Feb-24	1,650	2,950	5,400	6,000	7,550	8,500
Mar-24	1,500	3,050	5,450	6,100	7,500	8,650

The upper total population and upper remand range estimates are from the scenario variant with a low conclusion rate and high remand arrival rate. The lower range estimates for the total and remand populations are from the scenario with a high conclusion rate and a low remand arrival rate. Inclusion of these less likely scenarios for this update has resulted in a larger range than the previous publication. If the new scenario variants featuring higher or lower remand arrivals were removed so the projection only included scenarios featuring central remand arrivals, as in the previous publication[22], then in March 2024: the projected average daily total population would be in the range from 7,650 to 8,450; the remand population in the range from 1,700 to 2,900 and the sentenced population in the range from 5,450 to 6,100.

It should be noted that whilst the projections are based on recent trends, they do not explicitly model the impact of potential future policy or operational changes and their potential impact on the prison population.

6 Conclusions

The modelling indicates a projected range of between 7,500 and 8,650 for the average daily total prison population in March 2024. As at 1st October 2023, the prison population was around 7,950.

Further scenarios have been added to the prison projections. In the previous publication only low, central and high court throughput scenarios were reported. For this update, in addition to these three court throughput scenarios, there are six new scenarios featuring

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[21] The values have been rounded to the nearest 50 and exclude the home detention curfew population. The upper and lower estimates of the total prison population may not be equal to the sum of the sentenced and remand populations as they can be from different scenario variants.
[22] Scottish Government prison population projections, 1st June 2023, https://www.gov.scot/publications/scottish-prison-population-projections.

varying remand arrivals (low, central and high) combined with court throughput variations (also low, central and high). Over the course of the next few months remand arrivals, sentenced arrivals and case conclusion levels will be monitored to assess with which scenarios the actual prison population numbers are most closely aligned.

For several reasons, modelling the future prison population using the microsimulation gets less accurate the further ahead it is projected (whether due to systematic errors in the model, inaccurate assumptions due to unforeseen circumstances, or due to changed circumstances that the model is not built to account for). Experience to date suggests that to ensure reliable projections, a maximum duration for the projection of six months is preferred.

As previously highlighted, the key factors impacting changes in the prison population in the short term will be the flows into and out of the remand and sentenced populations. This is influenced by the court recovery programme, for example the resource re-allocation from summary to solemn which took place in April 2023. SCTS reporting has indicated that recent elevated levels of summary demand has meant that the level of outstanding summary trials has stabilised rather than continuing to fall. This has led to a review of options to address this challenge if the current level of demand for summary trials continues in the near term[23].

[23] SCTS criminal case publications, 24th October 2023, Monthly information on Criminal Case Throughput for September 2023 (scotcourts.gov.uk).

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Riaghaltas na h-Alba

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