Ministry of Justice

Prison Population Projections 2013 – 2019 England and Wales

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Contents

Key points

This bulletin presents projections of the prison population in England and Wales from November 2013 to December 2019. The prison population projections are based on assumptions about future custodial convictions and incorporate the anticipated impacts of selected policy and procedural initiatives.

The prison population projections are produced using a model of flows of offenders into and out of prison which counts the resulting prison population each month.

Three projected scenarios have been modelled. They track the impact of three different sentencing trends on custodial convictions, custodial sentence length and hence on the resulting prison population. These correspond to (though do not use the same assumptions as) the “Scenario 1”, “Scenario 2” and “Scenario 3” scenarios used in the 2012 projections. Other impacts included in the projections, such as those of changing legislation, changing procedures and new sentencing guidelines are applied equally to all three scenarios.

The projected prison populations under each scenario are given in Table 1. By the end of June 2019, the prison population is projected to be 77,300 in the Scenario 1 projection, 81,800 in the Scenario 2 projection and 86,600 in the Scenario 3 projection.

Table 1: Projected prison population (end June Figures)

	Sentencing Scenarios		
	Scenario 1	Scenario 2	Scenario 3
Jun-14	82,600	83,400	84,300
Jun-15	80,100	82,100	84,300
Jun-16	79,000	82,000	85,000
Jun-17	78,000	81,600	85,400
Jun-18	77,300	81,500	85,800
Jun-19	77,300	81,800	86,600

The assumptions informing these projections, and therefore the projections themselves, are subject to significant uncertainty. This is represented by the three scenarios, with each scenario being only as likely as the assumptions which inform it. Indeed, the 2013 Scenario 2 projection is lower than last year’s Scenario 2 (central) projection largely due to the decline in court disposals seen in the financial year 2012/2013.

The assumptions used are based on extensive consultation (see Appendix D for a list of those consulted), and observed data trends. A comparison between projected and actual prison population for September 2013 is given in Appendix B, but this publication does not anticipate which of the modelled scenarios is most likely to occur in the future.

1. Introduction

This bulletin presents prison population projections for England and Wales from November 2013 to December 2019. The projections are produced to aid development, capacity planning and resource allocation within the Criminal Justice System (CJS) and the National Offender Management Service (NOMS). The latest published useable operational capacity (1 November 2013) is 86,002[1].

Three projections of the prison population have been agreed through a consultative process. These projections track the impact of three different trends in sentencing on custodial convictions, custodial sentence length and hence on the resulting prison population. These scenarios also take into account drivers which impact equally on each scenario:

- trends in the age, gender and offence of defendants entering the system and in the flow of cases through the courts;
- views of future parole hearing frequency and expected outcomes for indeterminate (Life and Indeterminate for the Public Protection) sentences;
- the opening of The Verne as an immigration removal centre in February 2014;
- data recording changes for foreign nationals;
- the assumed impact of the changes to court committals; and
- the impact of the Legal Aid, Sentencing and Punishment of Offenders Act which achieved Royal Assent in May 2012[2].

The prison projections model is part of wider work within the Ministry of Justice to develop a consistent and coherent suite of models of the criminal courts and offender management, driven by common projections of demand for the Ministry of Justice's services.

The custodial convictions model uses projections of numbers of defendants entering the criminal courts and takes into account:

- the age, gender and offence of defendants entering the system;
- the flow of cases through the courts; and

[1] www.gov.uk/government/publications/prison-population-figures
[2] services.parliament.uk/bills/2010-11/legalaidsentencingandpunishmentofoffenders.html

- the sentences which concluded cases attract,

in order to project volumes of defendants being given a custodial sentence.

The prison population projections model takes projections of custodial convictions, converts them to projections of prison receptions and then models the amount of time that offenders spend in prison to calculate the resulting prison population.

The benefits of this method are that it allows us to:

- explicitly project custodial convictions (rather than just convictions);

- understand the Criminal Justice System factors which contribute to change in the prison population, be they time served, sentences given, trial and sentencing court changes or shifts in defendant demographics; and

- more easily model the impact on the prison population of specific Ministry of Justice and other Criminal Justice Agency policy changes relating to specific offences or specific sentences.

Appendix C provides details of the methods used to produce the prison population projections and the assumptions behind them.

2. Prison population June 2012 to June 2013

The 'Story of the Prison Population 1993 to 2012 is an in-depth look at what happened to the prison population between 1993 and 2012 and the major factors contributing to the changes.[3]

The prison population grew rapidly between 1993 to 2008 – an average of 4% a year. This rapid rise was driven by:

- Increased numbers of people sentenced to immediate custody from 1993 to 2002.
- Increases in the average custodial sentence length and increased use of indeterminate sentences.
- Increase in numbers recalled to prison following breaches of the conditions of licence and these offenders spending longer in prison once recalled.

The rise in the prison population slowed considerably from the summer of 2008, in part due to the introduction of the Criminal Justice and Immigration Act (CJIA) 2008[4], which changed sentencing and offender management in ways which helped to reduce growth in the prison population.

This flatter trend continued until the public disorder seen in UK cities from 6 to 9 August 2011 which had an immediate but temporary impact on the prison population.

During 2012 and into 2013, the prison population began to fall due to a falling remand population and a continued decline in the number of under 18s in custody. The falling remand population during 2012 reflected falling volumes going through the courts plus the introduction, in December 2012, of measures restricting the use of remand for all offenders who would be unlikely to receive a custodial sentence.[5]

[3] Story of the Prison Population: www.gov.uk/government/publications/story-of-the-prison-population-1993-2012
[4] services.parliament.uk/bills/2007-08/criminaljusticeandimmigration.html
[5] services.parliament.uk/bills/2010-11/legalaidsentencingandpunishmentofoffenders.html

Table 2 summarises these changes.

Table 2: Population in custody changes from 2005 to 2013

	Offender Management Statistics		Year on year % difference
	Start of Year	End of Year	
June 2005 to June 2006	76,190	77,982	2.4%
June 2006 to June 2007	77,982	79,734	2.2%
June 2007 to June 2008	79,734	83,194	4.3%
June 2008 to June 2009	83,194	83,454	0.3%
June 2009 to June 2010	83,454	85,002	1.9%
June 2010 to June 2011	85,002	85,374	0.4%
June 2011 to June 2012	85,374	86,048	0.8%
June 2012 to June 2013	86,048	83,842	-2.6%

3. Modelling methodology and projection scenarios

The method used for generating projections of the prison population in England and Wales for the 2013-2019 projections is consistent with the approach used to generate the 2012-2018 projections published at 1 November 2012.

At the core of the method is a model of flows of offenders into and out of prison which counts the resulting prison population each month for sentenced, recall and remand prisoners.

Inputs to the prison projections model include projections of future custodial convictions. These are generated from time series projections of numbers of defendants entering the criminal courts and take into account the age, gender and offence of defendants entering the system, the flow of cases through the courts and the sentences which concluded cases attract.

The prison projections model monitors the sizes of the sentenced, recall and remand prison populations. These populations depend on the inflows defined above and the outflows. These outflows are defined by observed distributions of custodial sentence lengths, and percentage of custodial sentence served for subsets of these populations. The model also simulates the ageing of the prison population over time.

The results of the prison projections model are supplemented with an estimate of the future non-criminal and fine defaulter populations, which is based on the average of published data from January to June 2013.

The projection model is based on data up to June 2013 from various sources including court proceedings and performance data, sentencing data and prison receptions and population data.

Three projected scenarios have been modelled as shown in Tables 3a and 3b. These scenarios track the impact of three different incremental changes in sentencing behaviour up to March 2016, where the scenario changes are flat-lined:

- The Scenario 1 projection assumes that decreasing trends in receipts to courts double, and disposals will fall in line with these trends. The average length of sentence also decreases following a reversal of current observed trends.

- The Scenario 2 projection assumes that recent trends in receipts will continue and disposals will stay constant with the previous year (April 2012 - March 2013). The average length of sentence remains consistent with that seen in the previous 15 months.

- The Scenario 3 projection assumes that the recent decreasing trends will be reversed going forwards and disposals will rise in line with this change. The average length of sentence also increases following current observed trends.

The three projected scenarios also incorporate the impact of:

- trends in the age, gender and offence of defendants entering the system and in the flow of cases through the courts;
- views of future parole hearing frequency and expected outcomes for indeterminate sentences;
- the opening of The Verne as an immigration removal centre in February 2014;
- data recording changes for foreign nationals;
- the assumed impact of changes to court; and
- the impact of the Legal Aid, Sentencing and Punishment of Offenders Act which achieved Royal Assent in May 2012.

The scenarios modelled are not predictions of what will happen to the prison population, but rather indications of what the prison population would look like if scenario conditions were to be fulfilled. The scenarios do not represent bounds on our projections of the prison population.

Table 3a: Prison projection scenarios – average change in custodial convictions, by demographic group, due to demographic and court route trends, for the Scenario 2 projection

	Average year on year percentage change in custodial convictions 2013 - 2016					
	21 years and over		18-20 years		Less than 18 years	
Sentencing Trends	Male	Female	Male	Female	Male	Female
Scenario 2	-1%	0%	0%	3%	-1%	0%

Table 3b: Additional changes in custodial convictions and custodial sentence length due to sentencing trends for the projections

	Average year on year percentage change in custodial convictions						Year on year percentage change in average custodial sentence length from Scenario 2
	21 years and over		18-20 years		Less than 18 years		
Sentencing Trends	Male	Female	Male	Female	Male	Female	
Scenario 1	-2%	-1%	-2%	-2%	-5%	-7%	-1%
Scenario 2	0%	0%	0%	0%	0%	0%	0%
Scenario 3	2%	1%	2%	1%	4%	0%	1%

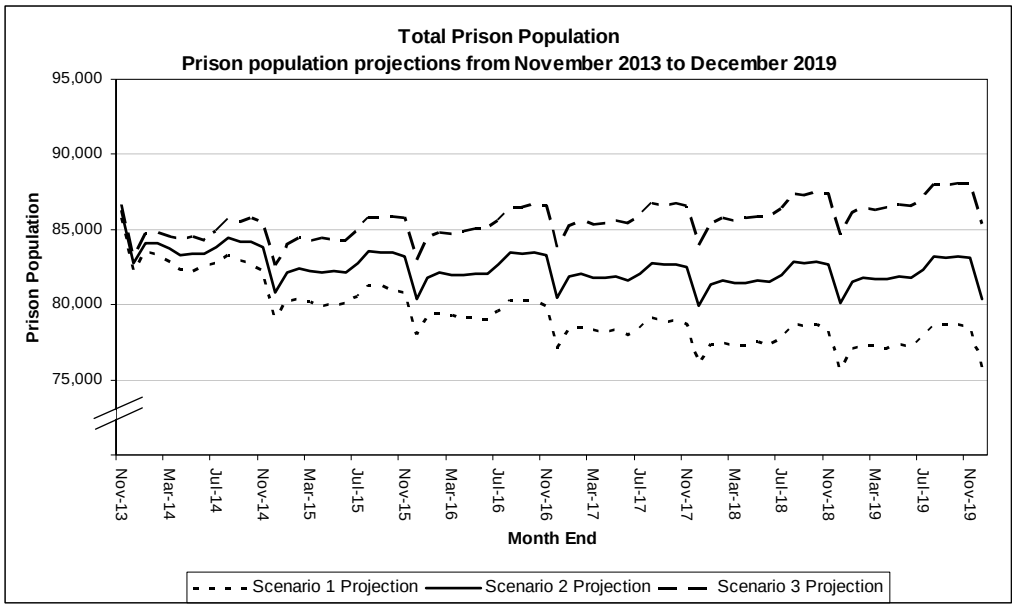
The modelling methodology, projection scenarios and assumptions used are described in detail in Appendix C.

4. Results

The Scenario 1 projection estimates that the prison population will fall to 82,600 by the end of June 2014 and to 77,300 by the end of June 2019. The Scenario 2 projection estimates that the prison population will fall to 83,400 by the end of June 2014 and to 81,800 by the end of June 2019. The Scenario 3 projection estimates that the prison population will fall to 84,300 by the end of June 2014 and subsequently rise to 86,600 by the end of June 2019. Chart 1 presents the projected scenarios to show changes in the prison population from November 2013.

Appendix A contains tables for annual projected end of June populations, average financial year populations and total monthly populations for each scenario. Sub-population figures are given for: determinate sentences; indeterminate sentences; remand; recalls; non-criminals; fine defaulters; 15-17 year olds; females 18 and over; males 18-20 and males 21 and over (determinates, indeterminates, recalls and remand).

Chart 1: Projected monthly prison population (all scenarios)



The projected trends reflect the cumulative impacts of the various circumstantial, sentencing, legislative and procedural assumptions that are used to generate the projections. The seasonal pattern reflects the dip in the prison population which is always seen around the Christmas period.

In the Scenario 2 projection, the prison population is expected to fall to 83,400 by June 2014, due to the continued impact of the Legal Aid, Sentencing and Punishment of Offenders Act and the decrease in court disposals seen in the financial year 2012/13. The projected population in this scenario is then

expected to fall 1.5 per cent by June 2015, before fluctuating slightly (between -0.5 and 0.3 per cent year on year) until 2019. The projected decrease seen to 2014 is primarily driven by a reduction in court disposals and the continued effect of the Legal Aid, Sentencing and Punishment of Offenders Act. The projected decreases seen after 2014 are small as the decline is counteracted by an increase in the longer term determinate population (4+ years). It should be noted that the Legal Aid, Sentencing and Punishment of Offenders Act has caused those that would have received an Imprisonment for Public Protection (IPP) sentence to now receive a determinate sentence. This has created a shift from the indeterminate population to the determinate population, which affects all three scenarios.

In the Scenario 1 projection, the prison population is expected to fall to 82,600 by June 2014. The projected prison population in this scenario is then expected to fall (between 3.0 and 0.1 per cent year on year) to 2019. This decrease can be attributed to a projected decrease in the number of immediate custodial convictions and shorter custodial sentence lengths under this scenario.

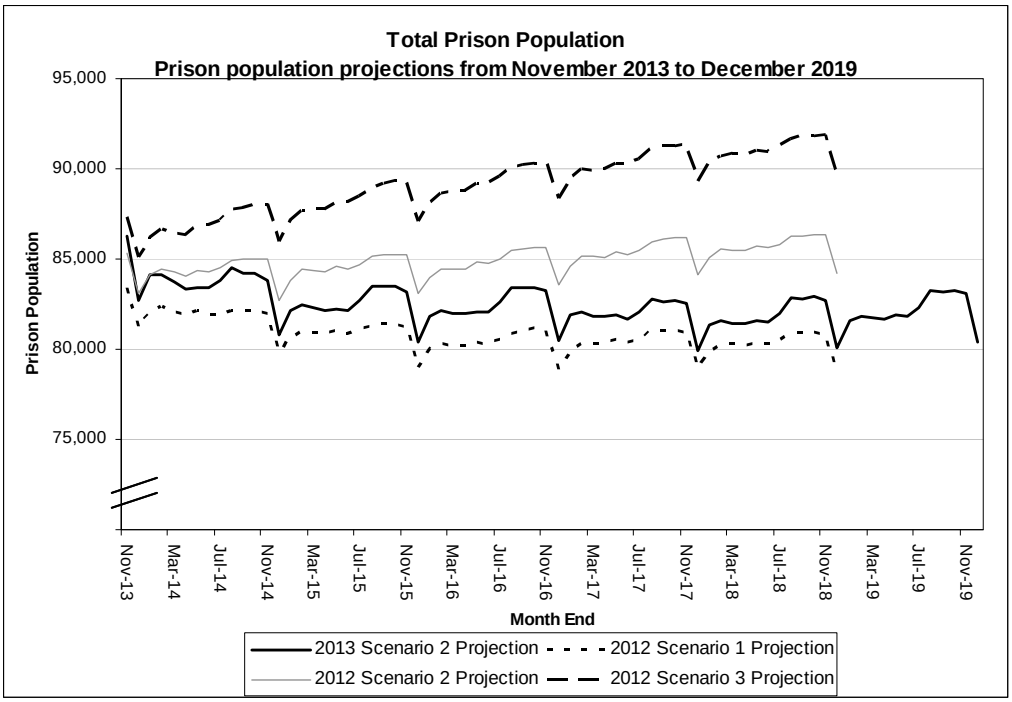
In the Scenario 3 projection, the prison population is expected to be at 84,300 in June 2014 and then expected to grow each year (between 0.1 and 0.9 per cent). These rises are the result of increases in the level of custodial sentences and the increase in custodial sentence length under this scenario, although this is moderated by the downward effects of the Legal Aid, Sentencing and Punishment of Offenders Act.

At the end of September 2013 the published prison population was within 2.1 per cent of the Scenario 2 projection, and within 1.6 per cent of the Scenario 1 projection and 2.6 per cent of the Scenario 3 projection. Most of this deviation is located in the projected remand population, which accounts for 1.2 percentage points of the 2.1 per cent difference from Scenario 2. This does not necessarily mean the prison population will track against either the Scenario 2 or Scenario 1 projection going forward.

Differences could be explained by changes, different to those projected, in overall demand, offence mix, age and gender of defendants, court routes, custody rates or sentence lengths. A discussion of the extent to which the actual prison sub-populations have tracked the Scenario 2 projection can be found in Appendix B.

Chart 2 plots the 2013 Scenario 2 projection against the three 2012 prison population projections. The 2013-2019 Scenario 2 projection is consistent with the 2012 Scenario 2 projection at the November 2013 point, but continues to fall slightly. Going forward the Scenario 2 projection sits between the 2012 Scenario 1 (the lower) and Scenario 2 (the central) projections. A comparison of end of June figures from the 2012 and 2013 projections can be found in Appendix A. The lower level of the new projections can be attributed mainly to a decrease in the number of custodial convictions in 2012/13.

Chart 2: Comparing 2012 and 2013 projections (November 2013 – December 2019)



5. Caveats on prison population projections

The projections presented here are a set of scenarios which reflect the impact of three possible trends in sentencing, combined with trends in the age, gender and offence of defendants entering the system and in the flow of defendants through the courts. The impacts of changes to legislation and guidance which took place before June 2013 and views of future parole hearing frequency and outcomes for indeterminate sentence prisoners have also been taken into account.

The projections do not reflect the impact of legislative, policy, operational or procedural change or guidance for which there is no definite timetable for implementation. The projections therefore provide a set of "baseline" scenarios against which the impacts of future changes can be assessed.

Even without these possible changes, the actual future prison population may not match any of the projected scenarios. Changes to criminal justice processes could influence the numbers of offenders being brought to the point of sentence or the way that offenders are managed. Changes to sentencing behaviour may also be different from those modelled. Finally, both sentencing behaviour and criminal justice processes, as well as policy decisions, can respond to a multitude of environmental factors which cannot be anticipated, such as high profile criminal cases, events like the August 2011 public disorder events, and public debate.

Other impacts included in the projections (such as changing legislation and changing procedures) are applied equally to all three scenarios.

Assumptions for modelling and scenario development were captured through a consultative process that included all major stakeholders (see Appendix D). The assumptions are based on analysis (where reliable data are available) and on expert judgement from policy makers, key deliverers and system influencers. The assumptions are therefore likely to be more robust for those measures and processes that have a well-defined boundary than for those that do not. For the total prison population, the Scenario 2 projection for September 2013 is within 2.1 per cent of published data[6].

Data used in the model have been derived from various sources, including court proceedings and performance data, sentencing data and prison receptions, and population data. Due to technical problems relating to the supply of data for statistical purposes, some of these data were unavailable from July 2009 to February 2010 and others from July 2009 onwards. This means certain data has been estimated by extrapolating between past and

[6] www.gov.uk/government/collections/offender-management-statistics-quarterly

current data and other data has been estimated from headline totals which were unaffected by these problems.

Appendix A: Additional tables[7]

Annual tables of overall projected prison population

Table A1: Projected prison population (end of June figures)

	Sentencing Scenarios		
	Scenario 1	Scenario 2	Scenario 3
Jun-14	82,600	83,400	84,300
Jun-15	80,100	82,100	84,300
Jun-16	79,000	82,000	85,000
Jun-17	78,000	81,600	85,400
Jun-18	77,300	81,500	85,800
Jun-19	77,300	81,800	86,600

Table A2: Average Projected prison population (financial year figures)

	Sentencing Scenarios		
	Scenario 1	Scenario 2	Scenario 3
2014/15	81,800	83,200	84,600
2015/16	80,100	82,400	84,900
2016/17	79,200	82,400	85,600
2017/18	78,100	81,900	85,800
2018/19	77,600	81,900	86,400

Table A3: Comparison of 2012 based and 2013 based Scenario 2 (central) projections (end of June figures)

	Sentencing Scenarios		
	2012	2013	Difference
Jun-13	84,600	--	--
Jun-14	84,300	83,400	-1.0%
Jun-15	84,400	82,100	-2.8%
Jun-16	84,700	82,000	-3.3%
Jun-17	85,300	81,600	-4.5%
Jun-18	85,600	81,500	-5.0%
Jun-19	--	81,800	--

[7] All figures are rounded to the nearest hundred. Sub-populations may not sum to total populations due to rounding and due to overlaps in some sub-population categories

Annual tables of subgroups within the overall projected prison population

Table A4: Projected determinate sentence prison population (end of June figures)

	Sentencing Scenarios		
	Scenario 1	Scenario 2	Scenario 3
Jun-14	51,600	52,600	53,600
Jun-15	49,800	52,200	54,500
Jun-16	49,400	52,600	55,800
Jun-17	48,900	52,700	56,700
Jun-18	48,800	53,100	57,600
Jun-19	49,000	53,700	58,600

Table A5: Projected indeterminate sentence prison population (end of June figures)

	Sentencing Scenarios		
	Scenario 1	Scenario 2	Scenario 3
Jun-14	12,300	12,600	12,900
Jun-15	11,600	11,900	12,300
Jun-16	11,000	11,400	11,700
Jun-17	10,500	10,800	11,200
Jun-18	10,000	10,400	10,800
Jun-19	9,700	10,100	10,500

Table A6: Projected remand prison population (end of June figures)

	Sentencing Scenarios		
	Scenario 1	Scenario 2	Scenario 3
Jun-14	11,100	10,600	10,100
Jun-15	11,300	10,500	9,800
Jun-16	11,400	10,600	9,900
Jun-17	11,300	10,500	9,800
Jun-18	11,300	10,600	9,800
Jun-19	11,300	10,600	9,900

Table A7: Projected recall prison population (end of June figures)

	Sentencing Scenarios		
	Scenario 1	Scenario 2	Scenario 3
Jun-14	5,100	5,100	5,100
Jun-15	4,800	4,900	5,100
Jun-16	4,800	4,900	5,100
Jun-17	4,800	5,000	5,200
Jun-18	4,700	4,900	5,100
Jun-19	4,700	4,900	5,100

Table A8: Projected non-criminal prison population (end of June figures)[8]

	Sentencing Scenarios		
	Scenario 1	Scenario 2	Scenario 3
Jun-14	2,400	2,400	2,400
Jun-15	2,400	2,400	2,400
Jun-16	2,400	2,400	2,400
Jun-17	2,400	2,400	2,400
Jun-18	2,400	2,400	2,400
Jun-19	2,400	2,400	2,400

Table A9: Projected fine defaulter prison population (end of June figures)[8]

	Sentencing Scenarios		
	Scenario 1	Scenario 2	Scenario 3
Jun-14	100	100	100
Jun-15	100	100	100
Jun-16	100	100	100
Jun-17	100	100	100
Jun-18	100	100	100
Jun-19	100	100	100

[8] Note that these projections are the same under all three projected scenarios

Table A10: Projected male 21 years and over prison population (end of June figures)

	Males 21 years and over					
	Total Population			Determinates		
Scenario	Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3
Jun-14	72,500	73,200	73,900	45,100	45,800	46,600
Jun-15	70,600	72,200	74,000	43,700	45,600	47,500
Jun-16	69,800	72,300	74,800	43,500	46,100	48,700
Jun-17	68,800	71,900	75,100	43,100	46,300	49,500
Jun-18	68,200	71,800	75,500	43,000	46,600	50,400
Jun-19	68,100	72,100	76,200	43,200	47,200	51,300

	Indeterminates			Remand		
Scenario	Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3
Jun-14	11,700	12,000	12,300	9,000	8,600	8,200
Jun-15	11,000	11,400	11,700	9,200	8,500	8,000
Jun-16	10,500	10,800	11,200	9,200	8,600	8,000
Jun-17	10,000	10,300	10,700	9,200	8,500	7,900
Jun-18	9,500	9,900	10,300	9,200	8,600	8,000
Jun-19	9,200	9,600	10,000	9,200	8,600	8,000

	Recall			Non Criminal		
Scenario	Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3
Jun-14	4,600	4,600	4,600	2,100	2,100	2,100
Jun-15	4,300	4,500	4,600	2,200	2,200	2,200
Jun-16	4,300	4,400	4,600	2,200	2,200	2,200
Jun-17	4,300	4,500	4,600	2,200	2,200	2,200
Jun-18	4,300	4,400	4,600	2,200	2,200	2,200
Jun-19	4,200	4,400	4,600	2,200	2,200	2,200

Table A11: Projected male 18-20 years old prison population (end of June figures)

	Sentencing Scenarios		
	Scenario 1	Scenario 2	Scenario 3
Jun-14	5,500	5,600	5,700
Jun-15	5,200	5,500	5,700
Jun-16	5,100	5,400	5,700
Jun-17	5,100	5,400	5,800
Jun-18	5,100	5,400	5,800
Jun-19	5,000	5,400	5,800

Table A12: Projected female 18 years and over prison population (end of June figures)

	Sentencing Scenarios		
	Scenario 1	Scenario 2	Scenario 3
Jun-14	3,700	3,700	3,800
Jun-15	3,500	3,600	3,700
Jun-16	3,400	3,500	3,600
Jun-17	3,400	3,500	3,700
Jun-18	3,400	3,500	3,700
Jun-19	3,400	3,500	3,700

Table A13: Projected 15-17 years old prison population (end of June figures)[9]

	Sentencing Scenarios		
	Scenario 1	Scenario 2	Scenario 3
Jun-14	800	900	900
Jun-15	800	800	900
Jun-16	800	800	900
Jun-17	700	800	900
Jun-18	700	800	900
Jun-19	700	800	900

[9] This population only includes those aged 15-17 in Youth Offending Institutions. 15-18 year olds housed in Secure Children's Homes or Secure Training Centres are not included.

Monthly tables of overall projected prison population

Table A14: Monthly values of the overall projected prison population (end of month figures)

	Sentencing Scenarios		
	Scenario 1	Scenario 2	Scenario 3
Nov-13	85,800	86,200	86,700
Dec-13	82,300	82,700	83,300
Jan-14	83,500	84,100	84,700
Feb-14	83,400	84,100	84,800
Mar-14	82,900	83,700	84,600
Apr-14	82,300	83,300	84,300
May-14	82,300	83,400	84,600
Jun-14	82,600	83,400	84,300
Jul-14	82,800	83,800	84,900
Aug-14	83,300	84,500	85,700
Sep-14	82,900	84,200	85,500
Oct-14	82,800	84,200	85,700
Nov-14	82,200	83,800	85,400
Dec-14	79,100	80,800	82,600
Jan-15	80,300	82,100	84,000
Feb-15	80,400	82,400	84,400
Mar-15	80,200	82,300	84,300
Apr-15	79,900	82,100	84,400
May-15	80,000	82,200	84,400
Jun-15	80,100	82,100	84,300
Jul-15	80,500	82,700	85,000
Aug-15	81,300	83,500	85,800
Sep-15	81,200	83,500	85,800
Oct-15	81,000	83,500	85,900
Nov-15	80,800	83,200	85,800
Dec-15	77,900	80,400	83,000
Jan-16	79,300	81,800	84,500
Feb-16	79,400	82,100	84,800
Mar-16	79,300	82,000	84,700
Apr-16	79,100	82,000	84,900
May-16	79,200	82,100	85,000
Jun-16	79,000	82,000	85,000
Jul-16	79,500	82,600	85,600
Aug-16	80,300	83,500	86,500
Sep-16	80,300	83,400	86,500
Oct-16	80,300	83,400	86,700
Nov-16	80,000	83,300	86,600

	Sentencing Scenarios		
	Scenario 1	Scenario 2	Scenario 3
Dec-16	77,100	80,500	83,800
Jan-17	78,400	81,900	85,300
Feb-17	78,500	82,000	85,600
Mar-17	78,400	81,800	85,400
Apr-17	78,200	81,800	85,500
May-17	78,300	81,900	85,600
Jun-17	78,000	81,600	85,400
Jul-17	78,400	82,100	85,900
Aug-17	79,100	82,800	86,700
Sep-17	78,900	82,700	86,600
Oct-17	78,900	82,700	86,700
Nov-17	78,700	82,500	86,600
Dec-17	76,000	79,900	84,000
Jan-18	77,300	81,300	85,400
Feb-18	77,400	81,600	85,700
Mar-18	77,400	81,500	85,600
Apr-18	77,300	81,400	85,700
May-18	77,600	81,600	85,900
Jun-18	77,300	81,500	85,800
Jul-18	77,700	82,000	86,400
Aug-18	78,700	82,900	87,300
Sep-18	78,600	82,800	87,300
Oct-18	78,600	82,900	87,500
Nov-18	78,300	82,700	87,300
Dec-18	75,700	80,100	84,600
Jan-19	77,100	81,600	86,100
Feb-19	77,300	81,800	86,500
Mar-19	77,200	81,700	86,300
Apr-19	77,100	81,700	86,400
May-19	77,400	81,900	86,600
Jun-19	77,300	81,800	86,600
Jul-19	77,800	82,300	87,100
Aug-19	78,700	83,200	88,000
Sep-19	78,700	83,100	88,000
Oct-19	78,600	83,200	88,100
Nov-19	78,500	83,100	88,100
Dec-19	75,800	80,400	85,300

Appendix B: Testing the validity of 2013-2019 prison population projections

The figures in this bulletin are not predictions of the prison population – they are scenarios showing what the future prison population would look like under various circumstances. However, comparing the projections with actual figures allows us to assess whether the actual prison population is aligned to any of the projections and whether the corresponding scenario assumptions hold true.

As the model provides population figures for September 2013 we can compare our projections with the actual prison population at this point. Table B1 shows the percentage difference between the Scenario 2 projection and published population figures[10] for September 2013.

Table B1: Percentage Deviation of published prison population figures from Scenario 2 projection

	September 2013
Total Prison Population	2%
Sub Population	September 2013
Determinates	1%
Indeterminates	2%
Remand	8.5%
Recall	2%
Non Criminal	1%
Fine Defaulters	20%
Males 21 and over (Total)	2%
Males 21 and over (Determinates)	1%
Males 21 and over (Indeterminates)	2%
Males 21 and over (Remand)	8%
Males 21 and over (Recall)	3%
Males 18-20 (Total)	1%
Females 18 and over	2%
15 - 17 year olds	7%

The Scenario 2 projection is in line with published figures for September 2013 which deviate no more than 2.1 per cent from the projection, with the overall sub-population of determinate, indeterminate and recall populations deviating ±2 per cent.

[10] www.gov.uk/government/collections/offender-management-statistics-quarterly

Most of the total population deviation occurs within the projected remand population (8.5 per cent), which accounts for 1.2 per cent of the total 2.1 per cent difference in Scenario 2. Past projections of remand have not provided any greater accuracy for this population. For example, projections published in 2012 predicted a central value which was higher than published figures by 6 per cent and in the 2011 published projections it deviated by -4 per cent. Assumptions used to model the remand population may be developed further in future.

Although the fine defaulter population shows a large percentage difference from the Scenario 2 projection this is only actually around a 20 place difference, due to the small numbers involved.

The sub-populations provided for adult males are within ±3 per cent for all populations, except remand. The male 18-20 and female 18 and over populations deviate by at most 2 per cent. This has been influenced by the over-estimation of the remand population and the small population size.

The 15-17 year old population is a small population which is difficult to model accurately. Currently, the medium projection for 15-17 year olds deviates by around 60 places (7 per cent difference). The 2012 projections provided no greater accuracy, with a deviation of 160 places.

Appendix C: Detail of models, scenarios and assumptions

The updated modelling approach

The prison projections form part of the Ministry of Justice's wider work to develop a consistent and coherent suite of models of the criminal courts and offender management, driven by common projections of demand for the Ministry of Justice's services.

The prisons model used to generate the 2013 projections has not changed substantially from that used in the 2012 projections. As in the 2012 projections, gender and age are also used in the allocation of custodial sentence lengths. These custodial sentence lengths are assigned to defendants by matching these characteristics to observed distributions of custodial sentence lengths and the percentage of custodial sentence served, which are taken from January 2012 to March 2013 data. This allows us to:

- understand the Criminal Justice System factors which contribute to change in the prison population, be they time served, sentences given, trial court and sentencing court changes, or shifts in the demographic characteristics of defendants;

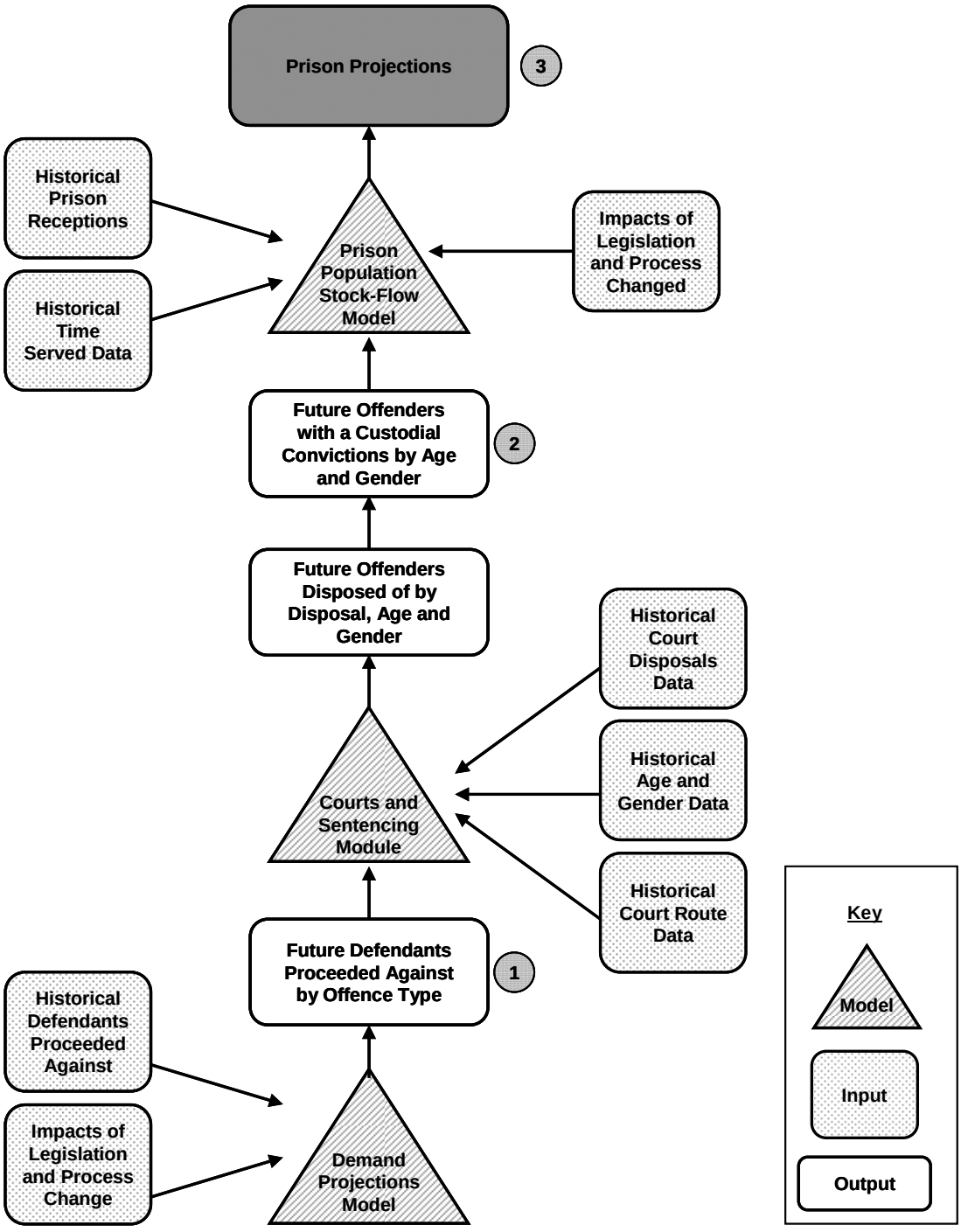
- more easily model the impact on the prison population of specific Ministry of Justice and other Criminal Justice Agency policy changes; and

- quantify some of the uncertainty around the time a defendant serves in prison.

Overview of the modelling approach

Central to the modelling approach is the Prison Population Stock-Flow model. Projections of future custodial convictions are fed into this model and outputs are adjusted to account for the impact of changes in legislation and process on the prison population, as shown in Figure C1, and described below.

Figure C1: Key Components of the prisons projections modelling system



1) Producing projections of defendants proceeded against

Projections of defendants proceeded against at court are chosen as the entry point to the modelling system because this is the entry point of defendants into the MoJ's area of responsibility. Underlying crime levels and the activities of the police and CPS will have an impact on the volume of defendants proceeded against. Consultation has taken place with the Home Office and CPS to understand these upstream impacts.

The Demand Projections Model produces baseline projections of all defendants proceeded against at court for 12 high-level offence categories based on historical time series data (January 2001 to March 2013) at a monthly resolution out to 2019. These are further sub-divided by age, gender and sub-offence using a top-down forecasting approach.

The demand projections are based on time series forecasting methods, including moving averages, exponential smoothing and ARIMA. Each offence category and its sub-categories are forecasted separately. Statistical error measurement scales and expert judgement are used in combination to find the most appropriate forecast model. Seasonality is applied based on the analysis of autocorrelations.

It should be noted that these projections can not be expected to track actual volumes of defendants proceeded against if there is any sudden or cumulative change which takes demand volumes or offence mix well outside the trends seen historically.

2) Converting the demand projections into custodial convictions

A Courts and Sentencing Module converts the demand projections into a set of projections of disposals by disposal type (including custodial convictions), offence, sex and age band at monthly resolution. These projections of custodial convictions by sex, age and offence type are used as a key input for the Prison Population Stock-Flow model.

The Courts and Sentencing Module is a combination of the Magistrates' and Crown Court Workload Models and the Sentencing Module. The demand projections are used as an input into a Magistrates' Workload Model, which uses historical data to split defendants into court routes (Table C1) and tracks their flow through the system. This informs the forecast for the number of cases for trial or sentence that will be received in the Crown Court Workload Model.

The Crown Court workload model takes forecasts of caseload and assigns various attributes (e.g. early guilty plea, remand status) to estimate likely hearing times and to prioritise the flow of cases through the system. The cases disposed of are then converted to the number of defendants disposed of using the observed ratio between cases and defendants for the time period of April 2012 to March 2013.

The key assumptions that are used in the Courts and Sentencing Module are:

- that there is no prioritisation of any age or sex group within the Magistrates' and Crown Court;
- the number of working days in each month is the primary driver of seasonality within the Magistrates' and Crown Court;
- no change in offence type occurs as cases move through the system;
- defendants that are tried at the Magistrates' Court proceed to sentencing without delay;
- delays within the Magistrates' Court are not significant for the monthly timescales used in the modelling; and
- a Magistrates' Court backlog will not develop during the forecast period.

The Sentencing Module takes the number of defendants disposed of in the Magistrates' Workload Model and the Crown Court Workload Model and applies sentencing splits using court proceedings data from January 2004 to March 2013 at a quarterly resolution. This results in a set of projections as broken down in Table C1. These are aggregated providing forecasts for each offence, gender, age and disposal category, which are used as the custodial conviction projections.

Table C1: Courts and Sentencing Module Splits Dimensions

Offence Type	Gender	Age Band	Court Route	Disposal
Burglary	Male	Age 10-17	MC	Discharge
Criminal Damage	Female	Age 18-20	MCCC	Fine
Fraud and Forgery		Age 21+	CC	Community Sentence
Indictable Motoring				Suspended Sentence
Other				Custodial <6 months
Robbery				Custodial 6 months - <1year
Sexual Offences				Custodial 1year - 4 year
Summary Motoring				Custodial 4 year+
Summary Non-Motoring				Indeterminate
Theft and handling				Otherwise Dealt With
Violence Against the Person				

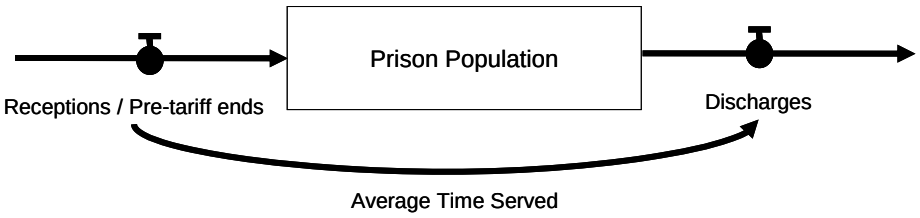
Key to the court route splits: MC: those tried and sentenced in the Magistrates Court; MCCC: those who are tried in the Magistrates Court and Sentenced in the Crown Court; CC: combines those defendants who are committed for trial in the Crown Court and sent for trial in the Crown Court into a single category.

If required, the Courts and Sentencing Module allows trends in the demographic splits and courts and sentencing processes to be implemented when projecting custodial convictions. This procedure was implemented to create the custodial convictions projections used in the three published scenarios.

3a) Producing prison population projections

Prison population projections are produced using the Prison Population Stock-Flow Model. The principal sub-populations in prison - determinate sentence, life sentence, imprisonment for public protection (IPP), remand and recall - are modelled using stock-flow structures based on the generic structure shown in Figure C2. The stock-flow structures model the flow of offenders into and out of prison and count the resulting prison population each month.

Figure C2: Generic stock-flow structure in the Prison Population Stock-Flow Model



For the determinate population, the monthly inflows to prison are based on the custodial convictions projections described above. These custodial convictions include offenders that may already be serving a sentence for a previous crime or those who would serve their whole custodial sentence on remand, meaning that they would not be a new reception to prison. Therefore, to convert from custodial convictions to prison receptions, the historical proportions of custodial receptions to prison receptions for each sub-population are calculated and averaged over the last twelve months of historical data (April 2012 to March 2013 inclusive). Projected receptions are set equal to projected custodial receptions multiplied by the relevant fraction for each sub-population.

Monthly outflows for the determinate population are based on observed custodial sentence lengths and the observed percentage of sentence length served taken from January 2012 to March 2013. Each projected offender that enters the model is given a custodial sentence length that is randomly selected from a distribution. This distribution is populated with custodial sentence lengths from actual offender receptions who share the same characteristics of offence, gender and age group in the observed time period. The per cent of custodial sentence length served is derived in the same manner, except that the observed distribution is made up of discharged offenders and the characteristic of custodial sentence length band is added.

Projected prison receptions are sub-divided by an age category, but an exact age of the offender is also applied in the same manner as the custodial sentence lengths. This allows the model to age the offenders whilst in prison.

The approach for the other sub-populations is similar and has not been substantially revised since the 2012 publication, with the methodology as follows.

For recall prisoners, the model assumes there will be a certain fraction of recall receptions per prison discharge and sets recall receptions in the same month as their related prison discharge. Recall discharged are based on a single average time served variable that is calibrated to fit the actual population over the time period April 2012 to March 2013 We assume that this effectively models the real world situation in which individual prisoners can be recalled a number of times and recall receptions are always some time after their related conviction receptions.

For remand prisoners, average custodial sentence lengths are calculated from remand receptions and remand populations and are not calibrated. Instead, reception projections are adjusted so that the modelled stock of prisoners is close to the actual historical numbers. The remand population is generated in two parts both using this approach – untried remand and unsentenced remand populations are generated separately.

IPP and life sentence prisoners have an extra section in the stock-flow structure which models their pre-tariff detention. Outflows from this section into the generic stock-flow structure depend on tariff length.

Subsequent outflow for IPP and life sentence prisoners depends on the frequency and outcome of Parole Board hearings. The values of these parameters are set at the average of the last 12 months of data (July 2012-June 2013).

The non-criminal population is modelled differently. In this case, the projected size of the non-criminal population is set equal to the average size of the non-criminal population over the last two months of available data (NOMS have made an agreement with the Home Office to hold an increased number of immigration detainees, which are only seen in the final two periods of historical data). This ensures that the non-criminal projections reflect the latest and most accurate count of the non-criminal population.

The population in prison at the end of each modelled month is aggregated into the categories defined by gender, current age group and, for determinate sentence prisoners, sentence length band, to produce raw, unadjusted prison population projections.

3b) Accounting for the impacts of circumstance, legislation, and for seasonal effects

The raw, unadjusted prison population projections are subject to model adjustments to show the impact of the Legal Aid, Sentencing and Punishment of Offenders Act which has not yet been realised, the opening of The Verne as an IRC, data recording changes and the assumed impact of changes in court

committals. Model adjustments are also used to account for seasonal variation in the population. Model adjustments have been applied equally to all the scenarios modelled.

The Legal Aid, Sentencing and Punishment of Offenders Act, which achieved Royal Assent in May 2012, has been included as a post model adjustment (where the full impacts have not already been seen within the prison population). The estimated impacts have been applied to the indeterminate, determinate and remand populations.

The Verne is to be opened as an immigration removal centre (IRC) with 580 places in February 2014. An adjustment has been made to the non-criminal projection for these additional places which would not previously have been counted as part of the prison population. It is expected that once occupancy meets capacity, The Verne will see more consistency with its occupancy rates in line with the rest of the IRC estate.

An adjustment has been made to the remand and sentenced populations for a short-term increase in the population which may be the result of changes to court committals.

Data quality work has taken place to improve the recording of offenders who are held post-sentence pending deportation (who should be recorded as non-criminals, but historically around 300 have wrongly remained recorded as sentenced prisoners). An adjustment has been made to the projections to ensure that these offenders are now being included in the non-criminal projections and have been removed from the sentenced population going forward.

The other ongoing changes within the system included in previous published projections are assumed to be captured in the past data and the trends detected therein.

Custodial conviction projections for each sub-population were smoothed using a centred 12 month average and seasonality was added back in to the final population projections. Seasonality was added to the smoothed projections where seasonality was identified using autocorrelation plots. It was added in to the smoothed projections over the future period using average seasonal adjustments seen in the historical populations.

Appendix D: Stakeholders consulted about scenarios

Internal stakeholders from across the Ministry of Justice.

External representatives from:

National Offender Management Service (NOMS)—Estates;

NOMS—Population Strategy;

NOMS—Public Protection Unit;

NOMS—Scenario Analysis Team;

The Magistrates' Association;

The Prison Service;

The Probation Service;

The National Bench Chairmen's Forum;

The Parole Board;

The Sentencing Council;

The Youth Justice Board.

Contact Points for further information

Current and previous editions of this publication are available for download from www.justice.gov.uk/publications/statistics-and-data/index.htm

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