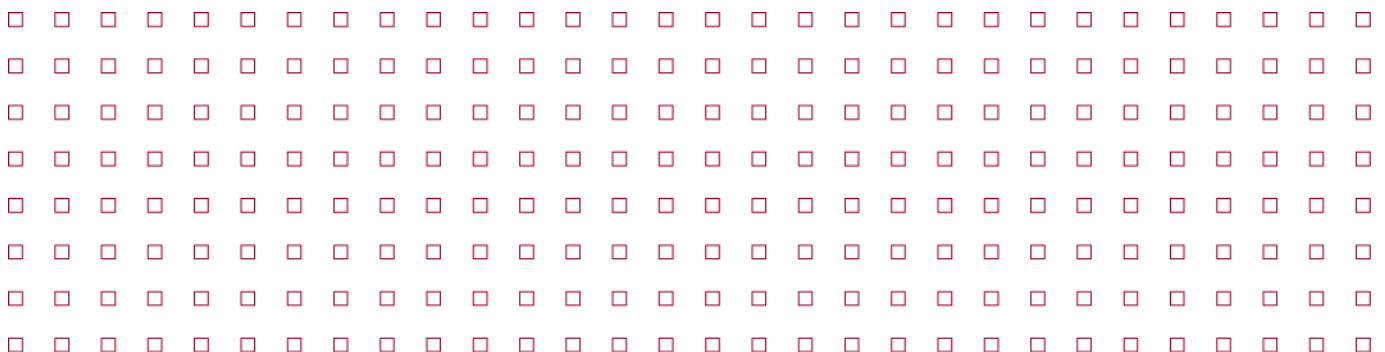# Prison Population Projections 2014 – 2020 England and Wales

Ministry of Justice
Statistics Bulletin

Published 27th November 2014

Contents

Key points

This bulletin presents projections of the prison population in England and Wales from November 2014 to December 2020. The prison population projections are based on assumptions about future custodial convictions and incorporate the anticipated impacts of agreed policy and procedural initiatives.

The "Central Scenario" estimates that the prison population will increase from the current position 85,925[1] to 87,700 by June 2015. By the end of June 2020 the prison population is projected to be 90,200. This Central Scenario is our best estimate based on the available information. The projected prison population under our Central Scenario is shown in Chart 1.

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.

Chart 1: Projected prison population (Central Scenario)
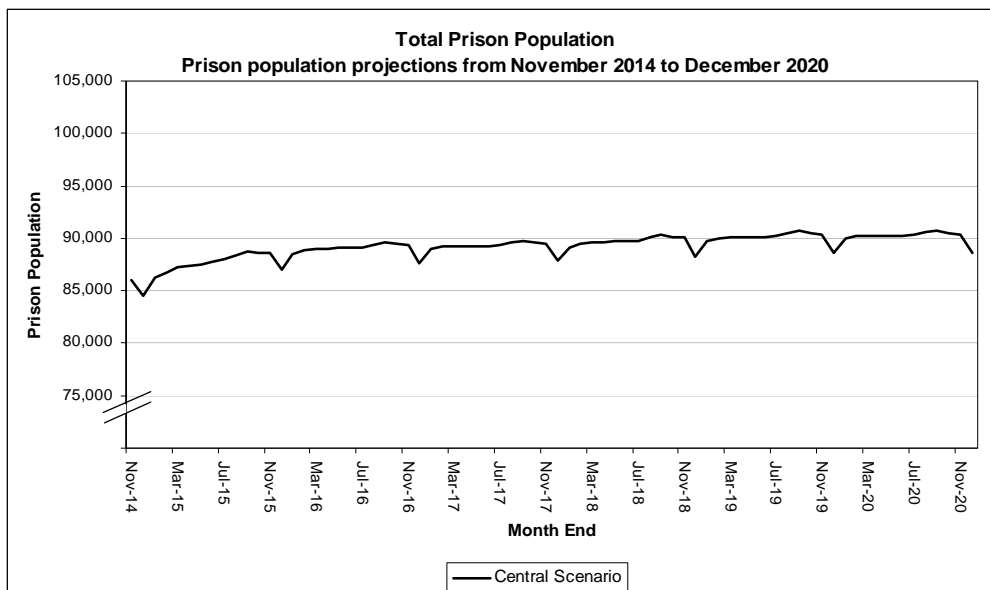
The Central Scenario has been modelled assuming custodial convictions are broadly in line with recent trends and average length of sentence to be flat based on recent trends.

The projections do not attempt to estimate the impact of any future Government policy that is yet to achieve Royal Assent, and therefore become less certain over time.

---

[1] As at 21 November 2014: www.gov.uk/government/statistics/prison-population-figures-2014

The assumptions used are based on consultation with policy and operational experts at the Ministry of Justice and the National Offender Management Service. They also take into account observed data trends:

- These projections represent a change from last year where the 2013 Scenario 2 (central) saw the population gradually falling over the six year lifetime of the projection. The Central Scenario in the projections this year shows the population rising over the next six years. This change arises from the fact that the latest projections capture a recent upward trend in prosecutions of more serious offences.

- Despite the fact that overall crime is falling there has been an increase in recorded crime for certain offence types:

    o Prosecutions for sexual offences are the highest in the decade and increased by 19% in the 12 months ending June 2014, in line with a 21% increase in recorded crime. Offenders sentenced for sexual offences had an Average Custodial Sentence Length (ASCL) of 59.7 months, a rise of 2.4 months, compared with year ending June 2013.

    o Violence against the person proceedings for indictable offences have increased by 7% in the 12 months ending June 2014. This is in line with an 11% increase in recorded crime.

Further statistics and commentary on the changes seen in Court proceedings and sentencing over the last year is presented in the Criminal Justice System Statistics Quarterly publication. This is available online on GOV.UK at: www.gov.uk/government/collections/criminal-justice-statistics-quarterly

1. Central Scenario

This bulletin presents prison population projections for England and Wales from November 2014 to December 2020. The central projection is 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 (21 November 2014) is 88,015[2].

The Central Scenario estimates that the prison population will rise to 87,700 by the end of June 2015 and to 90,200 by the end of June 2020.

The Central Scenario tracks the impact of current trends in sentencing on custodial convictions, custodial sentence lengths and hence on the resulting prison population. These assumptions have been agreed through a consultative process. Government policy is only included in these projections when it has received Royal Assent. These projections also take into account other drivers including:

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

- assumptions regarding future parole hearing frequency and expected outcomes for indeterminate (Life and Indeterminate for the Public Protection) sentences;

- the Home Office gaining access to all 580 places at the Verne Immigration Removal Centre (IRC) by January 2015;

- the impacts of the Offender Rehabilitation Act 2014[3] which achieved Royal Assent on 13 March 2014 meaning offenders sentenced to custodial sentences of less than 12 months will be released subject to licence. There will also be a new post-sentence supervision period following licence for offenders released from custodial sentences of less than 2 years;

- the impacts of the Release on Temporary Licence (ROTL) review deciding that all offenders who have previously absconded will no longer be allowed to return to the open estate or be released on temporary licence except in exceptional circumstances.

---

[2] www.gov.uk/government/statistics/prison-population-figures-2014
[3] www.justice.gov.uk/transforming-rehabilitation

Two illustrative scenarios are produced that consider the impact of; 1) a decrease in custodial convictions and sentence lengths; 2) an increase in custodial convictions and sentence lengths, compared to current trends.

2. Recent trends in the population

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.[4]

The prison population grew rapidly between 1993 to 2008, at 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; and

- an 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[5] 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.[6]

From the end of August 2013 to the end of October 2013, the remand population rose sharply, driving an overall increase in the prison population. This was being driven by an increase in demand in the Crown Courts, especially among more serious tri-able either way cases. The total population has continued to rise since the beginning of 2014 and reached 85,925[7] on the

---

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

[6] http://services.parliament.uk/bills/2010-11/legalaidsentencingandpunishmentofoffenders.html
[7] www.gov.uk/government/statistics/prison-population-figures-2014

21 November 2014. The latest projections assume demand in the courts remains at this higher level.

Table 1 summarises these changes.

Table 1: Population in custody changes from 2006 to 2014

	Offender Management Statistics		Year on year % difference
	Start of Year	End of Year	
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%
June 2013 to June 2014	83,842	85,509	2.0%

Further statistics and commentary on the changes seen in prison population over the last year, is presented in the Offender Management Statistics Quarterly publication. This is available online on GOV.UK at: www.gov.uk/government/collections/offender-management-statistics-quarterly

3. Modelling methodology and projection scenarios

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. In order to project volumes of defendants being given a custodial sentence, it also takes 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 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, such as 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 B provides details of the methods used to produce the prison population projections and the assumptions behind them.

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.

The method used for generating projections of the prison population in England and Wales for the 2014-2020 projections is consistent with the approach used to generate the 2013-2019 projections published on 7 November 2013.

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 the proportion of custodial sentences served for subsets of these populations. The model also simulates the ageing of the prison population over time.

The projection model is based on data up to June 2014 from various sources including court proceedings and performance data, sentencing data and prison receptions and population data.

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 latest available data to September 2014.

Three scenarios have been modelled. These scenarios track the impact of three different incremental changes in sentencing behaviour:

- The Central Scenario assumes custodial convictions are broadly in line with recent trends. The average length of sentence is assumed to be flat based on recent trends in sentence lengths. This broadly reflects the assumptions for Scenario 2 in the November 2013 projections.

We also consider two illustrative scenarios

- Scenario 1 assumes that custodial convictions will fall against recent trends. The average length of sentence is assumed to be lower than what has been observed in recent trends in sentence lengths.

- Scenario 2 assumes a rise in custodial convictions when compared to recent trends. Also the average length of sentence is assumed to be higher than what has been observed in recent trends in sentence lengths.

The three 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;

- assumptions regarding future parole hearing frequency and expected outcomes for indeterminate sentences;

- the Home Office gaining access to all 580 places at the Verne IRC by January 2015;

- the impacts of the Offender Rehabilitation Act 2014, whereby offenders with custodial sentences of less than 12 months will be released subject to licence and a new post-sentence supervision period following licence for offenders released from custodial sentences of less than 2 years;

- the impacts of the ROTL review deciding that all offenders who have previously absconded will no longer be allowed to return to the open estate or be released on temporary licence except in exceptional circumstances;

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.

Scenario 1 and Scenario 2 do not represent bounds on our central projection of the prison population, nor do they represent the likelihood of changes above or below our central projection.

4. Results

The Central Scenario estimates that the prison population will rise to 87,700 by the end of June 2015 and to 90,200 by the end of June 2020.

Chart 2 presents Prison population projections from November 2014 to December 2020.

Chart 2: Projected monthly prison population (all scenarios)
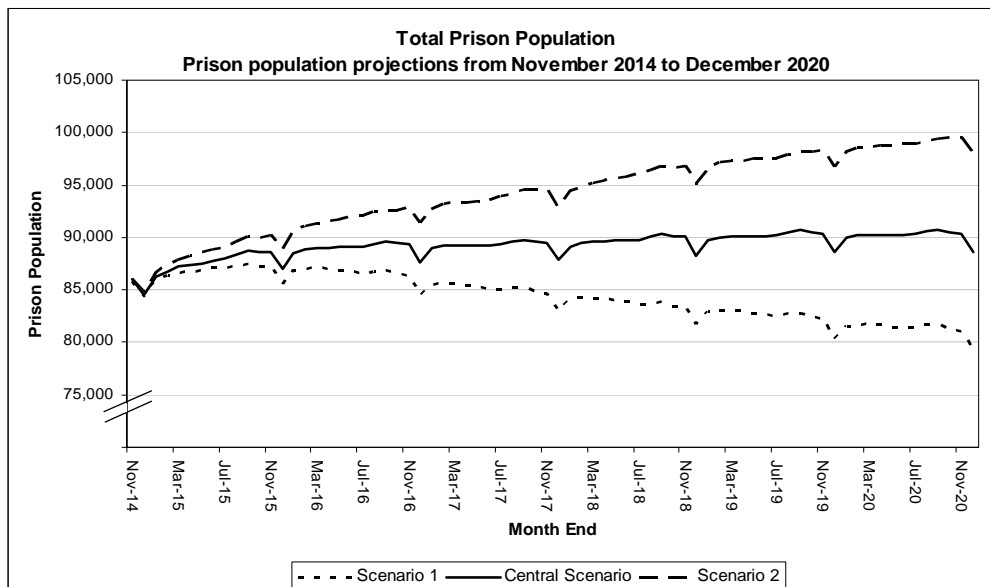
Illustrative Scenario 1 estimates that the prison population will rise to 87,100 by the end of June 2015 and then fall to 81,400 by the end of June 2020.

Illustrative Scenario 2 estimates that the prison population will rise to 88,900 by the end of June 2015 and to 98,900 by the end of June 2020.

The projected trends reflect the cumulative impacts of the various 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 Central Scenario, the prison population is expected to rise to 90,200 by June 2020. The projected population increase is largely due to the recent trends in case mix where we have seen more serious cases come before the courts. This results in offenders receiving longer custodial sentence lengths, which in turn places an upward pressure on the prison population. The growth in this scenario is largely driven by the rise in the determinate population which is projected to grow to 60,200 by June 2020. This is partially due to the

introduction of the Extended Determinate Sentence (EDS) as part of the Legal Aid, Sentencing and Punishment of Offenders[8] (LASPO) Act which commenced in December 2012. Some of the growth in the determinate population has been offset by a decline in the indeterminate population following the removal of the Imprisonment for Public Protection (IPP) sentence in the LASPO act.

Appendix A contains tables for annual projected end of June populations, average financial year populations and total monthly populations for each scenario along with detailed breakdown of the projections for our sub-populations.

---

[8] services.parliament.uk/bills/2010-11/legalaidsentencingandpunishmentofoffenders.html

5. Previous Projections

At the end of September 2014 the published prison population was within 1.8 % of the 2013 Scenario 2 (central) projection, and within 3.4 % of the 2013 Scenario 1 projection and 0.2 % of the 2013 Scenario 3 projection. This does not indicate which scenario the actual prison population will track going forward.

Differences between the 2013 projections and the actual population 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.

Chart 3 plots the 2014 Central Scenario projection against the three 2013 prison population projections. The 2014-2020 Central Scenario projection is above all three scenarios from last year. The higher level of the new projections can be attributed to a more serious case mix coming into the courts with a resulting increase in average custodial sentence lengths. The projection for June 2019 in the Central Scenario this year is 10.2 % above the equivalent scenario (Scenario 2) last year.

Chart 3: Comparing 2013 and 2014 projections (November 2014 – December 2020)
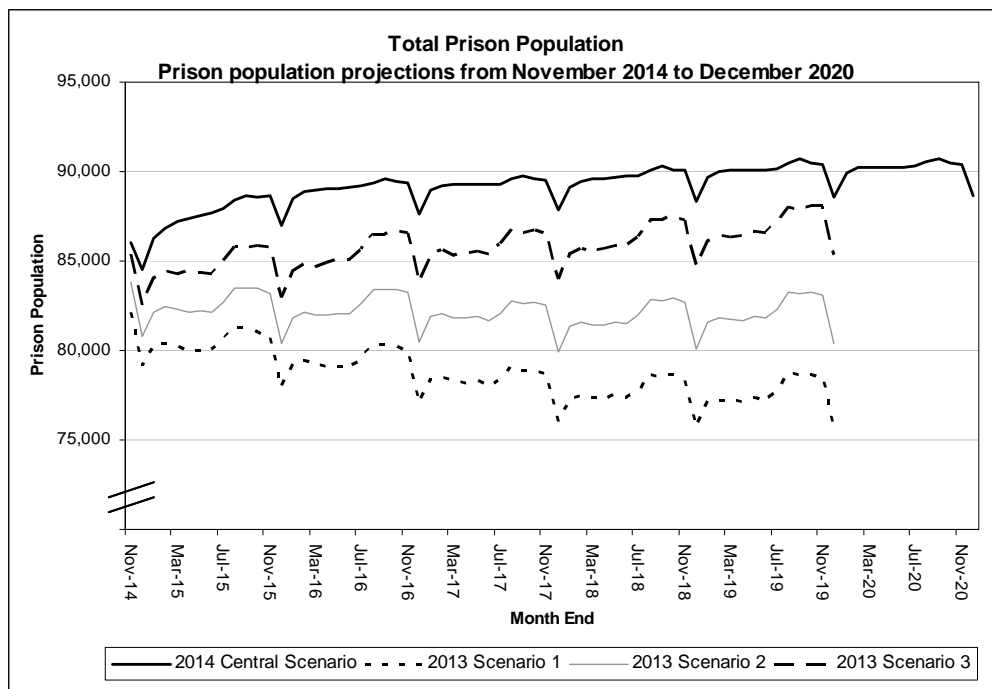
6. Caveats on prison population projections

The projections presented 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 2014 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.

Assumptions for modelling and scenario development were captured through consultation with policy and operational experts at the Ministry of Justice and the National Offender Management Service. 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.

Appendix A: Additional tables[9]

Annual tables of overall projected prison population

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

	Sentencing Scenarios		
	Scenario 1	Central	Scenario 2
Jun-15	87,100	87,700	88,900
Jun-16	86,800	89,100	92,000
Jun-17	85,200	89,300	93,600
Jun-18	83,900	89,700	95,800
Jun-19	82,600	90,100	97,600
Jun-20	81,400	90,200	98,900

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

	Sentencing Scenarios		
	Scenario 1	Central	Scenario 2
2015/16	87,000	88,200	89,700
2016/17	86,200	89,100	92,400
2017/18	84,700	89,300	94,100
2018/19	83,400	89,800	96,300
2019/20	82,200	90,100	97,900

Table A3: Comparison of 2013 based Scenario 2 and 2014 Central Scenario projections (end of June figures)

	Sentencing Scenarios		
	2013	2014	Difference
Jun-14	83,400	--	--
Jun-15	82,100	87,700	6.8%
Jun-16	82,000	89,100	8.6%
Jun-17	81,600	89,300	9.4%
Jun-18	81,500	89,700	10.1%
Jun-19	81,800	90,100	10.2%
Jun-20	--	90,200	--

[9] 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	Central	Scenario 2
Jun-15	54,600	55,500	56,600
Jun-16	54,400	57,000	60,000
Jun-17	53,500	57,900	62,300
Jun-18	52,600	58,800	64,900
Jun-19	51,800	59,600	67,200
Jun-20	51,000	60,200	68,900

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

	Sentencing Scenarios		
	Scenario 1	Central	Scenario 2
Jun-15	12,200	12,200	12,200
Jun-16	11,700	11,700	11,700
Jun-17	11,000	11,000	11,000
Jun-18	10,500	10,500	10,500
Jun-19	10,100	10,100	10,100
Jun-20	9,600	9,600	9,600

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

	Sentencing Scenarios		
	Scenario 1	Central	Scenario 2
Jun-15	12,900	12,300	11,700
Jun-16	13,000	12,300	11,600
Jun-17	12,900	12,300	11,600
Jun-18	13,000	12,300	11,600
Jun-19	13,000	12,300	11,700
Jun-20	13,000	12,300	11,700

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

	Sentencing Scenarios		
	Scenario 1	Central	Scenario 2
Jun-15	5,400	5,700	6,300
Jun-16	5,700	6,100	6,700
Jun-17	5,800	6,100	6,800
Jun-18	5,800	6,100	6,800
Jun-19	5,800	6,100	6,800
Jun-20	5,800	6,100	6,800

Table A8: Projected non-criminal prison population (end of June figures)[10]

	Sentencing Scenarios		
	Scenario 1	Central	Scenario 2
Jun-15	1,800	1,800	1,800
Jun-16	1,800	1,800	1,800
Jun-17	1,800	1,800	1,800
Jun-18	1,800	1,800	1,800
Jun-19	1,800	1,800	1,800
Jun-20	1,800	1,800	1,800

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

	Sentencing Scenarios		
	Scenario 1	Central	Scenario 2
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
Jun-20	100	100	100

---

[10] 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	Central	Scenario 2	Scenario 1	Central	Scenario 2
Jun-15	76,500	77,100	78,700	47,400	48,200	49,800
Jun-16	75,800	78,300	82,000	46,800	49,500	53,300
Jun-17	74,400	78,500	83,700	45,900	50,400	55,700
Jun-18	73,200	78,900	85,800	45,200	51,300	58,200
Jun-19	72,200	79,300	87,500	44,600	52,000	60,300
Jun-20	71,100	79,400	88,700	44,000	52,600	62,000

	Indeterminates			Remand		
Scenario	Scenario 1	Central	Scenario 2	Scenario 1	Central	Scenario 2
Jun-15	11,700	11,700	11,700	10,800	10,200	9,600
Jun-16	11,200	11,200	11,200	10,800	10,200	9,600
Jun-17	10,500	10,500	10,500	10,800	10,200	9,500
Jun-18	10,100	10,100	10,100	10,800	10,200	9,600
Jun-19	9,600	9,600	9,600	10,900	10,200	9,600
Jun-20	9,200	9,200	9,200	10,800	10,200	9,600

	Recall			Non Criminal		
Scenario	Scenario 1	Central	Scenario 2	Scenario 1	Central	Scenario 2
Jun-15	4,900	5,200	5,800	1,700	1,700	1,700
Jun-16	5,200	5,500	6,100	1,700	1,700	1,700
Jun-17	5,300	5,600	6,100	1,700	1,700	1,700
Jun-18	5,300	5,600	6,100	1,700	1,700	1,700
Jun-19	5,300	5,600	6,100	1,700	1,700	1,700
Jun-20	5,300	5,600	6,100	1,700	1,700	1,700

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

	Sentencing Scenarios		
	Scenario 1	Central	Scenario 2
Jun-15	5,700	5,700	5,300
Jun-16	6,300	5,900	4,900
Jun-17	6,200	5,900	4,700
Jun-18	6,200	5,900	4,800
Jun-19	6,100	5,900	4,800
Jun-20	6,000	5,900	4,800

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

	Sentencing Scenarios		
	Scenario 1	Central	Scenario 2
Jun-15	4,100	4,100	4,300
Jun-16	3,900	4,100	4,600
Jun-17	3,800	4,100	4,700
Jun-18	3,600	4,100	4,800
Jun-19	3,600	4,200	4,900
Jun-20	3,500	4,200	4,900

Table A13: Projected 15-17 years old prison population (end of June figures)[11]

	Sentencing Scenarios		
	Scenario 1	Central	Scenario 2
Jun-15	700	700	600
Jun-16	800	800	500
Jun-17	800	800	500
Jun-18	800	800	500
Jun-19	800	700	500
Jun-20	800	800	500

---

[11] 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				Sentencing Scenarios		
	Scenario 1	Central	Scenario 2		Scenario 1	Central	Scenario 2
Nov-14	85,800	86,100	86,100	Dec-17	82,900	87,800	92,900
Dec-14	84,300	84,600	84,800	Jan-18	84,200	89,200	94,400
Jan-15	85,900	86,200	86,700	Feb-18	84,200	89,500	94,800
Feb-15	86,400	86,800	87,400	Mar-18	84,100	89,600	95,100
Mar-15	86,700	87,200	87,900	Apr-18	84,100	89,600	95,500
Apr-15	86,700	87,400	88,300	May-18	84,000	89,700	95,700
May-15	86,900	87,500	88,600	Jun-18	83,900	89,700	95,800
Jun-15	87,100	87,700	88,900	Jul-18	83,700	89,800	96,000
Jul-15	87,100	88,000	89,100	Aug-18	83,700	90,100	96,400
Aug-15	87,300	88,400	89,600	Sep-18	83,800	90,300	96,800
Sep-15	87,400	88,700	90,100	Oct-18	83,400	90,100	96,700
Oct-15	87,300	88,600	90,000	Nov-18	83,400	90,100	96,800
Nov-15	87,200	88,600	90,200	Dec-18	81,600	88,300	95,100
Dec-15	85,500	87,000	88,900	Jan-19	82,900	89,700	96,500
Jan-16	86,900	88,500	90,500	Feb-19	83,000	90,000	97,200
Feb-16	87,100	88,900	91,100	Mar-19	83,000	90,100	97,400
Mar-16	87,100	89,000	91,400	Apr-19	83,000	90,100	97,300
Apr-16	87,000	89,000	91,600	May-19	82,800	90,100	97,500
May-16	86,900	89,100	91,800	Jun-19	82,600	90,100	97,600
Jun-16	86,800	89,100	92,000	Jul-19	82,600	90,200	97,600
Jul-16	86,500	89,200	92,100	Aug-19	82,800	90,500	98,000
Aug-16	86,700	89,400	92,400	Sep-19	82,800	90,700	98,100
Sep-16	86,800	89,600	92,600	Oct-19	82,400	90,500	98,100
Oct-16	86,500	89,400	92,600	Nov-19	82,200	90,400	98,300
Nov-16	86,300	89,400	92,800	Dec-19	80,300	88,600	96,700
Dec-16	84,400	87,600	91,300	Jan-20	81,500	89,900	98,200
Jan-17	85,600	88,900	92,800	Feb-20	81,700	90,200	98,500
Feb-17	85,600	89,200	93,200	Mar-20	81,800	90,300	98,700
Mar-17	85,600	89,200	93,300	Apr-20	81,700	90,300	98,800
Apr-17	85,400	89,300	93,300	May-20	81,500	90,300	98,800
May-17	85,300	89,300	93,500	Jun-20	81,400	90,200	98,900
Jun-17	85,200	89,300	93,600	Jul-20	81,400	90,300	98,900
Jul-17	85,000	89,300	93,900	Aug-20	81,600	90,600	99,300
Aug-17	85,200	89,600	94,200	Sep-20	81,800	90,700	99,500
Sep-17	85,200	89,800	94,500	Oct-20	81,300	90,500	99,500
Oct-17	84,900	89,600	94,500	Nov-20	81,100	90,400	99,600
Nov-17	84,700	89,500	94,600	Dec-20	79,200	88,700	97,900

Appendix B: 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 2014 projections has not changed substantially from that used in the 2013 projections. As in the 2013 projections custodial sentence lengths used in the model are disaggregated by gender, age of the offender and offence type. The total time to be served in prison by projected future prisoners is assigned by matching their gender and age characteristics to relevant distributions of (i) custodial sentence lengths and (ii) the percentage of custodial sentence served. These distributions are derived from data for the period October 2013 to April 2014. This allows us to:

- understand the Criminal Justice System factors which contribute to change in the prison population, including sentences lengths issued, the percentage of sentence served in custody, trial court and sentencing court changes, or shifts in the demographic characteristics of defendants;

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

- quantify the impact of uncertainty around the time a defendant serves in prison on the prison population.

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 B1, and described below.

Figure B1: Key Components of the prisons projections modelling system
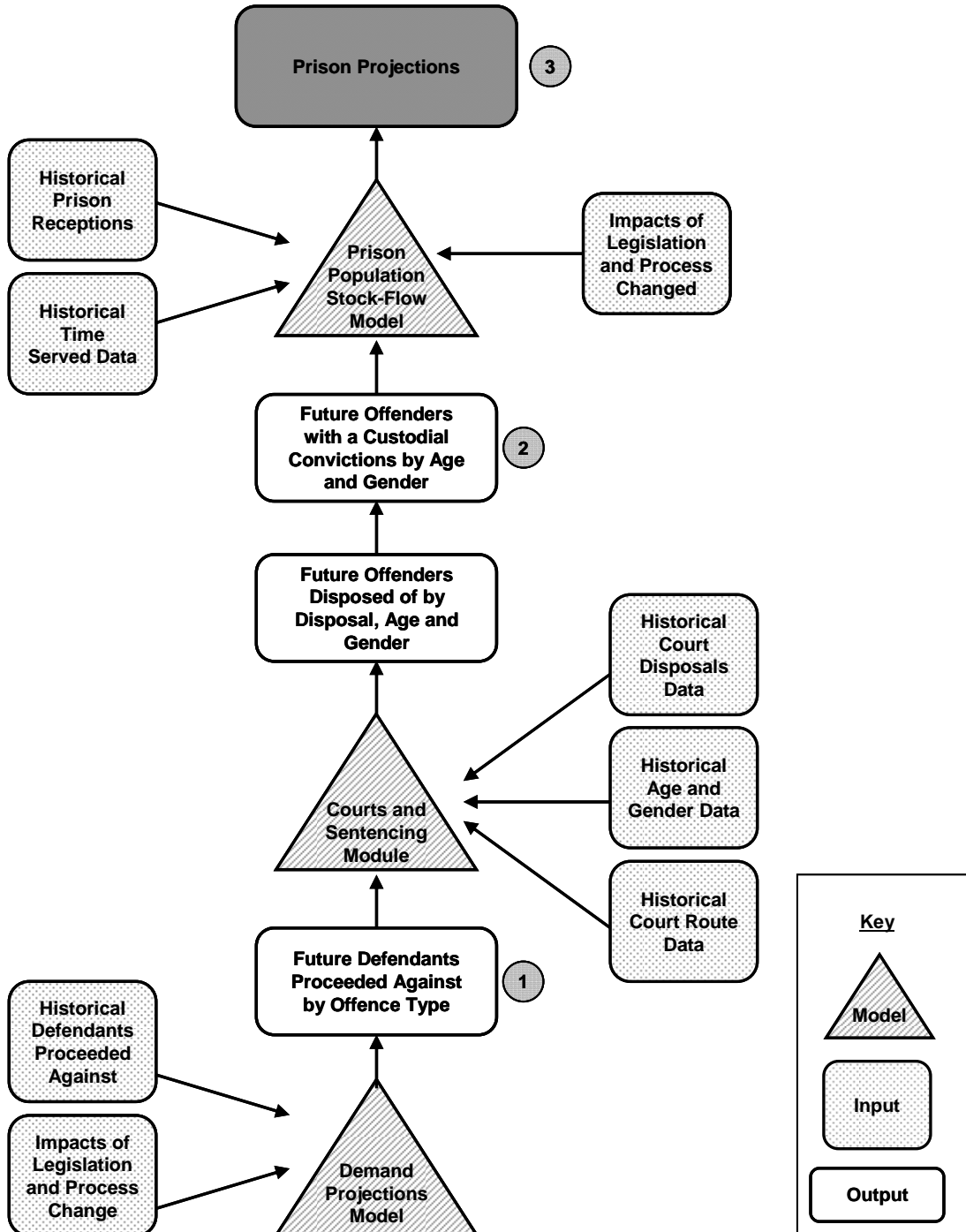
1) Producing projections of defendants proceeded against

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.

The Demand Projections Model produces baseline projections of all defendants proceeded against at court for 12 high-level offence categories. This is based on historical time series data (January 2002 to June 2014) at a monthly resolution out to 2020, sub-divided by region and age for the Magistrates' court and region for the Crown Court.

The demand projections are based on time series forecasting methods such as Seasonal Exponential Smoothing (SES). A 'middle-out' forecast is used, centred at the offence level. The other levels in the hierarchy are reconciled so that the levels below (e.g. region or offender age) when disaggregated, and the levels above (i.e. totals) when aggregated, are consistent with the forecasts derived at the offence level.

It should be noted that these projections cannot 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 a 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 B1) and tracks their flow through the system.

The Crown Court workload model takes forecasts of caseload and assigns various attributes (e.g. early guilty plea, effective trial mix) to estimate likely hearing times and the resulting flow of cases through the system. The cases disposed of are then converted to the number of defendants disposed of using recent data for the observed ratio between cases and defendants.

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 based on analysis of court proceedings data from January 2004 to June 2014. This results in a set of projections as broken down in Table B1. These are aggregated providing forecasts for each offence, gender, age and disposal category, which are used as the custodial conviction projections.

Table B1: 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 offender demographics and courts and sentencing processes to be incorporated into custodial convictions projections. 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) and remand – are modelled using stock-flow structures based on the generic structure shown in Figure B2. The stock-flow structures model the flow of offenders into and out of prison and count the resulting prison population at the end of each month.

Figure B2: Generic stock-flow structure in the Prison Population Stock-Flow Model
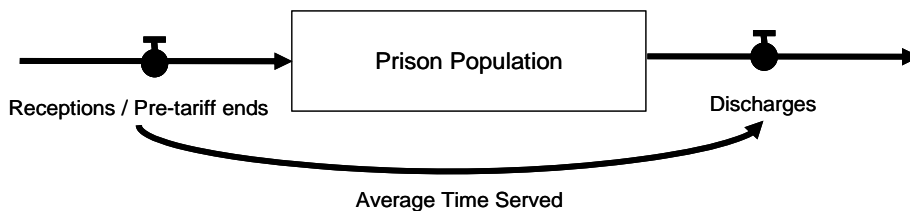
For the determinate population, the monthly inflows to prison are based on the custodial convictions projections described above. These custodial convictions include offenders that may already be serving a sentence for a previous crime or those who would serve their whole custodial sentence on remand, meaning that they would not be a new reception to prison. To convert from custodial convictions to prison receptions we apply a conversion ratio derived from the historical proportions of custodial convictions to prison receptions for each sub-population averaged over the last twelve months of historical data (April 2013 to March 2014 inclusive).

Monthly outflows for the determinate population are based on observed custodial sentence lengths and the observed percentage of sentence length served taken from October 2013 to April 2014. Each projected offender that enters the model is given a custodial sentence length that is randomly selected from the relevant distribution. These distributions are 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 percent of custodial sentence length served is derived in the same manner, except that the observed distribution is made up of discharged offenders further disaggregated by custodial sentence length band.

For offenders who receive the new EDS sentence an adjustment is made to the percent of custodial length served to reflect that these offenders will spend a greater proportion of their sentence in custody than standard determinate sentenced offenders discharged to date.

Projected prison receptions are sub-divided by age category (Juvenile, Young Adult, Adult) with the exact age of the offender attributed in the same manner as the custodial sentence lengths. This allows the model to explicitly age the offenders whilst in prison (e.g. move from Juvenile to Young Adult categories).

The approach for the other sub-populations is similar and has not been substantially revised since the 2013 publication. The methodology applied to each is briefly outlined below.

The recall population is projected going forward based on time-series data available to October 2014.

For remand prisoners the average time served on remand is calculated from the ratio of the remand population to remand receptions. The modelled stock of prisoners is calibrated to historical actuals by varying levels of receptions. The remand population is generated in two parts both using this approach – untried remand and unsentenced remand populations being treated separately.

IPP and life sentence prisoners have an extra section in the stock-flow structure which models the indeterminate nature of their sentence lengths. Outflows for IPP and life sentence prisoners depend on the tariff lengths they receive and on the frequency and outcome of Parole Board hearings. The values of these parameters are set and calibrated to reflect the most recent data on Parole Board outcomes.

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. The projected size of the non-criminal population is therefore set equal to the average size of the non-criminal population over the last two months of available 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 certain provisions in the Offender Rehabilitation Act 2014, changes at the Verne and the ROTL review. 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 Home Office is to gain access to all 580 places at the Verne IRC by January 2015. The estimated impacts have been applied to the non-criminal projection in the model.

Provisions in the Offender Rehabilitation Act 2014 will mean that offenders sentenced to custodial sentences of less than 12 months will be released subject to licence (in the same way as offenders currently released from

longer custodial terms). During the licence period, offenders are under probation supervision and can be subject to various conditions for the purposes of rehabilitation and public protection. The 2014 Act will also introduce a new post-sentence supervision period that follows licence for offenders released from custodial sentences of less than 2 years. Breaches of these licence or supervision periods could result in the offender being recalled or committed to custody, impacting the prison population. The estimated impacts have been applied to the recall populations in the model.

The impact of the ROTL review has also been included as a post model adjustment. The review decided that all offenders who have previously absconded will no longer be allowed to return to the open estate or be released on temporary licence except in exceptional circumstances. Alongside protecting the public this may have the impact of delaying the release decision for such offenders impacting the prison population. The estimated impacts have been applied to the determinate population with sentences of greater than 12 months and the indeterminate population.

Other ongoing changes within the system – included in previous published projections as model adjustments – 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. No seasonality in prison receptions and discharges was modelled explicitly. Seasonality was measured in the historical prison population and applied as a series of percentage adjustments to the final population projections. Seasonal factors for a set of sub-population categories (Remand, Determinate by sentence length band and Recall) were identified for each month by measuring statistically significant deviations from a centred 12 month average.

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

Press enquiries should be directed to the Ministry of Justice press office, telephone: 020 3334 3536

Other enquiries about these statistics should be directed to:

Justice Statistics Analytical Services
Ministry of Justice
7th Floor
102 Petty France
London
SW1H 9AJ

General enquiries about the statistical work of the Ministry of Justice can be e-mailed to: statistics.enquiries@justice.gsi.gov.uk

General information about the official statistics system of the UK is available from www.statistics.gov.uk

Alternative format versions of this report are available on request from the
Ministry of Justice at statistics.enquiries@justice.gsi.gov.uk