

Statistics Publication Notice

Crime and Justice Series

A National Statistics Publication for Scotland



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SCOTTISH PRISON POPULATION PROJECTIONS: 2008-2009 to 2017-2018

Current projections

The latest set of prison population projections show that the daily prison population in Scotland is projected to increase from an annual average of 7,700 over 2008-09, rising to 9,600 by 2017-18 (Table 1). These projections take into account recent trends in the prison population, including the latest available data for the first eight months of 2008.

Table 1 Prison population projections: October 2008 and October 2007

	October 2007 daily average population	October 2008 daily average population	Estimated home detention curfew population	Projected plus HDC population
2007-2008	7,300	7,376 (actual)	309 (actual)	7,685 (actual)
2008-2009	7,500	7,700	380	8,080
2009-2010	7,600	8,000	380	8,380
2010-2011	7,800	8,200	380	8,580
2011-2012	7,900	8,500	380	8,880
2012-2013	8,000	8,700	380	9,080
2013-2014	8,100	8,800	380	9,180
2014-2015	8,300	9,000	380	9,380
2015-2016	8,400	9,200	380	9,580
2016-2017	8,500	9,400	380	9,780
2017-2018		9,600	380	9,980

Note: Estimated home detention curfew population is based on current levels with the assumption that they will remain stable.

The prison population in the first eight months of 2008 has been higher than anticipated. The recent increase is reflected in the latest set of prison population projections, which project higher increases in the future population than the October 2007 projections. A brief description of the population trends in recent years is provided in the next section.

While the increase in the long-term population (sentenced to four years or more) has been gradual over the years, the number of remand prisoners has increased sharply during 2006, stabilising at about 1,600 in 2007 before increasing further to about 1,800 over June-September 2008. This is the main reason for the increased prison population in 2006 and one of the contributing factors to the high prison population in 2008.

However, the main reason for the record prison population levels seen so far in 2008 is the number of short-term prisoners (sentenced to less than four years). This increased consistently since early 2007, with the rate of increase accelerating markedly during 2008 (Chart 2 below).

Given the scale of changes over the past few years, and the relative uncertainty about the extent to which future changes might wholly reverse recent trends, it seems unlikely that the prison population will fall to any great extent over the next six months or so. The October 2008 projections presented below are therefore based on the assumption that the most recent trends should carry the most weight, at least in the short term.

The 2008 projections are the highest projections possible given the current methodology. Whether the high projection is realised in the medium to longer term will very much depend on developments over the next 6-12 months. As a result of the rapid changes over the past few years, the current projection methodology will need to be reviewed and we will be exploring the possibility of alternative approaches during the coming year.

Recent trends in the prison population

The prison population has been increasing steadily since the early 2000s, and the rate of increase has become more marked over the past four years, particularly during the past year: the overall increase in average daily population between 2006 and 2007 was 2.5%, while the monthly figures for 2008 show consistently higher percentage increases compared with 2007, with an accelerating rate of increase in the second half of the year (Table 2).

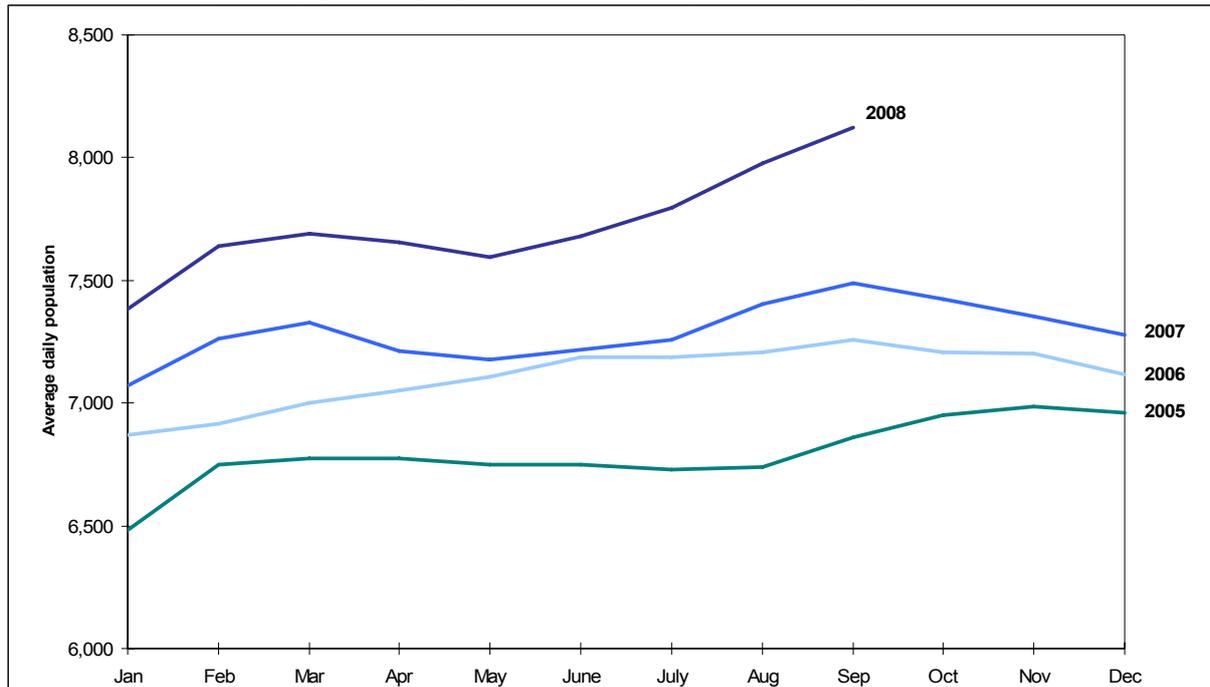
Table 2 Average daily population figures: January 2006 to September 2008

	2006	2007	2008 (provisional from April)	2007 v 2006	2008 v 2007
Jan	6,868	7,070	7,384	2.9%	4.4%
Feb	6,916	7,265	7,639	5.0%	5.2%
Mar	6,999	7,327	7,691	4.7%	5.0%
Apr	7,049	7,214	7,656	2.3%	6.1%
May	7,105	7,176	7,593	1.0%	5.8%
June	7,188	7,218	7,681	0.4%	6.4%
July	7,189	7,256	7,797	0.9%	7.5%
Aug	7,209	7,406	7,978	2.7%	7.7%
Sep	7,258	7,489	8,124	3.2%	8.5%
Oct	7,206	7,425		3.0%	
Nov	7,202	7,353		2.1%	
Dec	7,115	7,279		2.3%	
Annual	7,111	7,291	7,727 (provisional)	2.5%	

What is also notable is how seasonality has varied over the past four years. Population levels traditionally show a seasonal high in March-April which follows a marked dip over December-January (Chart 1). There also tends to be a lull over the summer months before the figures rise again. The seasonal lows reflect holiday periods and the reduced number of court sitting days.

However, in 2006 the population rose steadily until the autumn, despite the introduction of early release on home detention curfew for low risk prisoners in July. The unprecedented increases during 2008 have also undermined to some extent the reliance on past trends which has underpinned the way we currently project the future prison population.

Chart 1 Average daily prison population: January 2005 to September 2008



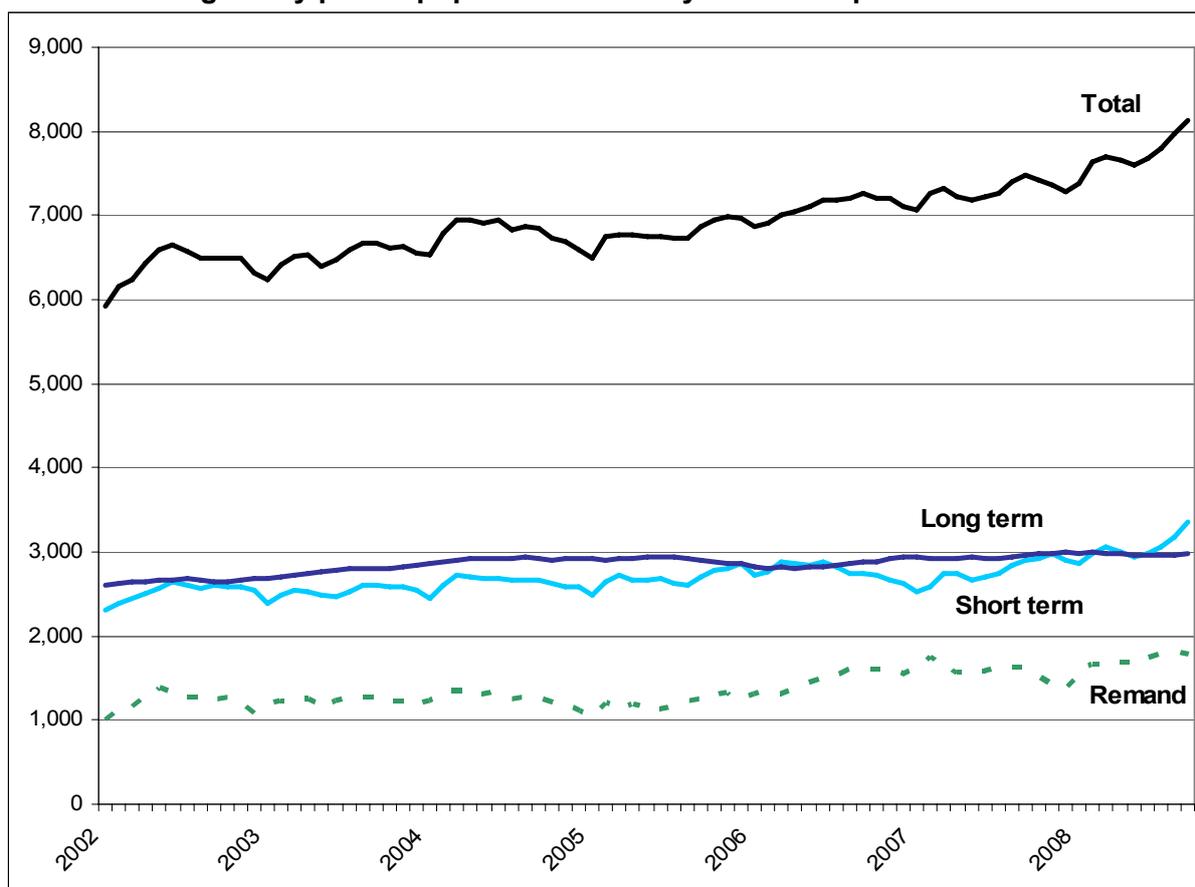
The patterns of change have not been the same for all segments of the prison population (Chart 2). While the increase in the long-term population (sentenced to four years or more) has been gradual over the years, the number of remand prisoners increased sharply during 2006, stabilising at about 1,600 in 2007 before increasing further during 2008. This is the main reason for the increased prison population in 2006 and one of the contributing factors to the high prison population in 2008.

However, the main reason for the record prison population levels seen so far in 2008 is the number of short-term prisoners (sentenced to less than four years). This increased consistently since early 2007, with the rate of increase accelerating markedly during 2008.

There have been a series of initiatives in the past few years, such as the focus on knife crime, summary justice reform and changes with respect to bail and legal aid, which are likely to have contributed to the observed increases in the prison population in the shorter term.

However, other developments, particularly in relation to alternatives to custody, may also impact on the sentencing practice and affect the prison population in the longer term. In particular, the Prison Commission has made strong recommendations regarding greater use of alternatives to custody. If these are implemented, the observed trends in sentencing behaviour will alter in future, and this will have to be taken into account in future prison population projections.

Chart 2 Average daily prison population: January 2002 to September 2008



Methodology

Reception data for different sentence categories are projected separately for adults and young offenders and then converted into populations. Female prisoners are not projected separately as the numbers of women in custody are too small to be modelled statistically.

Some groups of prisoners are treated differently from the direct sentenced group for the projections (details shown in Table A below)

- Remand receptions are projected as a proportion of direct sentenced receptions using available data from 2008.
- Part of the prison population consists of persons who have been previously released under licence or supervision but subsequently recalled into custody. This segment of the prison population has increased over the years and currently represents a larger proportion of the total population than previously. Given this relative increase, the recall population has been projected directly using linear regression.
- Receptions of fine defaulters are held constant at 2007 levels. This group spends very short periods in custody (around three days) and so any change in the number of receptions makes very little difference to the resulting projected population.
- The population of other types of prisoners is also very low and held constant at 2007 levels.

Projected receptions are converted into populations using the average time spent in custody, or time served factor, for each sentence band (see Table B below for more detail on time served factors).

The projection model was run during September-October 2008 using the most recent available reception data to September 2008. The underlying trends assumed for all categories of sentenced receptions are trends in receptions since 1972, but the projected trends are based on a range of time periods in order to model more accurately changes of different magnitudes over different time scales.

Sensitivity of population projections: high and low variants

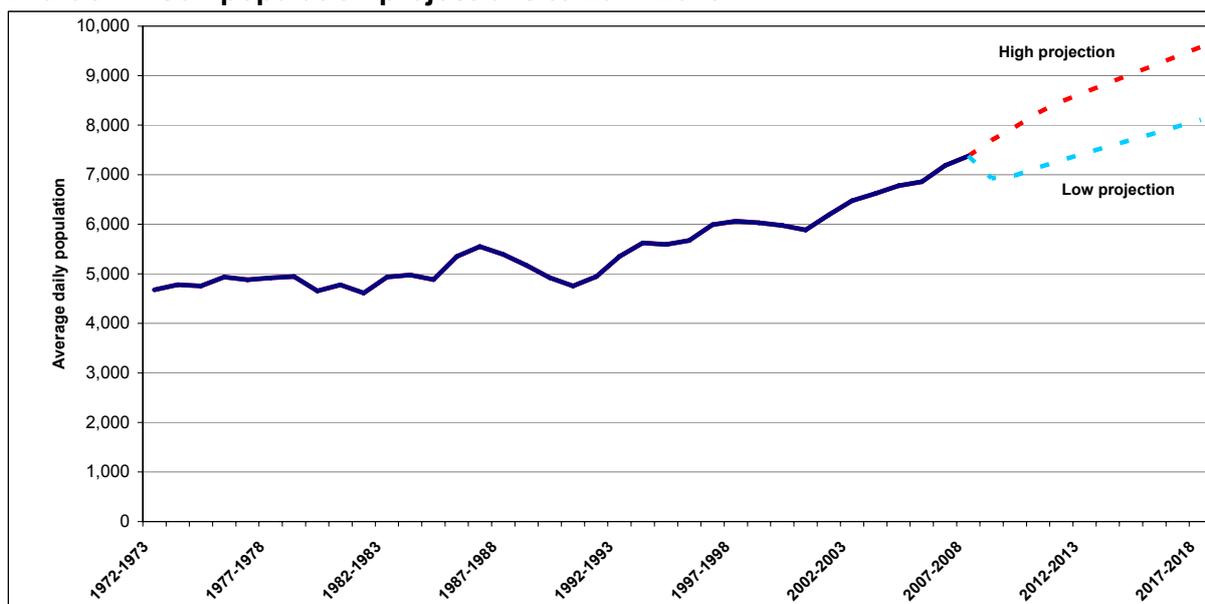
A range of methods are required to compensate for the inherent volatility of the population over time, particularly for the smaller groups. Three time periods are used to take account of short (past ten years), medium (past 25 years) and long (since 1972) term trends. Two different approaches are used: exponential smoothing models the seasonal variation over the year using monthly data, while linear regression models underlying trends using annual data. This gives six projection variants for each sentence category.

Previous projections were based on selecting the most likely projection variant for each sentence category based on knowledge of the area, and then combining them to produce a main projection. The sensitivity of the projection to the choice of variant is shown by the upper and lower limits for all possible projections. These are obtained by selecting the highest and lowest variant for each sentence category (Chart 3).

At present, ten years is the shortest time period used to establish a trend, and so the current projection methodology downplays to some extent the marked changes observed during recent years. This makes the projections less volatile in relation to potential short lived spikes in the figures, but it also makes them less sensitive to what may turn out to be emergent changes in trend.

Up until fairly recently, the choice of main projection has proved reasonably accurate. This has altered somewhat due to the marked changes over the past few years, and the April 2008 projections under projected the 2008 population by about 300-400. With the most recent October 2008 projections, it is the high projection gives the best fit with the current data while the next highest projection substantially under projects the population for 2008 to date, confirming to some extent that it is recent developments which are driving the increases in the shorter term.

Chart 3 Prison population projections to 2017-2018



Given the scale of changes over the past few years, and the relative uncertainty about the extent to which future changes might wholly reverse recent trends, it seems unlikely that the prison population will fall to any great extent over the next six months or so. The October 2008 projections presented here are therefore based on the assumption that the most recent trends should carry the most weight, at least in the short term.

The 2008 projections are the highest projections possible given the current methodology. Whether the high projection is realised in the medium to longer term will very much depend on developments over the next 6-12 months. As a result of the rapid changes over the past few years, the current projection methodology will need to be reviewed and we will be exploring the possibility of alternative approaches during the coming year.

Table A Components of the prison population and projection method

Population	Projection method
<i>Remand</i>	Receptions as fixed proportion of total
<i>Sentenced adults</i>	Receptions held constant
Fine defaulters	Full reception projection
Sentenced for less than 6 months	Full reception projection
Sentenced for 6 months, less than 18 months	Full reception projection
Sentenced for 18 months, less than 2 years	Full reception projection
Sentenced for 2 years, less than 4 years	Full reception projection
Sentenced for 4 years and over, excluding Life	Full reception projection
Life prisoners	Population projected directly using linear regression
<i>Sentenced young offenders</i>	Receptions held constant
Fine defaulters	Full reception projection
Sentenced for less than 6 months	Full reception projection
Sentenced for 6 months, less than 18 months	Full reception projection
Sentenced for 18 months, less than 4 years	Full reception projection
Sentenced for 4 years and over, excluding Life	Full reception projection
Life/S205/S206 prisoners	Population projected directly using linear regression
<i>Persons recalled from supervision/licence</i>	Population projected directly using linear regression over the period 1998 to 2007
<i>Others</i>	Population held constant

Note: Since 2004, the population of prisoners sentenced to life has been projected directly. This was due to changes in release policy for this group, with lifers being currently eligible for parole once the punishment part of their sentence has been served. This has resulted in larger numbers of long-serving lifers being released than had previously been the case, causing the projection method for lifer receptions to provide unrealistic estimates for the lifer population. The population of lifers is currently projected directly using linear regression over the period 1995 to 2007.

Table B Time served factors: September 2008 projections

Population	Time served factor	
	Years	Days
<i>Sentenced adults</i>		
Fine defaulters		2.89
Sentenced for less than 6 months		23.25
Sentenced for 6 months, less than 18 months		88.17
Sentenced for 18 months, less than 2 years		197.39
Sentenced for 2 years, less than 4 years	1.0397	
Sentenced for 4 years and over (excluding life)	3.1047	
Life prisoners	n/a	
<i>Sentenced young offenders</i>		
Fine defaulters		2.98
Sentenced for less than 6 months		19.48
Sentenced for 6 months, less than 18 months		88.03
Sentenced for 18 months, less than 4 years		303.52
Sentenced for 4 years and over (excluding life)	1.9003	
Life/S205/S206 prisoners	n/a	
<i>Persons recalled from supervision/licence</i>	n/a	
<i>Others</i>	n/a	

Notes:

1. Projected remand receptions are converted into populations using the contribution each remand reception makes to the remand population. This contribution is estimated by dividing the average daily remand population in the current year by the number of remand receptions during that period. The data available for part of 2008 were scaled up to estimate the number of remand receptions for the full year.

2. With the exception of prisoners sentenced to life, persons recalled from supervision/licence and 'other' prisoners, time served factors are estimated by dividing the average daily population in the relevant sentence length group by the number of receptions for that group. In the case of young offenders sentenced for four years and over (excluding life prisoners), this calculation is affected by the reclassification of young offenders to adult prisoners when they reach 21. For young offenders, the time served factor represents the time spent in custody before either release or reclassification.

3. Time served factors within some sentence length bands may appear rather lower than expected given that short-term prisoners must serve at least half of their sentence in custody. One reason is that time spent on remand counts towards this period. In addition, prisoners sentenced to less than four years can now be released early on home detention curfew.

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