FUTURE DEMOGRAPHIC CHANGE IN EDINBURGH

An analysis of the 2012-based population projections published by National Records of Scotland in May 2014

Planning Information

Services for Communities

City of Edinburgh Council

June 2014

Future demographic change in Edinburgh

1. In an era when public sector spending is coming under increasing pressure, there is increasing recognition of the powerful role that demographic factors play in shaping the demand for services and resources, and the need to ensure that services respond to demographic change.

2. This briefing report sets out some of the key demographic trends likely to play out in Edinburgh up to 2037, including the continuing growth of the population, changing age composition, and the relative significance of migration and natural change (births / deaths). Analysis of recent trends is also included to provide a context for future changes. The analysis is based on annual population estimates and the latest (2012-based) population projections at local authority level published by National Records of Scotland (NRS).
   (note : National Records of Scotland is the new name for the combined General Register Office for Scotland (GROS) and National Archives of Scotland).

3. It is intended to publish a further briefing note later in 2014 which will cover NRS's latest projections for the number and type of households. (This is scheduled for release in July 2014).

4. The report is structured as follows :

KEY POINTS :

- National Records of Scotland (NRS) has recently released **population projections** for local authority areas which take account of the findings from the 2011 Census. These adopt a starting point of 2012 and look forward 25 years to 2037.
- The 'Principal Projection' envisages that **Edinburgh's population will continue its recent rapid growth**, rising from 482,600 in 2012 to 537,000 in 2022 – an increase of 54,400 or 11.3% over the next 10 years.
- Over the full 25 year period, if recent trends continue, Edinburgh's population would grow by 136,400 or 28.2%, to reach 619,000 (at 2037).
- In both numerical and percentage terms, Edinburgh is projected to be **home to a faster growing population than anywhere else in Scotland**. The

54,400 increase to 2022 puts the city ahead of Glasgow City (+ 34,600), Aberdeen City (+ 24,900), Aberdeenshire (+18,200) and Fife (+ 14,200).

- The 11.3% increase over the same time period puts it ahead of Aberdeen City (+ 11.1%), Perth & Kinross (+ 9.2%), East Lothian (+ 8.8%) and Aberdeenshire (+ 7.1%).
- **Neighbouring local authority areas** with close links to Edinburgh's housing and labour markets are also projected to experience substantial population increases: Growth over the next 10 years amounts to 8.8% in East Lothian, 7.0% in Midlothian, 5.0% in West Lothian, and 3.9% in Fife.
- NRS updates its projections every 2 years. Compared with the previous (2010-based) projections, the 2012-based projections for Edinburgh are pegged to a lower starting point. This reflects the fact that the 2011 Census found some 18,000 fewer people in the city than previous estimates suggested.
- However, the **projected rate of increase is now even steeper than before**, and this means that by the end of the 25 year period the latest projection will catch up with the previous one.
- **Approximately 70% of Edinburgh's future population growth is accounted for by net migration** (i.e. excess of inward over outward migration), and the remaining 30% by 'natural' change (i.e. excess of births over deaths). However, compared with births and deaths, the scale of migration can be volatile and difficult to measure accurately.
- It is important to note that **projections are NOT forecasts** but an estimate of what will happen if recent trends continue. They take no account of future economic changes or policy interventions.
- The latest projections are heavily influenced by **recent volumes of migration into Edinburgh**, although **improving longevity** combined with a **small increase in fertility rates** have also played a role. These factors led to a 26,600 increase in Edinburgh's population between 2007 and 2012 (cf. increases of 8,600 for 2002-2007; 2,200 for 1997-2002; and 9,050 for 1992-1997).
- Over the last 30 years male life expectancy in Edinburgh has increased by 7.0 years (to 77.4) while female life expectancy has increased by 5.4 years (to 81.9).
- In addition to its 'Principal Projection', NRS also publishes '**variant projections**' which are based on higher and lower assumptions for migration, longevity and fertility. Excluding the 'zero migration' scenario, these all show substantial population growth in Edinburgh, with the 2022 population ranging from 525,300 to 549,300, and the 2037 population between 577,400 and 664,700.
- In-migrants tend to include a high proportion of young adults, and **Edinburgh has a very young age profile** compared with the Scottish average. It is expected that this will continue to be the case, although the average age will drift upwards.
- **Some age groups which make intensive use of public services are projected to increase more rapidly than the overall population growth**.

In particular, the projections envisage a 30% growth in the number of 5-11 year olds and a 28% growth in those aged 85+ between 2012 and 2022. The increase in primary school aged children is well above the national average, although the growth in the very elderly is below the national growth rate.

- **Edinburgh has the 2nd lowest 'dependency ratio' in Scotland**, after Aberdeen (i.e. those aged <16 or 65+ as a % of the 'working age' population aged 16-64). The dependency ratio is projected to increase from 42.7% in 2012 to 51.6% in 2037, but will remain well below the Scottish average (72.9% in 2037). In practice, it is likely that the working age range will extend upwards as health improves.
- **The number of Edinburgh residents aged 65 or older is projected to overtake those aged under 16 round about 2025**.

DETAILED COMMENTARY

Background

5. National Records of Scotland publishes annual estimates of Scotland's population at national and local authority level, known as 'mid year population estimates' (MYPEs). Every two years these are supplemented by population projections which look 25 years into the future, using detailed information on factors such as age-specific fertility and mortality rates, and international and local migration.

6. At the time of writing (June 2014) the latest MYPEs relate to June 2012. These take into account the findings of the 2011 Census, which in Edinburgh's case revealed the city's population to be some 18,000 fewer than previously estimated. The Census is generally regarded as the most thorough and reliable source of information on the size and composition of the population. Hence it has been used not only to calibrate the 2012 population estimates but also to re-calibrate the previously published estimates for all years as far back as 2002.

7. In May 2014 NRS published its latest population projections, which take the 2012 MYPEs as their starting point, and look ahead as far as 2037. The 2012-based projections therefore incorporate the latest information from the 2011 Census. They replace the previous 2010-based projections, which are founded on a starting population which is now thought to be overestimated. Amongst other things the analysis below looks at how the latest projections differ from the earlier ones.

8. It is vitally important to recognise that, although widely used as a pointer to what may unfold in the future, the figures published by NRS are projections and not forecasts. This is an important distinction, as projections are simply a best estimate of what would happen in the future if recent trends continue. They do not take account of extraneous factors which could lead trends to change course - for example changes in political priorities or policies at a local, national and international level, or major social and economic changes.

9. In practice, many trends cannot be relied upon to continue unabated. For example the recent prolonged economic downturn has reversed or slowed down many previously established trends, such as the rise in home ownership, shopping habits (large out-of-town supermarkets etc.), and diminishing household sizes (with grown-up children now living with parents for longer). Within the time horizon of the NRS projections, many factors could intervene to knock previous trends off-course, including potentially Scotland's political future and relationship to the UK and Europe, as well as political and economic changes in the rest of the world, and global environmental issues.

10. This all emphasises the need to treat the projections with a great deal of caution. They are useful as a framework for considering likely trends, but they cannot be interpreted as an accurate prediction of what will happen in 5 years time, far less 25 years. For this reason, it is important to be alert to emerging trends, opportunities and constraints on growth, which may well be reflected in future biennial revisions.

11. It should also be noted that, in addition to its 'Principal Projection', NRS has also produced a set of 'variant' projections which illustrate the effect of adopting different assumptions on migration, fertility and mortality. The commentary below provides further insight into this. These variant projections are often overlooked, but depending on how circumstances unfold at the local level, there may be good

reason to attach weight either to one of the variants or perhaps to a hybrid comprising elements of two or more projections.

12. The NRS projections for local areas within Scotland are constrained in such a way that they sum to the Scottish total, which in turn is governed by calculations at the UK level. This means that local authority projections, whilst taking account of local factors, are not produced in isolation from the broader national picture. Any adjustments in one local authority area would need to be counterbalanced by changes elsewhere in order to retain the pre-agreed national trend.

Recent and projected population growth

13. Edinburgh's population has been growing since the late 1980s, following a period of gradual decline during the previous five decades. In recent years the rate of growth has gathered pace, as shown by the following 5-year population increments:

1982 – 1987	-	4,820
1987 – 1992	-	3,000
1992 – 1997	+	9,050
1997 – 2002	+	1,770
2002 – 2007	+	8,550
2007 – 2012	+	26,600

By the time of the 2011 Census the City's population exceeded its previous peak of 472,000 recorded in 1939.

14. At mid 2012 the population of Edinburgh stood at 482,640, making it the second most populous local authority in Scotland after Glasgow (595,080). The city is home to 9.1% of Scotland's total population.

15. Between 2001 and 2012 the city's population grew by 33,600 (7.5%) from 449,000 to 482,640. This was the largest numerical increase of any local authority in Scotland, although the *rate* of growth was faster in some other areas such as Aberdeenshire (12.6%), East Lothian (11.8%) and West Lothian (10.7%) which fall within the housing and labour market areas of Aberdeen and Edinburgh.

16. More recently, the rate of growth in Edinburgh has pulled ahead of all other local authority areas apart from Aberdeen City: Between 2007 and 2012 Edinburgh recorded a population growth of 5.8% compared with 5.9% in Aberdeen, 5.5% in East Lothian, 4.8% in Midlothian, 4.7% in Perth & Kinross, and 4.6% in Aberdeenshire. It is clear from these figures that not only Edinburgh but neighbouring local authorities in south-east Scotland are now amongst the fastest growing in Scotland.

17. Prior to the release of the 2011 Census results it was estimated that the city's population had reached some 495,000 in 2011. However, the Census led to this being scaled back down to 476,600 as at March 2011 - a reduction in the region of 18,000. The growth rates quoted above already incorporate this reduction, and despite the downward revision, it is evident that the city's population has continued to grow at a rapid rate. Even over the 15 month period between the Census and the 2012 mid year population estimates the population has expanded by more than 6,000 people. This recent momentum towards growth is reflected in the new 2012-based population projections.

18. The principal projection envisages that, if recent trends continue, Edinburgh's population will reach the half million mark in 2016, rising to 550,000 as soon as 2025, and 600,000 by 2033. If this materialises, it would represent a sustained period of population growth surpassing anything the city has witnessed since Victorian times. The projected population figures for the period up to 2037 are summarised in Tables 1 to 5 (see pages 21 / 22).

19. To put these figures in perspective, Edinburgh's projected growth of 83,000 people over the 15 year period 2012-2027 is considerably larger than major towns such as East Kilbride (74,000), Dunfermline (68,000), Livingston (64,000), Ayr (62,000) or Inverness (61,000). Over the 25 year period up to 2037 the projected growth of 136,000 would equate to a new settlement larger than Falkirk (100,000) or nearly 87% the size of Dundee (157,000).

20. Whereas Edinburgh's population amounted to 81% of Glasgow's in 2012, by 2037 this would rise to 90%. Over the same period the city's proportion of Scotland's population would rise from 9.1% to 10.7%.

Comparison with 2010-based projections

21. As shown in Graph 1, although the 2012-based projections have been 'pegged down' at their starting point compared with the previous 2010-based projections, the projected rate of growth is even faster than before over the long-term, with a growth of 136,300 (28.2%) over the 25 year period compared with 125,200 (25.8%). Over a 15 year time horizon the growth envisaged is now 83,000 (17.1%) compared with 82,100 (16.9%)

22. However, over the shorter-term the latest projections suggest a slightly slower rate of growth than before: Looking 10 years ahead, the latest projections indicate that the city's population will grow by 54,400 (11.3%), which is lower than the previous projection (57,700 / 11.9%). Similarly, over the first 5 years of the projection period, the rate of growth is slower (25,500 / 5.3% as against 31,100 / 6.4%).

23. The combination of a lower starting point and slower initial pace of growth means that by 2020 the city's population would now reach 525,000 instead of 544,000. However, this scaling back of growth is progressively clawed back as the years advance. By 2035 the projected population of 609,000 is only marginally below the 611,000 in the previous projections.

Variant projections

24. The 'principal projection' published by NRS is accompanied by 7 'variant projections' which are based on different assumptions for the main components affecting population change. These are : (i) high migration, (ii) low migration, (iii) zero migration, (iv) high fertility, (v) low fertility, (vi) high life expectancy, and (vii) low life expectancy. The zero migration scenario is included as a 'special case' for illustrative purposes and is not regarded as a realistic possibility.

25. The outcomes of these projections for Edinburgh are shown in Graph 2. It can be seen that assumptions about migration have by far the biggest effect on the overall size of the population, while assumptions about life expectancy have a relatively minimal impact.

26. The following table summarises the range of potential outcomes as at 2027 (15 years ahead) and 2037 (25 years ahead). For comparison, figures are also included for the principal 2010-based projection.

2012-based population projections for Edinburgh	population in 2027	% incr. on 2012	population in 2037	% incr. on 2012
High migration projection	588,400	21.9%	664,700	37.7%
High fertility projection	575,200	19.2%	635,500	31.7%
High life expectancy projection	567,600	17.6%	624,800	29.5%
PRINCIPAL PROJECTION	**565,600**	**17.2%**	**619,000**	**28.2%**
Low life expectancy projection	563,600	16.8%	612,900	27.0%
Low fertility projection	559,200	15.9%	605,800	25.5%
Low migration projection	544,500	12.8%	577,400	19.6%
Zero migration projection	494,600	2.5%	481,200	0.3%
2010-based principal projection	*577,300*	*15.7%*	*n/a*	*n/a*

27. Even the relatively conservative low migration projection envisages that Edinburgh might be home to an additional 22,100 residents in 5 years time (2017), rising to 42,600 over the next decade (to 2022). Within 15 years the city would potentially need to accommodate 61,900 new residents, and within 25 years 94,800.

28. The principal projection is founded on the assumption that Edinburgh would attract a net inward migration of 3,550 persons in 2012 / 2013, rising steadily to 3,900 in 2018 / 2019, and remaining at that level for the rest of the projection period.

29. The high migration variant projection assumes a net inward migration of 3,700 in 2012 / 2013 rising to 5,600 in 2018 / 2019 and subsequent years. In contrast the low migration projection sees migration declining from 3,350 in 2012 / 2013 and then stabilising at 2,350 from 2018 / 2019 onwards.

Drivers of future change : migration, births and deaths

30. The NRS Principal Projection envisages that approximately 70% of Edinburgh's population growth up to 2037 will be accounted for by net inward migration, while the remaining 30% will be the result of natural change (i.e. excess of births over deaths).

31. The figures suggest that migration on its own would boost the city's population by 20% over the 25 year period (2012-2037), while natural change on its own would boost the population by just over 8%. The rate of increase due to migration is faster than anywhere else in Scotland apart from Perth & Kinross (22.7%), while the increase due to excess of births over deaths is exceeded only by Aberdeen City (9.2%).

32. Based on recent migration trends (which are summarised in the following section), the projections assume that net inward migration to Edinburgh will rise from 3,550 in 2012-2013 to 3,900 in 2018-2019 and remain at that level to the end of the projection period. This is a much greater volume of inflows than anywhere else in Scotland (Graph 3) – more than twice the numbers for Glasgow or Aberdeen.

Graph 3 also shows that Fife and East Lothian, with housing and labour markets closely linked to Edinburgh, are also likely to grow substantially as a result of migration.

33. NRS expects the number of births in Edinburgh to rise from some 5,300 per year in 2012-13 to 6,000 in 2021-22. Thereafter there is a very slow downward trend to 5,900 in 2032-33, followed by another reversal, to reach 6,050 in 2036-37.

34. The surplus of in-migration over out-migration is clearly much the dominant component affecting population projections for Edinburgh. However, it should be borne in mind that migration can be particularly volatile and difficult to predict, as it is subject to rapidly changing economic and political pressures. Furthermore, whereas reliable records of births and deaths are readily available, the information on local, national and international migration is much more piecemeal and error-prone. This generally depends on administrative records such as GP registrations and the International Passenger Survey.

Recent trends in migration, births and deaths

35. Graph 4 shows the relative contribution of migration and 'natural' change to population change in Edinburgh since 1980. Until the late 1980s deaths outnumbered births and migration was generally negative (i.e. outward), leading to a gradual loss of population. However, the number of births increased fairly significantly in the late 1980s, and for a long period between 1987 and 2005 they closely mirrored the number of deaths, with both birth rates and death rates gradually declining after 1990. Natural population change was virtually nil during this period.

36. Meanwhile the city began to benefit from increasing mobility of the workforce at a UK level and internationally, with its strongly performing economy attracting more migrants than it lost. Migration fluctuated from year to year, but delivered a net growth of some 1,500 persons per year on average during the 1990s.

37. As Graph 3 shows, the early years of the new millennium saw a dramatic shift in demographic trends, with a sharp increase in migration contributing to accelerated population growth. This was bolstered by renewed natural population growth as the growing population of child-bearing age combined with increasing fertility rates to generate a surplus of births over deaths. However migration has been by far the main contributor to the city's recent population growth: Between 2007 and 2012 net inward migration averaged 5,700 persons per year compared with a surplus of 1,150 per year due to natural change. According to NRS' estimates, net migration to Edinburgh has never dipped below 3,350 per annum since 2005.

38. Interestingly, there are no signs that the recent economic downturn has dented population growth. Indeed the highest figures for both migration and births were in 2010 and 2011, at the height of the recession. Edinburgh's relatively resilient economy is likely to have played a part in this, perhaps prompting the question whether it would retain the same drawing power when the benefits of economic recovery become more widespread.

39. Graph 5 shows that Edinburgh is unique in Scotland in the sheer numerical scale of migration that it has attracted. Between 2001 and 2012 it gained an additional 45,700 people through migration, compared with 23,400 in Aberdeenshire, 19,700 in Perth & Kinross, 18,500 in Fife, and 17,900 in Highland. The Edinburgh figure is substantially higher than those for the other larger Scottish cities : Aberdeen

14,400, Glasgow 5,300, and Dundee 3,700. As well as Edinburgh, it is noteworthy that other parts of South East Scotland also enjoyed significant growth due to migration : notably Fife, Scottish Borders (9,300), East Lothian (9,100), and West Lothian (8,400).

40. Graph 6 shows the changes at local authority level in percentage terms rather than numerical terms. Measured in this way, Edinburgh's population expanded by 9.3% between 2001 and 2011 solely due to migration, while neighbouring East Lothian grew by 9.2% and Scottish Borders by 8.7%. Two local authorities in Scotland experienced a faster rate of population growth than Edinburgh due to migration growth : Perth & Kinross (13.9%) and Aberdeenshire (9.7%).

41. Graph 5 also shows that, unlike Dundee and Glasgow, Edinburgh and Aberdeen have increased their populations over the last decade as a result of both migration and natural change. In Dundee and Glasgow natural change has been negative overall, as deaths have outweighed births.

42. Migration is not uniform across all age groups, but tends to be concentrated in specific ages which may vary depending on local circumstances (e.g. study-related, work-related or retirement-related migration). Over time, migration can therefore have a significant impact on the age profile of the host community.

43. In Edinburgh's case, the vast majority of both in- and out-migrants have tended to be aged between 16 and 39, i.e. the younger working age population, as shown in Graph 7. Migrants have also included a significant number of pre-school age children. On the whole these age groups tend to be the most mobile, with people willing and able to move to increase job and educational opportunities, or to find suitable accommodation.

44. In many age groups the number of people moving into Edinburgh approximately balances those who move out. But as Graph 7 shows, this is not the case with those in the 15-29 age bracket. Migration flows have particularly boosted the number of people in these student / young worker age groups, and this has helped to ensure that Edinburgh's age profile has remained relatively young by Scottish standards. (More detailed analysis of age structures follows below).

45. Between 2008 and 2012 the number of births in Edinburgh averaged 5,477 per year while deaths averaged 4,244 per year. These represented the highest number of births and lowest number of deaths ever recorded in the city in recent times.

46. Birth rates in Edinburgh are slightly higher than the Scottish average, although lower than in Glasgow, Aberdeen and Dundee (Graph 9). However, this ‘crude’ birth rate measures the number of births relative to the total population of all ages and both genders. Because non-childbearing age groups (notably older people and children) comprise a much smaller part of Edinburgh’s population, compared with other parts of Scotland, this tends to inflate the overall birth rate. The higher than average rate is therefore not surprising.

47. Fertility rates give an alternative perspective on natural replacement of the population, by measuring the number of births relative to the population of women of child-bearing age (age 15-44). As can be seen in Graph 10, in contrast with the crude birth rate, Edinburgh is close to the bottom of the table when fertility rates are compared by local authority area. The city lies well below the Scottish average, with only Stirling having a lower rate. This may be explained by women in Edinburgh starting their families at a later age and having fewer children in total,

possibly for economic reasons among others. The large number of students in the child-bearing age groups in Edinburgh would also tend to reduce fertility rates.

48. Graph 8 shows that Edinburgh fertility rates have fluctuated over the last 20 years, with a general downward trend between 1991 and 2001 followed by a gradual increase up to 2008 and then a levelling out. Current rates are below those of the early 1990s. Edinburgh has largely mirrored trends at the Scottish level, although the city has consistently had lower fertility rates than across the country as a whole.

49. Although fertility rates are generally considered to be a more informative measure than birth rates, Edinburgh's above average birth rates do nevertheless highlight growth pressures relative to the existing size of the population as a whole.

50. Life expectancy for both males and females in Edinburgh exceeds the Scottish average (Graphs 11 and 12), although it is known that there are significant variations at the local level within the city. The city ranks 13th out of 32 Scottish local authorities in terms of male life expectancy at birth, and 9th for female life expectancy. However, all the higher ranking areas are largely rural or suburban in character. Edinburgh life expectancy compares well with that in Glsagow, Dundee and Aberdeen.

51. As Graphs 11 and 12 show, there have been dramatic improvements in longevity over the last 30 years which have benefited all areas in Scotland to varying degrees. A male born in Edinburgh in 2012 could expect to live some 7 years longer than one born in 1981 (77.4 years compared with 70.3), while a female could now expect to live 5½ years longer (81.9 years compared with 76.5).

Future growth compared with other Scottish local authorities

52. Graphs 13 to 18 compare projected population growth at local authority level over 5-year, 10-year and 15-year time periods from 2012. Graphs 13, 15 and 17 portray the *numerical* increments while Graphs 14, 16 and 18 show the *rate* of growth. In each case local authority areas are ranked in descending order of projected growth.

53. This analysis highlights that Edinburgh is expected to have the fastest growing population in Scotland over all three time periods, not only in terms of raw numbers but also in terms of the rate of growth. The projections suggest that the city's population will grow at almost 3 times the national rate.

54. Glasgow, Aberdeen, Aberdeenshire and Fife follow Edinburgh in respect of additional population *numbers*, while the highest *rates* of growth outside Edinburgh are projected in Aberdeen, Perth & Kinross, East Lothian, Aberdeenshire and Midlothian.

Current and future age structure

55. Tables 1 to 5 summarises how the population in different age groups is projected to change in Edinburgh over the next 25 years. Graphs 19 (a) to (j) comprise detailed age profiles for Edinburgh in the form of 'population pyramids'. Comparative profiles are presented for Edinburgh and for Scotland as a whole as at 2012 and for future dates at 5-year intervals: 2017, 2022, 2027 and 2037.

56. The graphs highlight how Edinburgh's population structure differs significantly from that for Scotland. In common with Scotland's other cities, Edinburgh has a much higher proportion of its population in the working age groups (16-64), and lower proportions of both children and older residents. Edinburgh has a particularly high concentration of persons in the younger working age groups, with ages 19-33 being far more numerous than other age groups. Contrast this with the Scottish profile, where the dominant ages are in the range 40 to 50.

57. Graph 20 shows that the median age of Edinburgh's residents was just 36 in 2012, i.e. half the city's population was younger than this, and half older. This was the second lowest of any local authority area in Scotland, only marginally ahead of Glasgow. (At the other end of the spectrum, the median age was 47 in Argyll and Bute, and 46 in Eilean Siar and Scottish Borders).

58. Although children as a whole are under-represented in Edinburgh, it is notable that the proportion of *young* children (age 0 to 4) mirrors the national picture fairly closely (5.6% of the total population in 2012). Similarly, although older people as a whole are under-represented in Edinburgh, *the oldest age groups* (age 75+) are a closer match to the Scottish average (7.2% compared with 7.9% of the total population in 2012). These groups at either end of the age spectrum are significant because they tend to be intensive users of public services, particularly health and social care.

59. One consequence of having a high proportion of its population within the working age groups is that Edinburgh enjoys a particularly low dependency ratio - that is the ratio of those age groups which typically do not form part of the labour force to those which typically are included. The dependency ratio is expressed as a percentage and is calculated as :

100 x (pop. aged 0-15 **+** *pop. aged 65+) / (pop. aged 16-64).*

60. At 42.7% Edinburgh has the second lowest dependency ratio in Scotland, after Aberdeen (41.6%). The Scottish average is 53.0% (as at 2012), and some parts of the country have a dependency ratio in excess of 63% (Argyll & Bute, Dumfries & Galloway, Eilean Siar, Scottish Borders).

61. Edinburgh's age profile is expected to evolve over the next 25 years due to the combined influences of :

- a steady or growing number of births;
- increasing longevity and reduced annual deaths;
- ageing of the non-moving population; and
- differential in-migration and out-migration by age group

The last of these is expected to be particularly significant, given that over 70% of Edinburgh's population growth is projected to derive from migration. However, as discussed already, migration is also one of the factors which is most difficult to measure and predict with certainty.

62. As in most areas of Scotland, the average age of the population is expected to increase. (The exceptions to this trend are Perth & Kinross, East Lothian and Midlothian). It is estimated that the median age of Edinburgh's population could rise from 36 in 2012 to 40 in 2037. Nevertheless, the average age will remain below the Scottish average.

63. The population pyramid in Graphs 19 (a) to (j) show the 'bulge' in Edinburgh's population gradually shifting up through the age groups, with 30-35 year olds being the dominant age group in 2022 and 35-40 year olds in 2027. By 2037, however,

the original bulge, now in the 45-50 year age group is somewhat diminished and is supplemented by a re-emerging expansion in the number of 20-30 year olds (i.e. creating two distinct bulges).

64. A more detailed analysis of the changes in specific age groups follows in the next section of this report.

65. Despite the changes outlined here, the population pyramids show that Edinburgh's population structure will remain distinctive and very different from that in Scotland as a whole throughout the projection period. The Scottish profile has a much more even spread across the age groups, whereas Edinburgh is characterised by peaks in the younger working age population and a relative dearth of older working people and younger pensioners. The very elderly (85+) mirror the national composition over the next few years but then gradually drift behind (with slower growth in this age group in Edinburgh compared to Scotland). In contrast, the proportion of children (0-15) in Edinburgh very gradually draws closer to the national figure, although a gap still remains in 2037.

66. Edinburgh's dependency ratio is projected to increase from 42.7% in 2012 to 49.3% in 2027 and 51.6% in 2037 (Graph 25). This means that by 2029 there would be fewer than 2 people in the working age groups to support every one person in the non-working age groups. (However, this is based on a fixed working age assumption of 16-64 years, whereas in reality the pensionable age is gradually being raised).

67. In Scotland as a whole, the dependency ratio is already higher than in Edinburgh and is expected to increase more steeply, from 53.0% in 2012 to 65.0% in 2027 and 72.9% in 2037.

68. In 2012 the composition of the 'dependent' population in Edinburgh was fairly evenly split between children age 0-15 and those of retirement age. But by 2037 the retired age groups will account for about 60% of the total.

Changes in specific age groups (Tables 1 to 5; Graphs 21 to 28)

69. Graphs 21 to 28 show detailed trends in the population in specific age groups in Edinburgh over the next 25 years, based on NRS's Principal Projection. This information is presented in a number of different ways to suit different users. Some graphs show the absolute numerical change while others show percentage composition or indexed change relative to 2012. Graphs 28 (a) to (l) show indexed growth in Edinburgh compared with that for Scotland. These highlight whether any selected age group is expected to grow or shrink more rapidly or more slowly than the Scottish average between 2012 and any chosen date up to 2037.

Pre-school age (0- 4 year olds) (Graph 28 (b))

70. Over the last ten years the number of pre-school children in Edinburgh increased very steeply from 21,708 in 2002 to 27,057 in 2012 (a 25% increase). This is a much faster growth rate than the total population increase over the same period (8%) and also much faster than the national increase for this age group (9.7%).

71. This scale of increase is not projected to continue. Indeed the Principal Projection envisages only a 1% growth in this age group between 2012 and 2017. This will be followed by a period of very modest growth between 2017 and 2022, after which numbers will level out again. It is envisaged that the number of pre-school

children will be between 8% and 9% higher than now throughout the second part of the projection period, between 2022 and 2037. This differs from the previous (2010-based) projections, which identified a potential 5% reduction in this age group over the 25 year period.

Primary school age (5-11 year olds) (Graph 28 (c))

72. In contrast with pre-school children, the number of primary school aged children in the city fell between 2002 and 2010 (with a reduction of about 3,500 or 11%). However, this downward trend levelled out and between 2010 and 2012 there was a small increase.

73. Over the next few years this increase is projected to accelerate, leading to a 22% growth (+ 6,500) between 2012 and 2017, and a 30% growth (+ 8,800) by 2022. It is estimated that growth will peak at 40% (+ 11,600) in 2031. This is well in excess of the Scottish increase of 12% by the same date, and only exceeded by Aberdeen (61% increase). For comparison, the increases in the other major cities are 39% in Dundee and 33% in Glasgow. Clearly, increases of this magnitude will have major repercussions for educational provision and other child-related services.

74. Beyond 2031 the number of primary school aged children will start to fall again, but even at 2037 it will still be 30% higher than at present, according to the Principal Projection.

75. Even under the alternative 'low migration' scenario, the number of children in this age group would peak at a 32% increase (+ 9,400) in 2028. Under the 'high migration' scenario, the growth would be both faster and more prolonged, with numbers continuing to rise throughout the projection period and attaining an uplift of 53% (+ 15,600) by 2037.

Secondary school age (12-16 year olds) (Graph 28 (d))

76. Over the past decade (2002-2012) the number of secondary school aged children in Edinburgh fell from 23,350 to 21,650 – a reduction of about 1,700 or 7%.

77. Looking to the future, a further 7% decline (-1,400) is projected up to 2016, with a total of 20,200 recorded at the low point. After this date, numbers will increase again to the end of the projection period, reaching 29,400 in 2037. This represents an increase of 36% (+ 7,700) relative to 2012. The trend in Edinburgh departs significantly from the national situation, where the number of 12-16 year olds will only return to 2012 levels in 2030 following a sustained dip, then build to a modest 4% increase by 2037.

78. Aberdeen city is, once again, the Scottish local authority area with the biggest proportional increase by 2037 (+ 58%). After Edinburgh and Aberdeen, the next largest increases are in Dundee (+ 26%), East Lothian (+ 21 %), Glasgow (+ 20%), and Midlothian (18%).

79. Under the 'low migration' scenario Edinburgh's population of 12-16 year olds would peak at an increase of 28% (+ 6,000) in 2035. Under the 'high migration' scenario it would carry on growing throughout the projection period after 2016, leading to a 50% increment by 2037 (relative to 2012).

Working age groups (17-64 year olds) (Graphs 28 (e) to (i))

80. For the purposes of this analysis, the 'working age' population is standardised as those persons aged 17-64, although the reality is that state pension age is being increased on a phased basis for both males and females.

81. Edinburgh's working age population grew by 11% (+ 32,400) between 2002 and 2012. This was faster than the overall rate of population growth (8%). Working age as a proportion of the total population consequently increased from 67.4% of the total population in 2002 to 69.2% in 2012.

82. The Principal Projection indicates that the city's working age population will continue to grow throughout the period to 2037. Over the first 5 years (to 2017) it will grow by 4% and by 2022 it will be 8% higher than in 2012. By 2027 there will be an additional 12% in this age group, and by 2037 an additional 21% (+ 68,600 people).

83. However, because other age groups are expected to grow more rapidly, the working age population as a proportion of the total population will fall from 69.2% in 2012 to 65.0% in 2037.

84. The 21% growth in Edinburgh's working population over the next 25 years contrasts with a 4% decline across Scotland as a whole. Edinburgh will experience a faster rate of growth than any other Scottish local authority area. Indeed the only other areas expected to record a growing working age population over this 25 year period are Aberdeen City (19%), Perth & Kinross (12%), Dundee (9%), East Lothian (8%), Glasgow (8%), Stirling (4%), Aberdeenshire (3%) and Midlothian (2%).

85. Both the 'low migration' and the 'high migration' alternative scenarios envisage a continuing growth in the city's working age population. The former would result in an increase of 11% (+ 38,000) and the latter an increase of 31% (+ 102,700) by 2037.

86. The overall figures for the working age population conceal varying patterns for different component age groups within the total. In general, the city is projected to see an ageing of the workforce, with the fastest rate of growth in the 35 to 44 year age bracket over the medium term (to 2027), and in the 45 to 54 year age bracket over the longer term (to 2037).

87. 17 to 24 year olds are projected to decrease in numbers over the next 10 years (with a loss of 16% by 2022). Beyond this date their numbers will gradually recover again, with the 2012 position being restored by 2034.

88. 25 to 34 year olds will enjoy a modest growth up to 2018 but will fall back to present numbers between 2027 and 2032 and then slowly increase again.

89. 35 to 44 year olds will increase steadily in numbers up to 2028, at which point they will be 41% more numerous than in 2012. After plateauing for about 5 years they will begin to decline again. But at the end of the projection period (2037) they will still be 25% more numerous than in 2012.

90. 45 to 54 year olds will show very little change until 2024. However, after this date the Principal Projection calculates a very steep increase, with numbers rising from 65,000 in 2024 to over 91,000 in 2037. This will represent a 44% increase compared with 2012 – the largest for any pre-retirement age group.

91. 55 to 64 year olds will also enjoy a significant boost to their numbers, although the rate of growth is somewhat slower than that for the younger 45-54 cohort. The Principal Projection also envisages growth taking place in two main periods: firstly between 2012 and 2024, and then a further period after 2034. By 2037 it is estimated that the numbers in this age group will increase by nearly one-third over 2012 levels.

Retired age groups (65 years and older) (Graphs 28 (j) to (l))

92. The older age groups have not increased as quickly in Edinburgh as elsewhere in Scotland over recent years, probably due to a combination of a more youthful age profile and a degree of outward migration particularly in the immediate post-retirement group.

93. Between 2002 and 2012 the number of people aged 65+ increased by under 3% in Edinburgh compared with nearly 14% across Scotland as a whole. However, the trends have varied for each component age group within this overall grouping: the city saw very little growth in 65-74 year olds over the decade (1% increase) and a small decline in 75-84 year olds (1% decrease), compared with increases of 13% and 11% respectively at national level. For the most elderly group – those aged 85+ – the divergence was much less marked, with a substantial 23% increase in Edinburgh and a 28% increase in Scotland.

94. Future growth of the elderly population is projected to match or even exceed the national trend: Between 2012 and 2027 the city's population aged 65+ is projected to increase from 70,000 to 96,000 (+ 35%). By 2037 it could reach 117,000 (+ 66%). For the equivalent 15 and 25 year periods the Scottish growth rates are 35% and 59%.

95. Numerically, Edinburgh would experience the largest increase in this age group of any Scottish local authority up to 2037 (with a 46,500 increase on 2012, compared with 40,900 in Glasgow and 40,100 in Fife). However, Edinburgh's percentage growth of 66% would be exceeded by a number of other areas, the highest being a projected increase of 90% in West Lothian, followed by 81% in Shetland.

96. According to the Principal Projection, those aged 65+ will account for 19.0% of Edinburgh's population in 2037 compared with 14.7% in 2012. However, this will still remain well below the Scottish proportion of 25.5% in 2037, confirming that Edinburgh's population profile will still be relatively youthful in comparison with Scotland, even 25 years in the future.

97. All the variant projections envisage a significant growth in Edinburgh's retirement age population: As at 2027 the 'low migration' and 'high migration' scenarios would respectively lead to 34% and 36% increases, while the 'low life expectancy' and high life expectancy' scenarios would generate increases of 33% and 38%. Even the 'zero migration' assumption would result in a 37% increase. There is thus a reasonable degree of confidence that the city's retirement age population will increase by more than one-third between 2012 and 2027, and this will have significant implications for the planning of public services. It will also have wider implications in terms of consumer demands for goods and services, and other considerations such as mobility / accessibility.

98. Looking in more detail at component age groups within the broader retirement age category, the fastest rate of increase will be in the very elderly. The number of people aged 85+ is projected to more than double in Edinburgh by 2037 (110% increase from 10,100 to 21,300). Over the same time period the number of 65-74

year olds could increase by 56% while those aged 75-84 could rise by 61%. In terms of absolute numbers, however, the greatest increments will be in the recently retired age group. (An additional 20,200 people aged 65-74, compared with 15,100 aged 75-84, and 11,200 increase for those aged 85+).

99. As can be seen in Graphs 28 (j) to (l), the projection is that the recently retired age group (age 65-74) will grow significantly faster in Edinburgh than in Scotland as a whole throughout the 2012-2037 period. In contrast, despite a very large 110% increase in the most elderly population (aged 85+), the city will be outstripped by the national growth of 150% over this period.

100. Some local authority areas are projected to more than triple their number of residents aged 85+ by 2037. These include Edinburgh's close neighbours, West Lothian and Midlothian. Edinburgh's 110% increase is the 3rd slowest growth, ahead of Dundee (85%) and Glasgow (66%), but behind Aberdeen City (118%).

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Table 1 : Population counts by age group, Edinburgh, to 2037

	2012	2017	2022	2027	2037
Total population	482,640	508,102	537,007	565,641	618,978
age 0 to 4	27,057	27,267	29,336	29,454	29,405
age 5 to11	29,281	35,820	38,107	40,147	40,367
age 12 to 16	21,655	20,267	24,792	27,118	29,400
age 17 to 24	65,875	57,053	55,487	59,439	66,871
age 25 to 34	86,642	98,061	96,738	87,630	93,151
age 35 to 44	67,072	72,311	82,651	94,373	84,080
age 45 to 54	63,688	64,968	64,331	69,653	91,504
age 55 to 64	50,482	54,872	60,350	61,842	66,798
age 65 to 74	36,069	41,335	44,766	49,271	56,293
age 75 to 84	24,693	24,611	27,483	32,277	39,794
age 85 plus	10,126	11,537	12,966	14,437	21,315

Table 2 : % composition by age group, Edinburgh, to 2037

	2012	2017	2022	2027	2037
Total population	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %
Age 0 to 4	5.6 %	5.4 %	5.5 %	5.2 %	4.8 %
Age 5 to 11	6.1 %	7.0 %	7.1 %	7.1 %	6.5 %
Age 12 to 16	4.5 %	4.0 %	4.6 %	4.8 %	4.7 %
Age 17 to 24	13.6 %	11.2 %	10.3 %	10.5 %	10.8 %
Age 25 to 34	18.0 %	19.3 %	18.0 %	15.5 %	15.0 %
Age 35 to 44	13.9 %	14.2 %	15.4 %	16.7 %	13.6 %
Age 45 to 54	13.2 %	12.8 %	12.0 %	12.3 %	14.8 %
Age 55 to 64	10.5 %	10.8 %	11.2 %	10.9 %	10.8 %
Age 65 to 74	7.5 %	8.1 %	8.3 %	8.7 %	9.1 %
Age 75 to 84	5.1 %	4.8 %	5.1 %	5.7 %	6.4 %
Age 85 plus	2.1 %	2.3 %	2.4 %	2.6 %	3.4 %

Table 3 : Population dependency ratio, Edinburgh, to 2037 (expressed as %)

	2012	2017	2022	2027	2037
Age 0 to 15	73,421	79,310	87,668	90,815	93,227
Age 65 plus	70,888	77,483	85,215	95,985	117,402
Age 16 to 64	338,331	351,309	364,124	378,841	408,349
Dependency %	42.7 %	44.6 %	47.5 %	49.3 %	51.6 %

source : National Records of Scotland 2012-based principal population projections for local areas

Table 4 : Absolute population growth relative to 2012 by age group, Edinburgh, to 2037

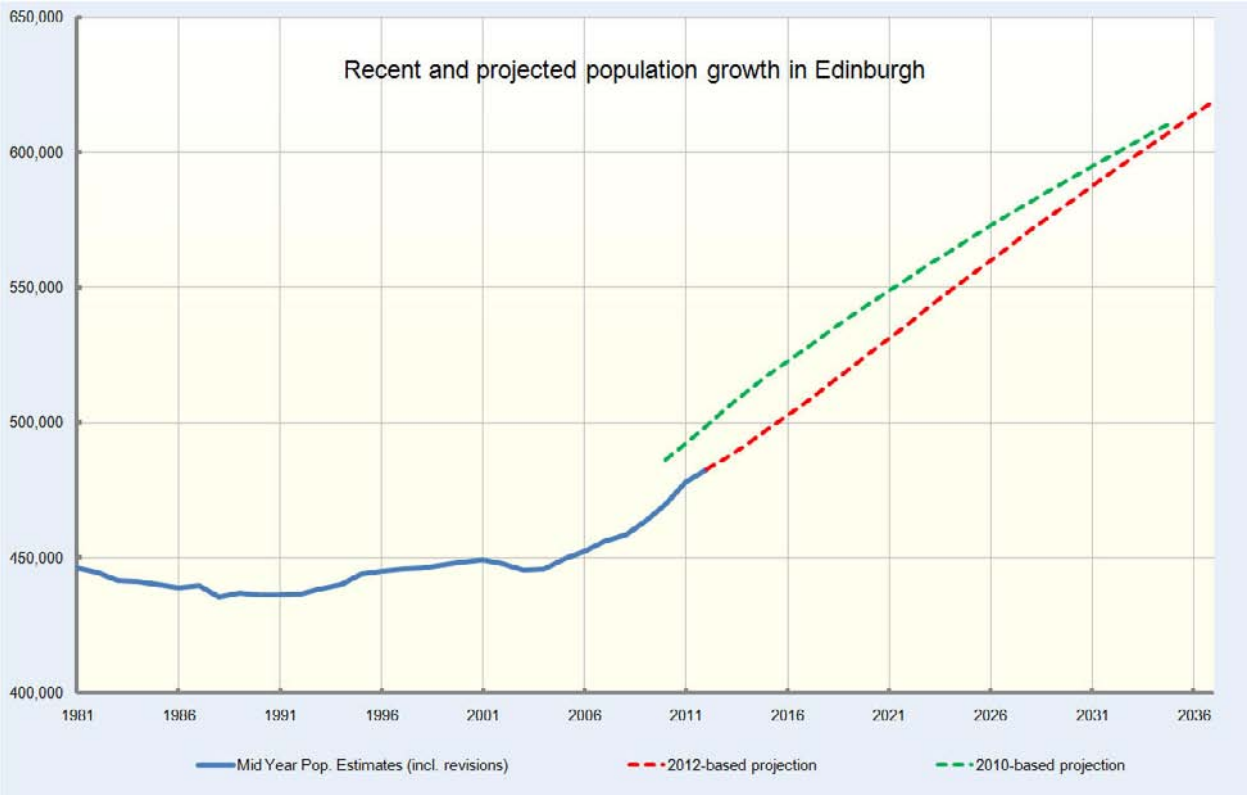
	2012	2017	2022	2027	2037
Total population	0	+ 25,462	+ 54,367	+ 83,001	+ 136,338
age 0 to 4	0	+ 210	+ 2,279	+ 2,397	+ 2,348
age 5 to 11	0	+ 6,539	+ 8,826	+ 10,866	+ 11,086
age 12 to 16	0	- 1,388	+ 3,137	+ 5,463	+ 7,745
age 17 to 24	0	- 8,822	- 10,388	- 6,436	+ 996
age 25 to 34	0	+ 11,419	+ 10,096	+ 988	+ 6,509
age 35 to 44	0	+ 5,239	+ 15,579	+ 27,301	+ 17,008
age 45 to 54	0	+ 1,280	+ 643	+ 5,965	+ 27,816
age 55 to 64	0	+ 4,390	+ 9,868	+ 11,360	+ 16,316
age 65 to 74	0	+ 5,266	+ 8,697	+ 13,202	+ 20,224
age 75 to 84	0	- 82	+ 2,790	+ 7,584	+ 15,101
age 85 plus	0	+ 1,411	+ 2,840	+ 4,311	+ 11,189

Table 5 : Relative population growth indexed to 2010 by age group, Edinburgh, to 2035 (2010 = 100)

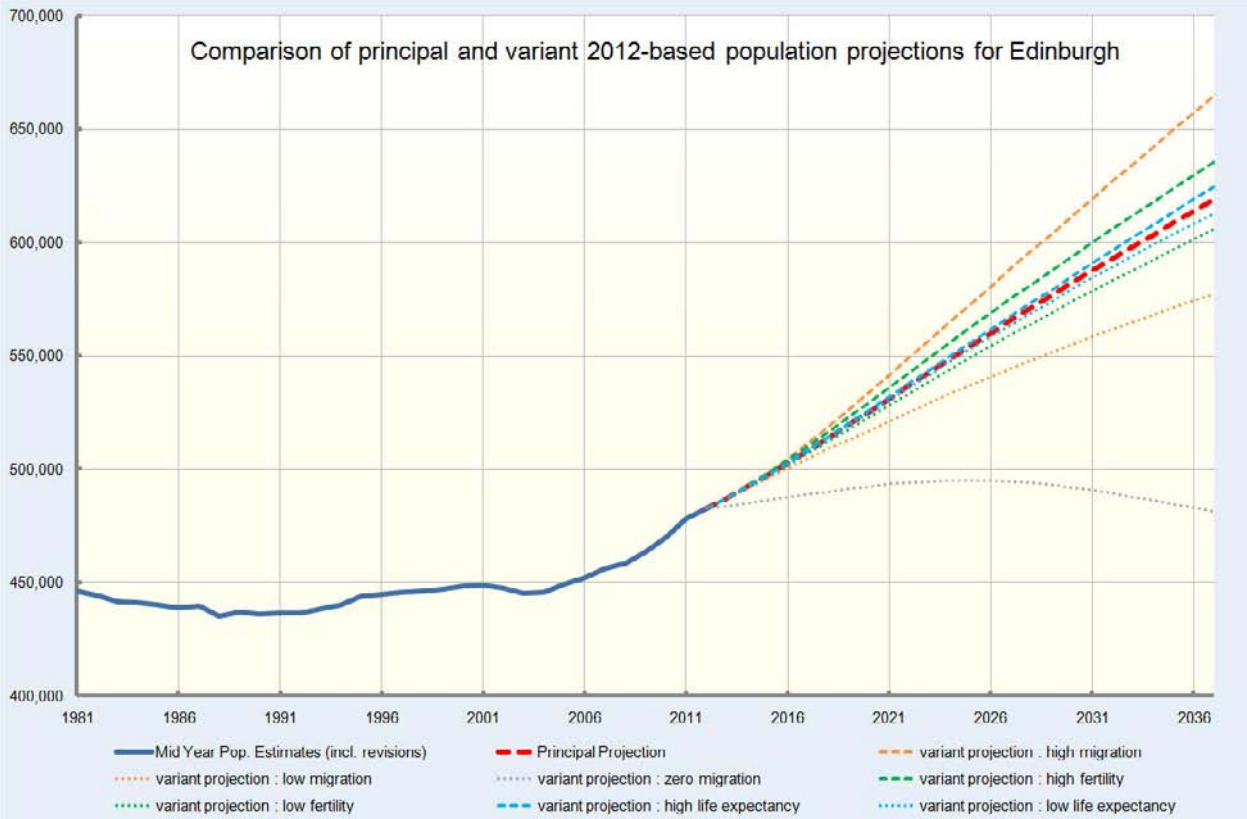
	2012	2017	2022	2027	2037
Total population	100	105	111	117	128
age 0 to 4	100	101	108	109	109
age 5 to 11	100	122	130	137	138
age 12 to 16	100	94	114	125	136
age 17 to 24	100	87	84	90	102
age 25 to 34	100	113	112	101	108
age 35 to 44	100	108	123	141	125
age 45 to 54	100	102	101	109	144
age 55 to 64	100	109	120	123	132
age 65 to 74	100	115	124	137	156
age 74 to 84	100	100	111	131	161
Age 85 plus	100	114	128	143	210

source : National Records of Scotland 2012-based principal population projections for local areas

Graph 1 : Comparison of 2012-based projection with 2010-based projection for Edinburgh

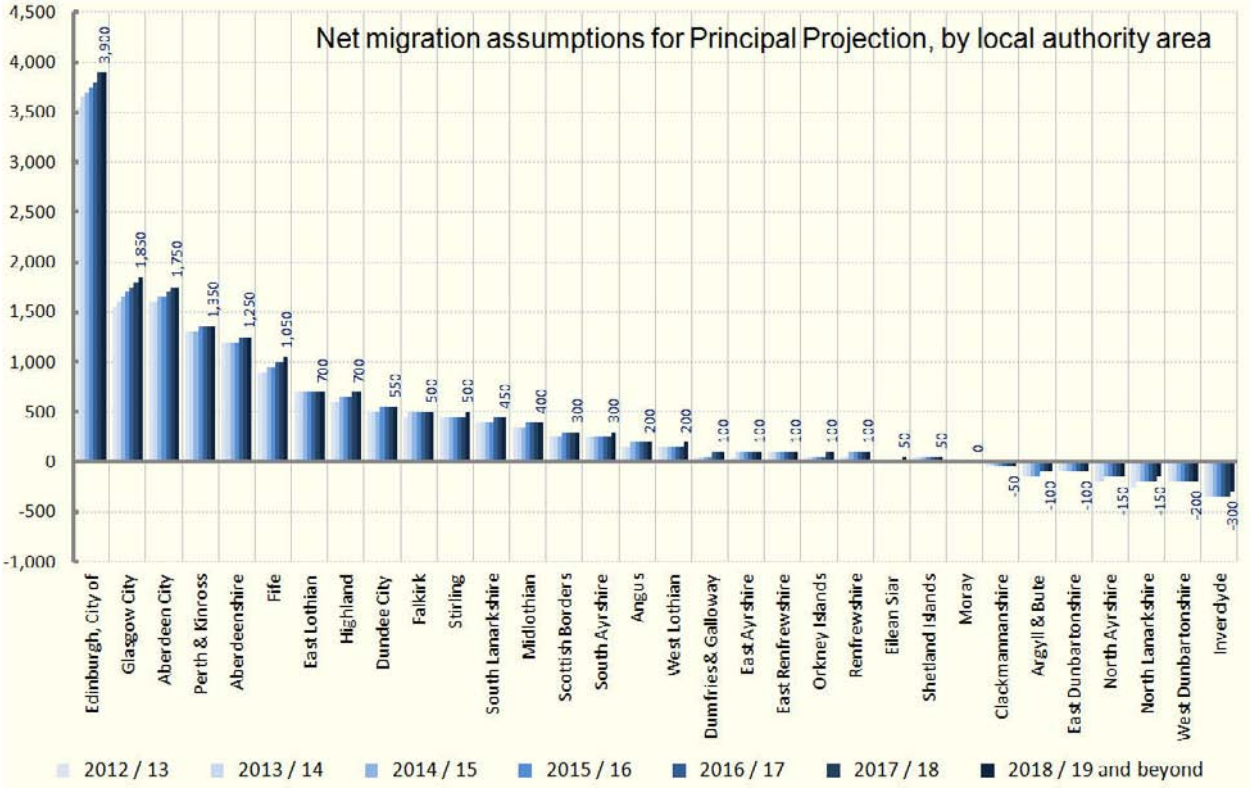


Graph 2 : Comparison of principal projection with variant projections for Edinburgh



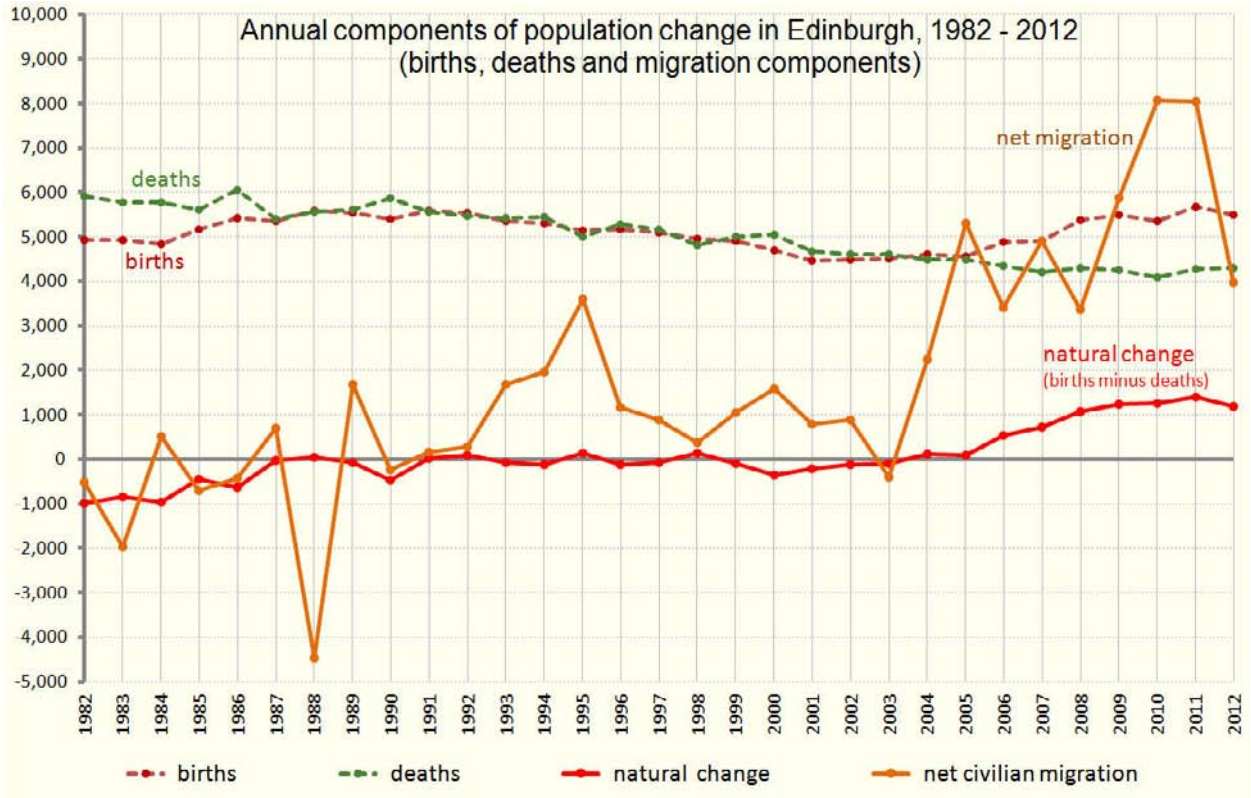
source : National Records of Scotland 2012-based population projections for local areas

Graph 3 : Net migration assumptions for Scottish local authorities (principal projection

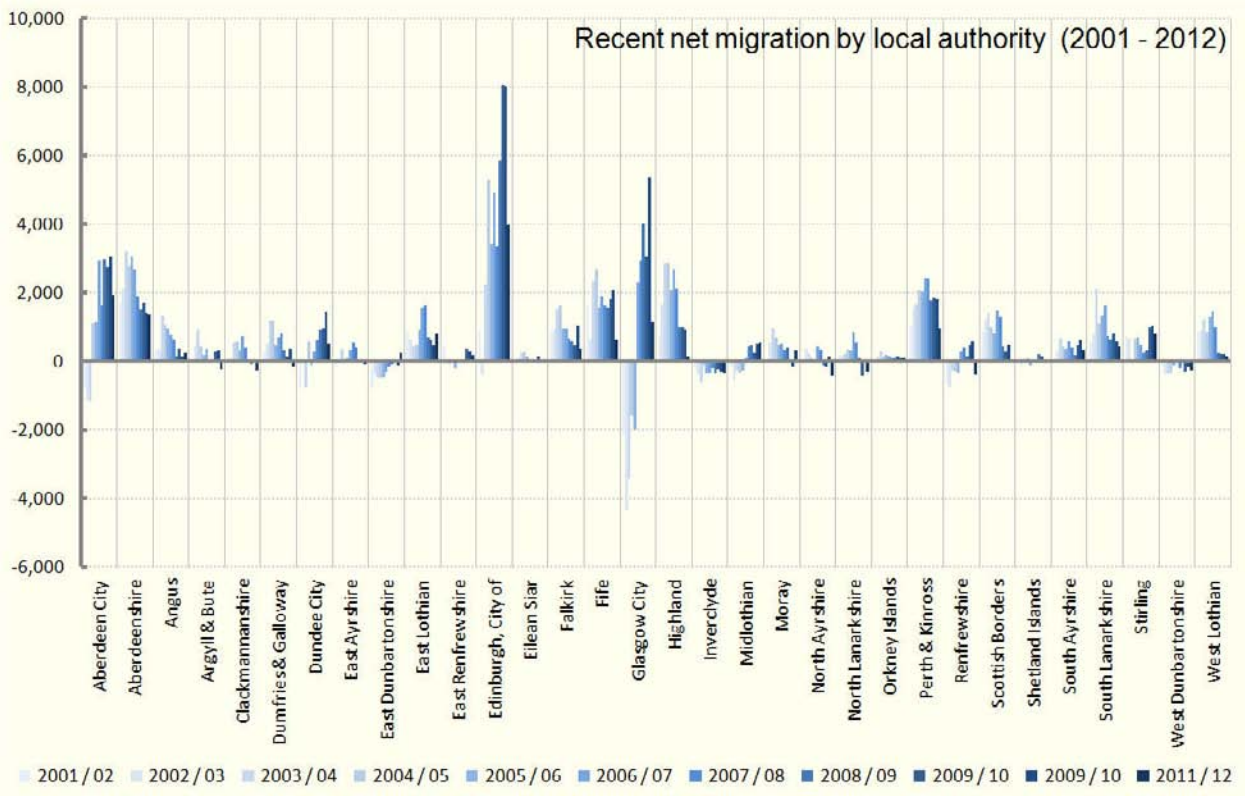


source : National Records of Scotland 2012-based principal population projections for local areas

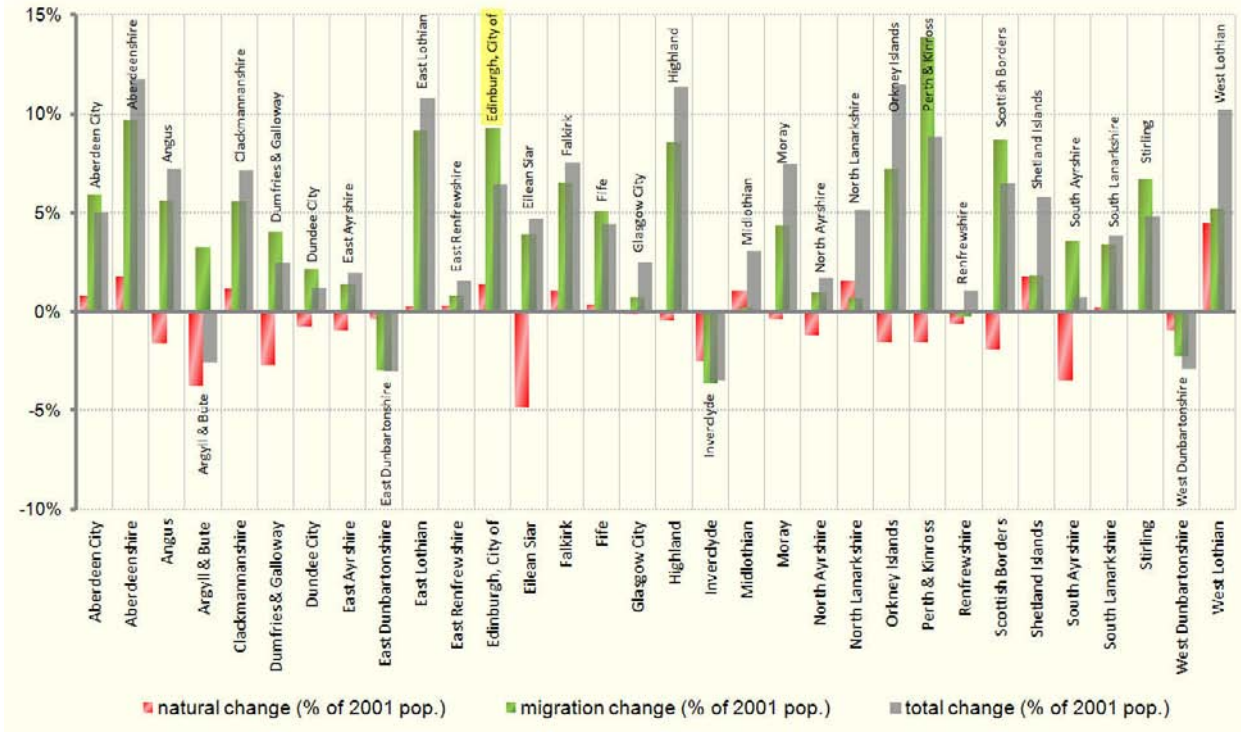
Graph 4 : Components of population change in Edinburgh 1982 - 2012



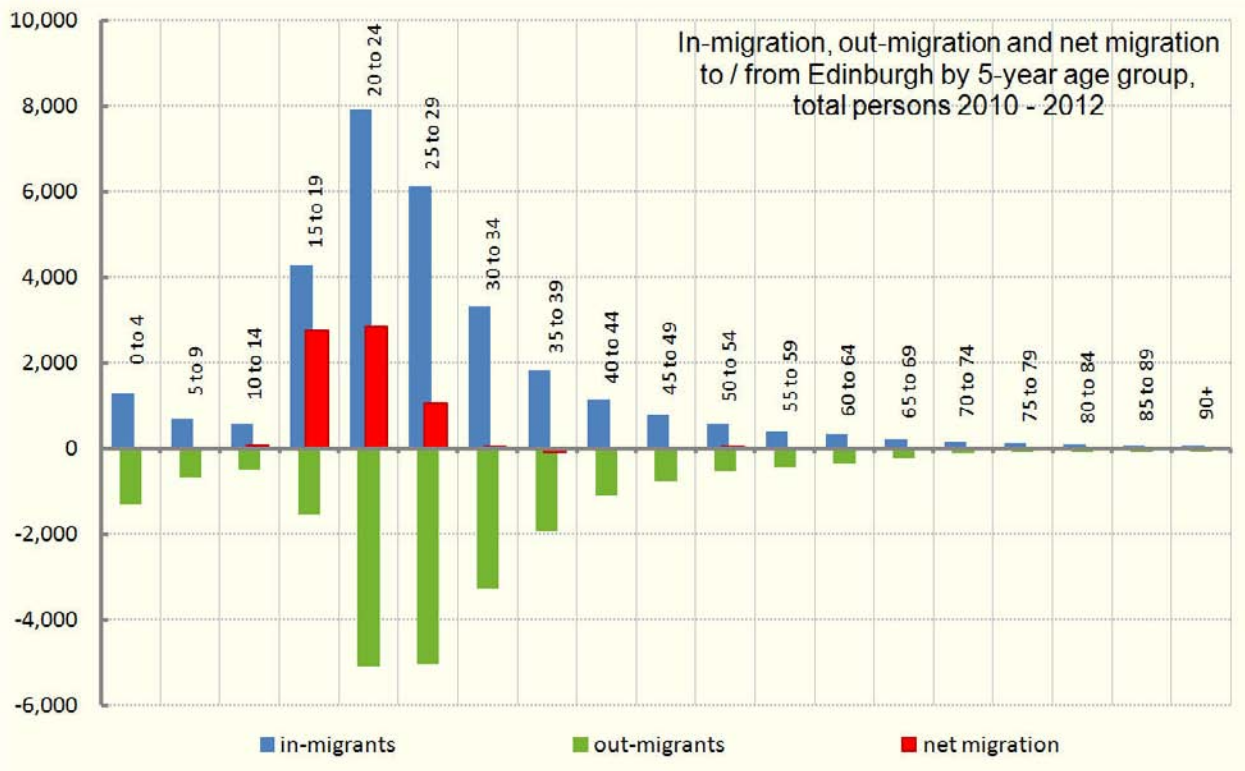
Graph 5 : Recent net migration to / from Scottish local authorities, 2001 - 2012



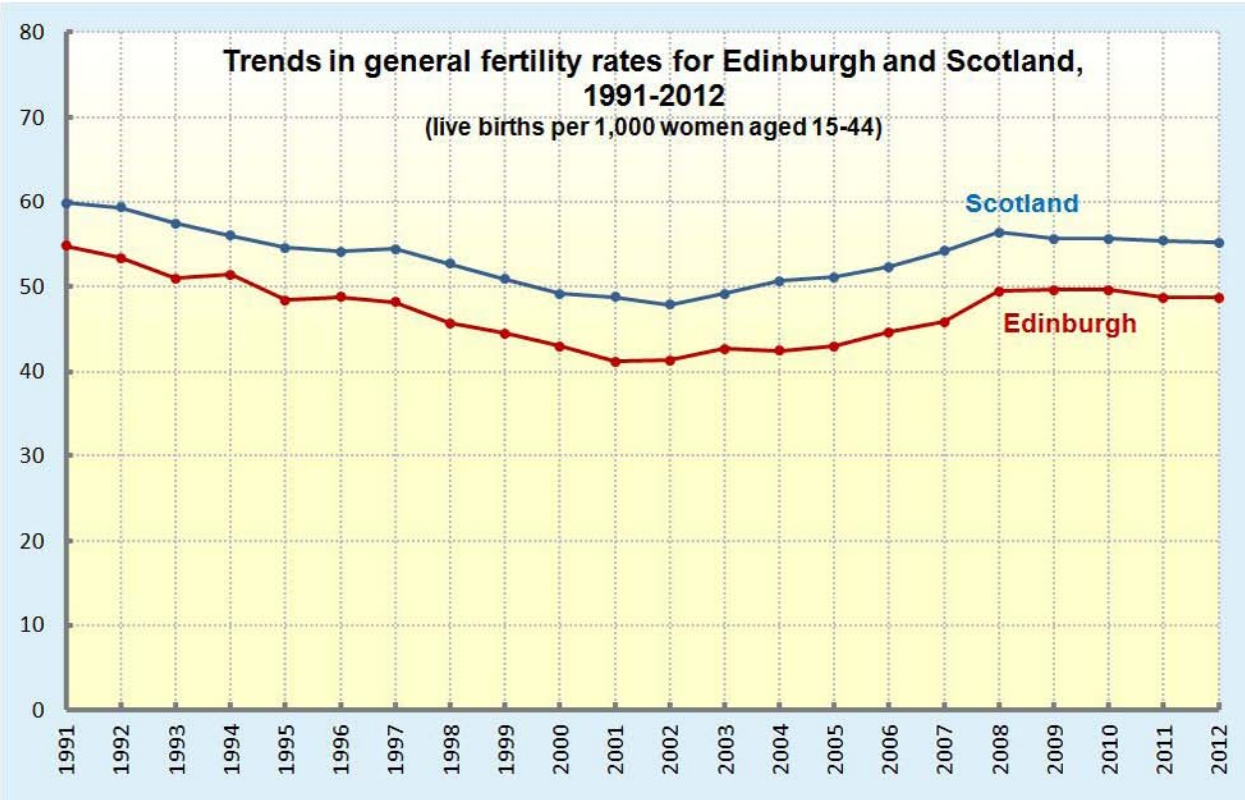
Graph 6 : Comparative population change in Scottish local authorities attributable to natural change and migration, 2001-2011



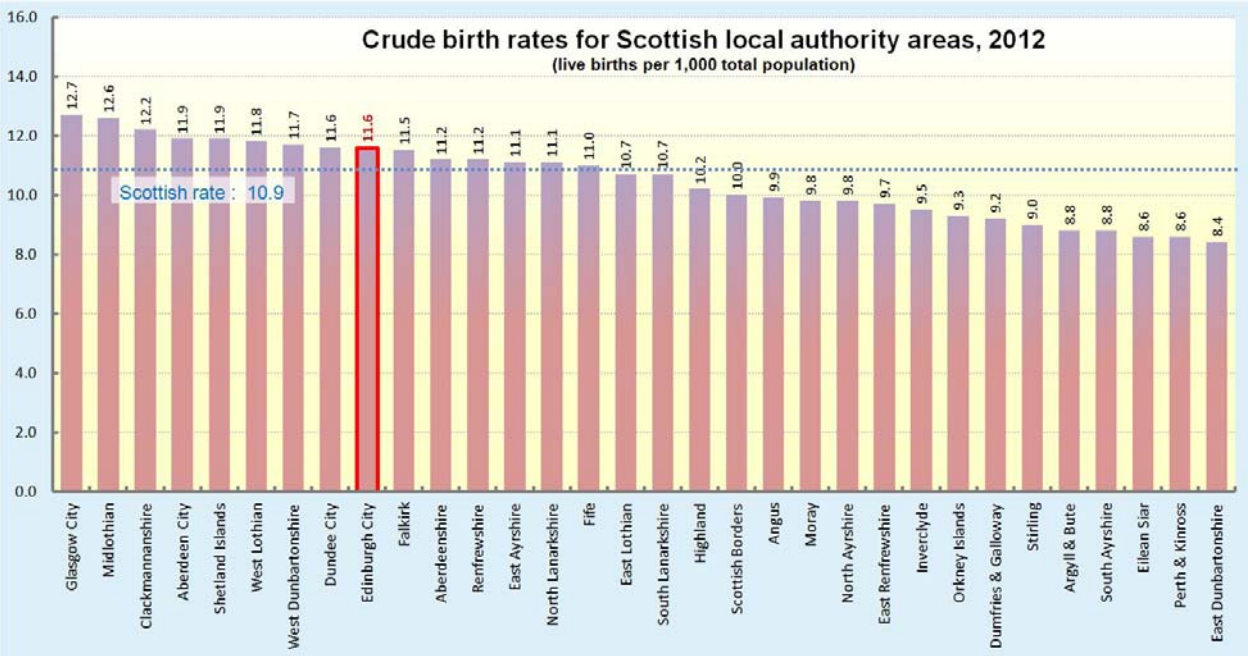
Graph 7 : Recent migration into and out of Edinburgh by age group (2010-2012)



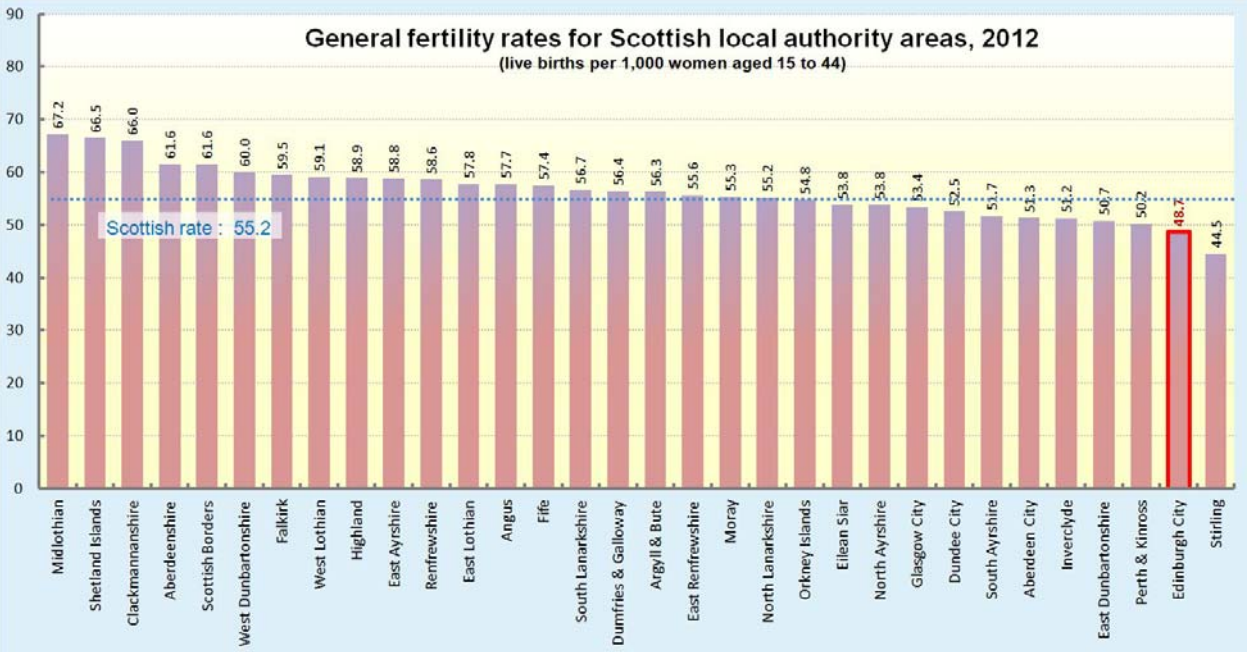
Graph 8 : Trends in general fertility rates 1991-2012, Edinburgh and Scotland



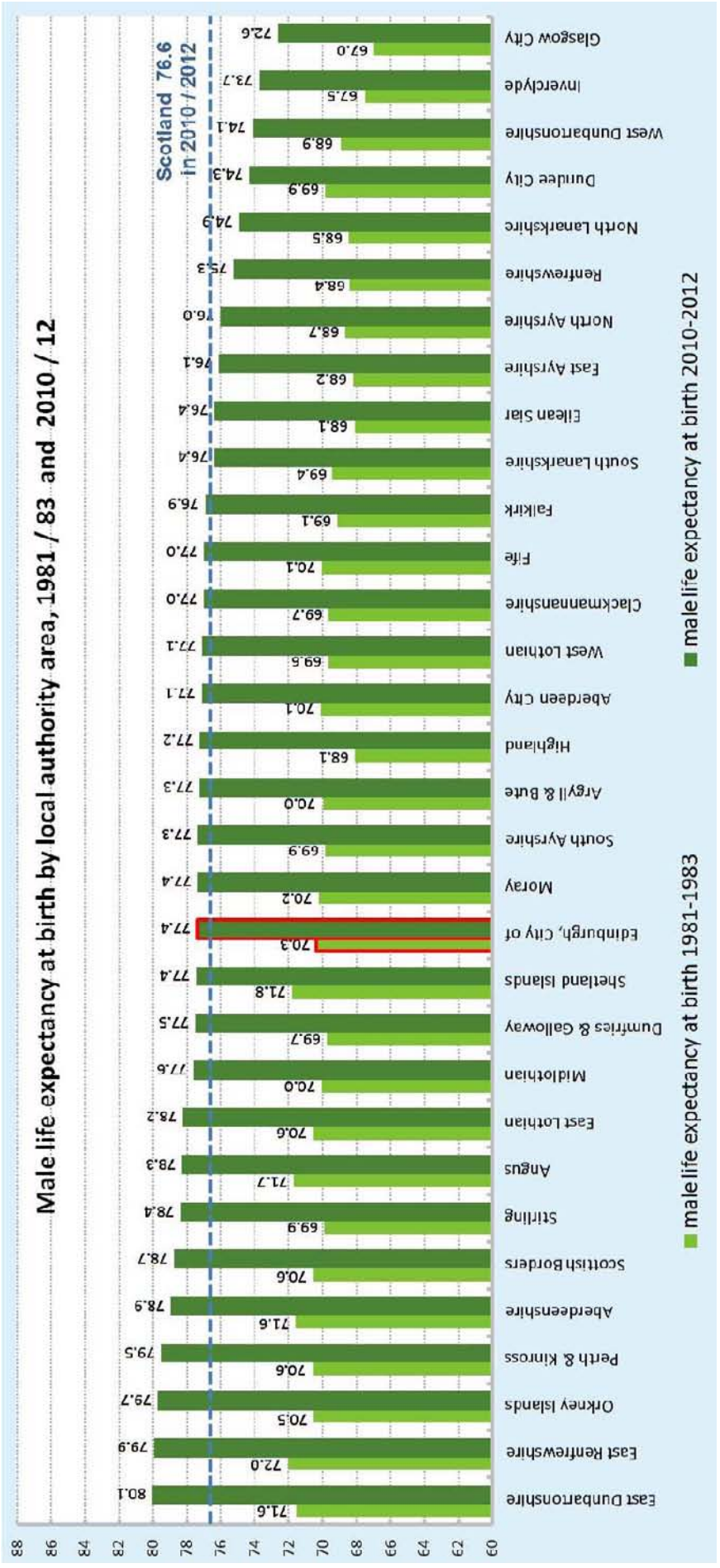
Graph 9 : Comparison of crude birth rates for Scottish local authority areas, 2012



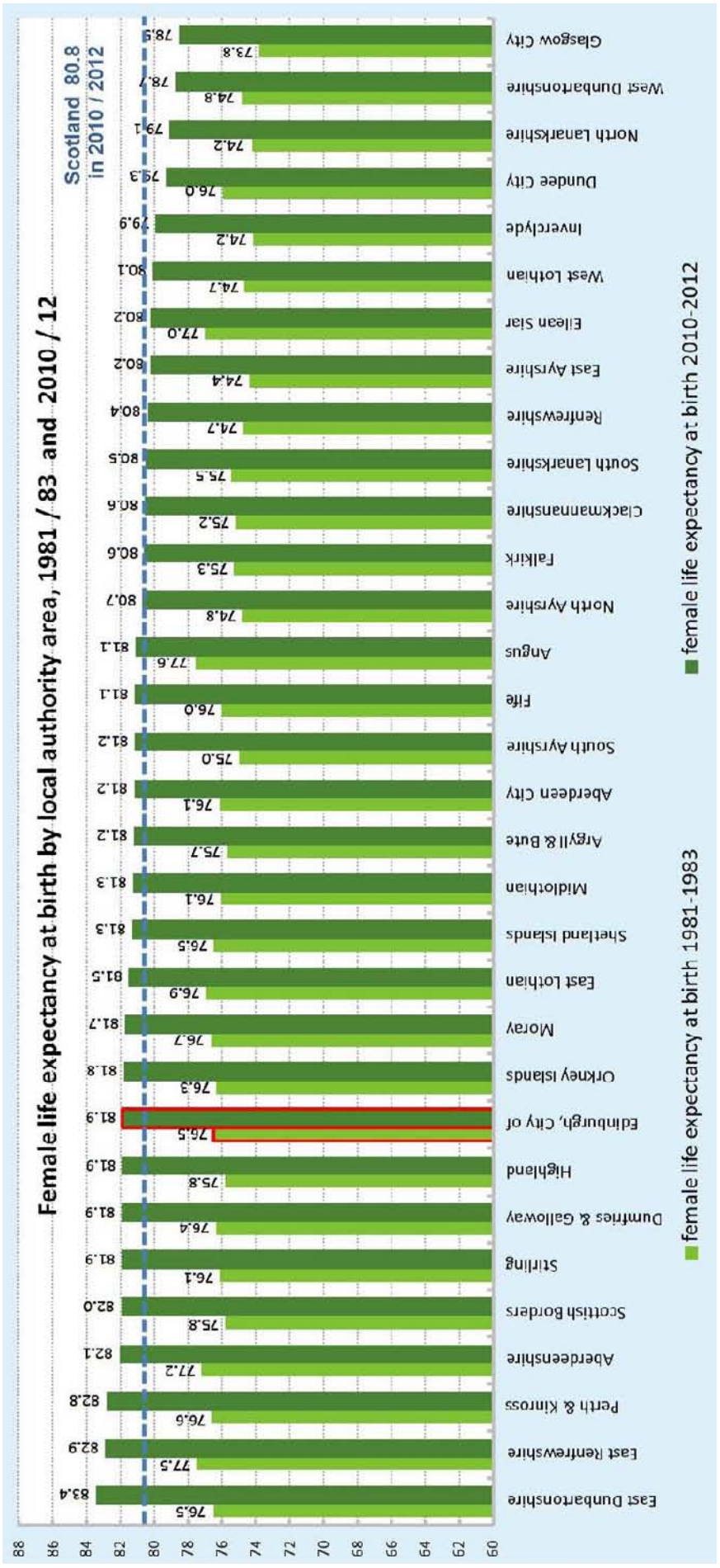
Graph 10 : Comparison of general fertility rates for Scottish local authority areas, 2012



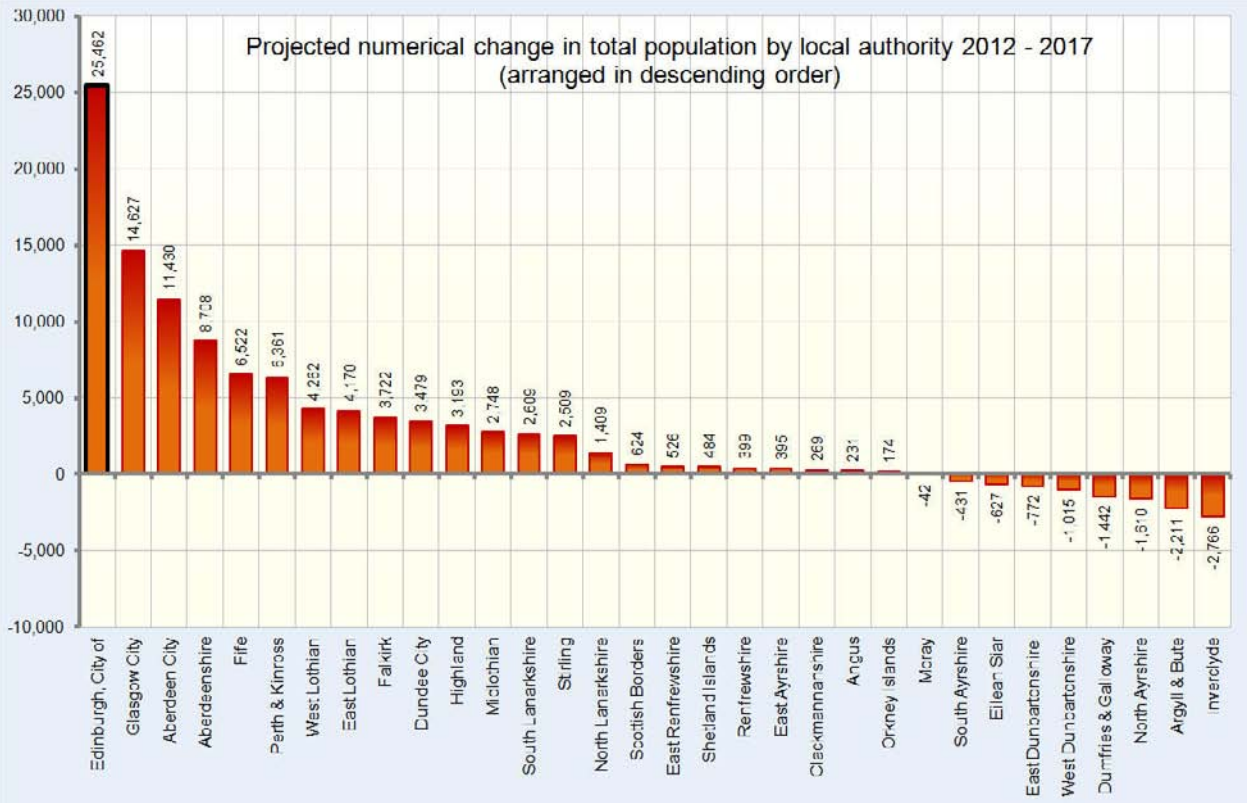
Graph 11 : Male life expectancy trends by local authority area, 1981 - 2012



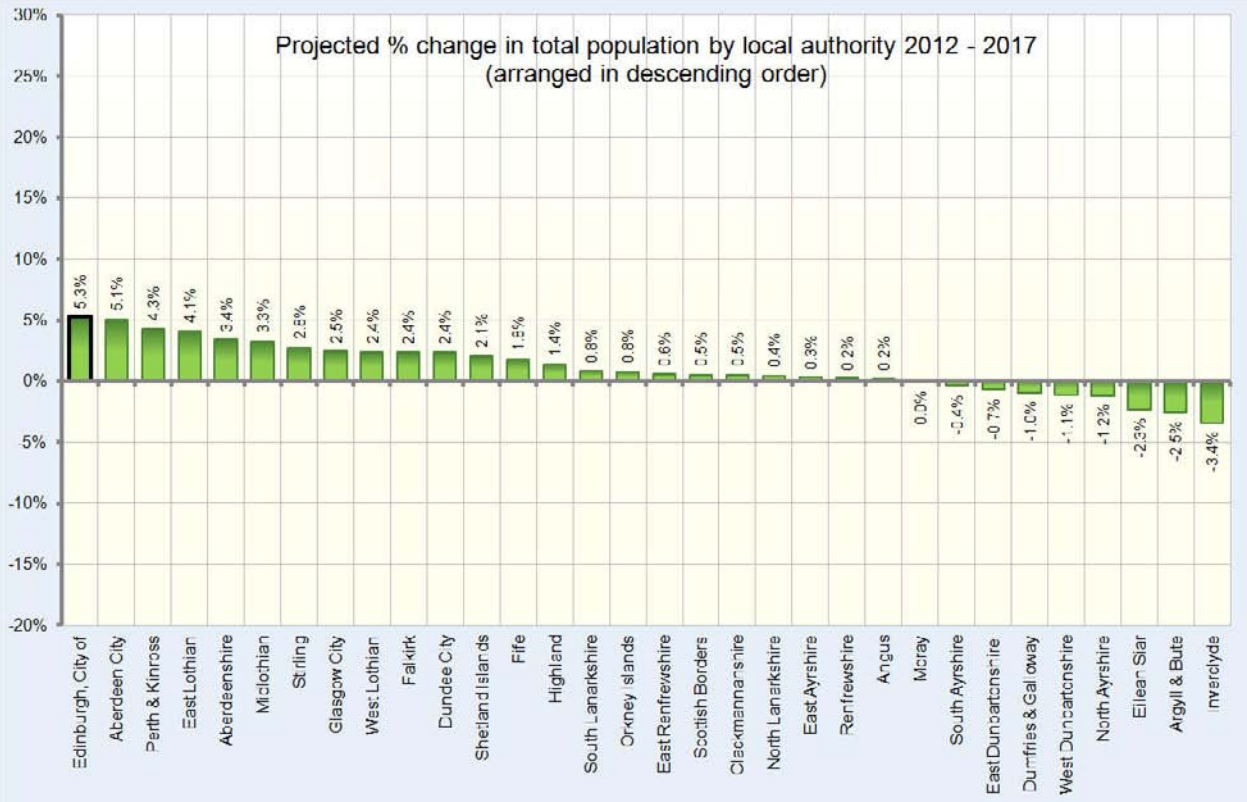
Graph 12 : Female life expectancy trends by local authority area, 1981 - 2012



Graph 13 : Projected population change by local authority 2012-2017 - numerical change

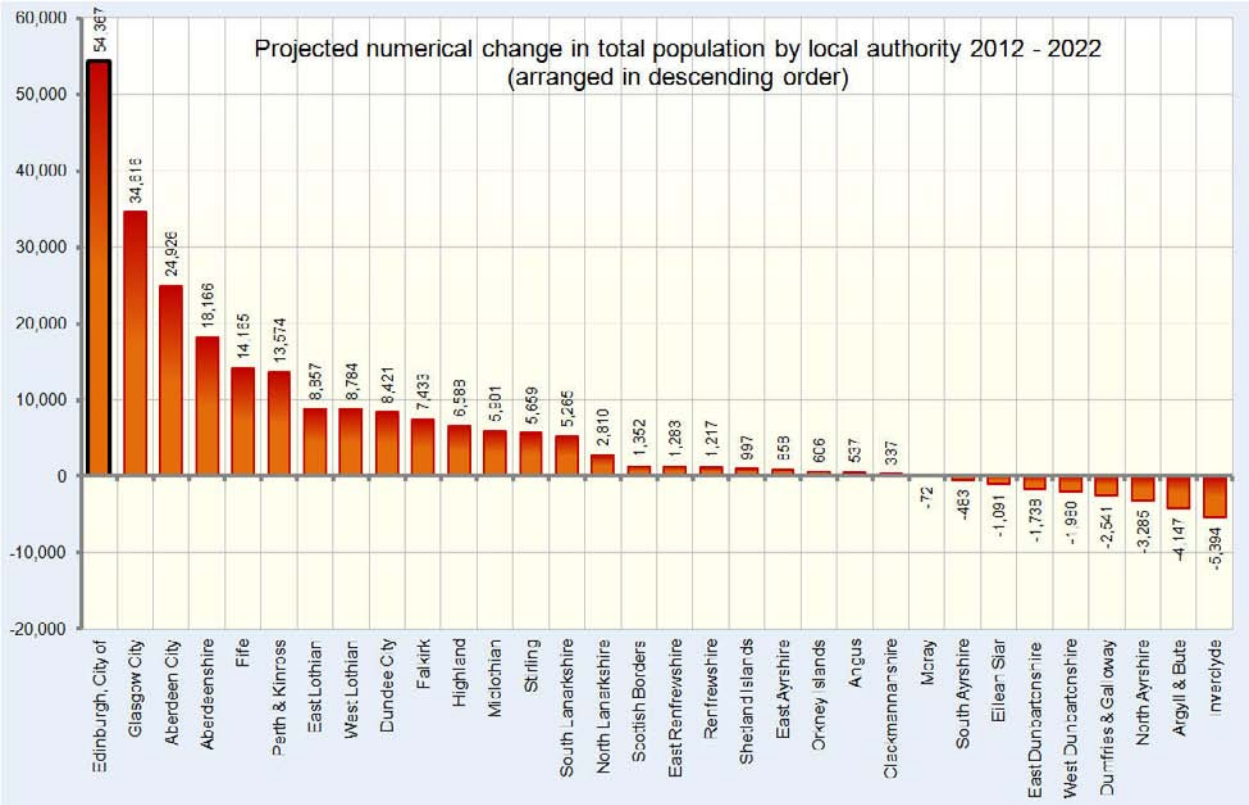


Graph 14 : Projected population change by local authority 2012-2017 - % change

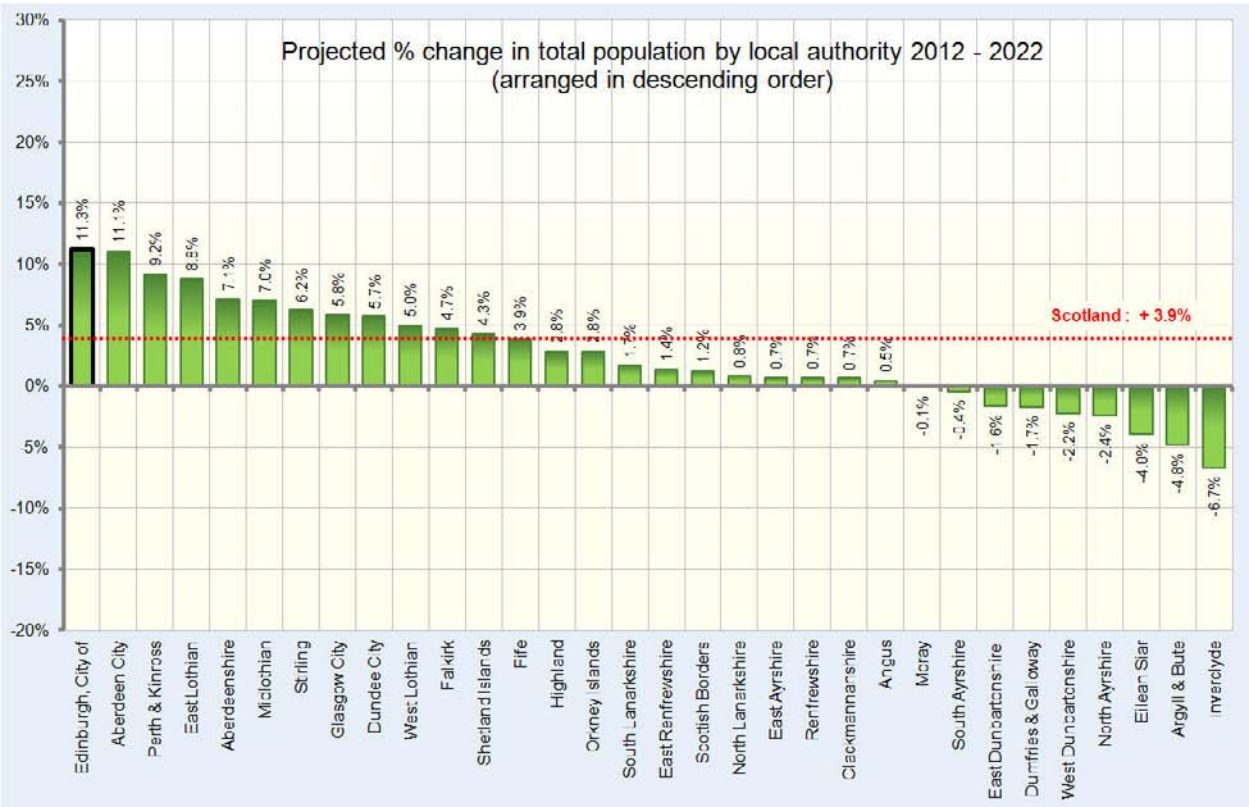


source : National Records of Scotland 2012-based principal population projections for local areas

Graph 15 : Projected population change by local authority 2012-2022 - numerical change

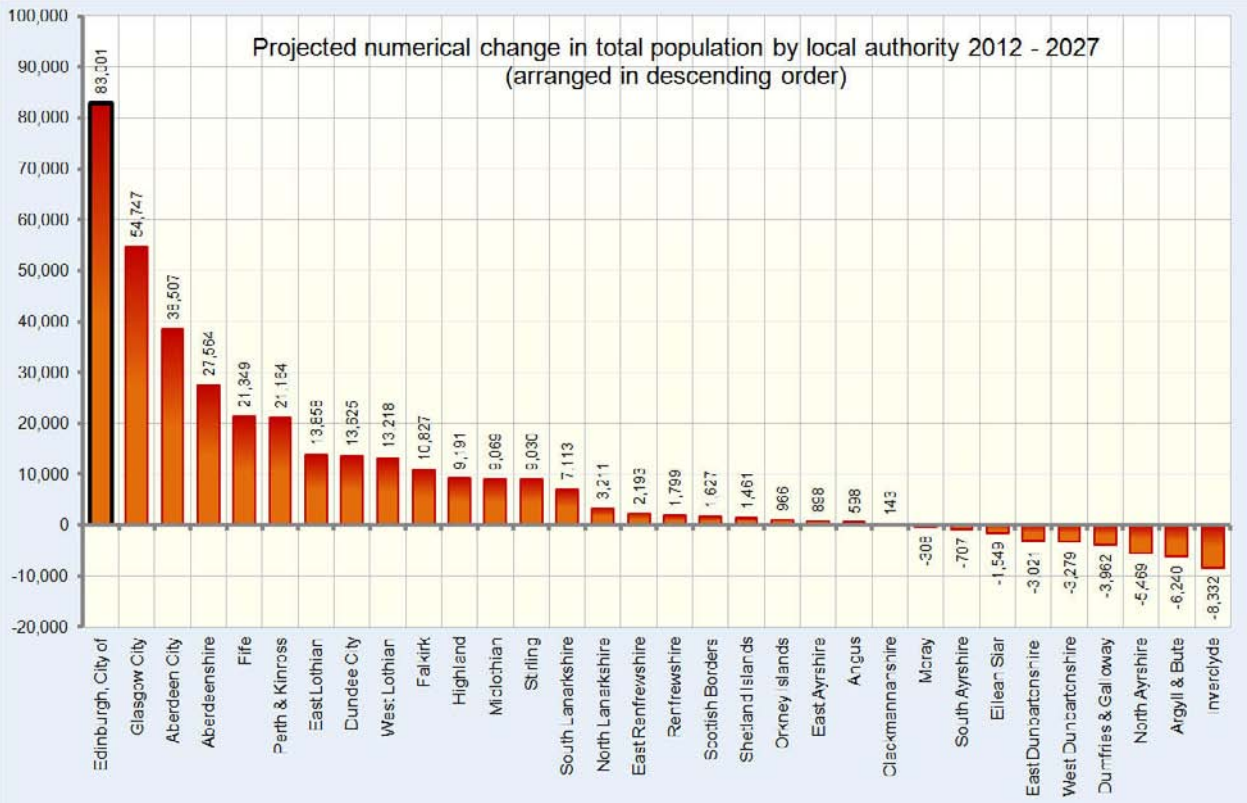


Graph 16 : Projected population change by local authority 2012-2022 - % change

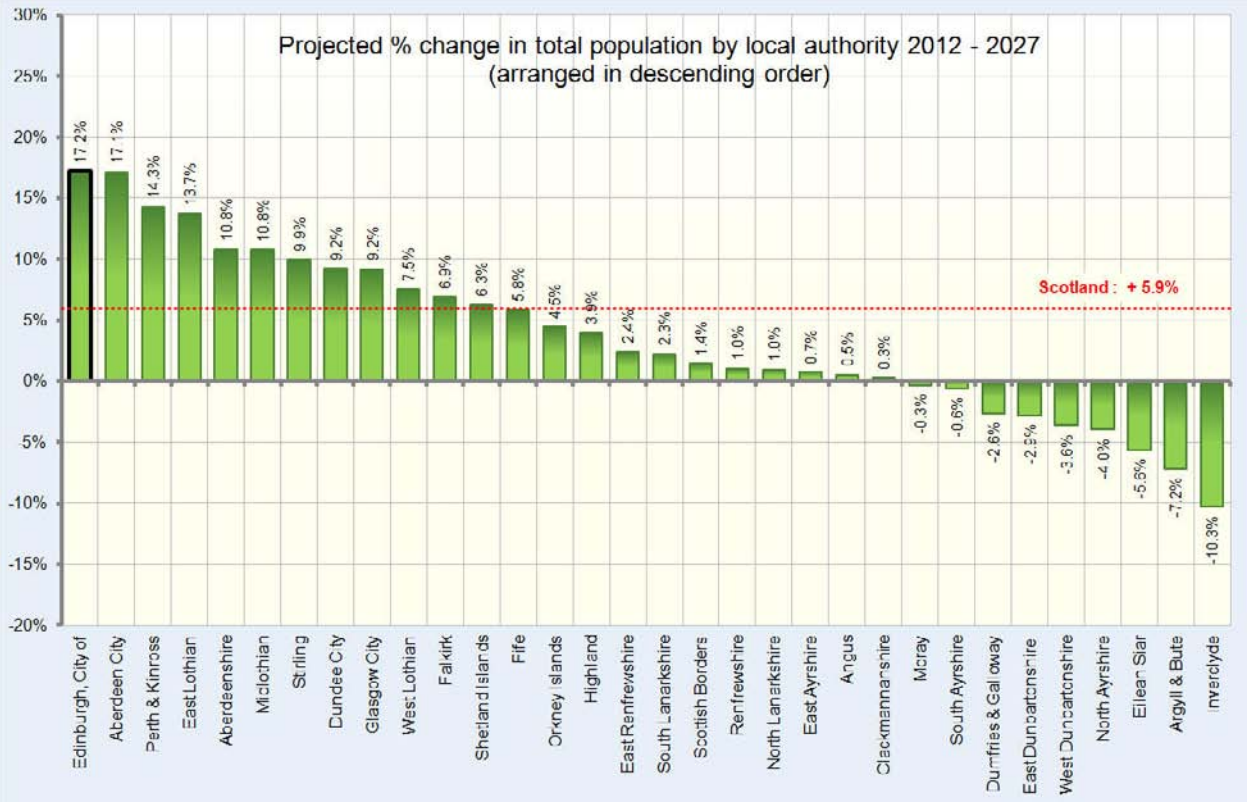


source : National Records of Scotland 2012-based principal population projections for local areas

Graph 17 : Projected population change by local authority 2012-2027 - numerical change

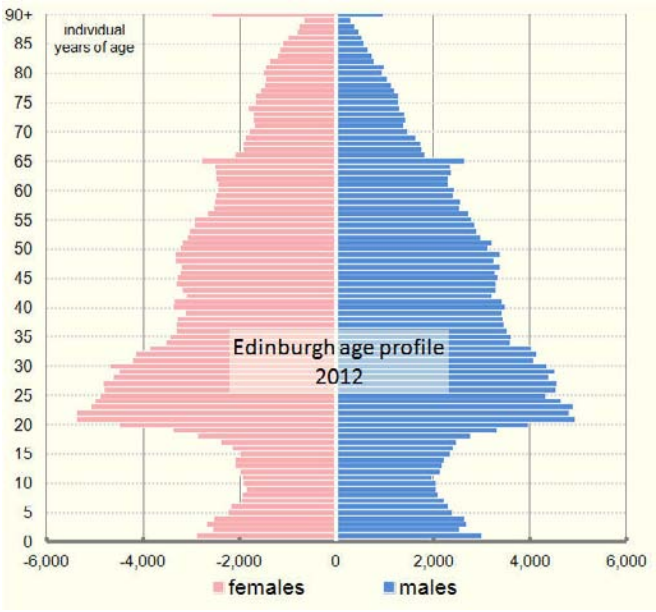


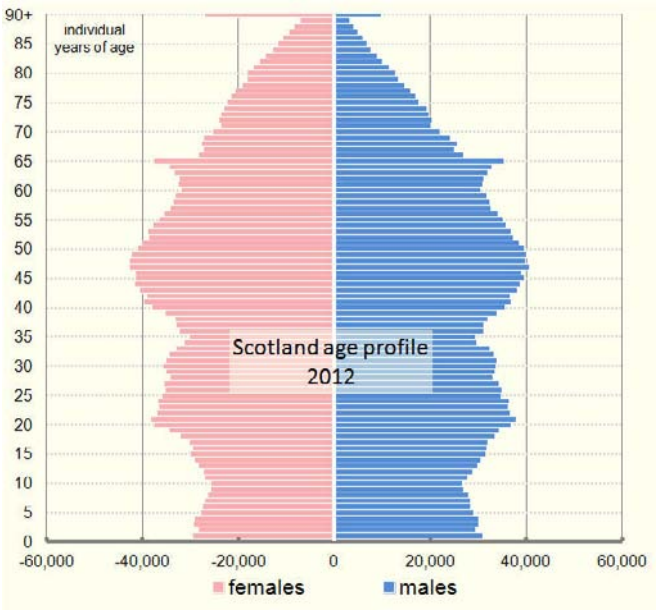
Graph 18 : Projected population change by local authority 2012-2027 - % change

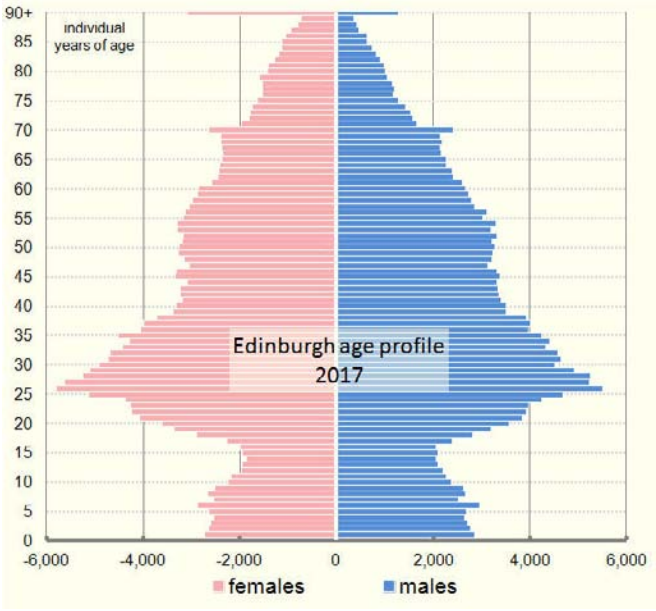


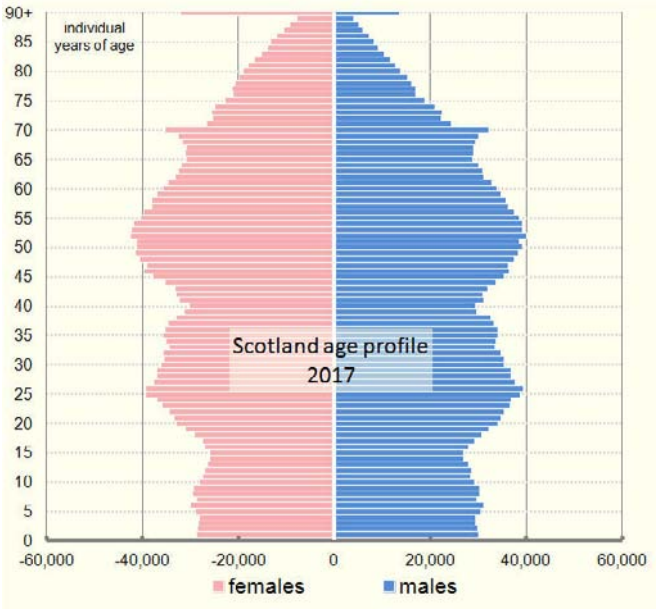
source : National Records of Scotland 2012-based principal population projections for local areas

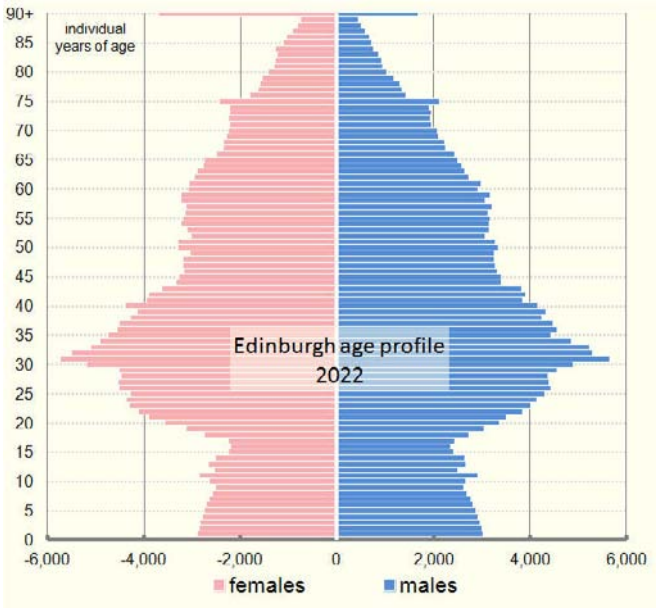
Graphs 19 (a) to (j) : Population pyramids (age profiles showing individual years)

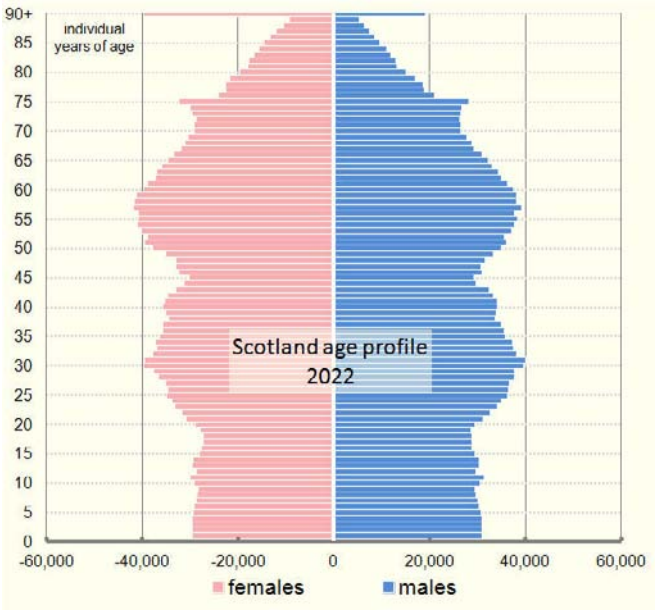












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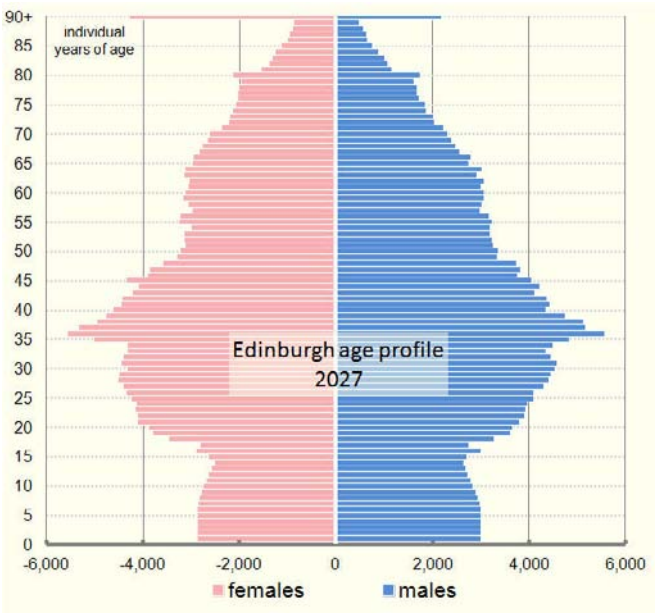
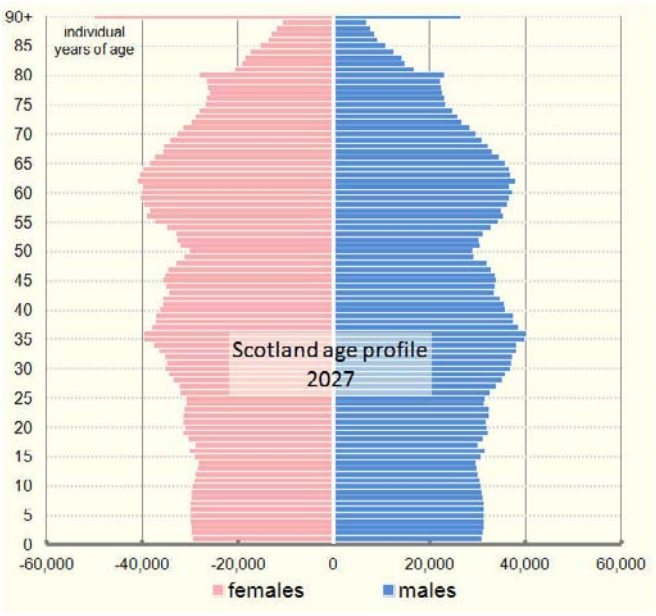
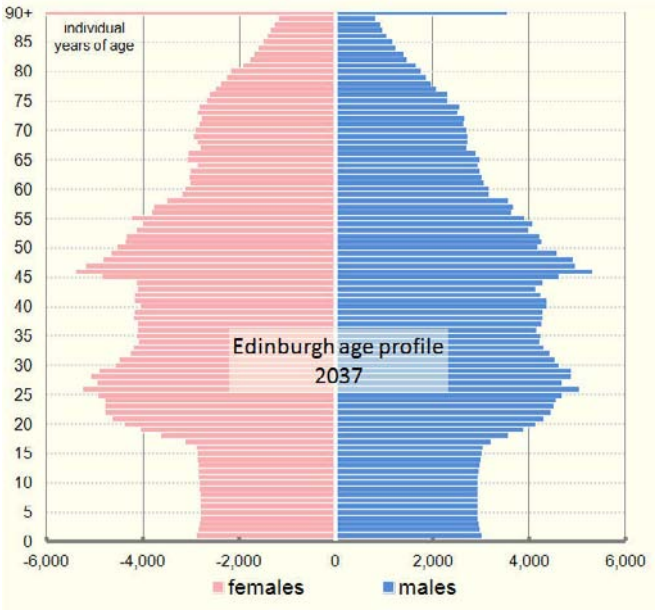
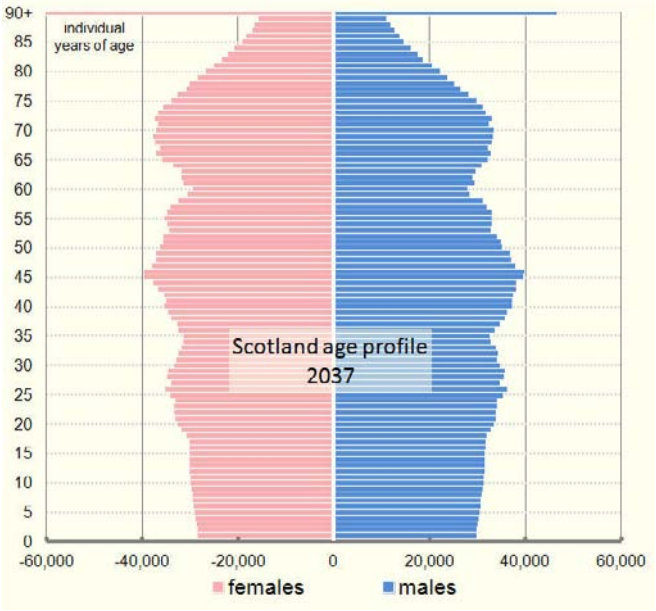


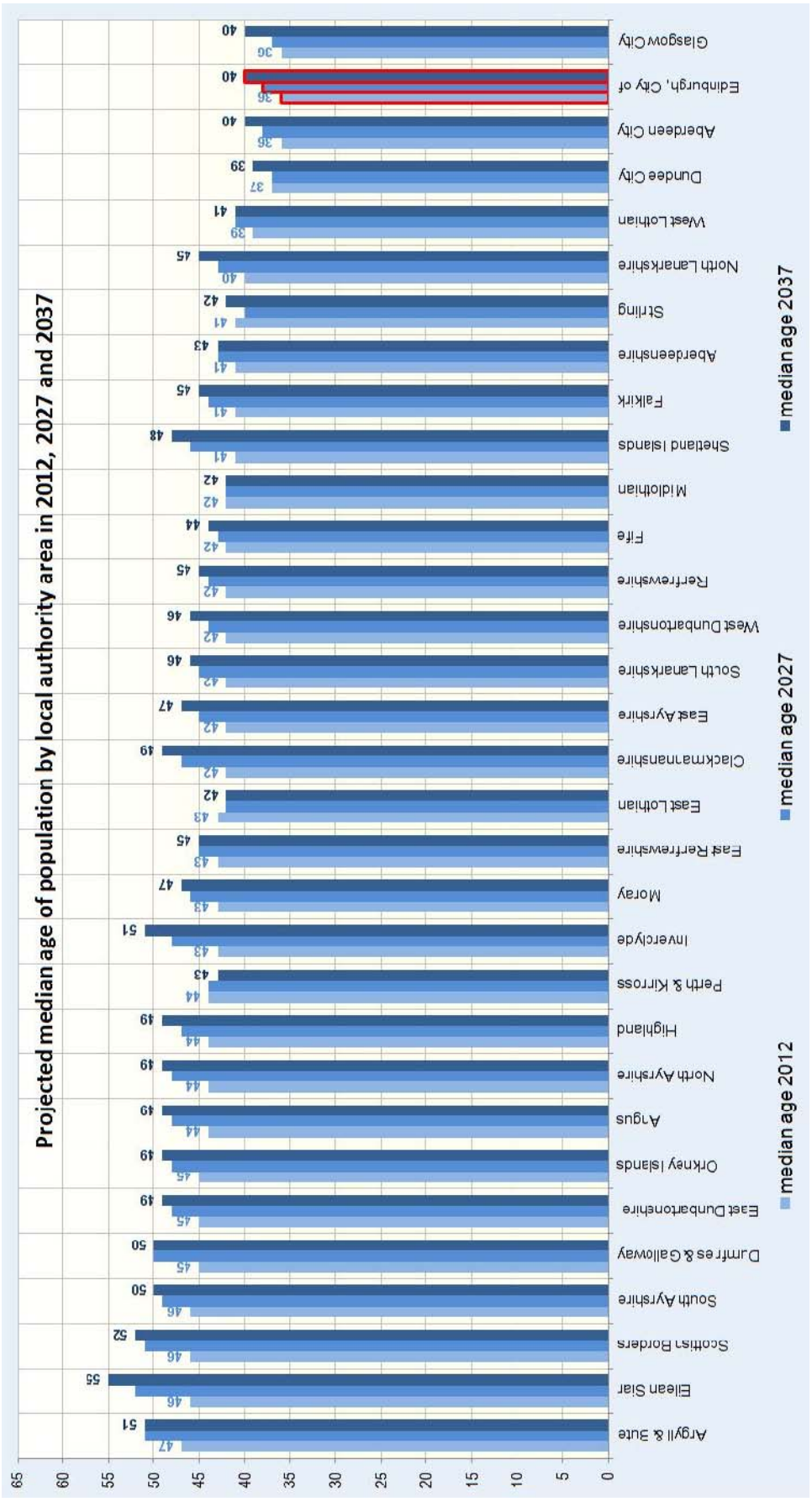






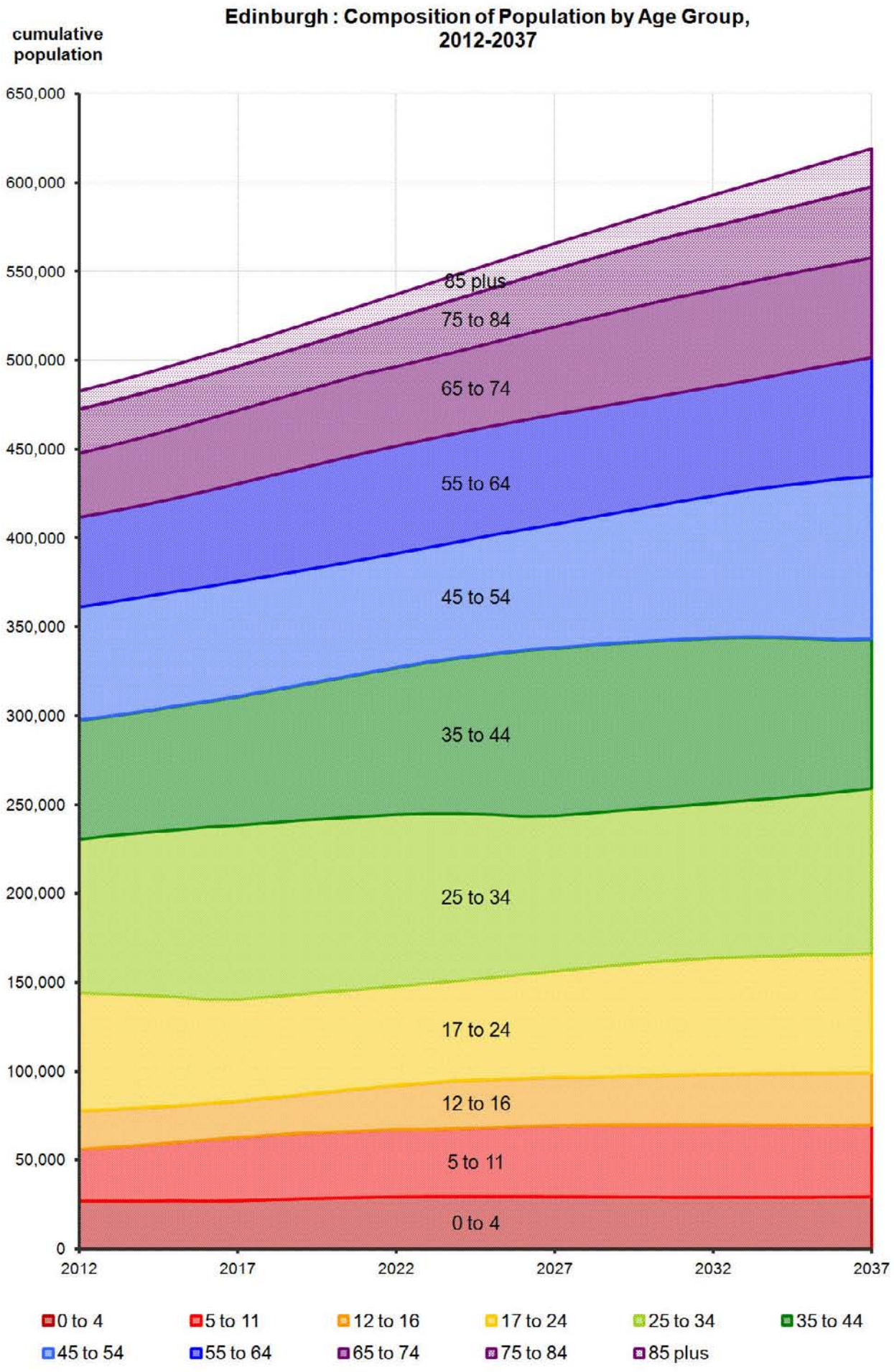
source : National Records of Scotland 2012-based principal population projections for local areas

Graph 20 : Average (median) age of population by local authority area, 2012, 2027 and 2037

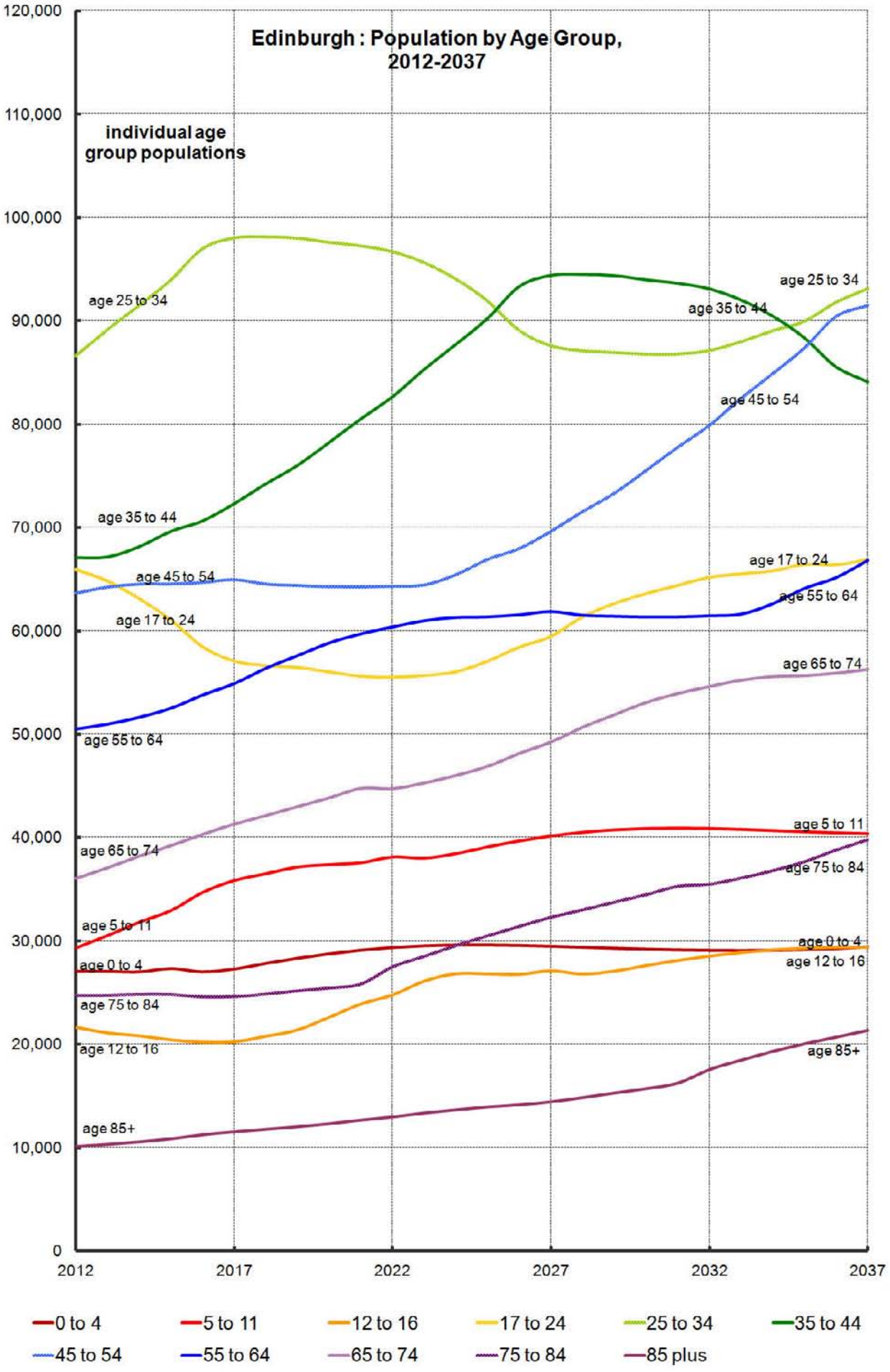


source : National Records of Scotland 2012-based principal population projections for local areas

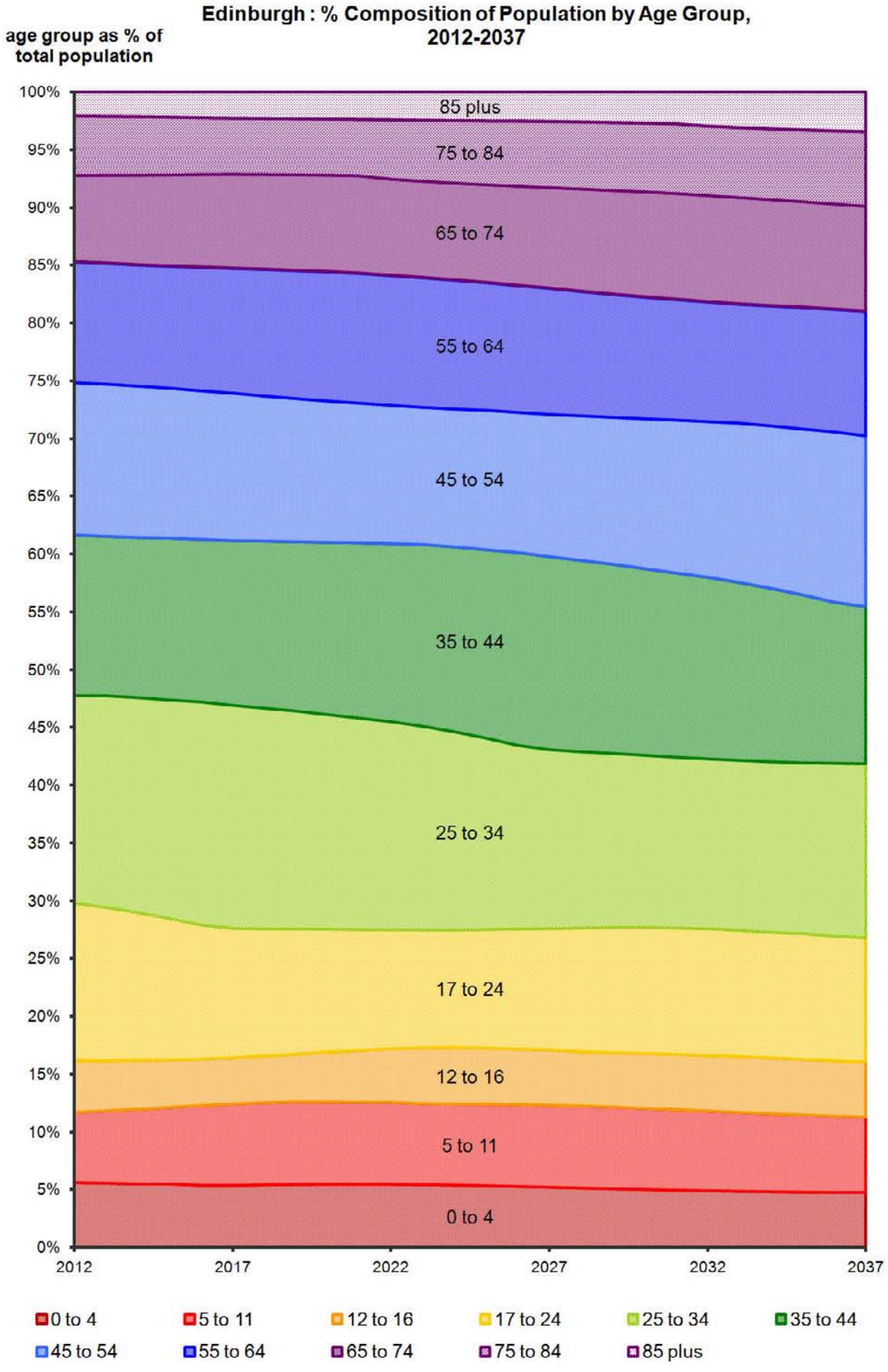
Graph 21 : Edinburgh's population by age group, 2012 to 2037 : absolute population counts (1) cumulative



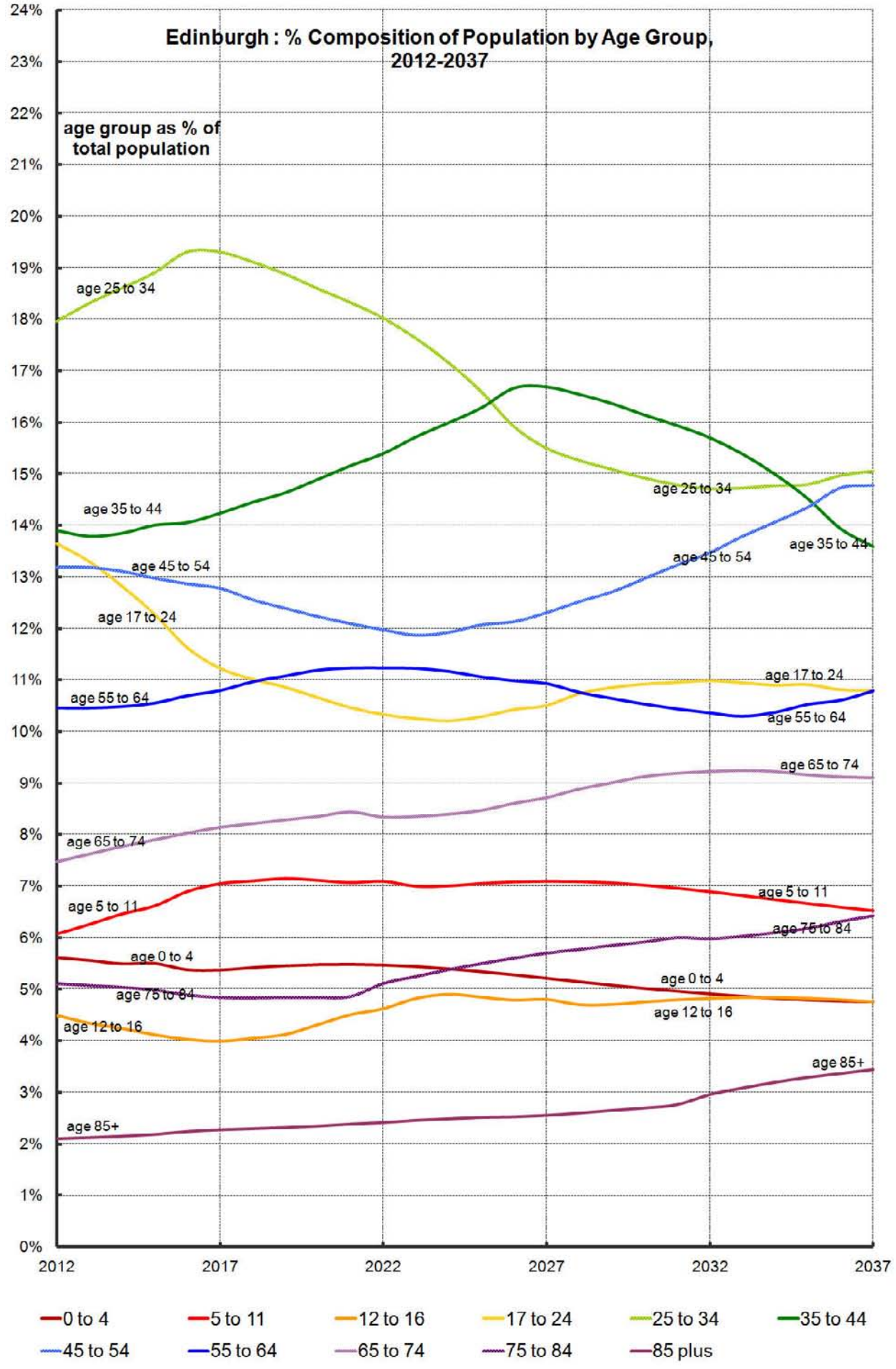
Graph 22 : Edinburgh's population by age group, 2012 to 2037 :
absolute population counts (2) non-cumulative



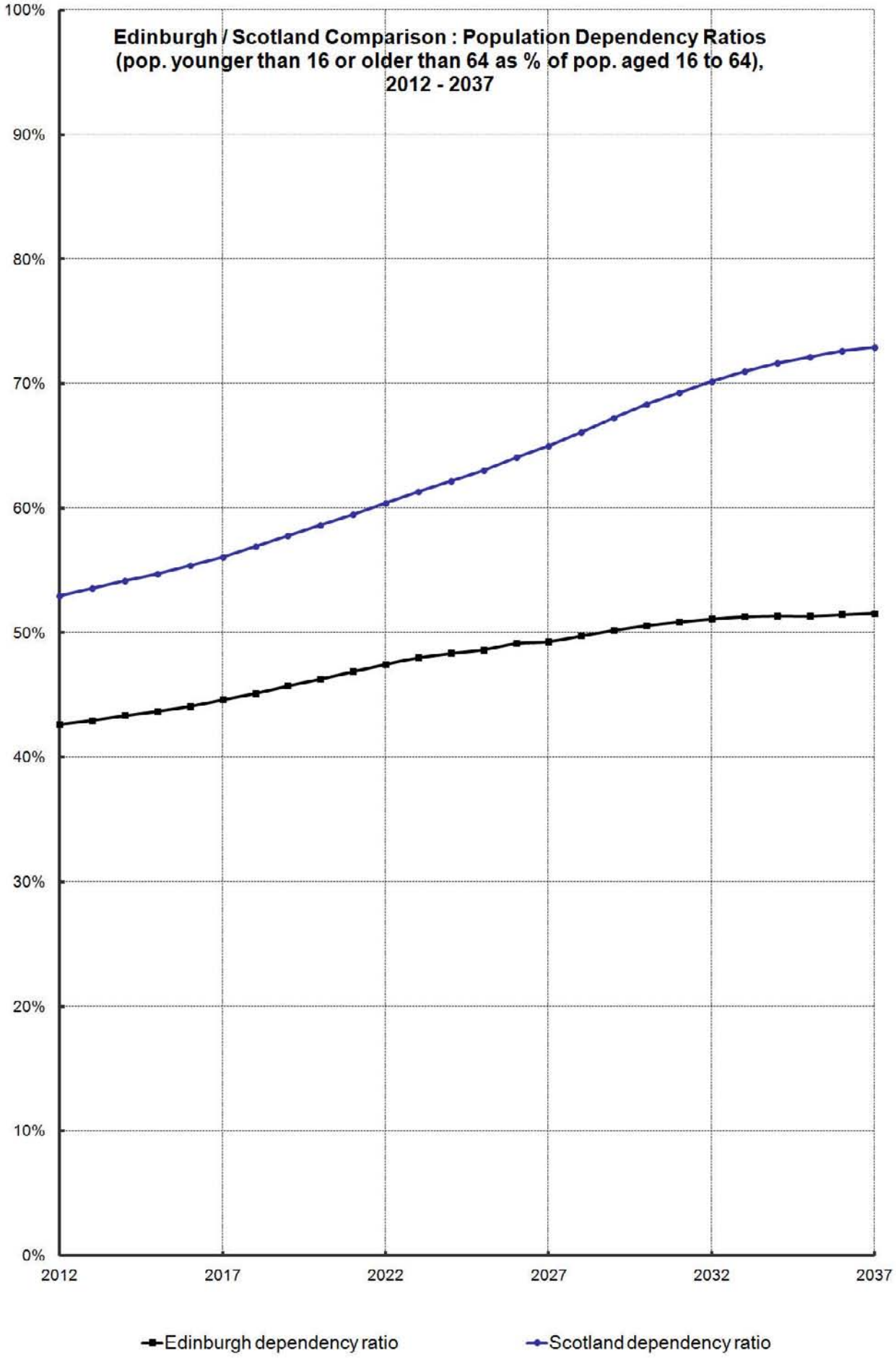
Graph 23 : Changing composition of Edinburgh's population by age group, 2012 to 2037 (1) cumulative %



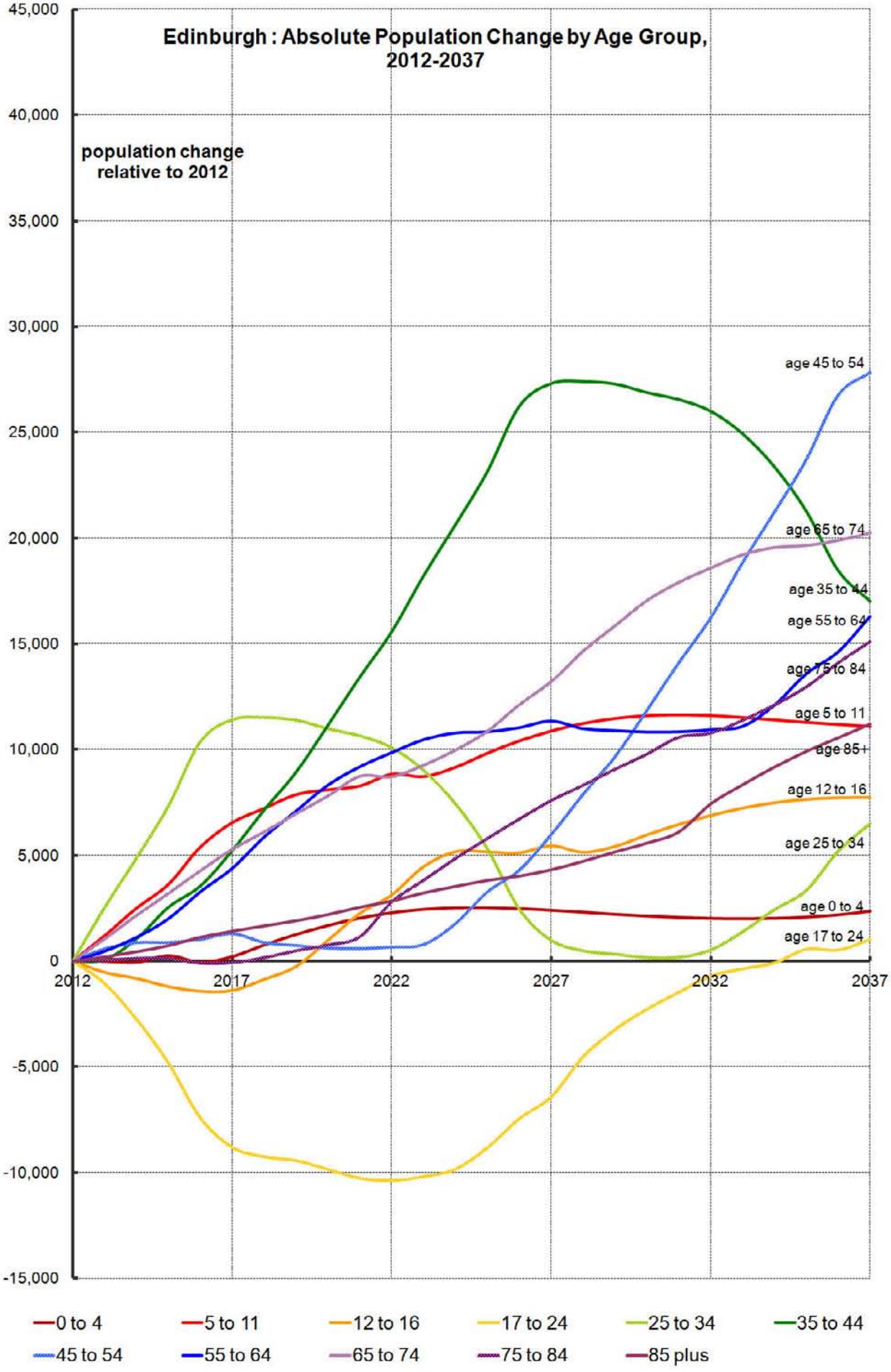
Graph 24 : Changing composition of Edinburgh's population by age group, 2012 to 2037 (2) non-cumulative %



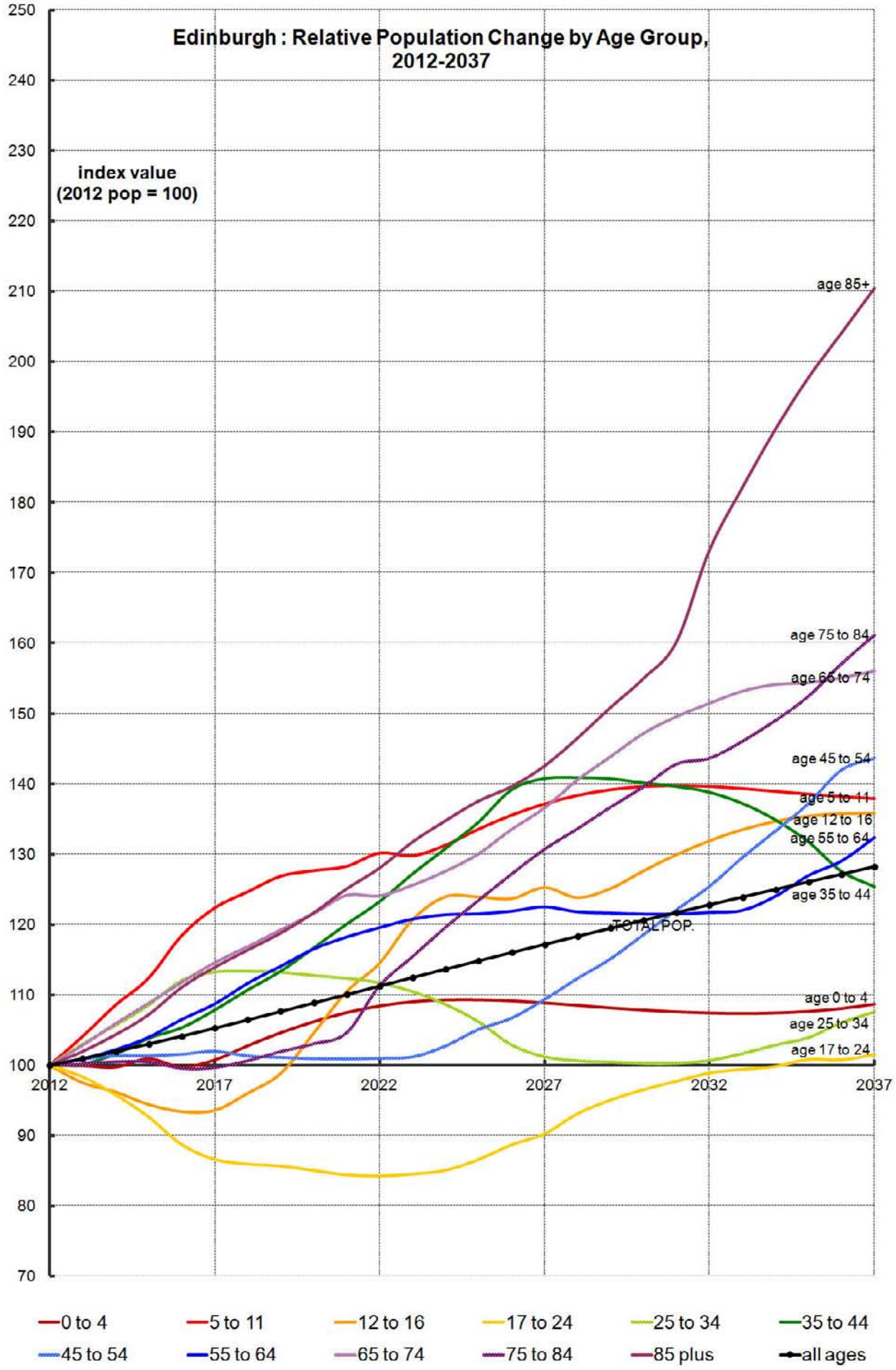
Graph 25 : Edinburgh / Scotland comparison of dependency ratios, 2012 to 2037 (non-working age as % of working age)



Graph 26 : Numerical change in Edinburgh's population compared to 2012, by age group, 2012 to 2037

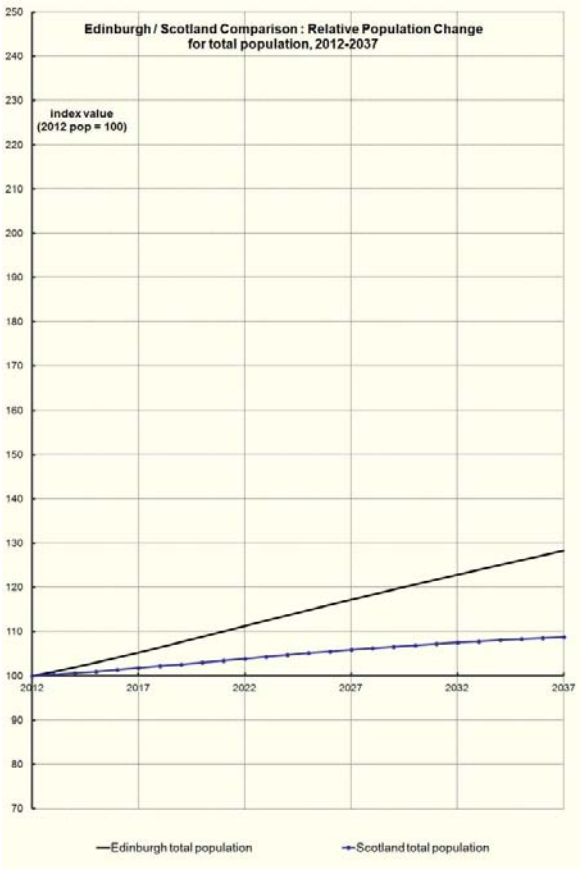


Graph 27 : Relative change in Edinburgh's population indexed to 2012, by age group, 2012 to 2037

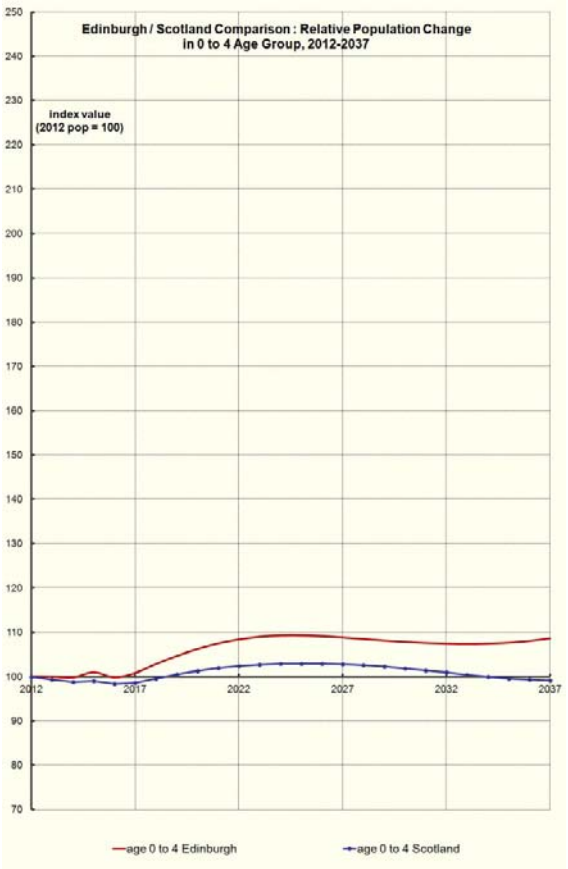


Graphs 28 (a) to (l) : Edinburgh / Scotland comparisons of indexed population changes for individual age groups

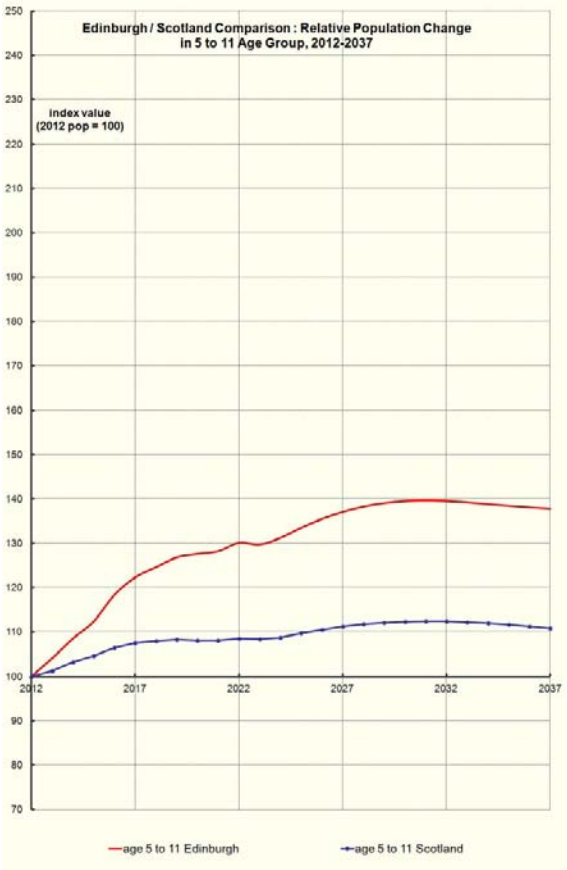
(a) Total population of all age groups



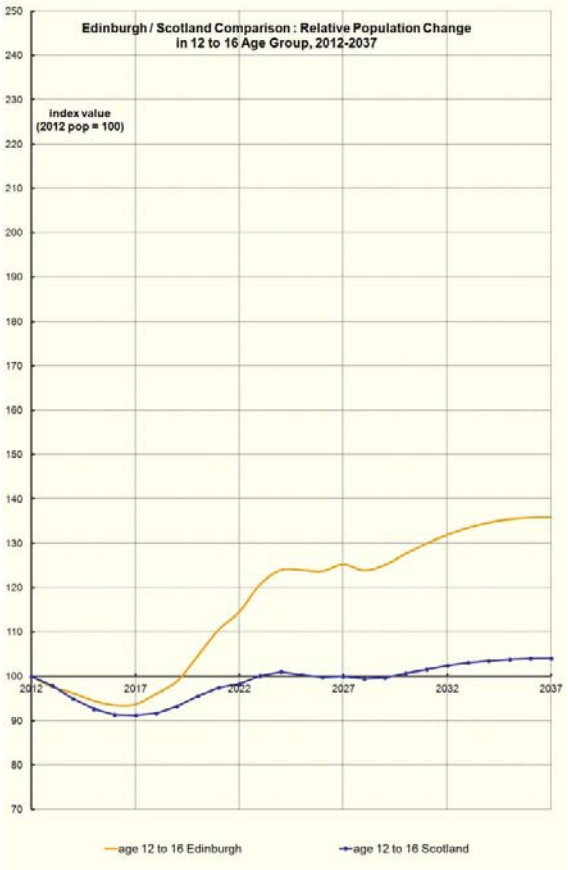
(b) Age 0 to 4



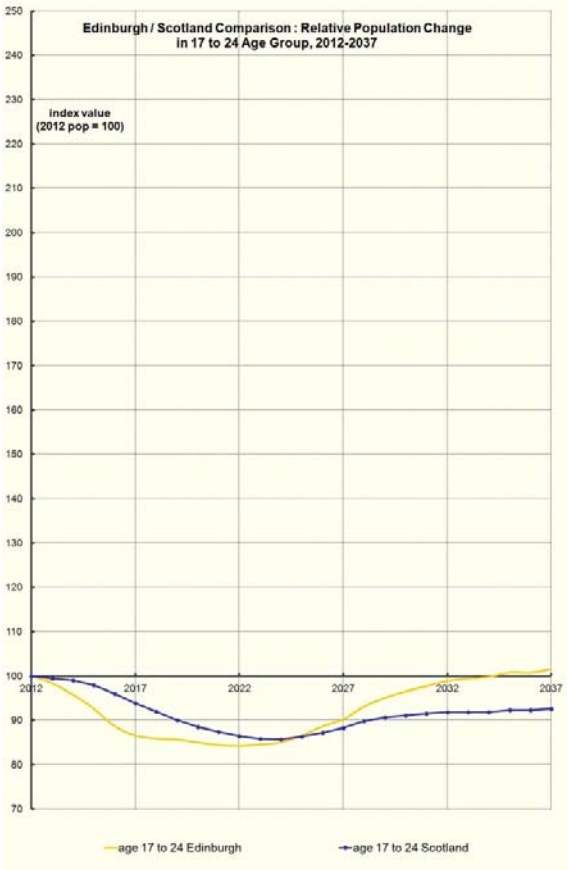
(c) Age 5 to 11



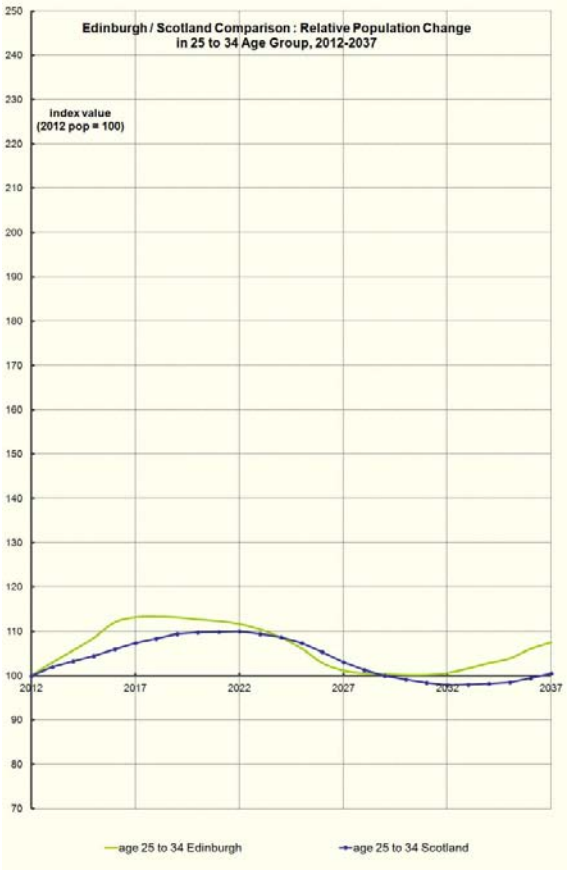
(d) Age 12 to 16



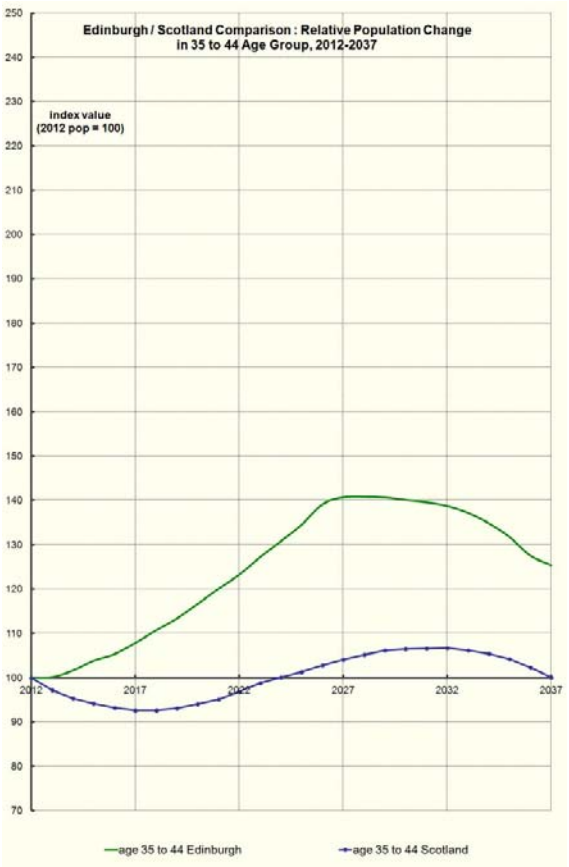
(e) Age 17 to 24



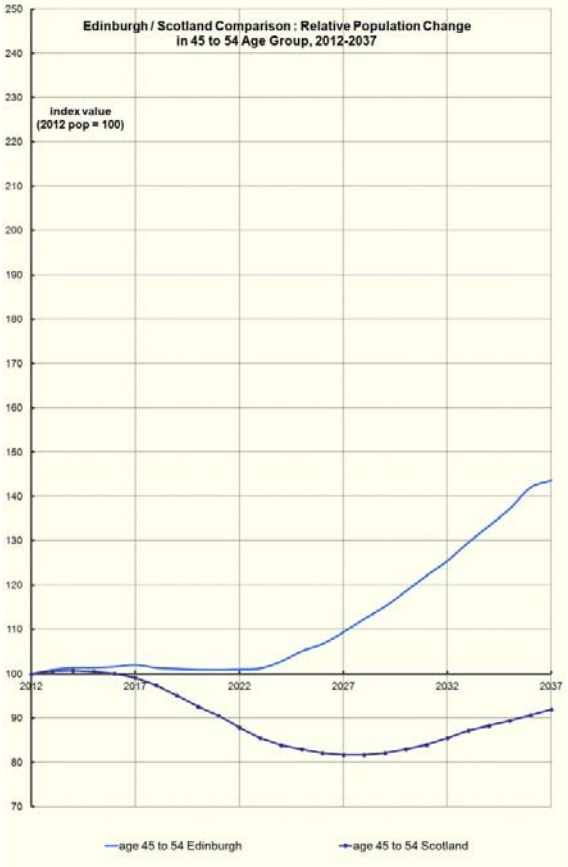
(f) Age 25 to 34



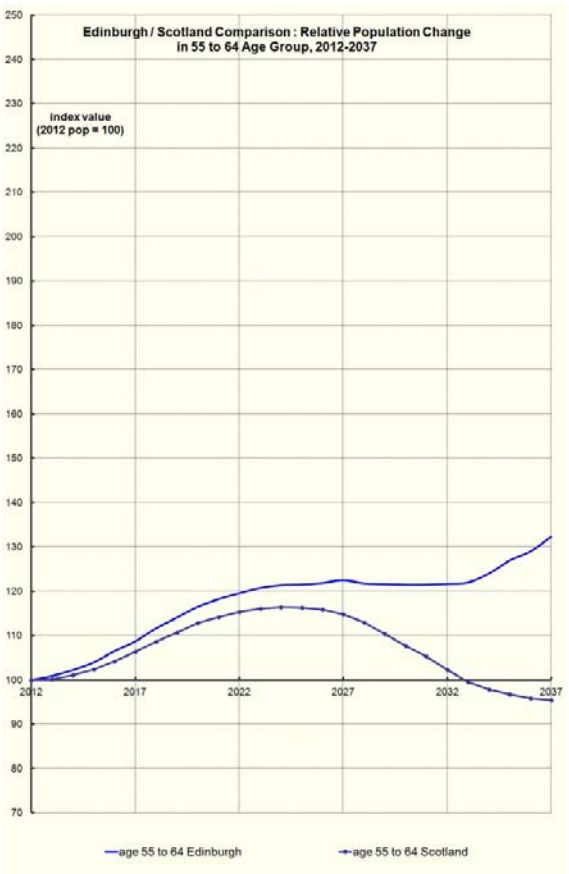
(g) Age 35 to 44



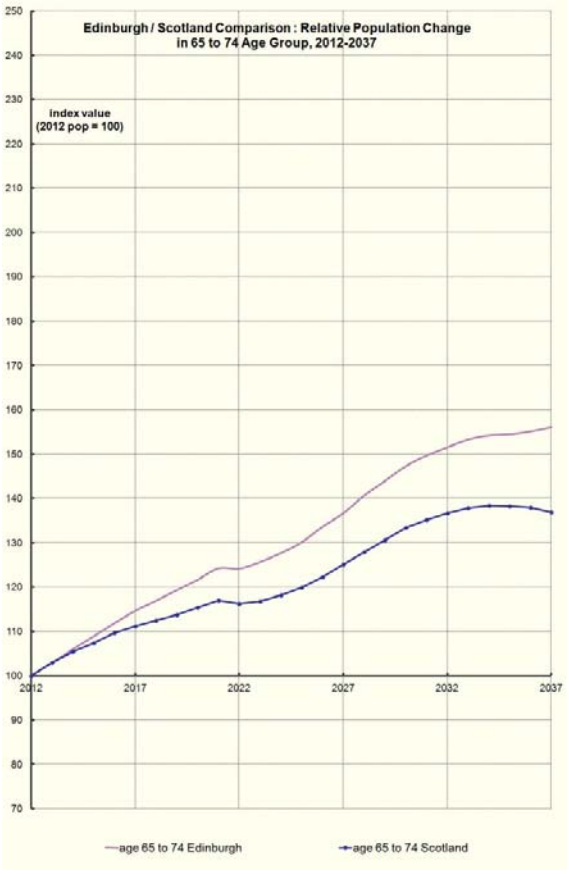
(h) Age 45 to 54



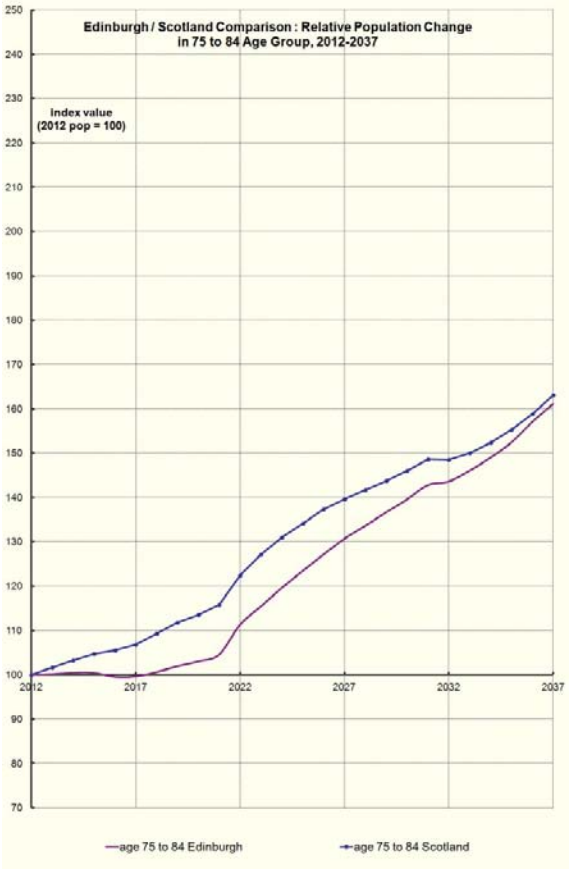
(i) Age 55 to 64



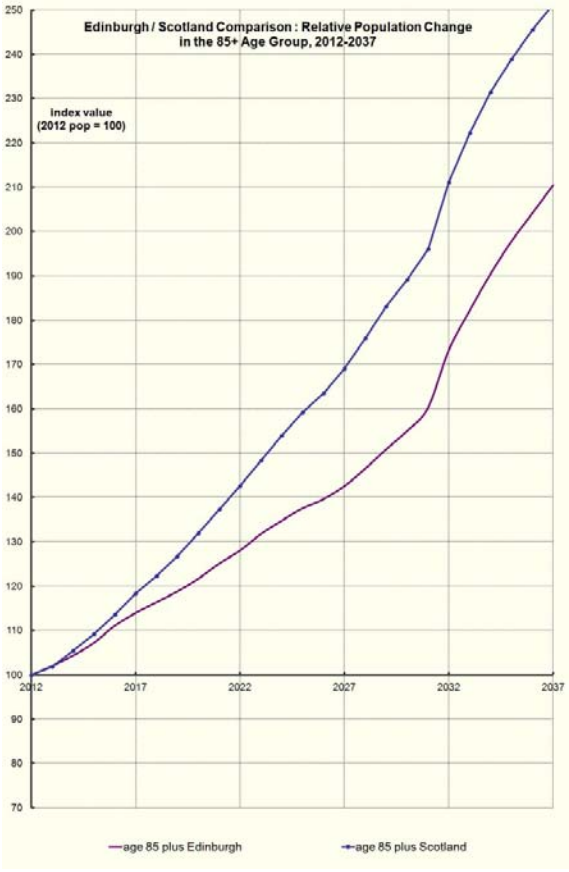
(j) Age 65 to 74



(k) Age 75 to 84



(l) Age 85 plus



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