

East Sussex Census 2011 estimates compared to GP registrations

Introduction

The purpose of this paper is to provide an overview of East Sussex Census 2011 estimates for usual residents compared to GP registrations for East Sussex residents (source: Exeter). The 2011 Census was conducted on 27th March 2011 and the GP registration data used is as at 1st April 2011 (referred to as Exeter throughout the rest of this paper, and relates to patients with an East Sussex postcode registered at any GP practice in or outside of East Sussex).

A summary of the comparison at a national level can be found at the following link:

<http://www.ons.gov.uk/ons/guide-method/census/2011/census-data/2011-census-user-guide/quality-and-methods/quality/how-census-compares-with-other-data-sources/index.html>

The text below (sourced from the ONS document/link above) explains why differences between census estimates and patient registrations may exist.

There are several key reasons why we might expect census estimates to differ to Patient Register counts:

- The PR only includes those people who have registered with a GP. Examples of those groups not registered with an NHS GP include sole private care users, armed forces personnel, long-term prisoners and patients in long stay hospitals
- List inflation exists on the PR where individuals are no longer resident at the address at which they are on the register. The extent of list inflation varies across the country depending on the demographic profile of each area and on how well lists are maintained to remove individuals who have moved
- Individuals intending to stay in the United Kingdom for longer than three months can register with an NHS GP. The 2011 Census definition of usual residence includes individuals who intend to stay for twelve months or more

Whilst considering the quality of GP registration data, it is important to note that registration patterns can vary by age and sex. Women are called in for screening programmes (e.g. cervical screening) and potentially have more contact with primary care than men due to contraceptive and maternity services. It is well known that young men are less likely to register with a GP than other groups.

<http://www.adls.ac.uk/department-of-health/gp-patient-register-dataset/?detail>

Census counts are referred to as estimates because although efforts are made to include everyone, some people will always be missed. To capture

those who have been missed ONS use complex statistical techniques to adjust for the undercount (as well as possible over counts); hence the final outputs are estimates. Although local census estimates have already been adjusted for undercount, it is worth noting populations that are more likely to have a poorer response rate to a census (hard to count). This is because the adjustments may not have gone far enough (or too far), so could be a possible explanation for differences between GP registrations and census estimates. For more information on the ONS adjustment process, please see link below.

<http://www.ons.gov.uk/ons/guide-method/census/2011/census-data/2011-census-user-guide/quality-and-methods/index.html>

Research conducted following the 2001 Census identified the top 10 variables for non-response (listed in order of importance) as:

- Renting privately
- Where occupants are Black, Asian, Chinese or Mixed ethnic group
- Paying part rent/part mortgage
- Containing a single person
- Where the average age of the people within the household is between 23 and 29 and 29 and 34
- Where the average age of the people within the household is 70+
- Renting from housing associations or the council
- Where more than two thirds of occupants had a different address one year earlier
- Living in commercial buildings
- In an area with higher Index of Multiple Deprivation income score

Source: Rahman, N and Goldring, S. (2006) Modelling Census Household Non-response. Available at www.s3ri.soton.ac.uk/isi2007/papers/Paper13.pdf

At a national level, when the first estimates were computed (after most adjustments were made) the numbers of males aged 20-49 years were still deemed 'outside the bounds of plausibility' and so further adjustments were made, and 303,000 males in this age group were added to the national census estimate. It is suggested that this may in part be due to men aged between 20 and 30 years not being good at filling in forms, as well as less likely to be in the UK due to working abroad and travelling. They are also less likely to be registered with a GP.

Source: <http://www.ons.gov.uk/ons/guide-method/census/2011/census-data/2011-census-user-guide/quality-and-methods/methods/coverage-assessment-and-adjustment-methods/index.html> and Census 2011: Five lesser-spotted things in the data <http://www.bbc.co.uk/news/magazine-18853714>

Students and boarding school children are a group that can be difficult to count properly. As in the 2001 Census, students were counted as usually resident at their term time address as this is where the information is most needed about them for service provision and housing requirements. However,

basic demographic information is also collected from students at their home address (if different from their term time address). The questions included in the census will identify students or schoolchildren in full-time education and filter them correctly, to ensure that the appropriate information is collected from them at different addresses, and that no-one is missed or double-counted. (Source: Final recommended questions for the 2011 Census in England and Wales, March 2010, ONS)

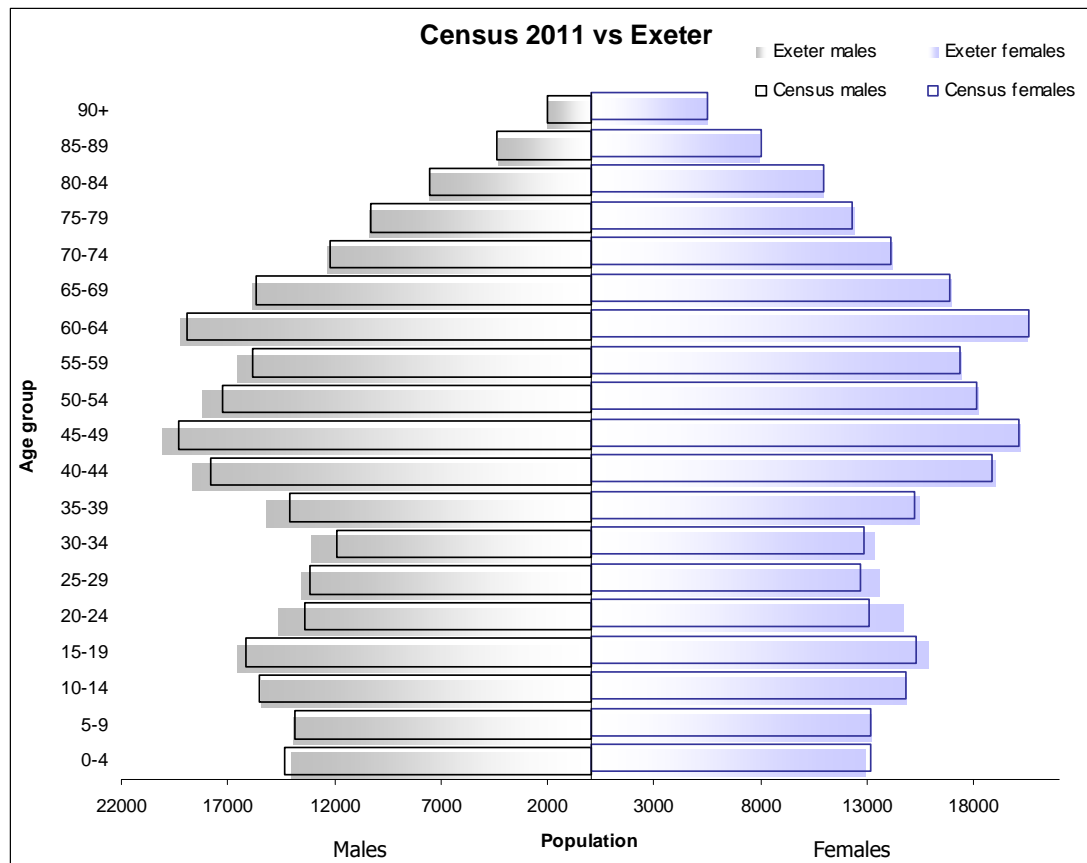
The 2011 census day was on a Sunday, whether, for example, children at boarding schools who were home for the weekend may have been more likely to be recorded at the permanent/family home only may be a factor.

East Sussex overview

The 2011 Census estimate is 11,709 persons (2.2%) below the Exeter count. The difference is larger in males (7,766 persons, 3.1%) than females (3,943 persons, 1.4%). Differences vary by age group, with the largest difference in those aged 20-24 years (2,772 persons, 10.5%).

Figure 1 shows the East Sussex population counts by age group and sex for both Census estimates and Exeter and figure 2 shows the difference between the two in percentage terms.

Figure 1

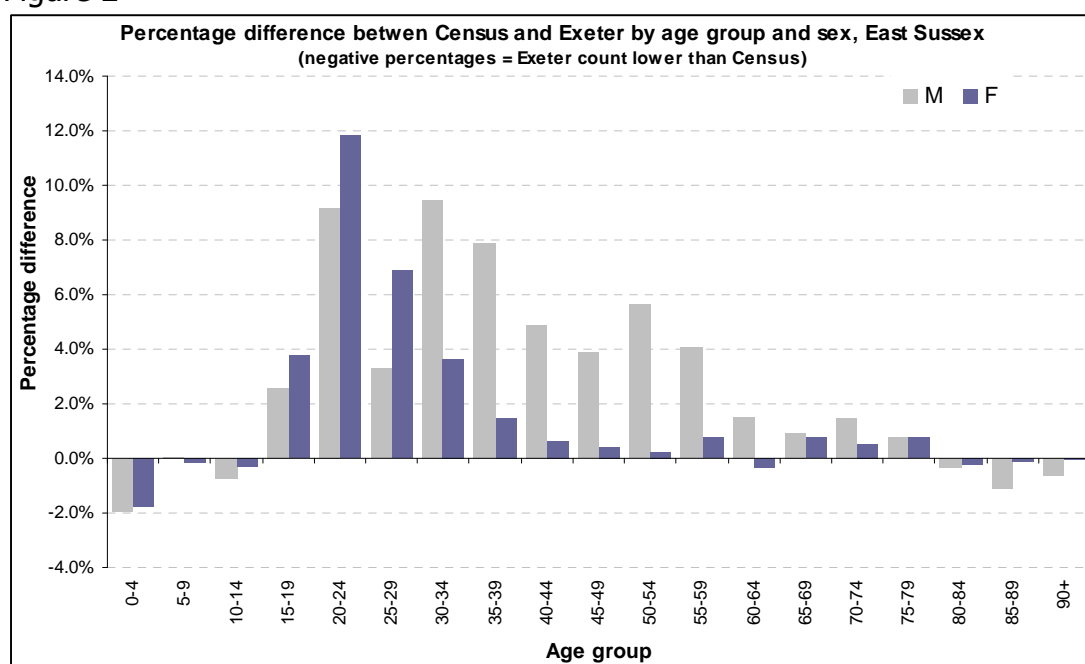


For under 15s (except males 5-9 years) the Exeter count is lower than Census estimates, and also for males and females aged 80 years or over (table 1).

Table 1

Age group (yrs)	Males (Exeter)	Females (Exeter)	Males (Census)	Females (Census)	Difference (Males)	Difference (Females)
0-4	14045	12902	14323	13133	-278	-231
5-9	13904	13142	13899	13165	5	-23
10-14	15422	14801	15542	14848	-120	-47
15-19	16555	15875	16134	15301	421	574
20-24	14636	14615	13408	13071	1228	1544
25-29	13569	13550	13138	12680	431	870
30-34	13054	13327	11923	12856	1131	471
35-39	15175	15449	14069	15221	1106	228
40-44	18691	18990	17823	18871	868	119
45-49	20080	20148	19333	20066	747	82
50-54	18205	18193	17235	18154	970	39
55-59	16514	17456	15868	17325	646	131
60-64	19233	20510	18945	20577	288	-67
65-69	15807	16965	15656	16840	151	125
70-74	12374	14154	12193	14077	181	77
75-79	10386	12392	10306	12301	80	91
80-84	7541	10927	7568	10956	-27	-29
85-89	4316	7975	4365	7984	-49	-9
90+	2023	5479	2036	5481	-13	-2
<i>Total</i>	<i>261530</i>	<i>276850</i>	<i>253764</i>	<i>272907</i>	<i>7766</i>	<i>3943</i>

Figure 2



At a lower tier, differences between Census estimates and Exeter for males are largest in Hastings and Rother, and for females the difference is largest in Eastbourne (table 2 and figure 3).

Table 2

	Males (Exeter)	Females (Exeter)	Males (Census)	Females (Census)	Difference (Males)	Difference (Females)
Eastbourne	49079	53168	47559	51853	1520	1315
Hastings	45859	46433	44014	46240	1845	193
Lewes	48256	50743	47363	50139	893	604
Rother	44837	48395	43021	47567	1816	828
Wealden	73499	78111	71807	77108	1692	1003
<i>Total</i>	<i>261530</i>	<i>276850</i>	<i>253764</i>	<i>272907</i>	<i>7766</i>	<i>3943</i>

Figure 3

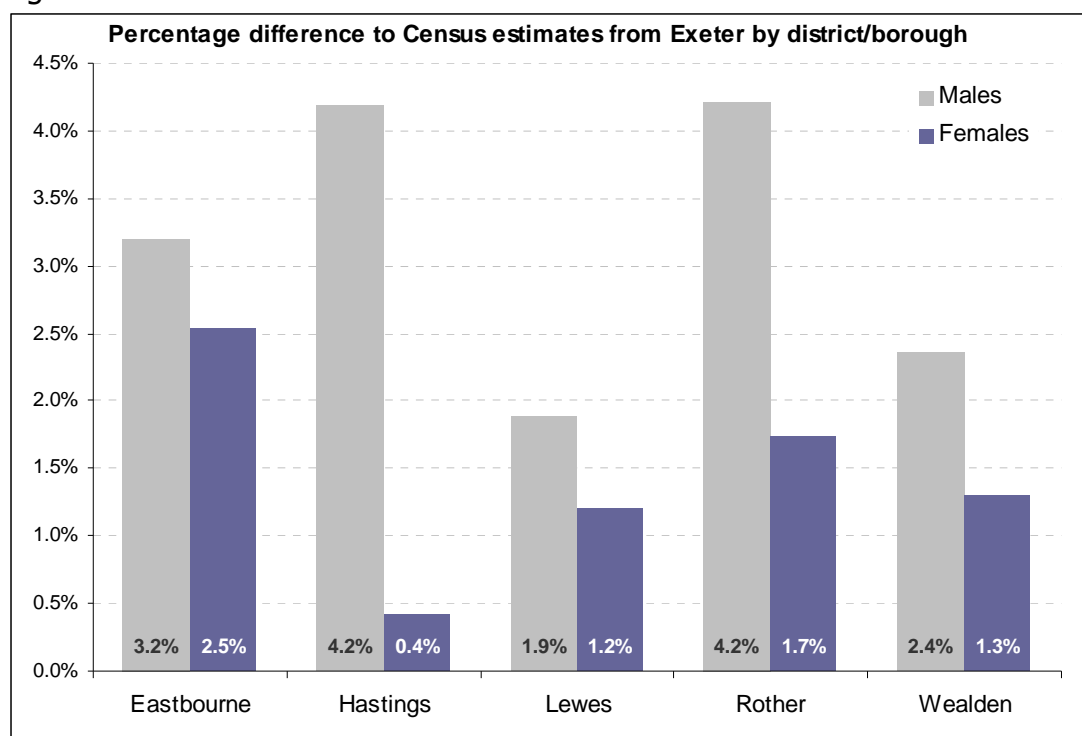


Figure 4 shows the percentage difference at a ward level with differences ranging from -4% in Maze Hill to 20% in Herstmonceux (some differences at ward level are explored further later in this paper). 28 out of 101 wards have a difference greater than 3% (in either direction) (Table 1).

Figure 4

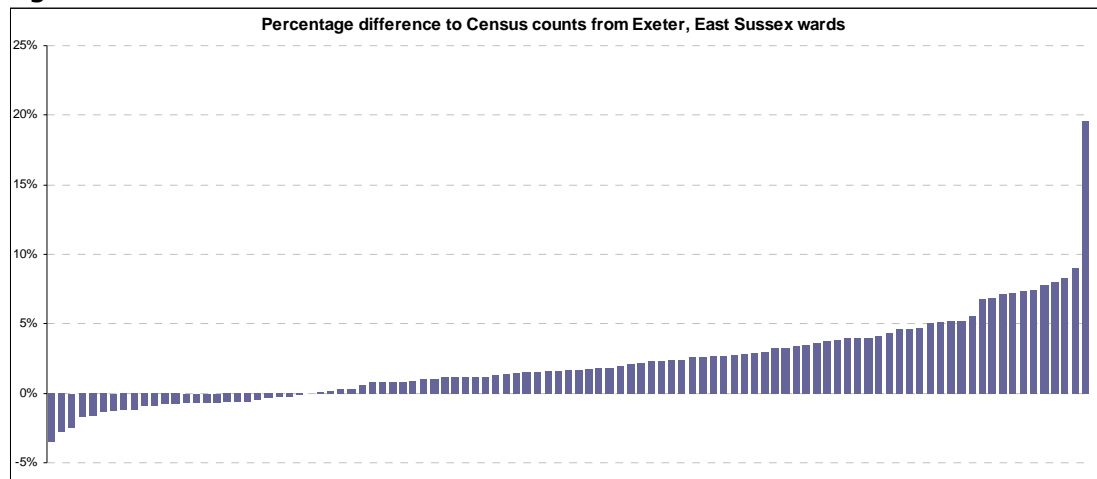


Table 1

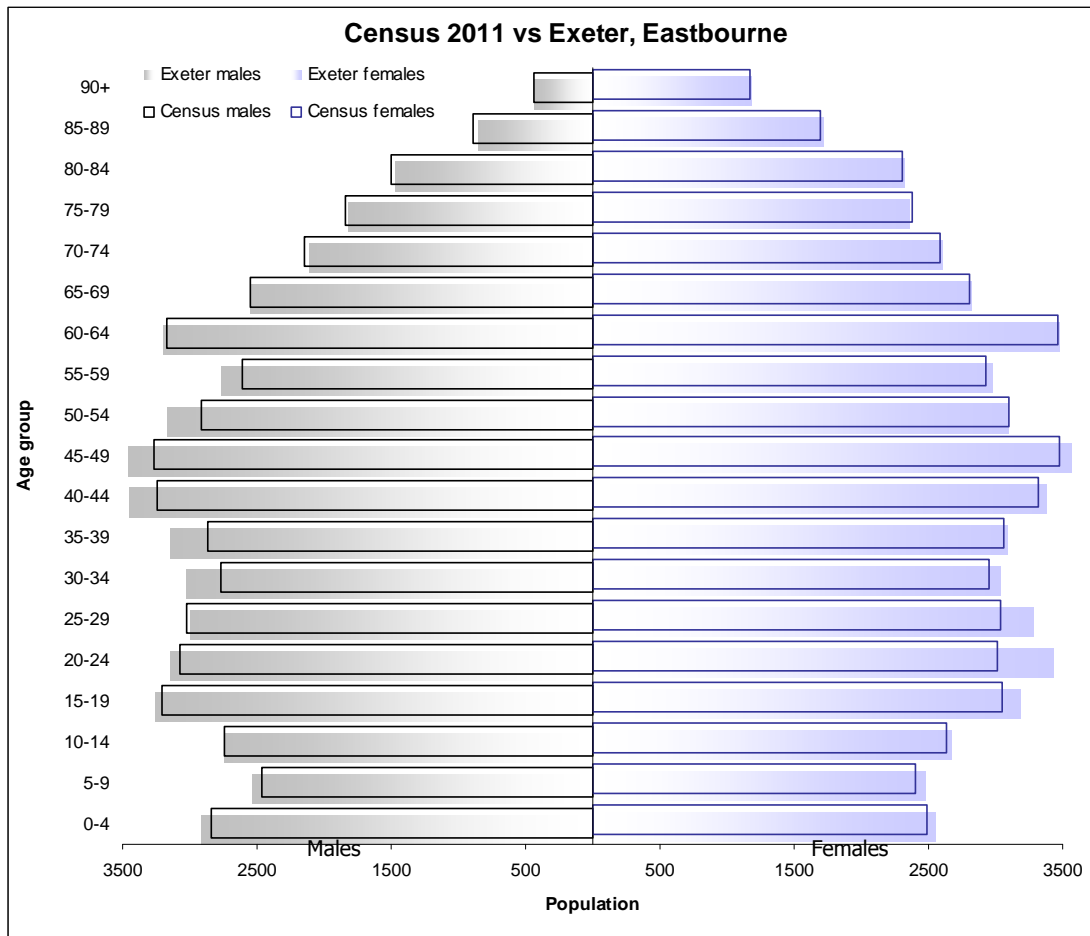
Difference	Number of wards
More than 3% above Exeter	1
1-3% above Exeter	19
0% difference	10
1-3% below Exeter	44
More than 3% below Exeter	27

Eastbourne overview

The 2011 Census estimate is 2,835 persons (2.9%) below the Exeter count. The difference is larger in males (1,520 persons, 3.2%) than females (1,315 persons, 2.5%). Differences vary by age group, with the largest difference in those aged 20-24 years (477 persons, 7.8%).

Figure 5 shows the Eastbourne population counts by age group and sex for both Census estimates and Exeter and figure 6 shows the difference between the two in percentage terms.

Figure 5



The Exeter count is lower than Census estimates for males aged 25-29 years and 70-89 years. For females the Exeter count is lower for 75-79 year olds (figure 6).

Figure 6

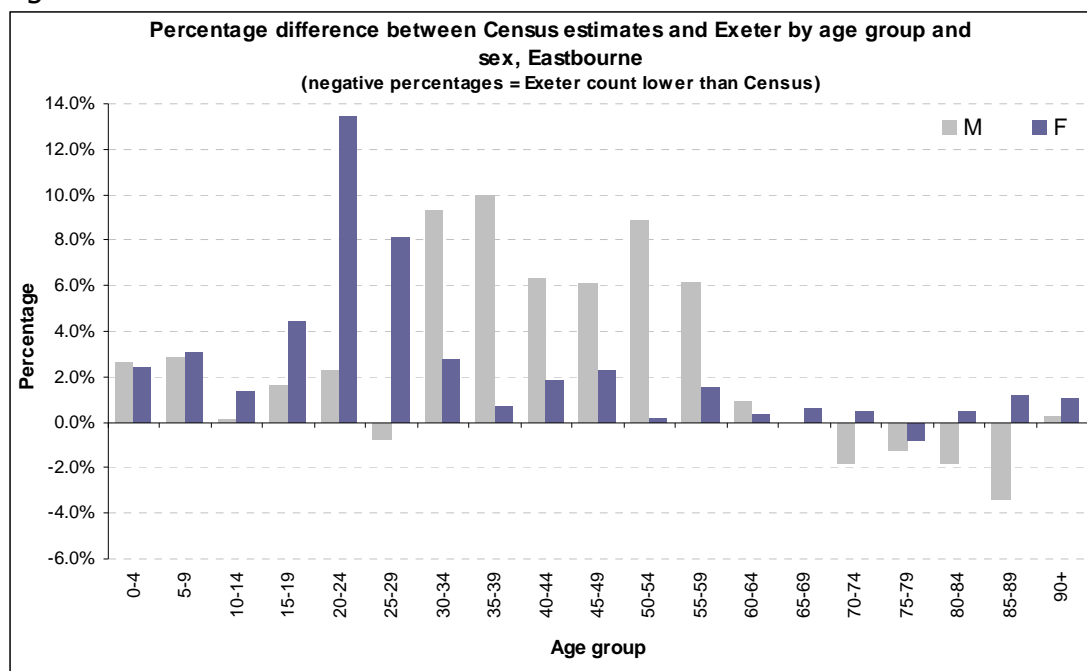
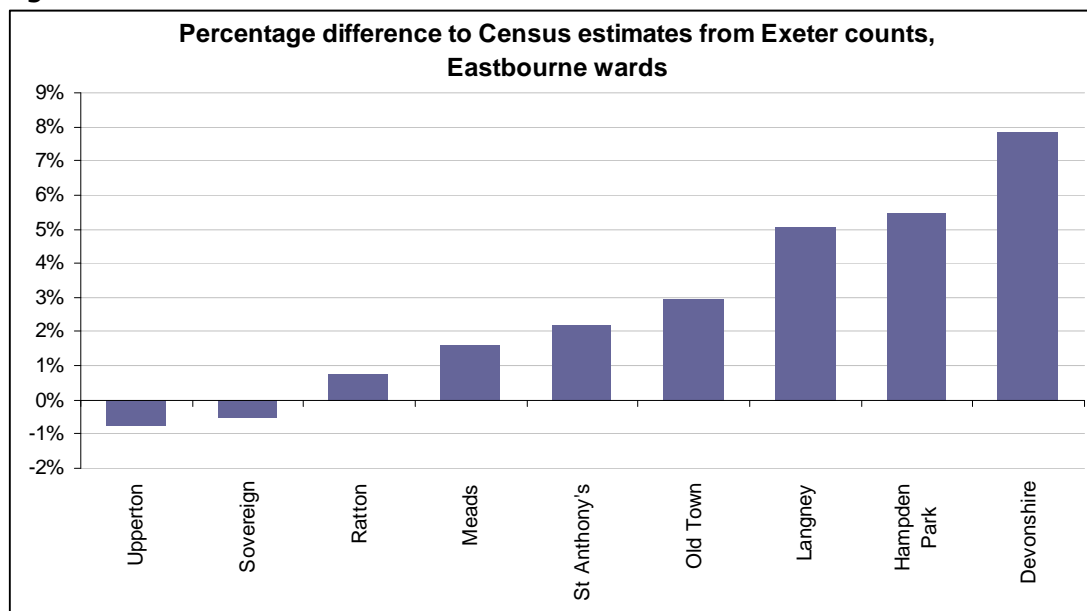


Figure 7 shows the percentage difference at a ward level with differences ranging from -1% in Upperton (Exeter has 78 persons fewer than Census) to 8% in Devonshire (Exeter has 1,032 more persons than Census).

Figure 7

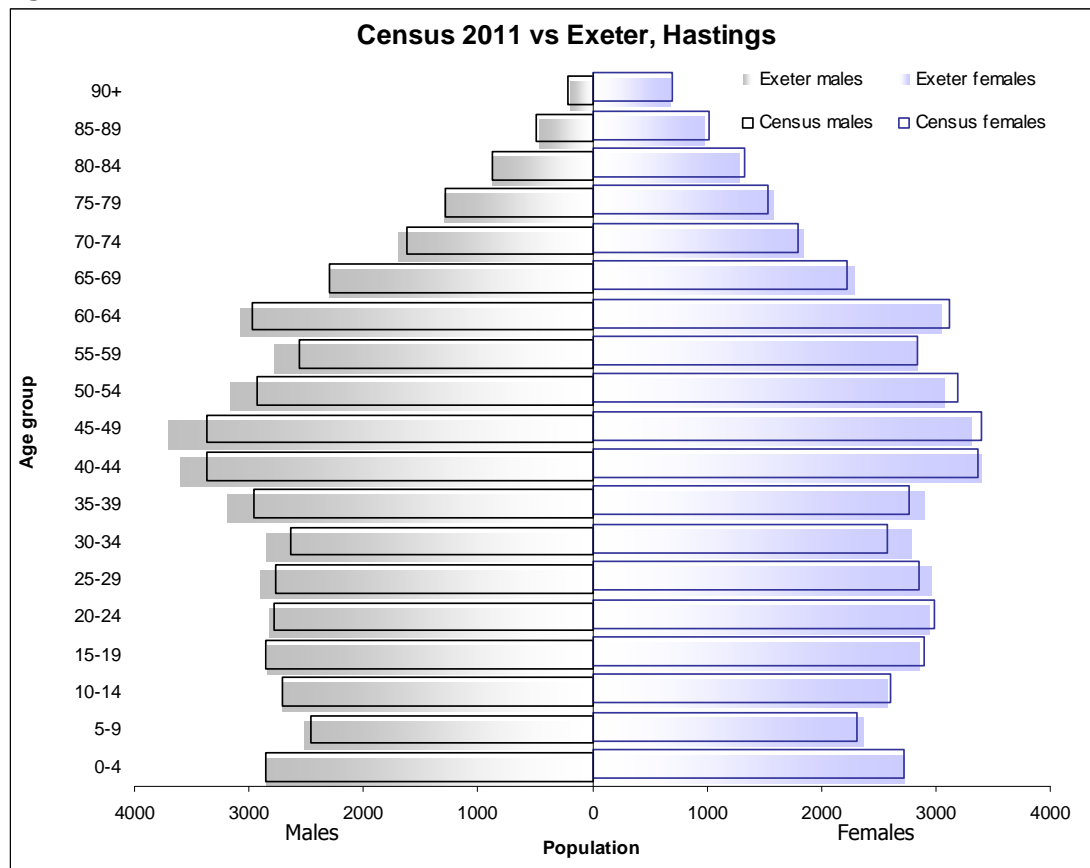


Hastings overview

The 2011 Census estimate is 2,038 persons (2.3%) below the Exeter count. The difference is larger in males (1,845 persons, 4.2%) than females (193 persons, 0.4%). Differences vary by age group, with the largest difference in those aged 30-34 years (430 persons, 8.2%).

Figure 8 shows the Hastings population counts by age group and sex for both Census estimates and Exeter and figure 9 shows the difference between the two in percentage terms.

Figure 8



The Exeter count is lower than Census estimates for males aged 10-19 years and 80 years and over. For females the Exeter count is lower for those aged 10-24 years, 45-54 years, 60-64 years and 80 years and over.

Figure 9

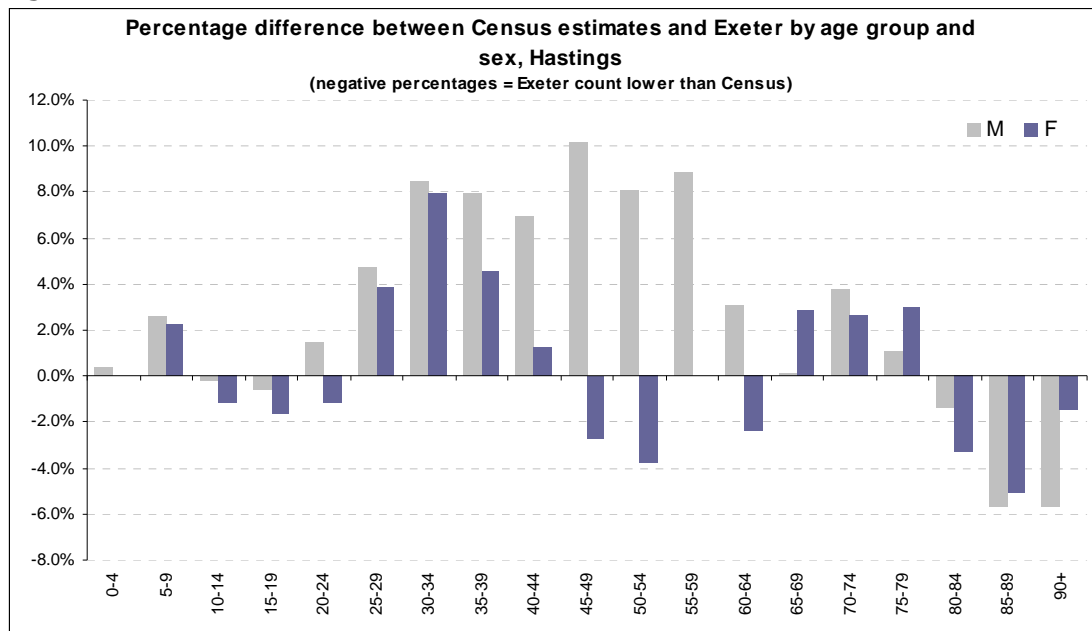
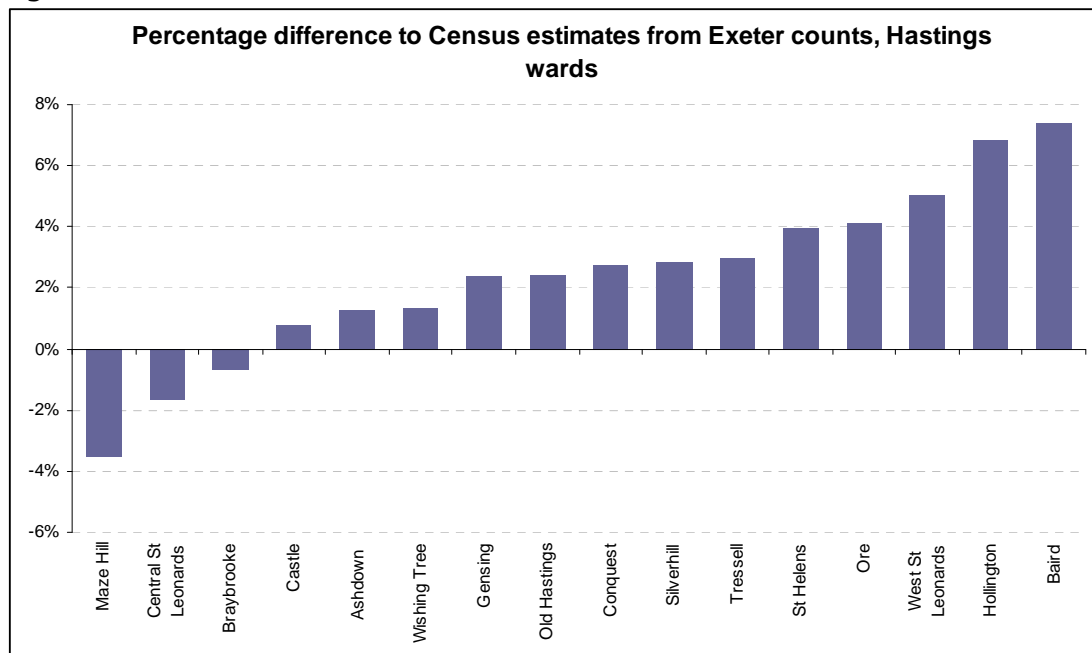


Figure 10 shows the percentage difference at a ward level with differences ranging from -4% in Maze Hill (Exeter has 192 persons fewer than Census) to 7% in Baird (Exeter has 358 more persons than Census).

Figure 10

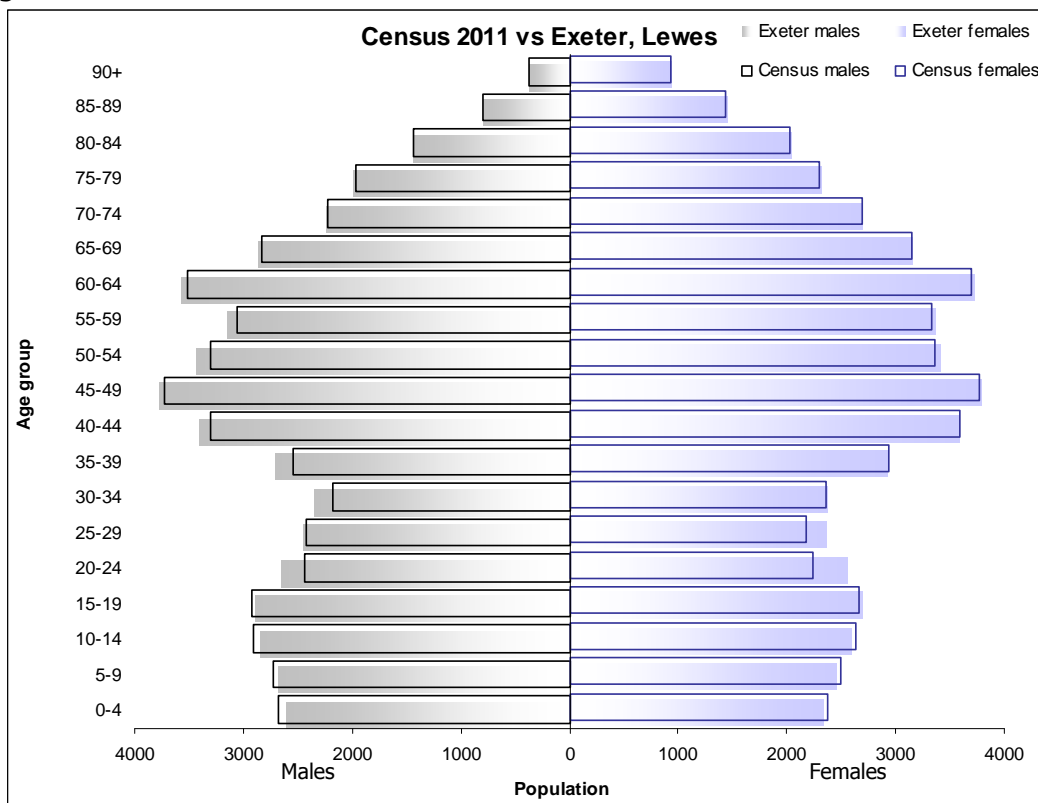


Lewes overview

The 2011 Census estimate is 1,497 persons (1.5%) below the Exeter count. The difference is larger in males (893 persons, 1.9%) than females (604 persons, 1.2%). Differences vary by age group, with the largest difference in those aged 20-24 years (533 persons, 11.4%).

Figure 11 shows the Lewes population counts by age group and sex for both Census estimates and Exeter and figure 12 shows the difference between the two in percentage terms.

Figure 11



The Exeter count is lower than Census estimates for males aged 0-19 years and 85-89 years. For females the Exeter count is lower for those aged 0-14 years, 35-44 years and 65-69 years old.

Figure 12

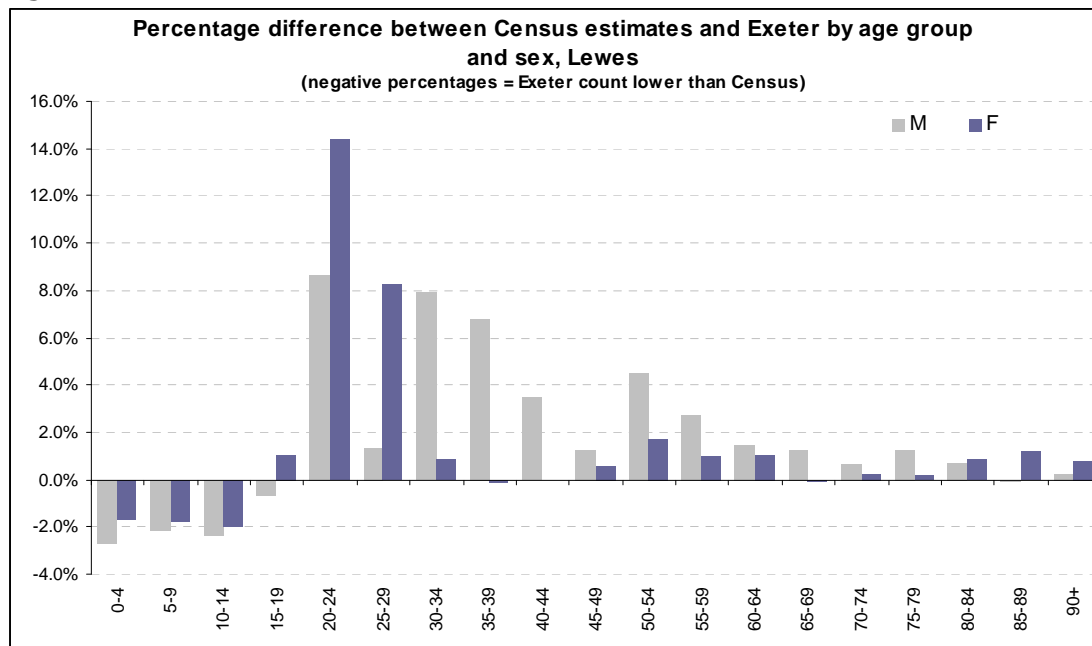
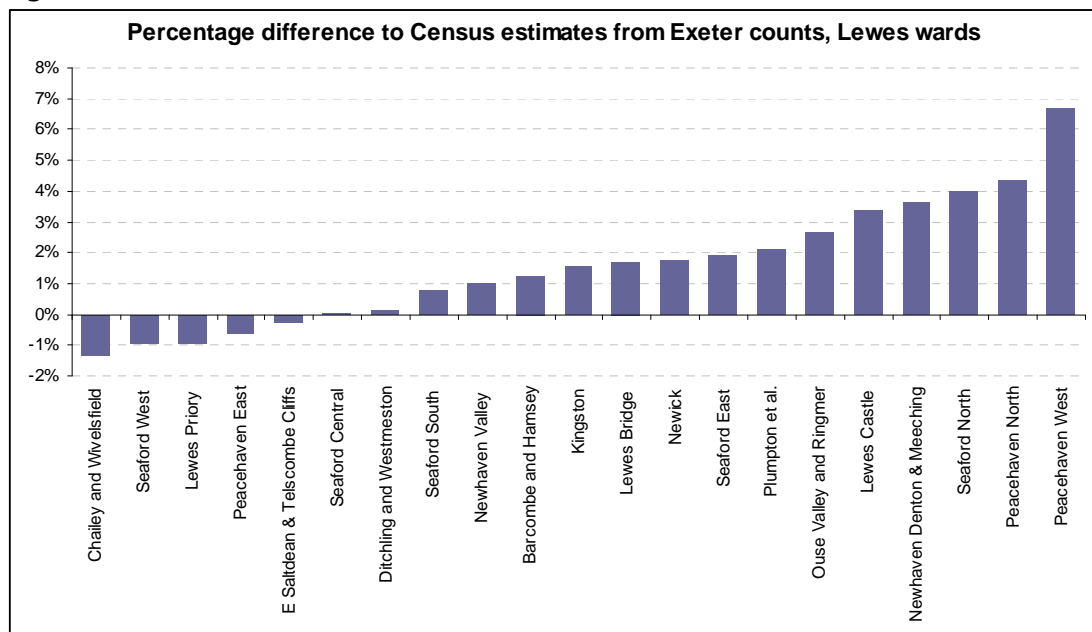


Figure 13 shows the percentage difference at a ward level with differences ranging from -1% in Chailey & Wivelsfield (Exeter has 67 persons fewer than Census) to 7% in Peacehaven West (Exeter has 291 more persons than Census).

Figure 13

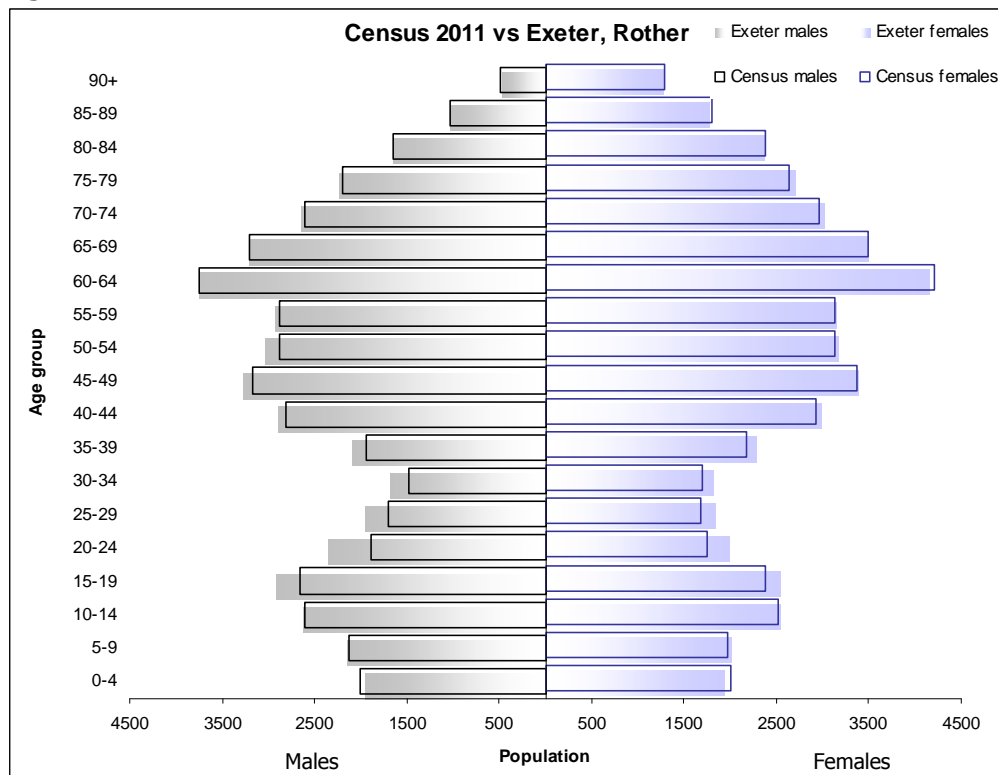


Rother overview

The 2011 Census estimate is 2,644 persons (2.9%) below the Exeter count. The difference is larger in males (1,816 persons, 4.2%) than females (828 persons, 1.7%). Differences vary by age group, with the largest difference in those aged 20-24 years (707 persons, 19.5%).

Figure 14 shows the Rother population counts by age group and sex for both Census estimates and Exeter and figure 15 shows the difference between the two in percentage terms.

Figure 14



The Exeter count is lower than Census estimates for males aged 10-19 years and 80 years and over. For females the Exeter count is lower for those aged 10-24 years, 45-54 years, 60-64 years and 80 years and over.

Figure 15

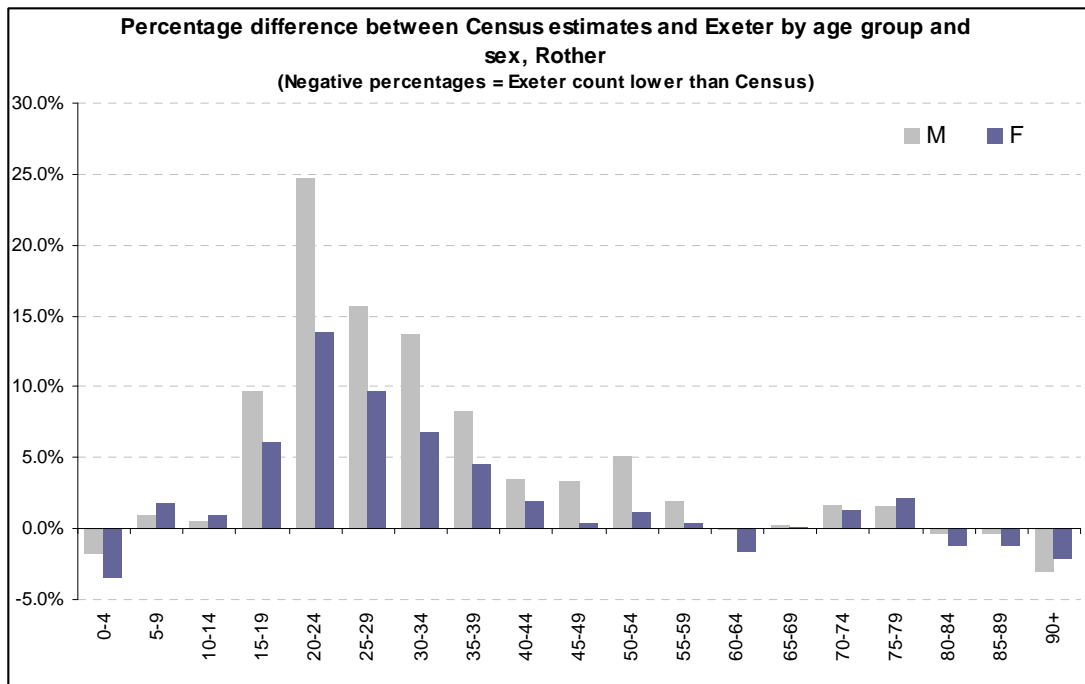
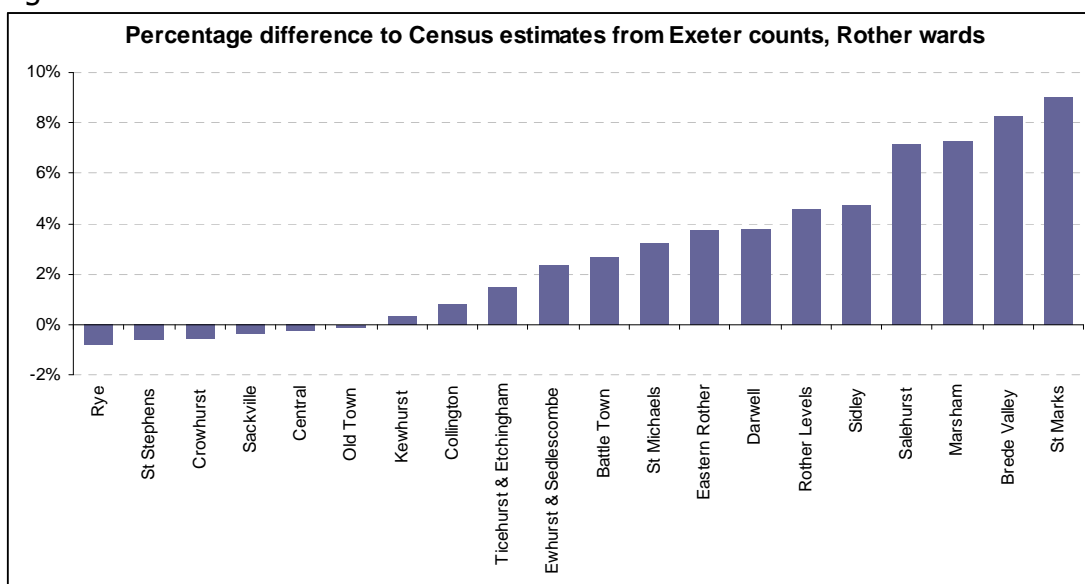


Figure 16 shows the percentage difference at a ward level with differences ranging from -1% in Rye (Exeter has 34 persons fewer than Census) to 9% in St Marks (Exeter has 408 more persons than Census). Further investigation into the Exeter data for St Marks suggest that there may have been patients from UAE Technical Training Project UK who had not de-registered since the facility closed at the end of 2010. Adjusting the Exeter count for this takes the difference down to 3% higher than Census for St Marks ward.

Figure 16

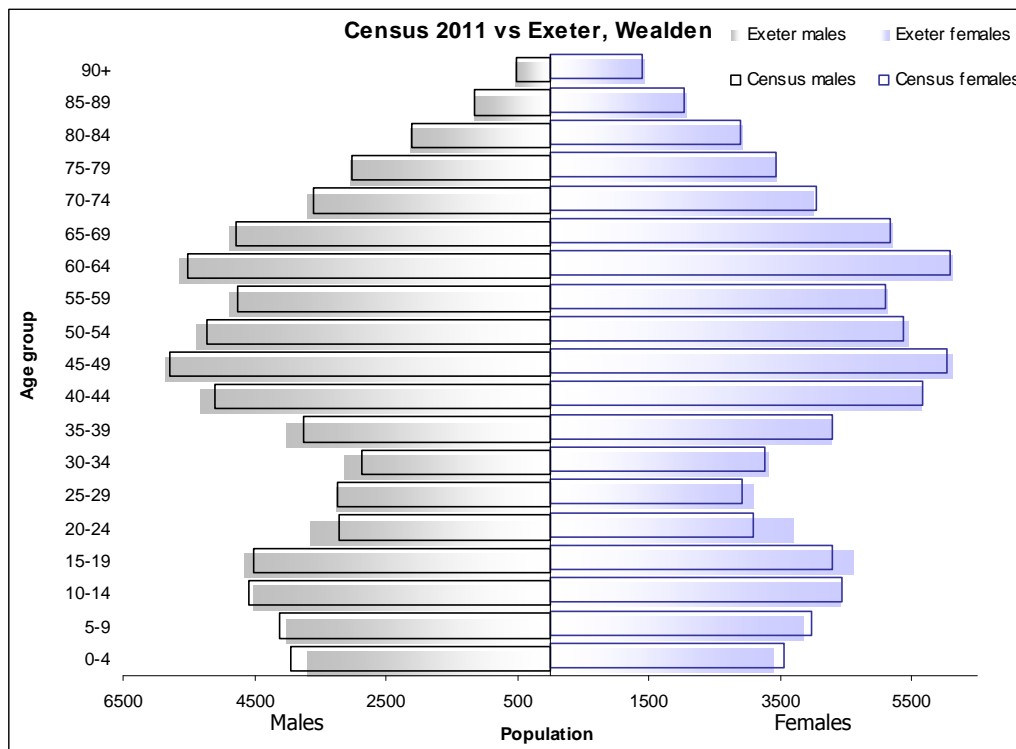


Wealden overview

The 2011 Census estimate is 2,644 persons (2.9%) below the Exeter count. The difference is larger in males (1,816 persons, 4.2%) than females (828 persons, 1.7%). Differences vary by age group, with the largest difference in those aged 20-24 years (707 persons, 19.5%).

Figure 17 shows the Wealden population counts by age group and sex for both Census estimates and Exeter and figure 18 shows the difference between the two in percentage terms.

Figure 17



The Exeter count is lower than Census estimates for males aged 0-14 years. For females the Exeter count is lower for those aged 0-14 years, 35-44 years and 70-74 years.

Figure 18

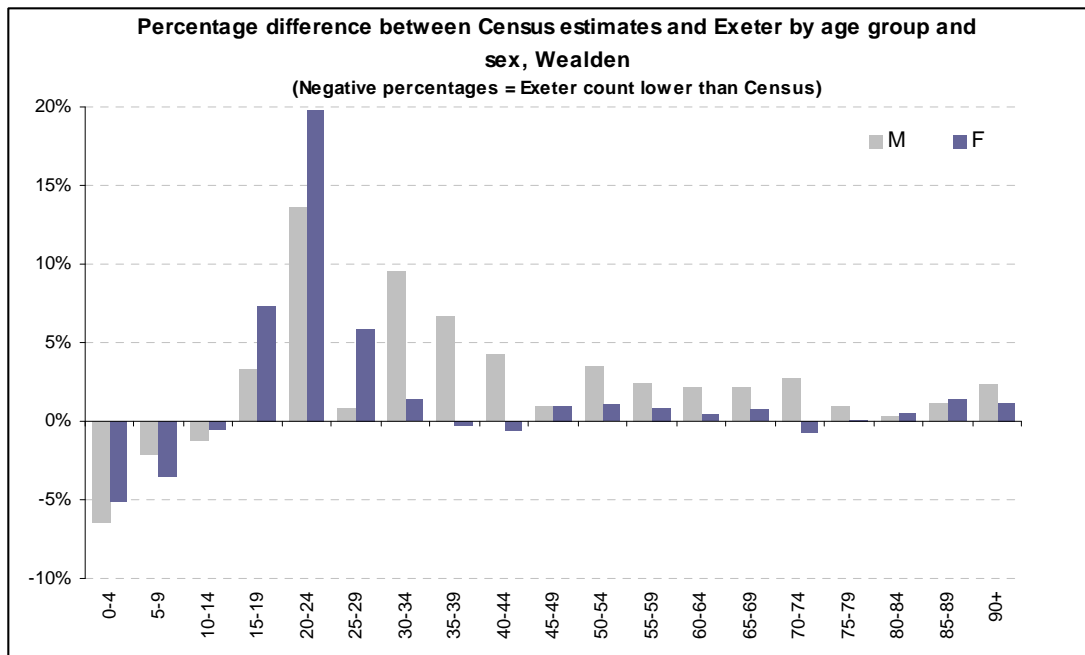
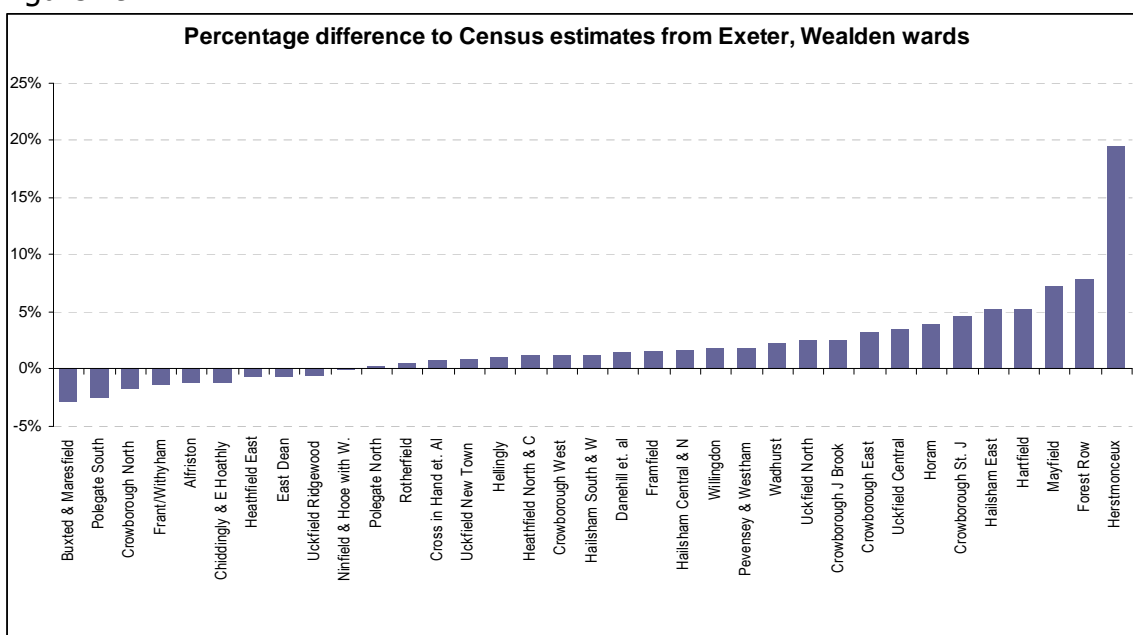


Figure 19 shows the percentage difference at a ward level with differences ranging from -3% in Buxted & Maresfield (Exeter has 156 persons fewer than Census) to 20% in Herstmonceux (Exeter has 558 more persons than Census). Further investigation into the Exeter data for Herstmonceux suggests that Exeter includes students from The Bader International Study Centre (BISC) based at Herstmonceux Castle. The Census definition of a usual residence is for those who intend to stay in the UK for twelve months or more (whereas you can register with a GP if you only intend to stay for 3 months or more). Adjusting the Exeter figure to exclude BISC students takes the difference down to 2% above Census estimates for Herstmonceux ward.

Figure 19



Under 5s overview

At an East Sussex level the Census estimate for the population aged 0-4 years is 1.9% (509 children) higher than the Exeter count, with variation at district/borough level. At a lower tier level it ranges from 3% higher in Eastbourne (Exeter has 134 more children than the Census estimate) to -6% in Wealden (Exeter has 436 fewer children than the Census estimate) (figure 20).

Figure 20

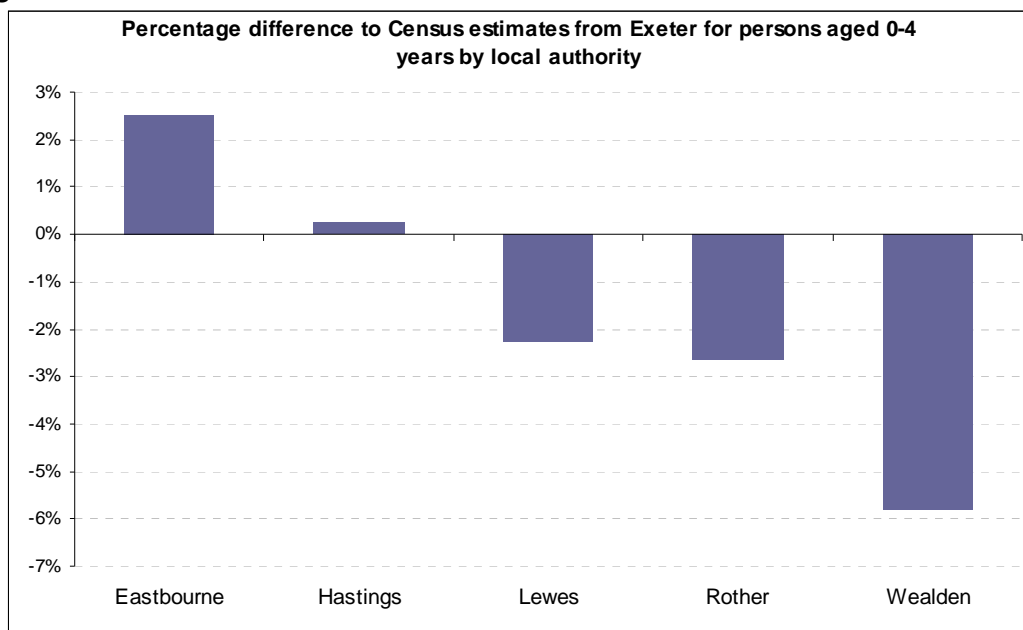
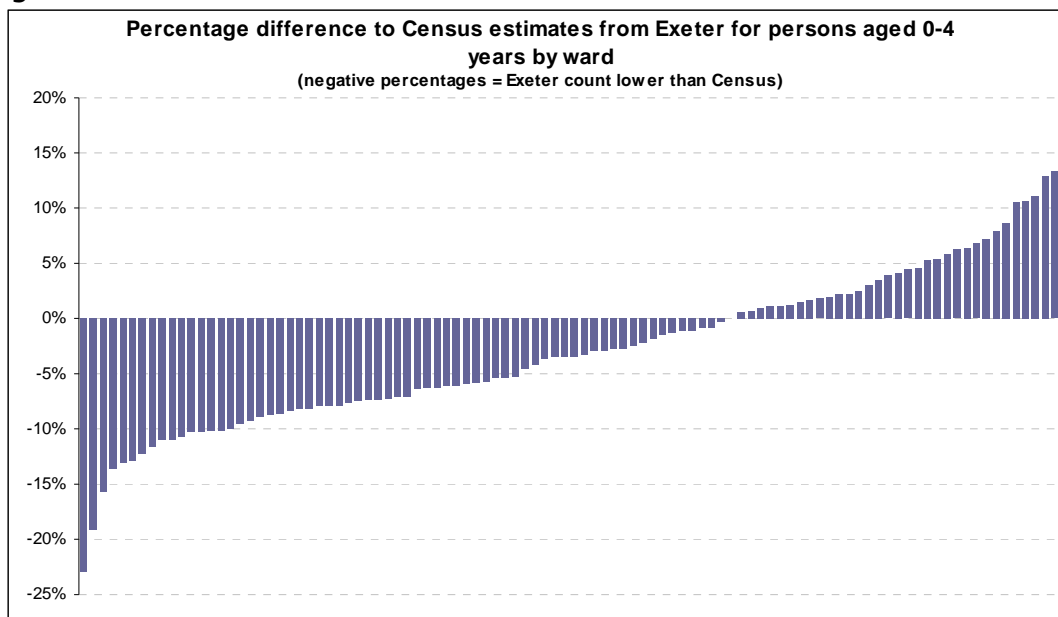


Figure 21 shows the percentage difference at a ward level with differences ranging from -23% in Crowborough St. Johns (Exeter has 17 children fewer than Census) to 17% in Collington (Exeter has 13 more persons than Census).

Figure 21



Analysis by single year of age shows that at an East Sussex level, the difference between Census and Exeter counts for the under 5s age group is due to the differences for children aged under 1 year (table 2).

Table 2

Age	Exeter	Census	Difference (n)	Difference (%)
0	4897	5394	-497	-9%
1	5395	5390	5	0%
2	5443	5446	-3	0%
3	5607	5630	-23	0%
4	5605	5596	9	0%
<i>Total</i>	<i>26947</i>	<i>27456</i>	<i>-509</i>	<i>-2%</i>

One possible explanation for the difference in babies could be due to the time between birth and the baby being registered with a GP. To register a baby with a GP, a form (FP58) is completed and presented to the practice. The FP58 form is issued with the birth certificate when the birth is registered (parents/guardians have 42 days within which to register the birth). The difference in counts of under 1s between Census and Exeter is similar to the number of births in East Sussex during a one month period, so the time taken to register a baby at a GP may be a reasonable explanation for the difference seen (although there is no way to validate this).