

ONS Longitudinal Study

Quality of linkage between the 1991 and 2001 Censuses

The forward linkage rate between the 1991 and 2001 Longitudinal Study (LS) samples was 88.0 per cent. At the 1991 Census, a sample of 543,884 LS members was enumerated as resident in England and Wales, of whom 535,015 (98.4 per cent) were traced. The sample of 1991 traced LS members expected to be found in the 2001 Census was 475,378 but the actual sample found was 418,204.

Between the censuses, 57,650 traced LS members had died and 1,987 were known to have embarked from England and Wales. But a further 57,174 traced LS members (11.6 per cent) who had been present at the 1991 Census were not found at the 2001 Census. There was no record of a death or embarkation occurring before the 2001 Census for these people.

The 2001 Census sample of LS members was 540,082, 99.3 per cent of whom were traced (536,377 cases). The change in the sample size at the 2001 Census was the result of natural population change (births and deaths) and migration.

Backward linkage of the 2001 traced LS sample resulted in 90.7 per cent of LS members being linked to a 1991 record. There were 461,614 traced LS members present in 2001 who should have been found in the 1991 Census. This excluded new births (59,820) and immigrations (14,943) to England and Wales during the decade. However, 418,562 were actually recorded in the 1991 Census.

The failure to link 11.6 per cent of traced members from the 1991 sample in 2001 may be partially explained by census under-enumeration, unreported embarkations and discrepancies in birth data. It is not possible to measure the contribution of each of these factors to the linkage failure.

Factors affecting non-linkage between 1991 and 2001

Linkage of records from the 1991 traced LS sample to 2001 Census records was high (88.0 per cent), although lower than in previous LS-census linking exercises. A number of factors in 1991 were associated with non-linkage to 2001 Census records:

- being young and male
- being never married, divorced, or living in a lone-parent household
- being born outside of the UK
- being a member of an ethnic minority
- living in a communal establishment, private rented accommodation or social housing
- being unemployed, on a government scheme, a student or in the economic position 'other inactive'
- being in the armed services

Table L9101.1 1991-2001 traced LS-Census samples: forward and backward linkage rates

Forward linkage	Number	Backward linkage	Number
1991 Census sample: traced LS members	535,015	2001 Census sample: traced LS members	536,377
Less died before 2001 Census	57,650	Less born after 1991 Census	59,820
Less embarked before 2001 Census	1,987	Less immigrant after 1991 Census	14,943
Eligible to be in 2001 Census	475,378	Should have been in 1991 Census	461,614
Less not found in the 2001 Census	57,174	Less not found in the 1991 Census	43,052
Recorded in 2001 Census	418,204	Recorded in 1991 Census	418,562
Forward linkage rate	88.0%	Backward linkage rate	90.7%

Notes

¹ Source: Office for National Statistics Longitudinal Study (LS)

² LS members, usually resident in England and Wales

³ For forward linkage 'traced' means the LS members' records were found on the National Health Service Central Register before or during the 1991 Census Link

⁴ For backward linkage 'traced' means the LS members' records were found on the National Health Service Central Register before or during the 2001 Census Link

Forward linkage rates between the 1991 and 2001 Censuses: traced members by sex and age

Among 1991 traced Longitudinal Study (LS) members who were not known to have died or embarked before the 2001 census, 88 per cent were linked to a 2001 Census record. Males (86.4 per cent linked) were less likely to be found than females (89.5 per cent linked). For both sexes, linkage failure was most likely among young people aged 10 to 29 (20 to 29 in 2001) and among those over 75.

Non-linkage of older groups may result from embarkations and possibly subsequent deaths that were not added to the database by the time of the 2001 Census. Late death registrations are a likely explanation for particularly high linkage failure among males aged 90 and over (66.7 per cent linked).

People in younger age groups were more likely to embark between censuses which means that some linkage failure may be due to unrecorded embarkation. Among the younger groups, linkage was lowest among young males, less than 80 per cent among those 10 to 24 in 1991. For example 76.1 per cent of males aged 15 to 19 were linked. For females, linkage was lowest among 10- to 14-year-olds at 83.7 per cent.

Linkage was most successful among 40- to 69-year-olds (over 91 per cent) after which age it becomes less likely for both males and females. Linkage rates were also higher for children aged under 10. For example among 0- to 4-year-olds, 88.6 per cent of males and 88.2 per cent of females were successfully linked.

Among males, those aged 15 to 19 in 1991 were less likely to be traced than those in the adjacent age groups. Among females, this was true among 10- to 14-year-olds. The least likely group to be traced was people of 90 and over (66.7 per cent for males and 74.4 per cent for females).

Table L9101.2 Forward linkage rates between the 1991 and 2001 Censuses: traced LS members by sex and age in 1991

Age and sex in 1991	Position by 2001 Census					Linkage success rate (%)
	LS Members present and traced in 1991	Died or embarked before 2001 Census	Eligible to be enumerated in 2001 Census	Not linked at 2001 Census	Linked at 2001 Census	
Males						
0-4	18,020	122	17,898	2,043	15,855	88.6
5-9	17,090	91	16,999	2,165	14,834	87.3
10-14	16,465	125	16,340	3,436	12,904	79.0
15-19	17,704	177	17,527	4,188	13,339	76.1
20-24	19,080	251	18,829	3,978	14,851	78.9
25-29	20,379	294	20,085	3,242	16,843	83.9
30-34	19,445	365	19,080	2,748	16,332	85.6
35-39	17,961	417	17,544	2,073	15,471	88.2
40-44	19,391	622	18,769	1,813	16,956	90.3
45-49	16,673	856	15,817	1,419	14,398	91.0
50-54	14,979	1,309	13,670	1,177	12,493	91.4
55-59	14,052	1,974	12,078	896	11,182	92.6
60-64	13,466	3,053	10,413	784	9,629	92.5
65-69	12,241	4,296	7,945	584	7,361	92.6
70-74	9,296	4,761	4,535	391	4,144	91.4
75-79	7,001	4,707	2,294	330	1,964	85.6
80-84	3,958	3,276	682	110	572	83.9
85-89	1,507	1,383	124	21	103	83.1
90+	425	413	12	4	8	66.7
Total	259,133	28,492	230,641	31,402	199,239	86.4
Females						
0-4	17,470	92	17,378	2,043	15,335	88.2
5-9	16,283	71	16,212	2,026	14,186	87.5
10-14	15,655	84	15,571	2,545	13,026	83.7
15-19	17,124	109	17,015	2,684	14,331	84.2
20-24	19,838	271	19,567	2,644	16,923	86.5
25-29	21,277	260	21,017	2,384	18,633	88.7
30-34	19,613	297	19,316	1,863	17,453	90.4
35-39	18,005	332	17,673	1,573	16,100	91.1
40-44	19,929	468	19,461	1,489	17,972	92.3
45-49	16,589	593	15,996	1,204	14,792	92.5
50-54	14,509	727	13,782	1,040	12,742	92.5
55-59	13,977	1,195	12,782	851	11,931	93.3
60-64	14,176	2,108	12,068	834	11,234	93.1
65-69	14,357	3,336	11,021	810	10,211	92.7
70-74	12,216	4,346	7,870	728	7,142	90.7
75-79	11,130	5,945	5,185	680	4,505	86.9
80-84	7,668	5,490	2,178	249	1,929	88.6
85-89	4,231	3,668	563	104	459	81.5
90+	1,835	1,753	82	21	61	74.4
Total	275,882	31,145	244,737	25,772	218,965	89.5

Table L9101.2 Forward linkage rates between the 1991 and 2001 Censuses: traced LS members by sex and age in 1991

Age and sex in 1991	Position by 2001 Census					Linkage success rate (%)
	LS Members present and traced in 1991	Died or embarked before 2001 Census	Eligible to be enumerated in 2001 Census	Not linked at 2001 Census	Linked at 2001 Census	
All people						
0-4	35,490	214	35,276	4,086	31,190	88.4
5-9	33,373	162	33,211	4,191	29,020	87.4
10-14	32,120	209	31,911	5,981	25,930	81.3
15-19	34,828	286	34,542	6,872	27,670	80.1
20-24	38,918	522	38,396	6,622	31,774	82.8
25-29	41,656	554	41,102	5,626	35,476	86.3
30-34	39,058	662	38,396	4,611	33,785	88.0
35-39	35,966	749	35,217	3,646	31,571	89.6
40-44	39,320	1,090	38,230	3,302	34,928	91.4
45-49	33,262	1,449	31,813	2,623	29,190	91.8
50-54	29,488	2,036	27,452	2,217	25,235	91.9
55-59	28,029	3,169	24,860	1,747	23,113	93.0
60-64	27,642	5,161	22,481	1,618	20,863	92.8
65-69	26,598	7,632	18,966	1,394	17,572	92.7
70-74	21,512	9,107	12,405	1,119	11,286	91.0
75-79	18,131	10,652	7,479	1,010	6,469	86.5
80-84	11,626	8,766	2,860	359	2,501	87.4
85-89	5,738	5,051	687	125	562	81.8
90+	2,260	2,166	94	25	69	73.4
Total	535,015	59,637	475,378	57,174	418,204	88.0

Notes

¹ Source: Office for National Statistics Longitudinal Study (LS)

² LS members, usually resident in England and Wales

³ 'Traced' means the LS members' records were found on the National Health Service Central Register before or during the 1991 Census-LS Link

Forward linkage rates between the 1991 and 2001 Censuses: traced members by sex and marital status

LS members who were married in 1991 were more likely than divorced or single people to be found in 2001. Almost 91 per cent of males and over 92 per cent of females who were married in 1991 were linked in 2001.

Table L9101.3 shows that 88.5 per cent of widowers and 90.1 per cent of widows were found in 2001.

People who were unmarried in 1991 were least likely to be found in 2001 (82.4 per cent of males and 86.3 per cent of females), followed by those who were divorced (84 per cent of males and 90.1 per cent of females).

Table L9101.3 Forward linkage rates between the 1991 and 2001 Censuses: traced LS members by sex and marital status in 1991

Marital status and sex in 1991	Position by 2001 Census					Linkage success rate (%)
	LS Members present and traced in 1991	Died or embarked before 2001 Census	Eligible to be enumerated in 2001 Census	Not linked at 2001 Census	Linked at 2001 Census	
Males						
Never Married	114,133	3,615	110,518	19,478	91,040	82.4
Married	126,327	18,810	107,517	10,043	97,474	90.7
Divorced	10,972	1,400	9,572	1,533	8,039	84.0
Widowed	7,701	4,667	3,034	348	2,686	88.5
Total	259,133	28,492	230,641	31,402	199,239	86.4
Females						
Never Married	102,827	3,608	99,219	13,633	85,586	86.3
Married	126,470	11,140	115,330	9,163	106,167	92.1
Divorced	15,201	1,304	13,897	1,370	12,527	90.1
Widowed	31,384	15,093	16,291	1,606	14,685	90.1
Total	275,882	31,145	244,737	25,772	218,965	89.5
All people						
Never Married	216,960	7,223	209,737	33,111	176,626	84.2
Married	252,797	29,950	222,847	19,206	203,641	91.4
Divorced	26,173	2,704	23,469	2,903	20,566	87.6
Widowed	39,085	19,760	19,325	1,954	17,371	89.9
Total	535,015	59,637	475,378	57,174	418,204	88.0

Notes

¹ Source: Office for National Statistics Longitudinal Study (LS)

² LS members, usually resident in England and Wales

³ 'Traced' means the LS members' records were found on the National Health Service Central Register before or during the 1991 Census-LS Link

Forward linkage rates between the 1991 and 2001 Censuses: traced members by sex and economic position

The economic position in 1991 of Longitudinal Study (LS) members influenced the likelihood of their being found in 2001. LS members who were employees (90.3 per cent linked) or retired (91.1 per cent linked) were more likely to be linked in 2001 than people in other economic positions.

Linkage failure was high among LS members waiting to start a job (78.1 per cent linked), the unemployed (78.1 per cent linked) and those on a government scheme (81.4 per cent linked).

Linkage failure was highest among people in the 'other inactive' group in 1991, which included people of independent means and those in domestic service. Linkage rates were also relatively low among students, with 73.9 per cent of males and 81.1 per cent of females linked. In contrast to females who were looking after their home or family, among whom 90.3 per cent were linked, males looking after the home or family had low linkage rates (81.1 per cent linked).

Considering all economic positions, females were typically more likely to be found in 2001 than males. However, among retirees, males were more likely to be found.

Table L9101.4 Forward linkage rates between the 1991 and 2001 Censuses: traced LS members aged 16+ by sex and economic position in 1991

Economic position and sex in 1991	Position by 2001 Census					
	LS Members present and traced at the 1991 Census	Died or embarked before 2001 Census	Eligible to be enumerated in 2001 Census	Not linked at 2001 Census	Linked at 2001 Census	Linkage success rate (%)
Males						
Economically active	150,204	6,999	143,205	18,246	124,959	87.3
Employees	107,737	4,598	103,139	11,283	91,856	89.1
Self-Employed	23,990	1,344	22,646	2,758	19,888	87.8
On a Government scheme	2,083	67	2,016	437	1,579	78.3
Waiting to start a job	454	15	439	111	328	74.7
Unemployed	15,940	975	14,965	3,657	11,308	75.6
Economically inactive	54,250	21,132	33,118	4,724	28,394	85.7
Student	7,865	118	7,747	2,023	5,724	73.9
Permanently sick or disabled	10,067	2,890	7,177	907	6,270	87.4
Retired	34,686	17,888	16,798	1,455	15,343	91.3
Looking after home/family	1,177	191	986	186	800	81.1
Other inactive	455	45	410	153	257	62.7
Total	204,454	28,131	176,323	22,970	153,353	87.0
Females						
Economically active	110,991	2,967	108,024	9,715	98,309	91.0
Employees	95,222	2,472	92,750	7,711	85,039	91.7
Self-Employed	7,122	265	6,857	666	6,191	90.3
On a Government scheme	1,316	28	1,288	178	1,110	86.2
Waiting to start a job	376	6	370	66	304	82.2
Unemployed	6,955	196	6,759	1,094	5,665	83.8
Economically inactive	112,455	27,913	84,542	8,909	75,633	89.5
Student	7,812	94	7,718	1,458	6,260	81.1
Permanently sick or disabled	7,245	1,899	5,346	619	4,727	88.4
Retired	46,597	19,923	26,674	2,416	24,258	90.9
Looking after home/family	50,362	5,892	44,470	4,333	40,137	90.3
Other inactive	439	105	334	83	251	75.1
Total	223,446	30,880	192,566	18,624	173,942	90.3
ALL						
Economically active	261,195	9,966	251,229	27,961	223,268	88.9
Employees	202,959	7,070	195,889	18,994	176,895	90.3
Self-Employed	31,112	1,609	29,503	3,424	26,079	88.4
On a Government scheme	3,399	95	3,304	615	2,689	81.4
Waiting to start a job	830	21	809	177	632	78.1
Unemployed	22,895	1,171	21,724	4,751	16,973	78.1
Economically inactive	166,705	49,045	117,660	13,633	104,027	88.4
Student	15,677	212	15,465	3,481	11,984	77.5
Permanently sick or disabled	17,312	4,789	12,523	1,526	10,997	87.8
Retired	81,283	37,811	43,472	3,871	39,601	91.1
Looking after home/family	51,539	6,083	45,456	4,519	40,937	90.1
Other inactive	894	150	744	236	508	68.3
Total	427,900	59,011	368,889	41,594	327,295	88.7

Notes

¹ Source: Office for National Statistics Longitudinal Study (LS)

² LS members, usually resident in England and Wales

³ 'Traced' means the LS members' records were found on the National Health Service Central Register before or during the 1991 Census-LS Link

⁴ The Census population base counts students as resident at their term-time addresses. A total of 1,853 LS members were enumerated as full-time students or schoolchildren studying away from the family home, but were not enumerated at their term-time addresses. This group were not included in this table

Forward linkage rates between the 1991 and 2001 Censuses: traced members by sex and social class

There were contrasting patterns in the rates of linkage by social class for men and women. For men, linkage rates were lower at the lower end of the social classification, with 83.7 per cent of men in unskilled occupations linked, and highest among those in intermediate (89.9 per cent linked) and professional occupations (89.8 per cent linked).

In contrast, linkage was at its lowest among professional women at 89.1 per cent. It was highest among women in skilled, non-manual occupations at 92.1 per cent but was also high among the unskilled at 92 per cent.

Although women (90.3 per cent linked) were typically more likely to be linked than men (87.0 per cent linked), at the top of the social classification the reverse was true. Men in the professional class (89.8 per cent linked) were more likely to be linked than women (89.1 per cent). However, this gap had narrowed compared with previous censuses (see linkage rates by social class in 1981 and 1991).

Table L9101.5 shows that linkage failure was high among people of both sexes in the armed forces (78.3 per cent of males and 80.1 per cent of females linked).

Table L9101.5 Forward linkage rates between the 1991 and 2001 Censuses: traced LS members aged 16+ by sex social class in 1991

Social class and sex in 1991	Position by 2001 Census					
	LS Members present and traced at the 1991 Census	Died or embarked before 2001 Census	Eligible to be enumerated in 2001 Census	Not linked at 2001 Census	Linked at 2001 Census	Linkage success rate (%)
Males						
I Professional	10,738	690	10,048	1,025	9,023	89.8
II Managerial and Technical	45,473	3,268	42,205	4,259	37,946	89.9
IIIN Skilled Non-manual	18,995	1,336	17,659	2,037	15,622	88.5
IIIM Skilled Manual	54,167	4,216	49,951	5,967	43,984	88.1
IV Partly-Skilled Occupations	27,345	2,516	24,829	3,411	21,418	86.3
V Unskilled Occupations	9,266	925	8,341	1,361	6,980	83.7
Armed Forces	1,748	42	1,706	370	1,336	78.3
Occupation inadequately described	1,512	126	1,386	346	1,040	75.0
Missing	35,210	15,012	20,198	4,194	16,004	79.2
Total	204,454	28,131	176,323	22,970	153,353	87.0
Females						
I Professional	2,316	64	2,252	246	2,006	89.1
II Managerial and Technical	35,783	1,244	34,539	3,203	31,336	90.7
IIIN Skilled Non-manual	55,152	1,895	53,257	4,184	49,073	92.1
IIIM Skilled Manual	10,692	455	10,237	926	9,311	91.0
IV Partly-Skilled Occupations	26,200	1,182	25,018	2,273	22,745	90.9
V Unskilled Occupations	10,973	763	10,210	820	9,390	92.0
Armed Forces	171	5	166	33	133	80.1
Occupation inadequately described	1,279	69	1,210	163	1,047	86.5
Missing	80,880	25,203	55,677	6,776	48,901	87.8
Total	223,446	30,880	192,566	18,624	173,942	90.3
All						
I Professional	13,054	754	12,300	1,271	11,029	89.7
II Managerial and Technical	81,256	4,512	76,744	7,462	69,282	90.3
IIIN Skilled Non-manual	74,147	3,231	70,916	6,221	64,695	91.2
IIIM Skilled Manual	64,859	4,671	60,188	6,893	53,295	88.5
IV Partly-Skilled Occupations	53,545	3,698	49,847	5,684	44,163	88.6
V Unskilled Occupations	20,239	1,688	18,551	2,181	16,370	88.2
Armed Forces	1,919	47	1,872	403	1,469	78.5
Occupation inadequately described	2,791	195	2,596	509	2,087	80.4
Missing	116,090	40,215	75,875	10,970	64,905	85.5
Total	427,900	59,011	368,889	41,594	327,295	88.7

Notes

¹ Source: Office for National Statistics Longitudinal Study (LS)

² LS members, usually resident in England and Wales

³ 'Traced' means the LS members' records were found on the National Health Service Central Register before or during the 1991 Census-LS Link

Forward linkage rates between the 1991 and 2001 Censuses: traced members by sex and country of birth

LS members who were born in the UK (89.2 per cent linked) were more likely to be linked in 2001 than those born elsewhere (74.3 per cent linked). Linkage was most successful among people born in England and Wales (89.2 per cent linked). This group contributes a substantial proportion to the linkage success rates of the LS because they constitute the overwhelming majority of the LS sample (around 90 per cent of traced members in 1991).

Linkage failure in 2001 was highest among people born in the USA (59.5 per cent linked) but this group comprised just 0.2 per cent of the entire number of LS members to be accounted for in 2001. Linkage failure was also high among people who were born in the countries of the old Commonwealth (Australia, Canada and New Zealand), at 68.9 per cent.

Linkage was also relatively low among people born in the 'West African Commonwealth' (65.1 per cent found). This is consistent with the finding from the 1991 Census-LS link, where people born in West Africa were least likely to be linked (see Table L8191.6).

Among people born outside the UK, linkage was most successful among those born in the 'East African Commonwealth' (80.7 per cent linked) and India (80.0 per cent linked). This was also true in 1991.

Table L9101.6 Forward linkage rates between the 1991 and 2001 Censuses: traced LS members by sex and country of birth in 1991

Country of birth and sex in 1991	Position by 2001 Census					
	LS Members present and traced at the 1991 Census	Died or embarked before 2001 Census	Eligible to be enumerated in 2001 Census	Not linked at 2001 Census	Linked at 2001 Census	Linkage success rate (%)
Males						
United Kingdom	238,616	26,111	212,505	26,390	186,115	87.6
England and Wales	233,574	25,344	208,230	25,542	182,688	87.6
Scotland	3,916	551	3,365	654	2,711	80.6
Northern Ireland	1,126	216	910	194	716	78.7
Outside United Kingdom	20,517	2,381	18,136	5,012	13,124	72.4
Irish Republic	2,705	554	2,151	613	1,538	71.5
Old Commonwealth	696	89	607	193	414	68.2
New Commonwealth	11,251	855	10,396	2,724	7,672	73.8
India	3,226	312	2,914	578	2,336	80.2
Pakistan	2,032	118	1,914	550	1,364	71.3
Bangladesh	908	39	869	293	576	66.3
African Commonwealth	1,836	85	1,751	439	1,312	74.9
East Africa	1,312	52	1,260	253	1,007	79.9
Southern Africa	409	22	387	153	234	60.5
Caribbean	115	11	104	33	71	68.3
Mediterranean	1,329	169	1,160	369	791	68.2
Remainder	758	70	688	173	515	74.9
Europe, excluding USSR	2,911	517	2,394	563	1,831	76.5
USA	409	56	353	158	195	55.2
Elsewhere and not stated	2,545	310	2,235	761	1,474	66.0
Total	259,133	28,492	230,641	31,402	199,239	86.4
Females						
United Kingdom	253,986	29,057	224,929	21,047	203,882	90.6
England and Wales	248,989	28,289	220,700	20,311	200,389	90.6
Scotland	3,888	560	3,328	613	2,715	81.6
Northern Ireland	1,109	208	901	123	778	86.3
Outside United Kingdom	21,896	2,088	19,808	4,725	15,083	76.1
Irish Republic	3,255	596	2,659	619	2,040	76.7
Old Commonwealth	852	120	732	223	509	69.5
New Commonwealth	10,832	529	10,303	2,364	7,939	77.1
India	3,230	210	3,020	609	2,411	79.8
Pakistan	1,630	45	1,585	403	1,182	74.6
Bangladesh	900	10	890	242	648	72.8
African Commonwealth	1,762	57	1,705	370	1,335	78.3
East Africa	1,214	42	1,172	217	955	81.5
West Africa	421	9	412	126	286	69.4
Southern Africa	127	6	121	27	94	77.7
Caribbean	1,499	133	1,366	356	1,010	73.9
Mediterranean	700	42	658	149	509	77.4
Remainder	1,111	32	1,079	235	844	78.2
Europe, excluding USSR	3,905	529	3,376	705	2,671	79.1
USA	466	54	412	152	260	63.1
Elsewhere and not stated	2,586	260	2,326	662	1,664	71.5
Total	275,882	31,145	244,737	25,772	218,965	89.5

Table L9101.6 Forward linkage rates between the 1991 and 2001 Censuses: traced LS members by sex and country of birth in 1991

Country of birth and sex in 1991	Position by 2001 Census					
	LS Members present and traced at the 1991 Census	Died or embarked before 2001 Census	Eligible to be enumerated in 2001 Census	Not linked at 2001 Census	Linked at 2001 Census	Linkage success rate (%)
All						
United Kingdom	492,602	55,168	437,434	47,437	389,997	89.2
England and Wales	482,563	53,633	428,930	45,853	383,077	89.2
Scotland	7,804	1,111	6,693	1,267	5,426	81.1
Northern Ireland	2,235	424	1,811	317	1,494	82.5
Outside United Kingdom	42,413	4,469	37,944	9,737	28,207	74.3
Irish Republic	5,960	1,150	4,810	1,232	3,578	74.4
Old Commonwealth	1,548	209	1,339	416	923	68.9
New Commonwealth	22,083	1,384	20,699	5,088	15,611	75.4
India	6,456	522	5,934	1,187	4,747	80.0
Pakistan	3,662	163	3,499	953	2,546	72.8
Bangladesh	1,808	49	1,759	535	1,224	69.6
African Commonwealth	3,598	142	3,456	809	2,647	76.6
East Africa	2,526	94	2,432	470	1,962	80.7
West Africa	830	31	799	279	520	65.1
Southern Africa	242	17	225	60	165	73.3
Caribbean	2,828	302	2,526	725	1,801	71.3
Mediterranean	1,458	112	1,346	322	1,024	76.1
Remainder	2,273	94	2,179	557	1,622	74.4
Europe, excluding USSR	6,816	1,046	5,770	1,268	4,502	78.0
USA	875	110	765	310	455	59.5
Elsewhere and not stated	5,131	570	4,561	1,423	3,138	68.8
Total	535,015	59,637	475,378	57,174	418,204	88.0

Notes

¹ Source: Office for National Statistics Longitudinal Study (LS)

² LS members, usually resident in England and Wales

³ 'Traced' means the LS members' records were found on the National Health Service Central Register before or during the 1991 Census-LS Link

⁴ 'England and Wales includes people born in 'Other UK'

Forward linkage rates between the 1991 and 2001 Censuses: traced members by sex and ethnic group

In 2001, linkage failure was higher for LS members from ethnic minorities (73.7 per cent linked) than for White LS members (89.1 per cent linked). Black Africans were least likely of all ethnic groups to be linked (56.6 per cent of males and 66.2 per cent of females linked). This group was characterised as the most transient in 1991, largely comprising people coming to the UK to study.

Linkage rates by country of birth also show that people born in the West African Commonwealth were least likely to be found in 2001 (see Table L9101.6). However, even among those describing themselves as 'Black Other', which is considered largely to comprise the children of first-generation migrants, linkage was relatively low (70.7 per cent of males and 74.8 per cent of females linked).

Among ethnic minority groups, Indians were most likely to be found (80.6 per cent linked), followed by Pakistanis (73.3 per cent linked). People of Asian ethnicities (Indian, Pakistani, Bangladeshi) were typically more likely to be linked than Black people.

In every ethnic group, males were less likely to be linked than females. This difference is greatest among Black Africans (56.6 per cent of males and 66.2 per cent of females linked) and smallest among Indians (80.3 per cent of males and 80.9 per cent of females linked).

Table L9101.7 Forward linkage rates between the 1991 and 2001 Censuses: traced LS members by sex and ethnic group in 1991

Ethnic group and sex in 1991	Position by 2001 Census					Linkage success rate (%)
	LS Members present and traced at the 1991 Census	Died or embarked before 2001 Census	Eligible to be enumerated in 2001 Census	Not linked at 2001 Census	Linked at 2001 Census	
Males						
White	241,460	27,625	213,835	26,657	187,178	87.5
Minority ethnic groups	17,673	867	16,806	4,745	12,061	71.8
Black Caribbean	2,451	176	2,275	802	1,473	64.7
Black African	994	47	947	411	536	56.6
Black Other	832	16	816	239	577	70.7
Indian	5,689	286	5,403	1,065	4,338	80.3
Pakistani	3,239	138	3,101	887	2,214	71.4
Bangladeshi	1,179	42	1,137	370	767	67.5
Chinese	855	44	811	252	559	68.9
Other Asian	1,004	65	939	328	611	65.1
Other	1,430	53	1,377	391	986	71.6
Total Males	259,133	28,492	230,641	31,402	199,239	86.4
Females						
White	258,393	30,611	227,782	21,651	206,131	90.5
Minority ethnic groups	17,489	534	16,955	4,121	12,834	75.7
Black Caribbean	2,769	146	2,623	704	1,919	73.2
Black African	1,007	23	984	333	651	66.2
Black Other	891	11	880	222	658	74.8
Indian	5,491	174	5,317	1,016	4,301	80.9
Pakistani	2,865	50	2,815	695	2,120	75.3
Bangladeshi	1,206	8	1,198	309	889	74.2
Chinese	786	26	760	214	546	71.8
Other Asian	1,067	61	1,006	297	709	70.5
Other	1,407	35	1,372	331	1,041	75.9
Total Females	275,882	31,145	244,737	25,772	218,965	89.5
All						
White	499,853	58,236	441,617	48,308	393,309	89.1
Minority ethnic groups	35,162	1,401	33,761	8,866	24,895	73.7
Black Caribbean	5,220	322	4,898	1,506	3,392	69.3
Black African	2,001	70	1,931	744	1,187	61.5
Black Other	1,723	27	1,696	461	1,235	72.8
Indian	11,180	460	10,720	2,081	8,639	80.6
Pakistani	6,104	188	5,916	1,582	4,334	73.3
Bangladeshi	2,385	50	2,335	679	1,656	70.9
Chinese	1,641	70	1,571	466	1,105	70.3
Other Asian	2,071	126	1,945	625	1,320	67.9
Other	2,837	88	2,749	722	2,027	73.7
Total	535,015	59,637	475,378	57,174	418,204	88.0

Notes

¹ Source: Office for National Statistics Longitudinal Study (LS)

² LS members, usually resident in England and Wales

³ 'Traced' means the LS members' records were found on the National Health Service Central Register before or during the 1991 Census-LS Link

Forward linkage rates between the 1991 and 2001 Censuses: traced members by housing tenure

Longitudinal Study (LS) members who were living in communal establishments or whose household information was missing, were less likely to be found in 2001 than those living in private households. Among those living in private households, there was wide variation in linkage success. People renting privately were least likely to be found in 2001 (75.5 per cent linked). Owner-occupiers were most likely to be found in 2001 (90.2 per cent linked), while 83.7 per cent of LS members living in social housing in 1991 were linked in 2001.

Table L9101.8 Forward linkage rates between the 1991 and 2001 Censuses: traced LS members by housing tenure in 1991

Housing tenure in 1991	Position by 2001 Census					
	LS Members present and traced at the 1991 Census	Died or embarked before 2001 Census	Eligible to be enumerated in 2001 Census	Not linked at 2001 Census	Linked at 2001 Census	Linkage success rate (%)
Owner occupied	373,876	32,649	341,227	33,573	307,654	90.2
Social housing	107,699	17,196	90,503	14,730	75,773	83.7
Rented privately	43,089	4,611	38,478	7,092	29,045	75.5
Living in communal establishment or household information missing	12,692	5,181	7,511	1,779	5,732	76.3
Total	535,015	59,637	475,378	57,174	418,204	88.0

Notes

¹ *Source: Office for National Statistics Longitudinal Study (LS)*

² *LS members, usually resident in England and Wales*

³ *'Traced' means the LS members' records were found on the National Health Service Central Register before or during the 1991 Census-LS Link*

Forward linkage rates between the 1991 and 2001 Censuses: traced members by household size

The household size in 1991 of Longitudinal Study (LS) members impacted on the likelihood of their being found at the 2001 census. Table L9101.9 shows that people in larger households, with seven or more people (76.7 per cent linked), were less likely to be found than those in smaller households. Linkage was most successful among people in two-person households (90.3 per cent linked).

Linkage rates were lower among LS members living alone in 1991 (86.9 per cent of linked in 2001). This aspect of non-linkage makes a substantial contribution to overall linkage failure as around 10 per cent of traced LS members present in 1991 were living in single-person households.

Table L9101.9 Forward linkage rates between the 1991 and 2001 Censuses: traced LS members by household size in 1991

Household size in 1991	Position by 2001 Census					
	LS Members present and traced at the 1991 Census	Died or embarked before 2001 Census	Eligible to be enumerated in 2001 Census	Not linked at 2001 Census	Linked at 2001 Census	Linkage success rate (%)
1	54,977	17,557	37,420	4,889	32,531	86.9
2	141,740	25,113	116,627	11,307	105,320	90.3
3-6	312,549	11,394	301,155	36,335	264,820	87.9
7+	11,086	284	10,802	2,521	8,281	76.7
Absent from household	14,663	5,289	9,374	2,122	7,252	77.4
Total	535,015	59,637	475,378	57,174	418,204	88.0

Notes

¹ *Source: Office for National Statistics Longitudinal Study (LS)*

² *LS members, usually resident in England and Wales*

³ *'Traced' means the LS members' records were found on the National Health Service Central Register before or during the 1991 Census-LS Link*

Forward linkage rates between the 1991 and 2001 Censuses: traced members by sex and position in household

The position of Longitudinal Study (LS) members in the household has been examined using 'minimal household units'. Minimal household units are the smallest unit or group of people within a household that might be expected to share the same or a similar lifestyle. (For information on minimal household units see LS User Guide 20)

LS members' household circumstances affected the likelihood of their being linked in 2001. LS members enumerated in communal establishments in 1991 (71 per cent linked) were less likely to be found in 2001 than those enumerated in private households. However, people enumerated in communal establishments comprised only about two per cent of the 1991 traced LS sample and therefore did not substantially affect overall linkage rates.

Adult LS members in married-couple families were most likely to be linked in 2001. LS members married without dependent children (92.5 per cent of males and 92.8 per cent of females linked) had the highest linkage rate. Married people with dependent children were the group next most likely to be linked, at 89.6 per cent for males and 91.9 per cent for females. Among private households, linkage was least likely for dependent children of lone parents (77.4 per cent linked in 2001). Overall, linkage was less likely for LS members who were part of lone-parent families than for people in two-parent families.

Dependent children were generally less likely to be linked than adults. Linkage rates by age and sex show that young people in the age range 10 to 34 in 1991 were less likely to be found in 2001. Dependent children are aged 16 and under (or 17 to 18 and in full time education) and would therefore make up a substantial proportion of this group.

Linkage rates were lower for adults living alone (84.8 per cent linked) compared with other adults in private households. This instance of non-linkage made an important contribution to overall linkage rates, given that over a fifth (23.6 per cent) of traced LS members were adults living alone in 1991.

Reference

Brassett-Grundy, A. (2003) *LS User Guide 20: Researching Households and Families using the ONS Longitudinal Study*, London: Office for National Statistics

Table L9101.10 Forward linkage rates between the 1991 and 2001 Censuses: traced LS members by sex and position in household in 1991

Position in household and sex in 1991	Position by 2001 Census					Linkage success rate (%)
	LS Members present and traced in 1991	Died or embarked before 2001 Census	Eligible to be enumerated in 2001 Census	Not linked at 2001 Census	Linked at 2001 Census	
Males						
Adult living alone	59,044	8,095	50,949	9,449	41,500	81.5
Married couple with no dependent children	70,819	16,132	54,687	4,119	50,568	92.5
Cohabiting couple with no dependent children	7,700	387	7,313	1,048	6,265	85.7
Married couple with dependent children	49,247	1,494	47,753	4,952	42,801	89.6
Cohabiting couple with dependent children	3,707	89	3,618	724	2,894	80.0
Lone parent with dependent children	1,131	67	1,064	182	882	82.9
Dependent child living with two parents	48,045	315	47,730	6,634	41,096	86.1
Dependent child with lone parent	9,500	73	9,427	2,354	7,073	75.0
Visitor to a private household	2,841	189	2,652	561	2,091	78.8
Visitor to a communal establishment	2,152	380	1,772	418	1,354	76.4
Living in a communal establishment	2,875	1,063	1,812	575	1,237	68.3
Total	257,061	28,284	228,777	31,016	197,761	86.4
Females						
Adult living alone	67,677	16,228	51,449	6,140	45,309	88.1
Married couple with no dependent children	69,940	9,279	60,661	4,393	56,268	92.8
Cohabiting couple with no dependent children	7,481	242	7,239	747	6,492	89.7
Married couple with dependent children	48,901	833	48,068	3,884	44,184	91.9
Cohabiting couple with dependent children	3,799	45	3,754	376	3,378	90.0
Lone parent with dependent children	11,032	207	10,825	1,389	9,436	87.2
Dependent child living with two parents	46,324	234	46,090	5,729	40,361	87.6
Dependent child with lone parent	9,398	48	9,350	1,885	7,465	79.8
Visitor to a private household	3,036	330	2,706	386	2,320	85.7
Visitor to a communal establishment	1,962	522	1,440	221	1,219	84.7
Living in a communal establishment	4,434	2,942	1,492	382	1,110	74.4
Total	273,984	30,910	243,074	25,532	217,542	89.5

Table L9101.10 Forward linkage rates between the 1991 and 2001 Censuses: traced LS members by sex and position in household in 1991

Position in household and sex in 1991	Position by 2001 Census					Linkage success rate (%)
	LS Members present and traced in 1991	Died or embarked before 2001 Census	Eligible to be enumerated in 2001 Census	Not linked at 2001 Census	Linked at 2001 Census	
All people						
Adult living alone	126,721	24,323	102,398	15,589	86,809	84.8
Married couple with no dependent children	140,759	25,411	115,348	8,512	106,836	92.6
Cohabiting couple with no dependent children	15,181	629	14,552	1,795	12,757	87.7
Married couple with dependent children	98,148	2,327	95,821	8,836	86,985	90.8
Cohabiting couple with dependent children	7,506	134	7,372	1,100	6,272	85.1
Lone parent with dependent children	12,163	274	11,889	1,571	10,318	86.8
Dependent child living with two parents	94,369	549	93,820	12,363	81,457	86.8
Dependent child with lone parent	18,898	121	18,777	4,239	14,538	77.4
Visitor to a private household	5,877	519	5,358	947	4,411	82.3
Visitor to a communal establishment	4,114	902	3,212	639	2,573	80.1
Living in a communal establishment	7,309	4,005	3,304	957	2,347	71.0
Total	531,045	59,194	471,851	56,548	415,303	88.0

Notes

¹ *Source: Office for National Statistics Longitudinal Study (LS)*

² *LS members, usually resident in England and Wales*

³ *'Traced' means the LS members' records were found on the National Health Service Central Register before or during the 1991 Census-LS Link*

⁴ *This table does not include 3,970 LS members for whom household circumstances information is missing*

Inconsistencies between the 1991 and 2001 Censuses

There were 419,096 traced and untraced LS members found in both the 1991 and 2001 Census-LS samples. Three variables that should have a high degree of consistency across censuses are date of birth, sex and country of birth.

Among the LS members present in both 1991 and 2001, 2.4 per cent had dates of birth that were inconsistent by one year or more. This was most pronounced among people aged 75 and over in 1991 (4.2 per cent inconsistent).

Among those present in both 1991 and 2001, 0.1 per cent gave inconsistent reports of their sex. There was no difference between males and females in the proportions reporting their sex inconsistently.

There were inconsistencies in country of birth for 1.3 per cent of LS members found in 1991 and 2001. Inconsistencies were lowest for those giving their country of birth in 1991 as England or Wales (0.9 per cent). Inconsistencies were highest for those giving their country of birth in 1991 as a country in the 'African Commonwealth' (12.3 per cent), Pakistan (11.3 per cent) or a country in Europe (6.6 per cent).

Table L9101.11 Inconsistencies in the characteristics of LS sample members between the 1991 and 2001 Censuses

	Consistent with 1991	Inconsistent with 1991	Per cent with discrepancy
Sex			
Male	198,788	207	0.1
Female	218,393	186	0.1
All people	417,181	393	0.1
Age			
Under 10	58,244	1,937	3.2
10-24	83,576	1,863	2.2
25-59	209,034	4,439	2.1
60-74	48,462	1,256	2.5
75+	9,190	404	4.2
All ages	408,506	9,899	2.4
Country of birth			
England and Wales	375,267	3,280	0.9
Scotland	5,215	184	3.4
Northern Ireland	1,428	76	5.1
Irish Republic	3,418	125	3.5
Old Commonwealth	893	38	4.1
New Commonwealth			
India	4,393	291	6.2
Pakistan	2,195	279	11.3
Bangladesh	1,115	61	5.2
African	2,345	328	12.3
Caribbean	1,604	128	7.4
Europe, excluding USSR	4,228	299	6.6
USA	462	20	4.1
All countries	408,075	5,497	1.3

Notes

¹ Source: Office for National Statistics Longitudinal Study (LS)

² LS members, usually resident in England and Wales

³ 'Traced' means the LS members' records were found on the National Health Service Central Register before or during the 1991 Census-LS Link

⁴ Based on sample of 419,096 traced and untraced LS members found in both the 1991 and 2001 Censuses

⁵ This table does not include cases for whom relevant information was imputed in 2001