

BOF Membership Data Analysis (Version 2)

The following is a summary of the findings. Figure 3 will probably be of most interest. I have not at this stage attempted any interpretation of the results.

The data cover the period 1991 to 2006. The most detailed yearly information is of the number of individuals (not units) in each age class across the whole country, split by men and women. The junior age classes below M/W21 are M/W19, 17, 15, 13, 11 and below 11.¹ The highest age class is M/W65 and above. This is tabulated at Annex A. The figures for 1991, 1993 and 1995 have been interpolated. There is also some limited regional summary information which is based on membership units (not individuals).

It is most useful to work in detail with individual data rather than unit data. There is a potential correlation between individual data and results data, the latter of which (in the absence of membership data) may need to be employed for analysis of earlier periods. However, the regional data does give a useful pointer as to when the current decline in membership numbers began. Virtually every region saw an all-time peak in numbers at the beginning of the 1990's. By 1993 the decline had set in across the whole country. The aggregated membership numbers from 1990 to 2006 (Figure 1) indicate that there has been a steady and consistent decline in national numbers from 1993 onwards.

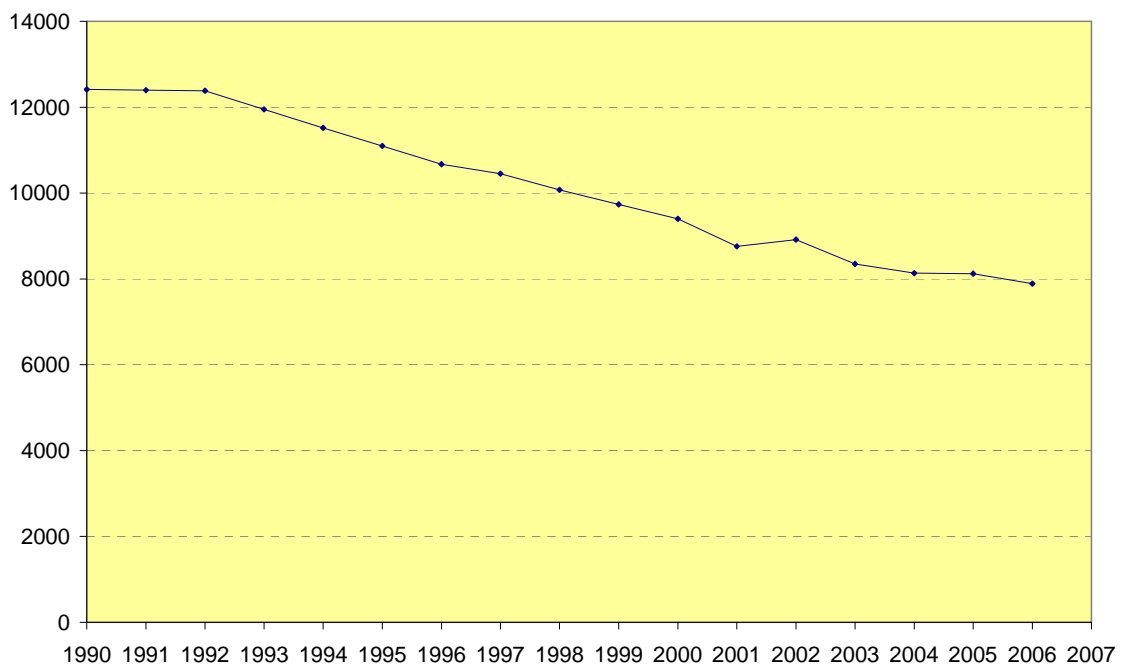


Figure 1: Total Membership 1990-2006

The kink at 2001/02 was due to the foot and mouth epidemic and can be effectively ignored since the 2003 figure is in line with what would be expected from the period prior to the ban. 2005 didn't continue the downward trend to the same degree but

¹ 2006 junior data was presented as M/W20,18,16,14,12 but the numbers were consistent with the previous years (labelled M/W19,17,15,13,11) so I have treated them as such.

2006 saw another decline. This can perhaps be seen better by looking at the yearly percentage changes in total membership (Figure 2).

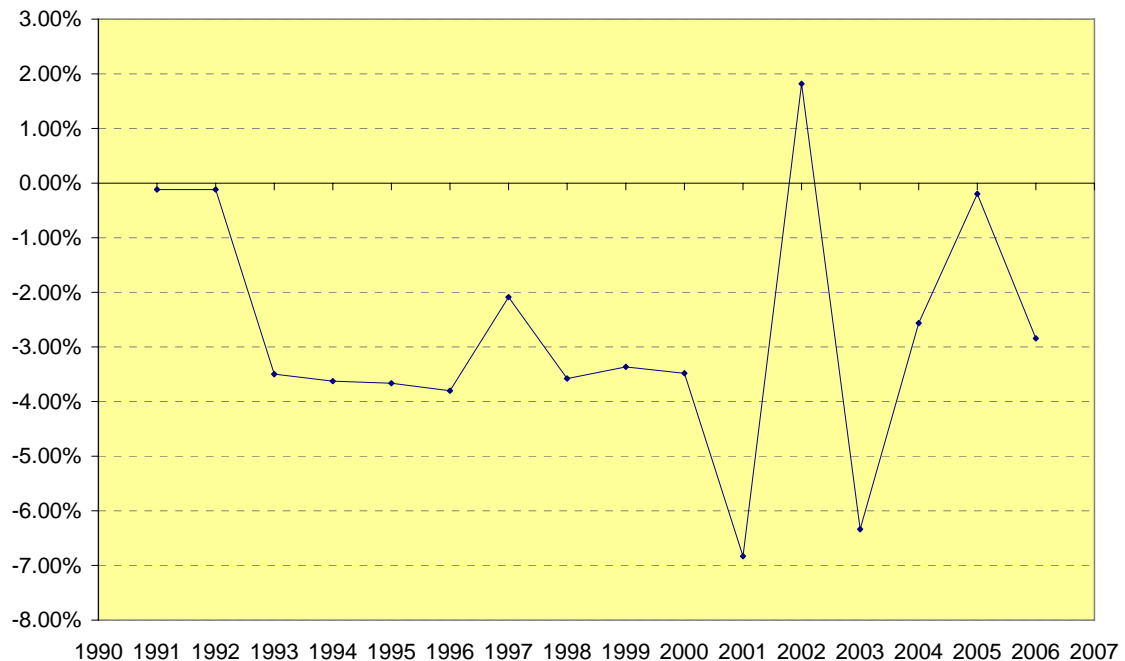


Figure 2: Yearly % changes in total membership

The three points for 2001, 2002 and 2003 are all affected by foot and mouth, so 2005 does stand out as breaking the pattern; unfortunately this was not sustained in 2006. For this reason I have initially concentrated on the entire period 1993-2006 as the basis for examining the mechanisms for the decline in numbers, assuming that they (the mechanisms) remain constant over this time period.

Looking at the raw numbers in each class from year to year gives an overall impression of trend but in order to get the most out of the data it is necessary to consider the year-end transitions that occur between age classes. The general model for transition is described in Annex B. There is no heavy maths involved – what is being done is to compare the actual number of people in each age class with the number that would have been expected from the previous year had there been no additions or reductions to the membership (i.e. if all that had happened was that everyone became a year older and changed class accordingly). The resulting transition factor is greater than 1 if there has been a net gain of members and less than 1 if there has been a net loss. I have calculated this ratio for every age class and for every year between 1993 and 2006. The values are given in Table 1.

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	mean
<11	1.16	1.15	1.20	1.20	1.15	1.13	1.18	1.17	1.24	1.37	1.09	1.20	1.16	1.10	1.26
11+	1.11	1.10	1.19	1.20	1.23	1.19	1.23	1.24	1.07	1.16	1.30	1.16	1.17	1.24	1.08
13+	1.05	1.09	1.02	0.97	0.98	1.06	1.03	1.03	0.87	1.18	0.97	0.93	1.16	1.03	1.03
15+	0.95	0.93	0.92	0.95	0.94	0.92	0.93	0.95	0.93	0.98	0.87	1.01	0.90	0.90	0.94
17+	0.87	0.84	0.86	0.86	0.97	0.92	0.92	0.88	0.77	0.94	0.86	0.86	0.85	0.99	0.88
19+	0.64	0.62	0.63	0.59	0.70	0.62	0.59	0.57	0.61	0.70	0.55	0.87	0.96	0.89	0.67
21+	0.93	0.93	0.91	0.89	0.93	0.90	0.90	0.89	0.85	0.95	0.90	0.91	0.96	0.94	0.91
35+	1.04	1.04	1.04	1.05	1.06	1.06	1.04	1.03	0.98	1.12	0.95	0.95	1.04	0.98	1.03
40+	0.97	0.97	0.97	0.97	0.98	1.01	0.98	0.99	0.94	1.04	0.95	1.05	1.01	0.95	0.99
45+	0.98	0.99	0.99	1.00	0.96	0.91	0.98	0.98	0.95	1.02	0.96	0.96	1.01	0.99	0.98
50+	0.91	0.93	0.93	0.95	0.99	0.99	0.97	0.97	0.96	0.95	0.90	0.97	0.98	0.97	0.95
55+	0.92	0.90	0.89	0.89	0.90	0.91	0.89	0.91	0.96	1.02	0.97	0.97	1.02	0.96	0.93
60+	0.95	0.96	0.92	0.91	0.96	0.94	0.94	0.94	0.94	0.94	0.91	0.94	0.95	0.97	0.94
>65	0.89	0.88	0.90	0.90	0.90	0.90	0.90	0.90	0.88	0.95	0.89	0.93	0.91	0.90	0.90
Total	0.96	0.96	0.96	0.96	0.98	0.96	0.97	0.97	0.93	1.02	0.94	0.97	1.00	0.97	0.97

Table 1: Yearly transition factors

What is striking about these figures is the degree of consistency from year to year and the overall long term pattern that emerges. This can be seen much better by looking at the data graphically (Figure 3).

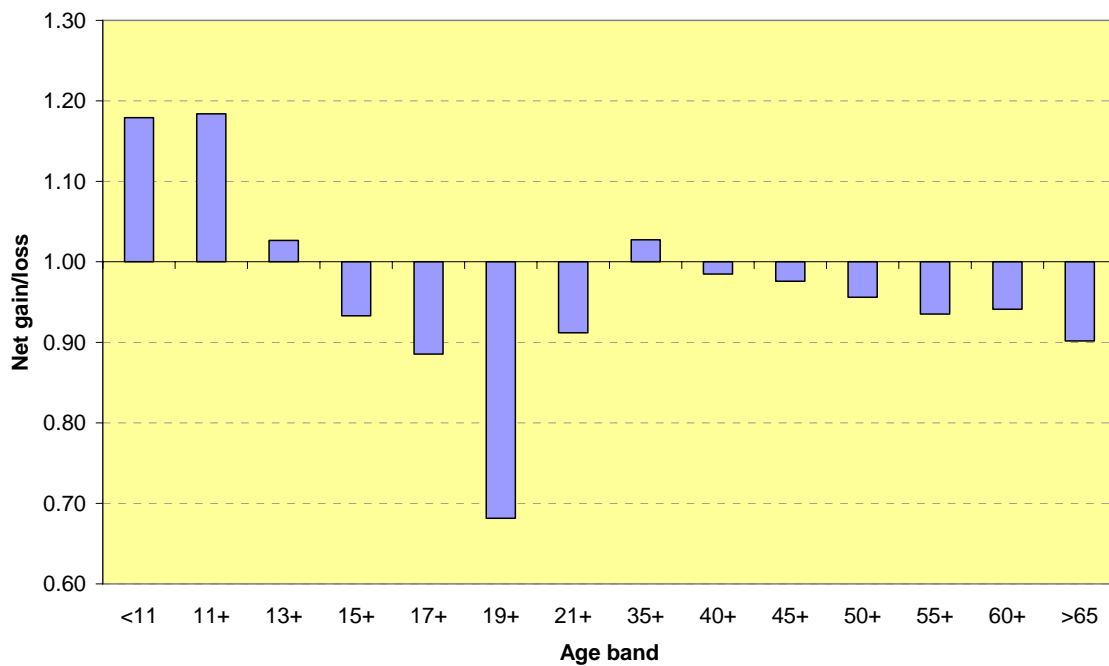


Figure 3: Average annual transition factors (1993-2006)

Net membership gain comes mainly from the youngest junior classes, most notably M/W13 and below. There is also a slight net gain in M/W35. The pattern in the older junior classes is very clear; from M/W15 and above there is an increasing rate of wastage which reaches a peak at M/W19. However, the high rate of wastage extends to the M/W21 class as well before recovering at M/W35. Beyond that there is a steady pattern of loss increasing with age which reaches a peak at the oldest age class.

I have broken this down by men and women but the profiles are similar; there does not appear to be a significant difference in behaviour between the sexes. The

percentage of female members has remained steady at between 38% and 39%. (Note: this is curiously inconsistent with the steady upward trend of female percentage participation at the British Champs over the same period from about 30% to almost 40%).

I have used the transition factors to attempt to forecast future membership figures. These are as follows:

	2005 (actual)	2006 (forecast)	2006 (actual)	2007 (forecast)	2008 (forecast)	2009 (forecast)	2010 (forecast)
<11	440	417	386	396	375	356	338
11+	296	278	292	263	248	235	223
13+	368	341	342	318	298	280	264
15+	299	312	299	305	292	276	260
17+	263	247	278	245	241	234	224
19+	223	162	217	136	127	122	119
21+	788	767	794	721	671	624	583
35+	556	517	492	483	451	422	394
40+	917	834	803	761	697	639	588
45+	1041	991	1003	936	879	821	766
50+	960	932	950	901	867	830	791
55+	856	819	839	786	755	726	697
60+	538	565	581	578	582	579	571
>65	576	617	614	658	698	735	767
Total	8121	7798	7890	7487	7181	6880	6584

Table 2: Forecast of Membership Figures (2007-2010)

The average age of the membership continues to rise as Figure 4 demonstrates. Close observation shows that the rate of increase is reducing slightly.

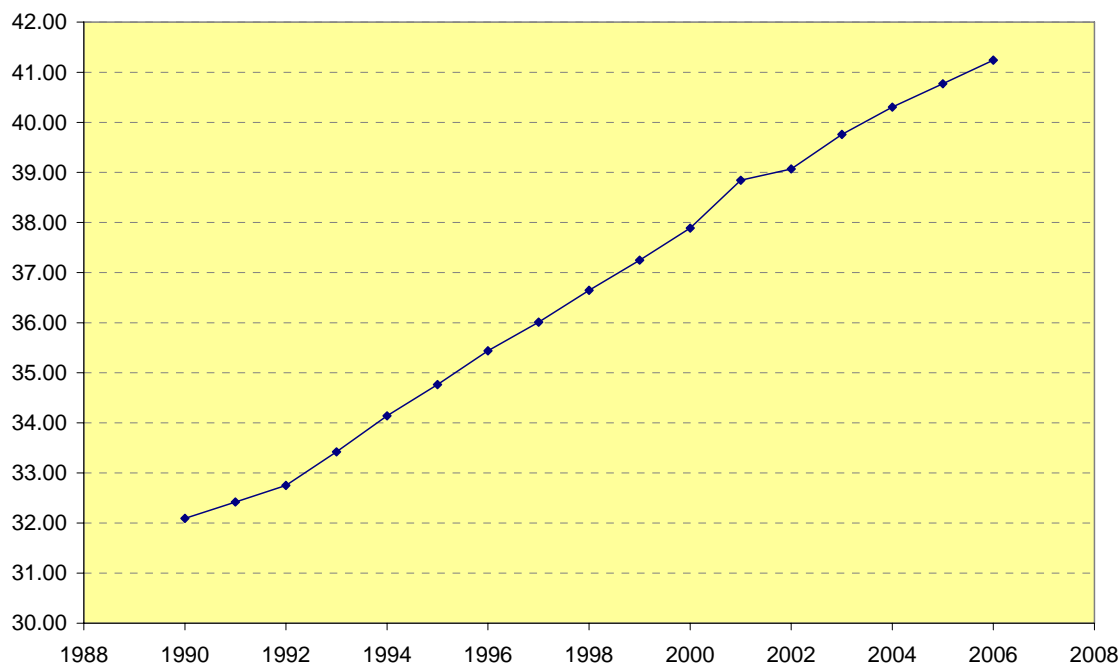


Figure 4: Average age of membership

There is another interesting feature of the data that is worth highlighting. Bearing in mind how poor the M/W19 and M/W21 trend has been, there does seem to have been a change over the last few years. This can be seen by observing the improved transition factors and also the raw figures themselves (Figure 4). However, it couldn't really have carried on as it was doing or it would have hit zero by now!

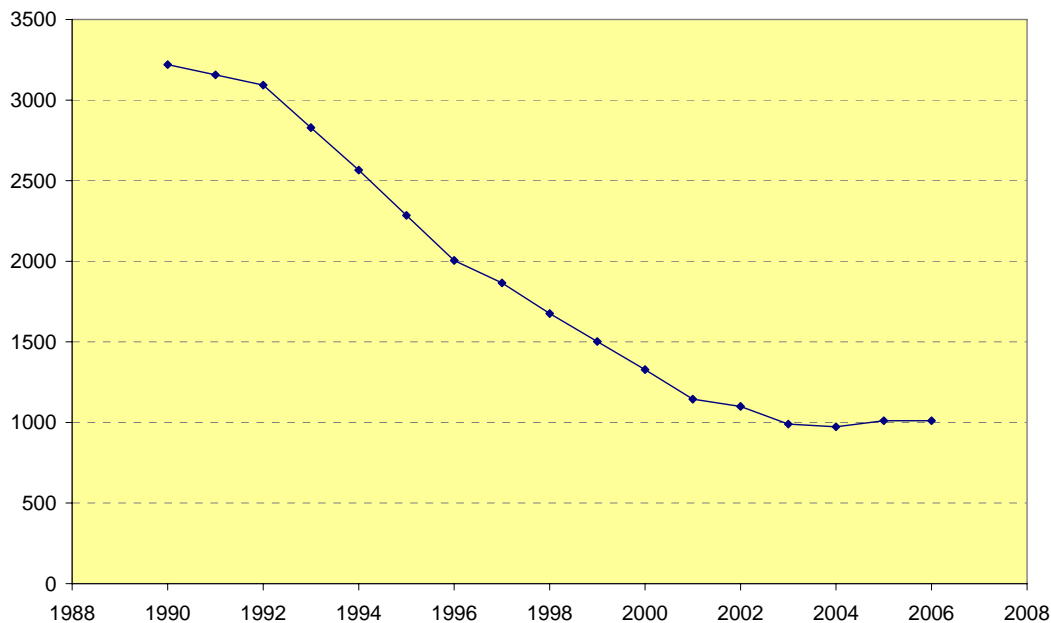


Figure 5: Total M/W19 and 21 membership

What would be interesting would be to compare the transition profile to what it looked like over a period of growth (i.e. 1980s), in order to focus on where there has been a net change in behaviour. For example, it's not entirely clear whether the big change has been at older junior level, M21 level or older senior level. In the absence of membership data this would have to be achieved by using event attendance data, but this would only be valid if I could establish a significant correlation between recent membership and results data (the anomaly already noticed regarding female participation isn't a good sign in this respect). This is potentially a long task and would require access to historical National Event level results over many years. If membership data exists somewhere, it would be a lot better.

Annex A – Overall Yearly Membership Figures

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
<11	1004	948	891	826	761	734	706	652	591	558	524	518	566	494	476	440	386
11+	500	520	539	497	455	450	445	448	422	405	388	320	305	345	314	296	292
13+	638	629	619	610	601	541	480	454	477	462	447	365	404	343	319	368	342
15+	626	619	611	582	553	531	508	462	421	419	417	401	376	339	343	299	299
17+	602	579	555	507	458	436	413	445	417	387	356	299	330	304	276	263	278
19+	252	283	314	280	245	220	195	212	204	184	163	158	159	134	191	223	217
21+	2968	2874	2779	2550	2321	2066	1810	1654	1472	1319	1165	987	941	856	783	788	794
35+	1539	1536	1533	1478	1423	1359	1294	1232	1174	1084	993	860	847	711	598	556	492
40+	1753	1702	1650	1584	1517	1457	1397	1353	1342	1288	1233	1108	1098	1000	986	917	803
45+	1155	1277	1398	1413	1427	1434	1441	1371	1247	1237	1226	1163	1178	1112	1043	1041	1003
50+	629	667	705	770	835	890	944	1036	1088	1089	1089	1075	1036	956	962	960	950
55+	366	392	418	435	452	473	494	528	570	603	635	695	783	810	810	856	839
60+	195	211	226	251	275	285	294	322	341	365	389	411	440	463	502	538	581
>65	187	167	147	171	195	224	253	282	311	343	374	397	453	484	534	576	614
Total	12414	12400	12385	11952	11518	11096	10674	10451	10077	9738	9399	8757	8916	8351	8137	8121	7890

Annex B – Calculation of Transition Factors

Let age class A span Y_A years and class B (the class below it) span Y_B years. We assume that in Year 0 there are a total of N_{A0} members in class A, N_{B0} members in class B and that the numbers in each class are spread evenly across the class. As we move into Year 1, the top year of class A moves on up to the class above and the top year of class B joins class A. Ignoring for the moment any resignations or new joiners, the expected number of members in class A for Year 1 will be given by:

$$E(N_{A1}) = (Y_A - 1)/Y_A * N_{A0} + (1/Y_B) * N_{B0} \quad (\text{for M/W11 to M/W60})$$

$$E(N_{A1}) = (Y_A - 1)/Y_A * N_{A0} \quad (\text{for 11 and under classes})$$

$$E(N_{A1}) = N_{A0} + (1/Y_B) * N_{B0} \quad (\text{for M/W65 and above})$$

The assumption about the numbers being spread evenly in each class makes this transition mechanism as simple as possible. I believe this is quite reasonable for all classes except the youngest and oldest. In the case of the youngest class, namely 11 and below, it is probably not fair to assume that there are as many 1 year olds as 10 year old members. In the analysis, I have assumed that this lower age class spans five years rather than eleven. The oldest age class will clearly tail off at the upper end but we don't have to make an assumption about its profile for the above transition expression.

In reality, in Year 1 we actually end up with N_{A1} members for class A. This encompasses the transitions explained above, plus any new joiners and minus resignations. We will focus on the ratio $N_{A1}/E(N_{A1})$. This statistic will take values greater than 1 if there has been a net gain of members in class A between Years 0 and 1, and less than 1 for a net loss.