

1. INTRODUCTION

This report has been compiled by the Sport Industry Research Centre (SIRC) at Sheffield Hallam University on behalf of the Sports Council for Northern Ireland. The research is concerned with informing SCNI's approach to the support and development of medal winning athletes competing for Northern Ireland in the Commonwealth Games. The significance of the Commonwealth Games is that it is the only major multi-sports event in which athletes representing Northern Ireland compete for Northern Ireland rather than for a combined Great Britain and Northern Ireland team - as is the case at the summer and winter Olympic Games. The approach used to conduct the research is an adaptation of the analysis of Scotland's performance in the Commonwealth Games conducted by SIRC in 2004¹.

2. TERMS OF REFERENCE

The specific requirements of the research are detailed below and the results are presented in the same sequence.

- An overview of the Commonwealth Games held since 1950 covering the number of sports, the number of events, the number of athletes and the number of nations. Where data is available for future events, e.g. Melbourne 2006 and Delhi 2010 this will be included alongside the historical data.
- The number of countries winning a gold medal or any medal between 1950 and 2002.
- Northern Ireland's points through medals 1950 – 2002 where a gold medal equals 3 points, a silver 2 points and a bronze 1 point.
- Northern Ireland's overall market share 1950 – 2002 where market share is defined as the percentage of points won expressed as a function of the total points available.
- Northern Ireland's market share sub analysed for men and women 1950 – 2002.
- Analysis of the sports Northern Ireland has medalled in overall and by gender.
- Comparison of the sports Northern Ireland has medalled in compared with other countries (Australia, Canada, England, New Zealand, Wales, Scotland, South Africa, Malaysia and India). Comparison will also be made with nations having a similar population and Gross Domestic Product to Northern Ireland.
- Analysis of the medals won by the three most successful sports for Northern Ireland and the comparator countries.
- Breakdown of the number and proportion of medals won by gender for Northern Ireland and the comparator countries.
- Breakdown of the number and proportion of medals won by type (gold, silver, bronze) for Northern Ireland and the comparator countries.
- Breakdown of success by sports in which Northern Ireland has won medals.
- Given that events for Elite Athletes with a Disability (EAD) are now part of the Games' programme, the results of EAD events in Manchester will be analysed in isolation.

¹ **sportscotland** (2004) An analysis of Scotland's performance in the Commonwealth Games 1950 – 2002, **sportscotland**, Edinburgh.

3. METHODOLOGY

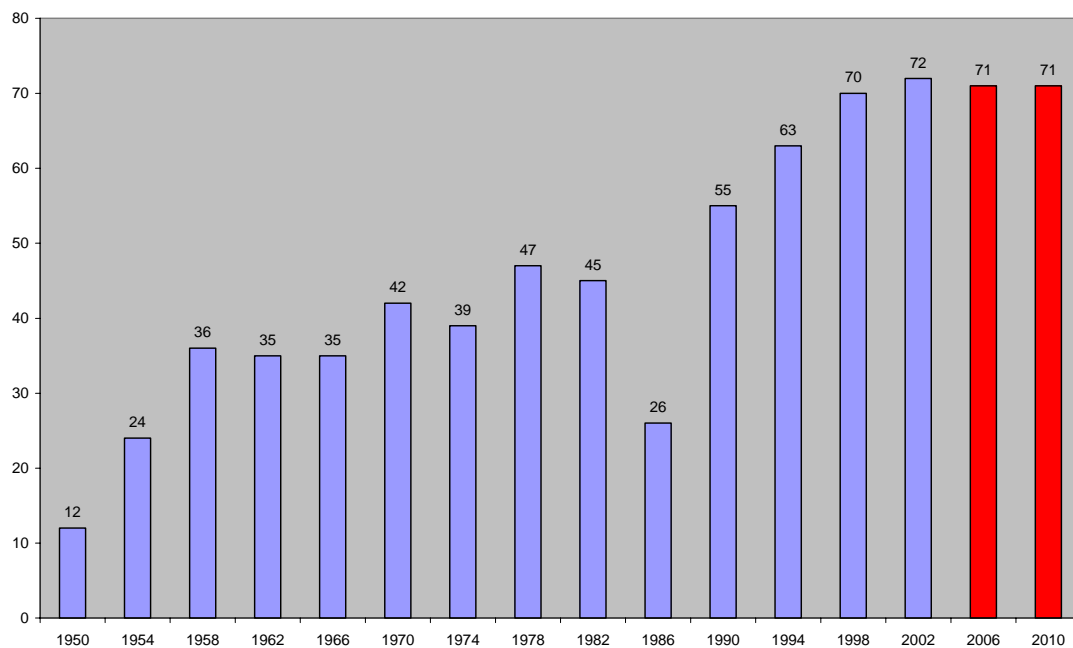
The method used to compile this report was desk research whereby a programme of secondary analysis was conducted on the results' database of the Commonwealth Games from 1950 – 2002. The Commonwealth Games takes place every 4 years and thus the results are based on 14 editions of the event. The results' data for each edition was downloaded from the official website of the Commonwealth Games (www.thecgf.com) and was formatted and analysed to meet the requirements of the terms of reference. Data for future events has been accessed from www.melbourne2006.com.au and www.cwgdelhi2010.com.

4. RESULTS

4.1 Context

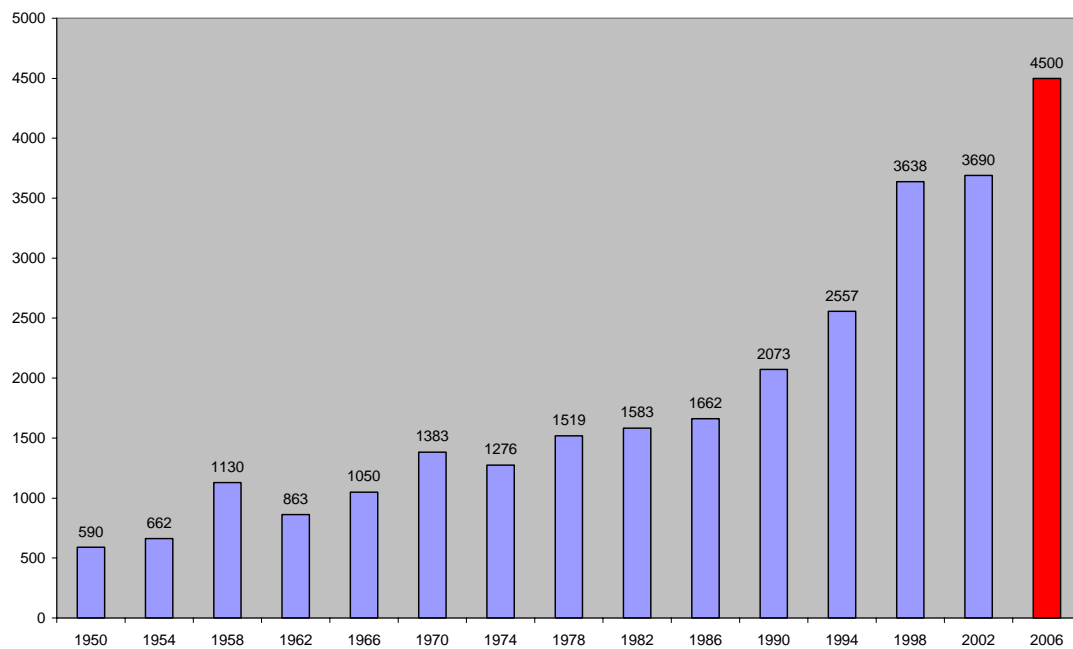
The Commonwealth is currently an alliance of some 71 'nations' and one of the ways in which the alliance expresses itself is via a quadrennial Commonwealth Games. In 2002 the Commonwealth was 72 nations but following Zimbabwe's withdrawal in 2003, the current total is 71. The number of nations taking part at each edition has steadily increased such that all 72 nations were represented in Manchester 2002.

Graph 4.1: The number of nations taking part in the Commonwealth Games



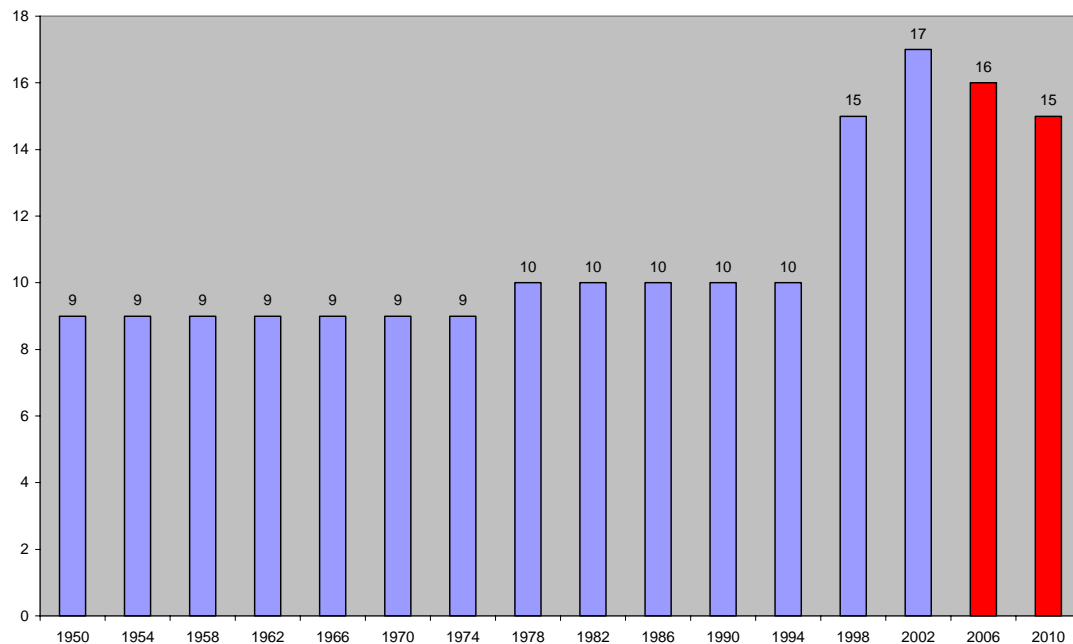
In 1950, 12 nations took part and this increased steadily over time to 45 nations in 1982. A boycott led by the African nations in 1986 reduced the number of nations taking part to 26, but in the four editions since, the number of participating countries has increased to 72/72 in 2002. One of the modern themes of the Commonwealth Games is inclusiveness and it is likely that future editions will attempt to emulate Manchester's feat of having at least one representative of each nation attend the Games. Melbourne and Delhi are both predicting that all 71 Commonwealth nations will attend their respective events and these predictions are shown in red on Graph 4.1

Graph 4.2: The number of athletes taking part in the Commonwealth Games



In the same way that the number of nations taking part in the Commonwealth Games has increased, so too has the number of athletes. In 1950, 590 athletes took part in the event and there has been a growth trend in the intervening years peaking at a record 3,690 athletes in 2002. Melbourne is predicting that it will welcome 4,500 elite athletes to the Games in 2006. The number of sports contested at each edition of the Commonwealth Games since 1950 is shown in Graph 4.3.

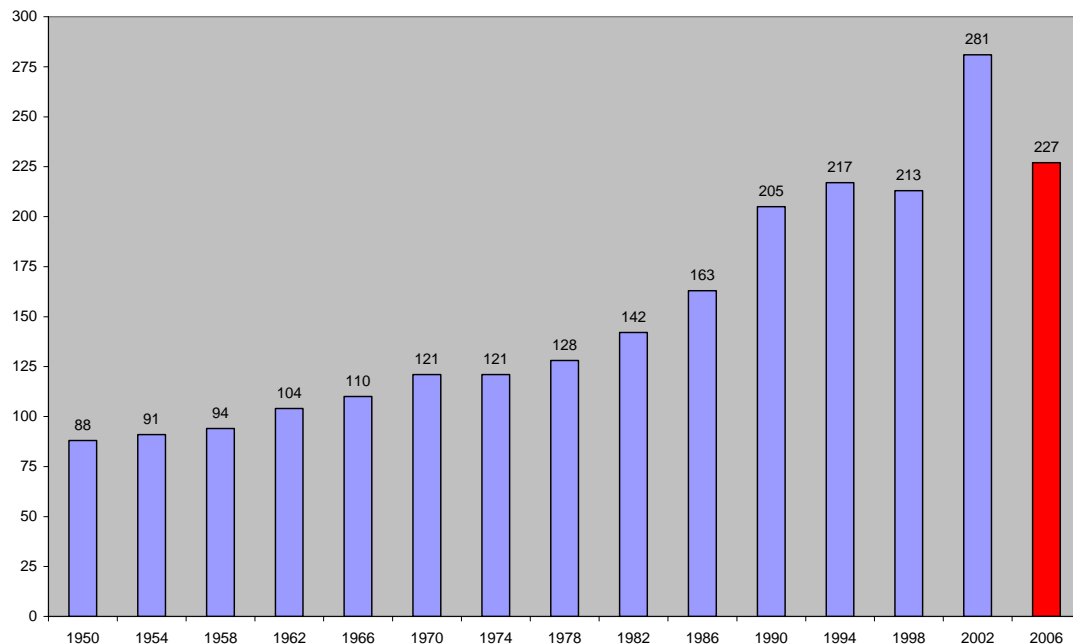
Graph 4.3: Number of sports contested at the Commonwealth Games



Until 1994 the number of sports contested at each Commonwealth Games was either 9 or 10. In 1998 the sports contested increased to 15 when netball, cricket, ten pin bowling, squash and rugby 7s were included for the first time. The expansion

continued in 2002 with a record 17 sports contested. The programmes for Melbourne 2006 and Delhi 2010 indicate that 16 and 15 sports will be contested respectively.

Graph 4.4: The number of events contested at each Commonwealth Games



In 1950 the 590 athletes taking part contested 88 events and by 2002 the 3,690 athletes contested 281 events. In Melbourne 2006 the number of events will reduce by 54 to 227. It is worth examining the events contested in 2002 and those to be contested in 2006 so that the variances at individual sport level can be seen.

Table 4.0: A comparison of the events contested 2002 – 2006

Sport / Discipline	2002	2002 (%)	2006	2006 (%)	Variance	Variance %
Athletics	48	17.1%	46	20.3%	-2	4%
Weightlifting	46	16.4%	16	7.0%	-30	56%
Swimming	44	15.7%	44	19.4%	0	0%
Shooting	40	14.2%	40	17.6%	0	0%
Cycling	17	6.0%	18	7.9%	1	-2%
Gymnastics	14	5.0%	5	2.2%	-9	17%
Judo	14	5.0%	0	0.0%	-14	26%
Boxing	12	4.3%	11	4.8%	-1	2%
Table Tennis	8	2.8%	8	3.5%	0	0%
Lawn Bowls	8	2.8%	6	2.6%	-2	4%
Wrestling	7	2.5%	0	0.0%	-7	13%
Diving	6	2.1%	10	4.4%	4	-7%
Badminton	6	2.1%	6	2.6%	0	0%
Squash	5	1.8%	5	2.2%	0	0%
Hockey	2	0.7%	2	0.9%	0	0%
Triathlon	2	0.7%	2	0.9%	0	0%
Netball	1	0.4%	1	0.4%	0	0%
Rugby 7's	1	0.4%	1	0.4%	0	0%
Synchronised Swimming	0	0.0%	4	1.8%	4	-7%
Basketball	0	0.0%	2	0.9%	2	-4%
Totals	281	100%	227	100%	-54	100%

Table 4.0 provides the following information:

- A list of the sports contested in 2002 and a list of the sports to be contested in 2006;
- The number of events contested by sport in 2002 and the number of events to be contested by sport in 2006, for example 48 athletics events were contested in 2002 and 46 will be contested in 2006
- The proportion of the total number of events accounted for by each sport in both 2002 and 2006, for example in 2002 athletics represented 17.1% of the programme whereas in 2006 it will be 20.3% of the programme;
- The difference between the number of events contested by sport in 2002 and 2006, for example the athletics programme will be 2 events less in 2006 compared with 2002; and
- The percentage of any change expressed as a function of total change; for example the reduction of 2 events in athletics accounts for 4% of the change from 281 events in 2002 to 227 events in 2006 ($2/54 = 4\%$).

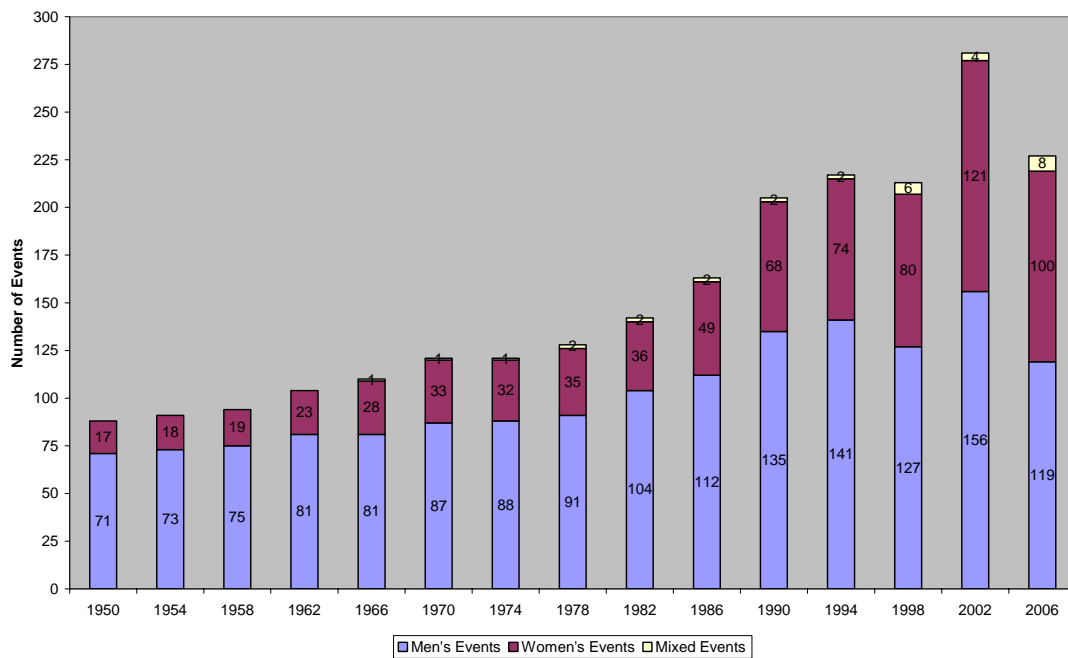
The key points arising from Table 4.0 are as detailed below.

- The most significant reduction of events occurs in weightlifting in which the 46 events contested in 2002 have been reduced to 16 (-30 events). Any nation which has taken a strategic approach to achieve success in weightlifting, for example India, will therefore be at an immediate disadvantage because of the reduction in medal winning opportunities. To a lesser extent the same is true for gymnastics in which the number of events has been reduced by 9 from 14 to 5.
- Any nations taking a strategic approach to achieve success in Judo and Wrestling will be at a relative disadvantage to 2002 as these sports will not be contested in 2006.
- Aquatics and its various disciplines will become an increasingly important determinant of overall success as the number of medals available for diving, swimming and synchronised swimming will increase from 50 to 58.
- In 2002 four sports (athletics, weightlifting, swimming and shooting) accounted for 63.4% of all events and in 2006 the same sports will account for 64.3% of all events. Thus as weightlifting has fallen in importance the traditional 'high volume' events of athletics, swimming and shooting will all assume greater importance in 2006. Nations wishing to be successful need to target these sports to make any meaningful impact on the overall Commonwealth Games medal table.

As per the Olympic Games, early editions of the Commonwealth Games were dominated by events for men and only a minority of events were available for women.

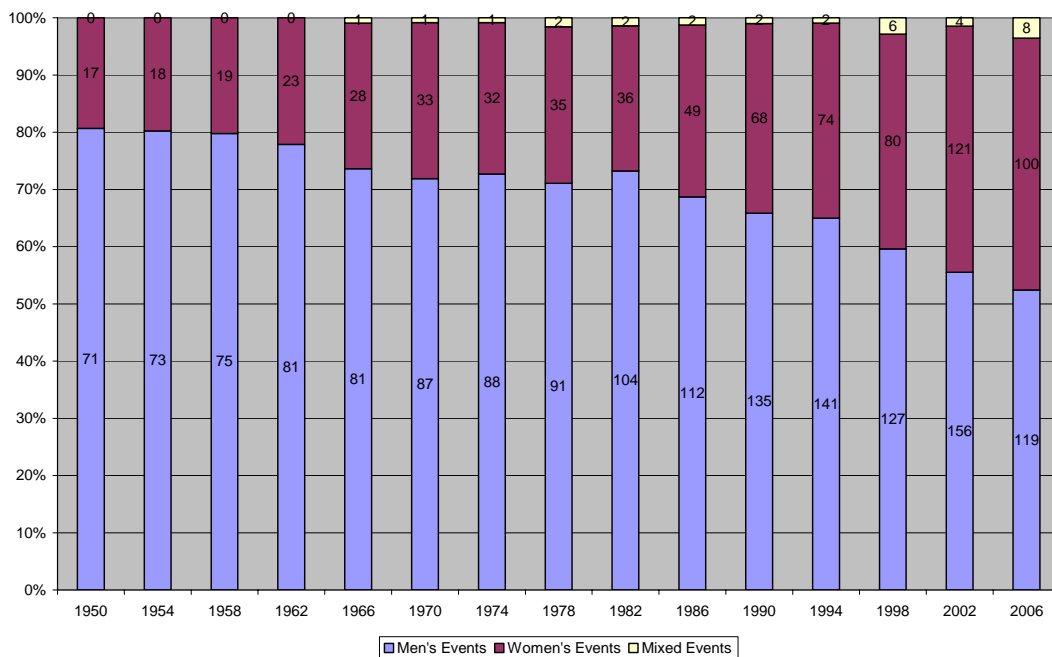
To illustrate this point Graph 4.5 analyses the number of events contested by men, women, and men and women (mixed events) between 1950 and 2006.

Graph 4.5: Number of events by gender



Although Graph 4.5 shows that the majority of events in the Commonwealth Games are for men, much of the growth in the number of events contested overall has been driven by an increase in the number of events for women. This point is best appreciated by looking at the relative proportion of events for each gender over time as shown in Graph 4.6.

Graph 4.6: Proportion of events by gender 1950 – 2006



In 1950, 81% of the 88 events were contested by men and 19% were contested by women. Over time the proportion of male events as a function of total events has steadily reduced such that in 2006 53% of events will be contested by men, 44% will be contested by women and 3% will be contested by men and women on equal terms. The number of events contested by women will have grown by 555% between 1950 and 2006 whereas during the same period the percentage increase for men has been a more modest 167%.

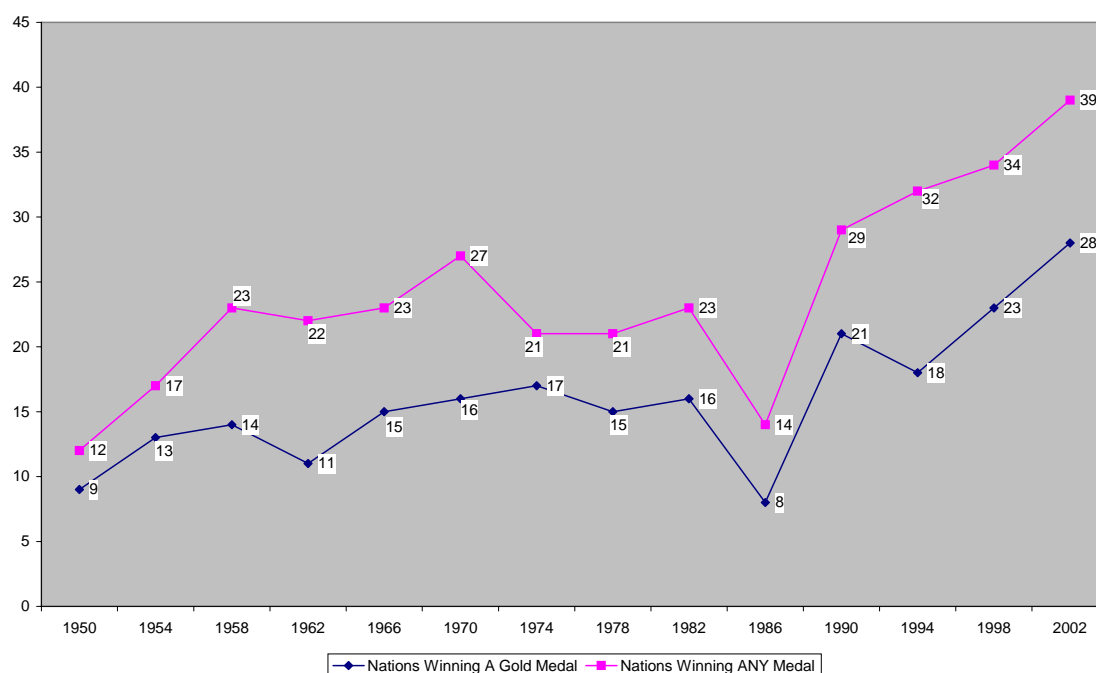
Key points

- The number of nations contesting the Commonwealth Games has increased from 12 in 1950 to 72 in 2002 and future editions of the Games are explicitly targeting representation of all nations (currently 71).
- The number of athletes contesting the Commonwealth Games has increased from 590 in 1950 to 3,690 in 2002 and a predicted 4,500 in 2006.
- The number of sports has increased from 9 in 1950 to 17 in 2002. Melbourne 2006 will have 16 sports and Delhi 2010 has 15 sports already confirmed.
- The number of events increased from 88 in 1950 to 281 in 2002. 2002 was likely to be the peak year and in 2006 only 227 events will be contested.
- In 2006 4 sports (athletics, swimming, weightlifting and shooting) will account for 64.3% of all events.
- The number of events contested by women will have grown from 17 (19%) in 1950 to 100 (44%) in 2006.

4.2 Evidence of increasing competition

Although the contextual material suggests that competition for medals may have increased over time, by virtue of more nations and more athletes taking part in the Games, a more conclusive diagnosis can be made by looking at the number of different countries which have won a gold medal or any medal over time. Graph 4.7 presents a time series analysis of the number of countries winning a gold medal and a medal of any hue (i.e. gold, silver or bronze).

Graph 4.7: Number of countries winning a gold medal and any medal



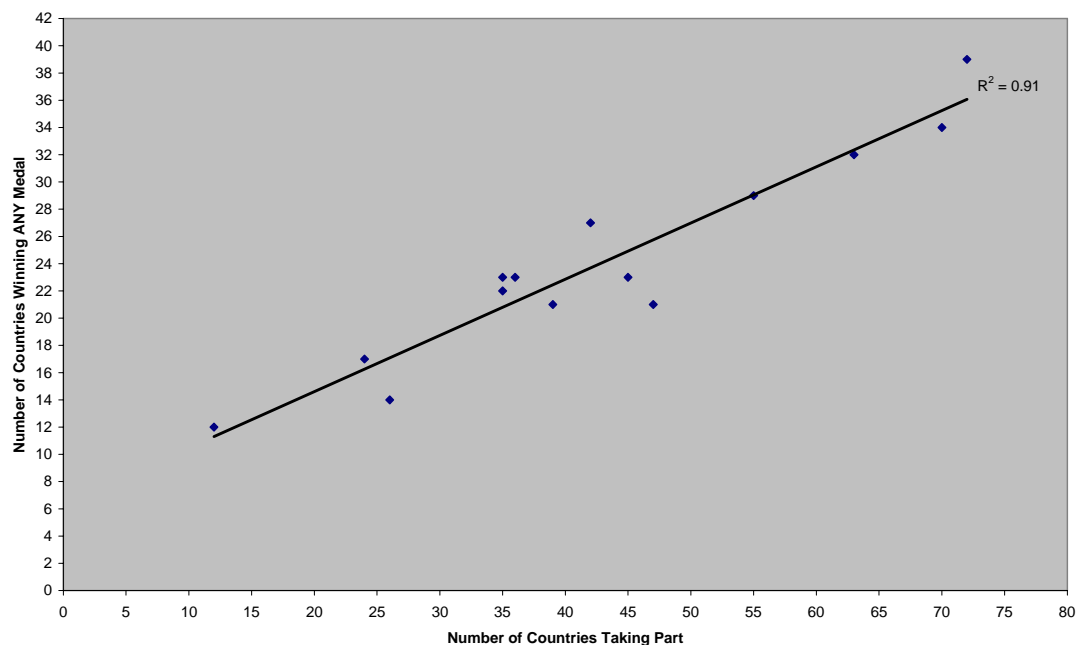
In 1950, 9 countries won a gold medal and all 12 of the participating countries won a medal of any colour. In the most recent edition (2002) 28 of the 72 nations taking part won at least one gold medal and 39 won at least one medal of any colour. Following the boycott led by the African nations in 1986 there has been a steep increase in the number of nations winning gold medals (8 in 1986, 28 in 2002) and an increase in the number of nations winning any medal (14 in 1986, 39 in 2002).

The steep rise in the trend line from 1986 to 2002 is not a coincidence and can in part be explained by some nations taking a state-sponsored strategic approach towards achieving success in international competition. Notable examples include Australia through its Australian Institute of Sport and more recently the United Kingdom through the World Class Performance Programme. At sub-UK level the home nations have also striven to achieve success by supporting emerging athletes who are not yet eligible for UK Sport's 'World Class' status.

The phenomenon of an increasing number of nations winning medals is not confined solely to the Commonwealth Games and has also been seen in the Olympic Games, where in Sydney 2000 a record 81 nations won a medal of some sort. Thus it would appear that there is some evidence that more nations are developing a medal winning capability and therefore medals are more difficult to win. We have tested this theory

using regression analysis and have found a very strong relationship between the number of nations taking part in the Commonwealth Games and the number of nations winning a medal. This analysis is shown in Graph 4.8

Graph 4.8: Regression analysis to illustrate increasing competition



In Graph 4.8 the number of countries taking part in the Commonwealth Games is plotted against the number of countries winning a medal of any hue. The correlation coefficient is 0.91 which is very high and means that there is a strong relationship between the number of nations contesting the Commonwealth Games and the number of nations winning medals. In other words, medals have become increasingly difficult to win. This situation is likely to be maintained into the future as both Melbourne 2006 and Delhi 2010 are explicitly targeting the attendance of all Commonwealth nations.

There are also strong relationships between:

- The number of nations taking part and the number of nations winning a gold medal ($r = 0.82$);
- The number of athletes taking part and the number of nations winning a gold medal ($r = 0.70$) and any medal (0.73).
-

Key points

- Competition, defined by the number of countries capable of winning medals, has increased thereby making medals increasingly difficult to win.
- Some of the increase in competition can be explained by nations taking a state sponsored strategic approach towards the 'production' of medal winners.
- There is a very strong relationship ($r = 0.91$) between the number of nations contesting the Commonwealth Games and the number of nations winning any medal.

4.3 Northern Ireland's performance in the Commonwealth Games

Northern Ireland's overall performance by sport in the Commonwealth Games between 1950 and 2002 is shown in Table 4.2.

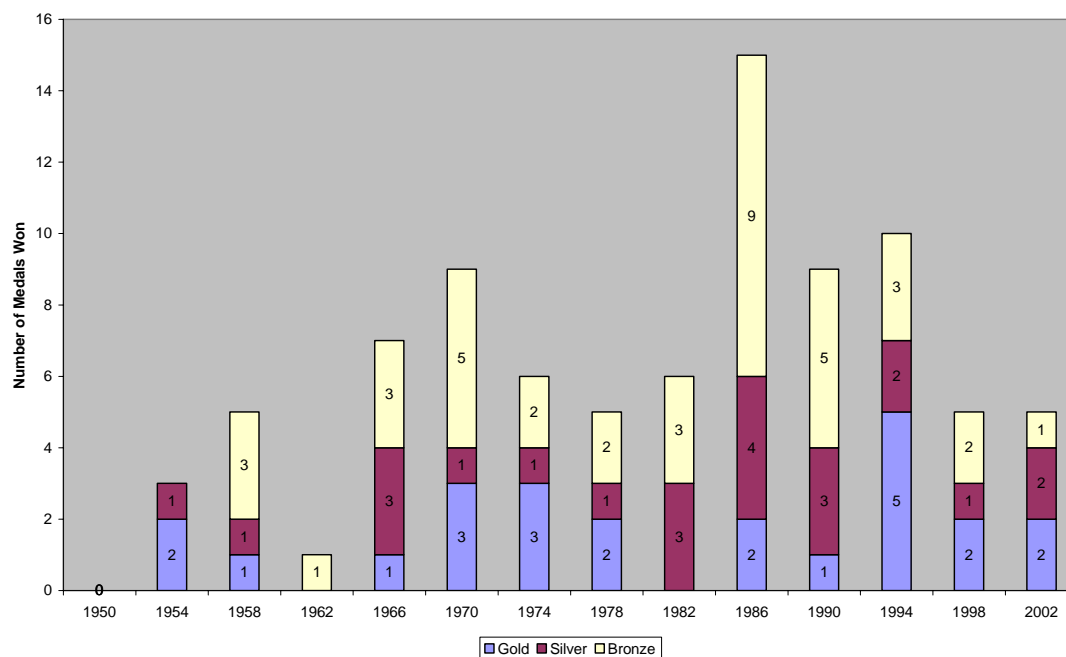
Table 4.1: Northern Ireland's overall performance by sport 1950 - 2002

Sport	Gold	Silver	Bronze	Total	%	Cumulative
Boxing	8	9	20	37	43%	43%
Athletics	7	9	1	17	20%	63%
Shooting	5	1	3	9	10%	73%
Lawn Bowls	4	2	10	16	19%	92%
Judo	0	1	2	3	3%	95%
Archery	0	1	0	1	1%	97%
Cycling	0	0	2	2	2%	99%
Wrestling	0	0	1	1	1%	100%
Total	24	23	39	86	100%	

In the 14 editions of the Commonwealth Games since 1950, Northern Ireland has won 86 medals of which 24 (28%) are gold medals, 23 (27%) are silver medals and 39 (45%) are bronze medals. In descending order of the most gold medals won, boxing (8/24), athletics (7/24), shooting (5/24) and lawn bowls (4/24) are the only sports in which Northern Ireland has won a gold medal. These 4 sports account for 92% of all medals won by Northern Ireland in the Commonwealth Games since 1950.

The remaining 8% of Northern Ireland's medals have been won in judo (3 medals), archery (1 medal), cycling (2 medals) and wrestling (1 medal) To illustrate how Northern Ireland's 86 medals have been won over time, Graph 4.9 shows the number and nature of medals won between 1950 and 2002.

Graph 4.9: Northern Ireland's medal winning performance by edition

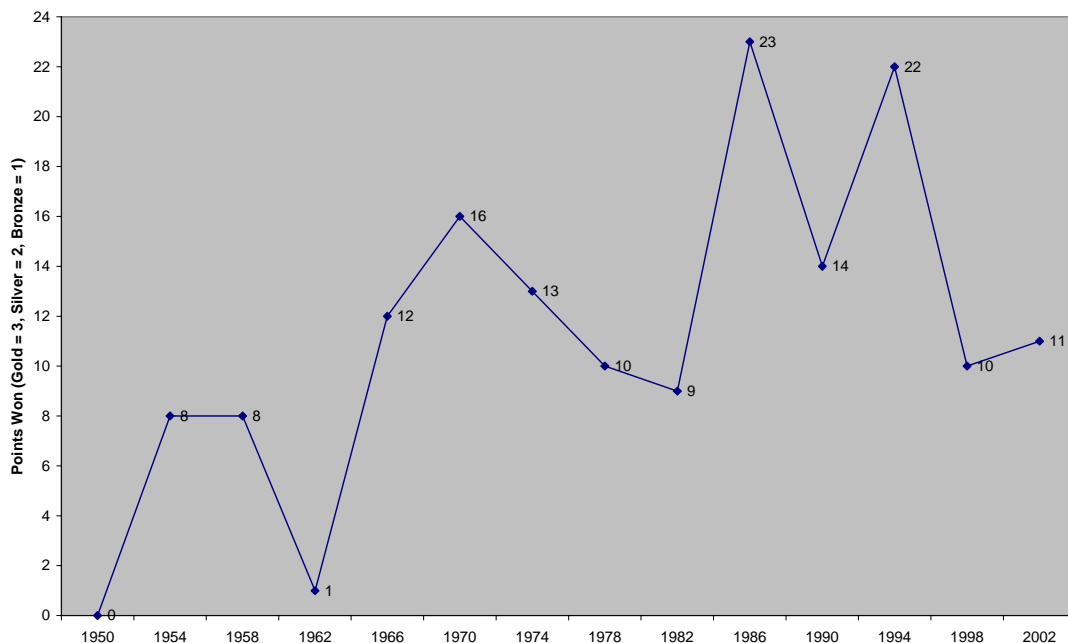


Since 1950 Northern Ireland has won a maximum of 5 gold medals (1994) and has failed to win a gold medal on 3 occasions (1950, 1962 and 1982). The long term average is almost 2 gold medals per edition of the Games since 1950. The most frequently occurring medal category is confirmed as bronze with 39/86 (45%) of all medals won since 1950 being bronze.

It is worth noting that 1986 was Northern Ireland's best Commonwealth Games in terms of medals won (15 v average of 6). However, 1986 was the boycotted Commonwealth Games in which only 26 nations took part in the event. This therefore resulted in a reduced level of competition making medals less difficult to win than under normal conditions. Furthermore, 5 of the 15 medals won were bronze boxing medals – a sport in which 2 bronze medals are awarded. The African nations, who led the boycott, have an impressive record in Commonwealth Games boxing and their non-attendance detracted from the quality of the boxing competition. Therefore much of Northern Ireland's success in 1986 can be attributed to extraneous factors particular to the event, rather than the result of a successful strategic programme to 'produce' medal winners.

On average Northern Ireland has won 6 medals per Commonwealth Games between 1950 and 2002. In this respect recent performance is deteriorating as five medals were won in 1998 and 2002 despite the number of events contested increasing. A key finding in Graph 4.8 is that since the expansion of the Games from 1990 in terms of the number of sports and the number of events contested (Graphs 4.3 and 4.4), Northern Ireland has failed to maintain its performance in line with the increase in scale of the event. As will be shown later, this is reflected in a declining market share ratio. Converting medals won into points where gold = 3, silver = 2 and bronze = 1 gives the 'totality of achievement' trend line shown in Graph 4.10.

Graph 4.10: Northern Ireland's points 1950 – 2002



Graph 4.10 shows a random pattern of performance with no overall systematic trend. Perhaps the most noticeable feature is that the points won in 1998 (10) and 2002 (11) are similar to the period 1966-1982 when fewer events were contested. Furthermore,

the UK home nations have been permitted to spend proceeds from the National Lottery since 1997. All things being equal it might be expected that greater financial investment in elite sport might lead to an improvement in performance. The evidence of 1998 and 2002 indicates that this has not been the case for Northern Ireland and that performance since 1997 is worse in points terms relative to performance in 1994, 1990 and 1986.

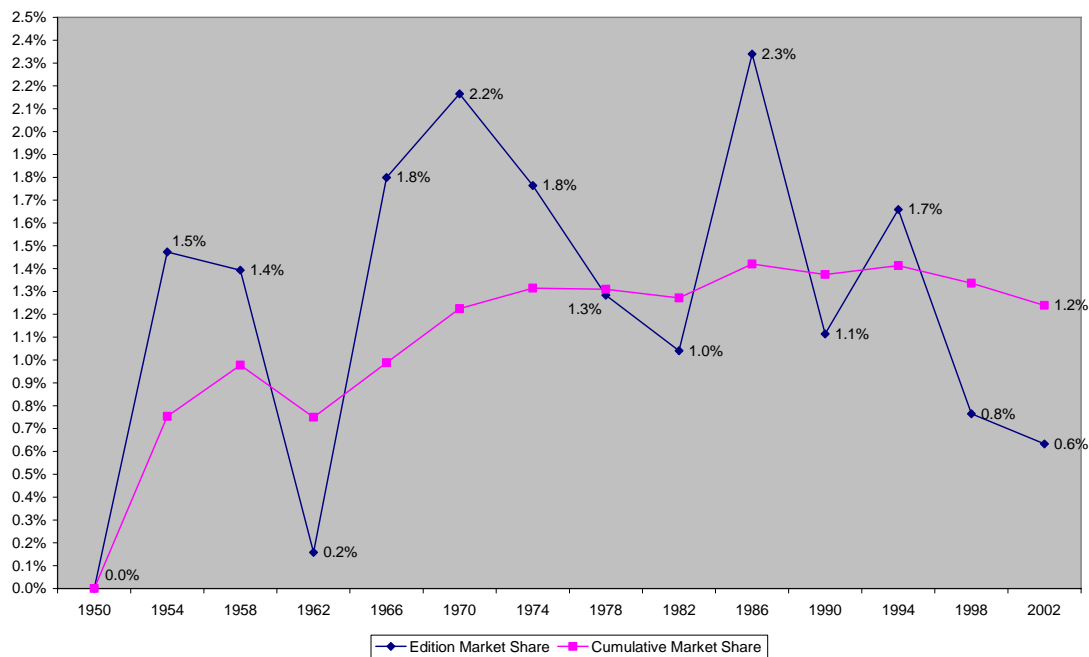
Examining points won in isolation is of limited value because the number of events and has been different in 13 of the 14 editions since 1950. Thus it would be unwise to assume that the points won in one edition was a greater achievement than the points won in another edition without taking into account points available. The relationship between points won and points available is called 'market share' and an extract of Northern Ireland's market share between 1982 and 2002 is shown in Table 4.2.

Table 4.2: Comparison of points won with market share

Edition	Points	Points Rank	Points Available	Market Share %	Market Share Rank
1982	9	6	865	1.0%	4
1986	23	1	983	2.3%	1
1990	14	3	1256	1.1%	3
1994	22	2	1326	1.7%	2
1998	10	5	1308	0.8%	5
2002	11	4	1738	0.6%	6

Table 4.2 shows that market share peaked in 1986 when the 23 points won represented 2.3% market share. The 11 points won in 2002 was, in relative terms, the worst achievement as it represented only 0.6% of the 1,738 points available. A full time series analysis of market share from 1950 to 2002 is shown in Graph 4.11.

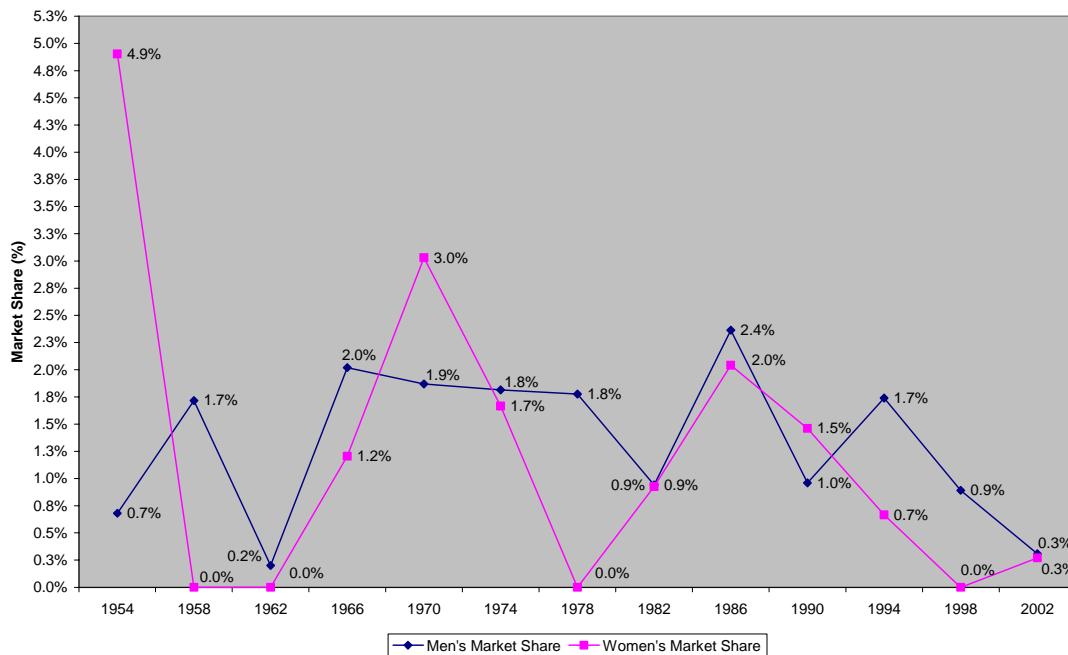
Graph 4.11: Northern Ireland's market share 1950 - 2002



Since Northern Ireland's highly successful Games in 1986 (the boycotted Games) where market share peaked at 2.3% the last four editions have shown relative decline most notably in 1998 and 2002 when market share fell below 1%. When looking at the cumulative market share, it can be seen that this has been on a downward trend since 1994.

In the same way that the points system masks relative achievement, so too, overall market share masks the difference in achievement between men and women. Graph 4.12 addresses this issue by showing time series analysis of market share sub-analysed by gender and edition.

Graph 4.12: Market share by gender



Graph 4.12 illustrates market share for Northern Ireland's males and female athletes between 1954 and 2002 (1950 is excluded as no medals were won). The main finding is that when comparing the performance of Northern Ireland's male and female athletes on a standardised basis, men have outperformed women on 8/13 times; women have outperformed men on 3/13 times; and performance has been identical on 2/13 times.

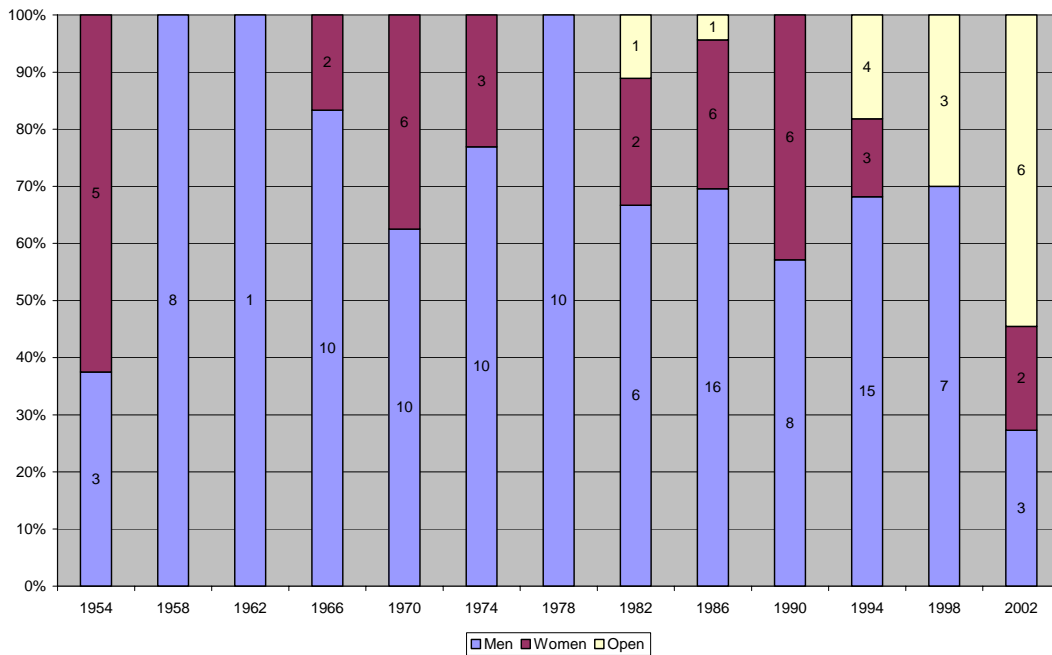
On four occasions between 1954 and 2002 Northern Ireland's women athletes won no medals (0% market share). Since 1986 the performance has been on a predominantly downward trend. As will be shown in greater depth later, Northern Ireland is over reliant on male athletes for its success in the Commonwealth Games. This point can perhaps be appreciated by cross referencing to Table 4.2 where it was shown that 43% of all Northern Ireland's medals have been won in boxing – a sport contested solely by men.

The data in Graph 4.12 excludes athletes competing in 'Open' events where men and women compete against each other on equal terms. This is a significant omission in the case of Northern Ireland as it excludes the prolific achievements of the shooter

David Calvert who has won 4 gold and 3 bronze medals in the Fullbore Rifle Queen's Prize (Individual and Pairs) between 1982 and 2002.

To illustrate the importance of David Calvert's achievements over the last 20 years, Graph 4.13 plots the number of points won and their relative proportions in events for men, women and open categories.

Graph 4.13 Points won and their relative proportions by gender categories



The predominance of blue in Graph 4.13 confirms Northern Ireland's reliance on male athletes for medal winning success in the Games. All of the points won in the open events have been won by David Calvert either on his own or with a partner and reveal a further reliance on a particularly talented shooter for overall success. It should be noted that Calvert is not the product of a system, yet in the two editions since Northern Ireland has operated its own system to support elite athletes (1998 and 2002) he has contributed 9/21 (43%) of all points won.

Key points

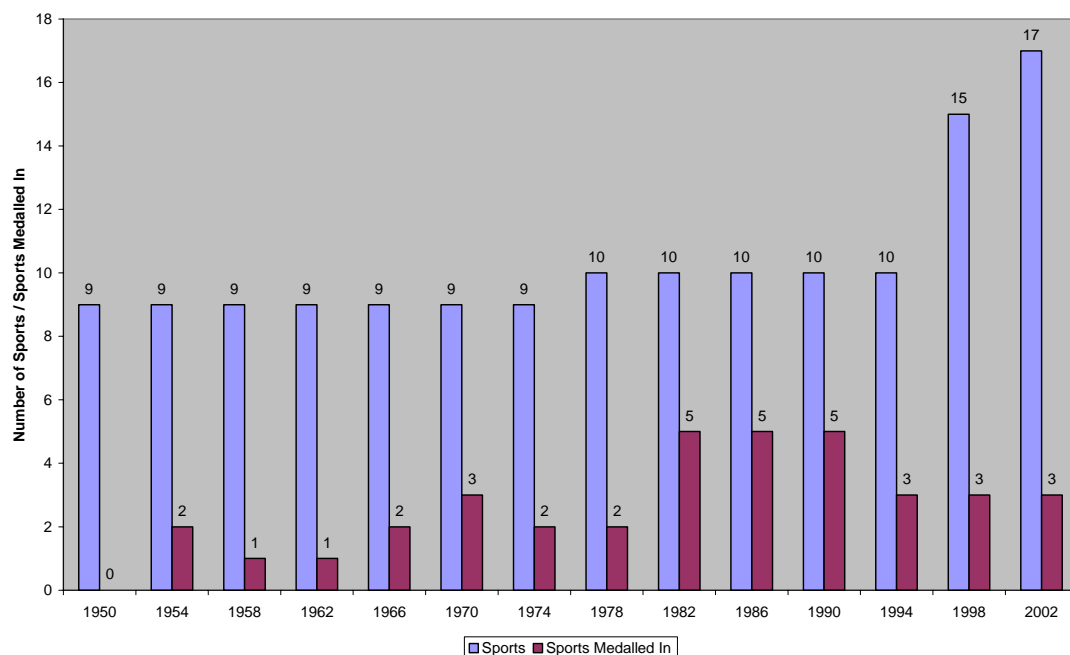
- Four sports, boxing, athletics, shooting and lawn bowls account for 92% of all medals won by Northern Ireland in the Commonwealth Games between 1950 and 2002.
- Northern Ireland has averaged 6 medals per Commonwealth Games between 1950 and 2002. Despite the increasing number of events the last two editions of the Games have both yielded 5 medals (i.e. a below long term average performance).
- Northern Ireland's best Commonwealth Games was 1986 when 15 medals were won. This edition was boycotted and only 26 nations took part. 5/15 medals won were bronze medals in boxing, a sport in which 2 bronze medals are awarded per event.

- When standardising the performance at each edition using market share, Northern Ireland has been on a downward trend since the highly successful 1986 Games at which 15 medals were won (2.3% market share).
- In market share terms, 2002 was Northern Ireland's worst performance for 40 years.
- Male athletes representing Northern Ireland consistently outperform their female counterparts. Women athletes have failed to win any medals in 4/13 editions between 1954 and 2002.
- Northern Ireland is over reliant on men for its success and has also become over reliant on a particularly talented and successful shooter.
- Northern Ireland's support for elite athletes does not appear to be delivering medal winning performance at the Commonwealth Games.

4.4 Analysis of the number of sports in which Northern Ireland has won medals

Graph 4.14 presents an analysis of the total number of sports contested at each edition of the Commonwealth Games since 1950 and an analysis of the number of sports that Northern Ireland has won medals in at each edition.

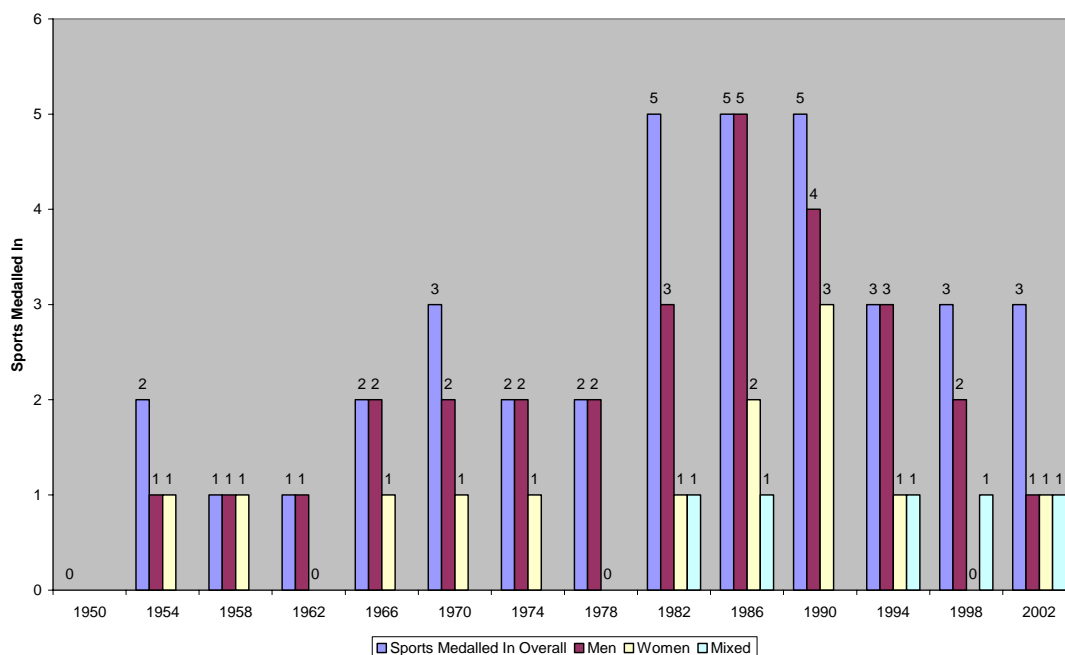
Graph 4.14: Number of sports medalled in at each edition 1950 - 2002



The number of sports in which Northern Ireland has won medals can be split into three clear time periods. First, between 1954 and 1974 medals were won in a range of 1 to 3 different sports. On the one occasion (1970) when medals were won in 3 sports, this was equivalent to one third of the sports contested (9). Second, between 1982 and 1990 was a particularly successful period for Northern Ireland with medals won in 5 of the 10 sports contested. Third, between 1994 and 2002 medals have been won in 3 sports. This is further evidence that Northern Ireland's performance has not kept pace with the growth in the Games. However, it should be noted that a significant number of the new sport are team sports such as rugby, netball and hockey. Whilst nations with relatively small populations will produce the occasional world class individual athlete, it is more difficult to produce world class teams.

When sub-analysing the data in Graph 4.14 by gender it can be seen that men invariably win medals in more sports than women. This is perhaps not surprising as there are more sports available for men to contest than women. Nonetheless, Northern Ireland's women athletes have never medalled in more than 3 different sports (1990) at any one edition and have failed to win any medals in 3 editions (1962, 1978 and 1998).

Graph 4.15: Sports medalled in by gender



As a result of winning medals in relatively few sports it follows that Northern Ireland is heavily dependent on a minority of sports for its overall success. This point is made in Table 4.2 where it is shown that 92% of Northern Ireland's medals have been won in four sports and that medals have only ever been won in 8 different sports. An adapted version of Table 4.2 is shown below in Table 4.3.

Table 4.3: Medals won by sport and number of sports medalled in

Sport	Total Medals	Men	Women	Mixed
Archery	1	0	1	0
Athletics	17	7	10	0
Boxing	37	37	0	0
Cycling	2	2	0	0
Judo	3	1	2	0
Lawn Bowls	16	13	3	0
Shooting	9	2	0	7
Wrestling	1	1	0	0
Total Medals Won	86	63	16	7
Sports Medalled In	8	7	4	1

Table 4.3 reveals that in addition to winning medals in 8 sports overall, men have won medals in 7 sports, women have won medals in 4 sports and mixed teams have won medals in 1 sport. Whether it be by design or by accident Northern Ireland appears to

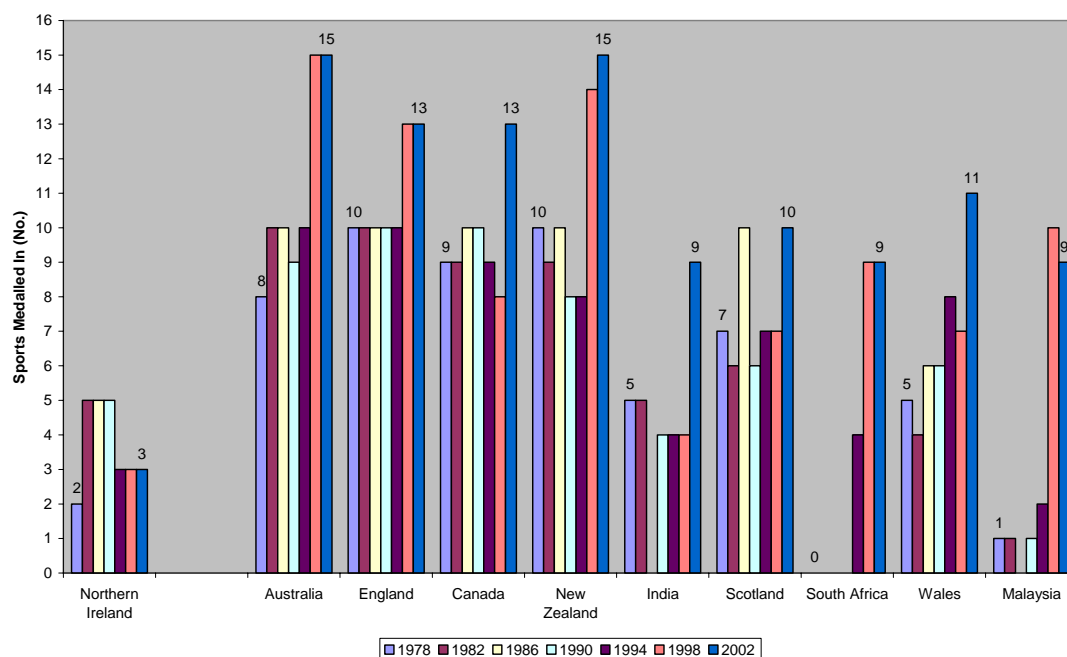
be pursuing a strategy of specialisation (winning a high proportion of its medals in a low number of sports) rather than diversification (winning medals in a broad range of sports). To contextualise the number of sports in which Northern Ireland has won medals we have benchmarked Northern Ireland against 9 comparator nations. The overall performance of these nations in descending order of gold medals between 1950 and 2002 can be seen in Table 4.4.

Table 4.4: Performance of comparator nations 1950 - 2002

	Gold	Silver	Bronze	Total	%
Australia	611	523	463	1597	25%
England	473	456	481	1410	22%
Canada	337	358	386	1081	17%
All Other Nations	250	266	339	855	13%
New Zealand	110	144	204	458	7%
India	80	79	62	221	3%
Scotland	64	78	118	260	4%
South Africa	57	55	65	177	3%
Wales	45	57	78	180	3%
Malaysia	29	36	41	106	2%
Northern Ireland	24	23	39	86	1%
Totals	2080	2075	2276	6431	100%

Table 4.4 shows that the dominant nations over time have been Australia, England and Canada who between them have won 64% of all medals. Northern Ireland has won just over 1% (1.34%) of all medals contested since 1950. It is against the backdrop of total performance that the number of sports medalled in at each edition between 1978 and 2002 is reviewed in Graph 4.16.

Graph 4.16: Sports medalled in by Northern Ireland and international comparators



Graph 4.16 shows that Northern Ireland wins medals in relatively few sports compared with the traditionally dominant countries (Australia, England and Canada).

Of particular note is the achievement of New Zealand (population c 3.8m) which managed to win medals in 15 of the 17 sports contested in Manchester 2002. All of the comparator countries have taken advantage of the expansion in the number of sports to increase the number of sports in which they win medals. The nearest comparator nation in the sample to Northern Ireland in terms of population and GDP is Wales which has increased the number of sports it has medalled in from 5 in 1978 to 11 in 2002. Northern Ireland has clearly not expanded its range of medal winning sports in proportion to the expansion of the Games, unlike the comparator nations.

Table 4.4 and Graph 4.16 are somewhat unfair comparisons as Northern Ireland has neither the population nor the resources (Gross Domestic Product) to compete evenly against the so called comparator countries. We have therefore produced a secondary set of comparators based on the nations with the population and GDP most comparable to Northern Ireland. Table 4.5 shows the medals won by Northern Ireland relative to the four nations whose population is the closest to that of Northern Ireland (1.66m). The comparator nations selected are those which are one and two ranks above and below the population of Northern Ireland respectively. If medal winning success was solely a function of population, it would be reasonable to expect Northern Ireland to be ranked in the middle (3rd) of this group.

Table 4.5: Northern Ireland and its population comparators

Nation	Population	Gold	Silver	Bronze	Medals	Points	Rank	GDP US\$ Billion
Botswana	1,479,039	0	2	3	5	7	4	14.20
Namibia	1,648,000	2	2	6	10	16	3	13.85
Northern Ireland	1,663,000	24	23	39	86	157	2	38.35
Lesotho	2,129,000	1	0	0	1	3	5	5.58
Jamaica	2,921,000	30	25	25	80	165	1	10.61

It can be seen that relative to its closest population comparators Northern Ireland has performed better than might have been expected (2nd rather than 3rd). There are two key reasons for this. First, Northern Ireland has competed in more editions of the Games than the other nations. Second, Northern Ireland has more resources at its disposal to produce medal winning elites. Its GDP of US\$ 38.35 is 2.7 times that of the next highest nations (Botswana and Namibia).

When analysing performance by GDP, Northern Ireland is ranked 3rd in the group of 5 as might be expected, with Wales ranked 1st as also might be expected. However, it is worth noting the performance of Kenya which despite having a population of 28.8m has a GDP less than Northern Ireland and yet is ranked 2nd in the group when it might be expected that Kenya would be ranked 5th.

Table 4.6: Northern Ireland and its GDP comparators

Nation	GDP US\$ Billion	Gold	Silver	Bronze	Medals	Points	Rank	Population
Kenya	33.03	53	42	49	144	292	2	28.8m
Uganda	36.10	8	15	16	39	70	5	23.5m
Northern Ireland	38.35	24	23	39	86	157	3	1.66m
Ghana	44.44	13	17	16	46	89	4	19.3m
Wales	66.25	45	57	78	180	327	1	2.9m

In short, Northern Ireland’s performance relative to macro-economic indicators such as population and GDP are in line with what might be reasonably expected. Interesting enquiries for future research might include analysing the performance of Northern Ireland and Wales. The rationale for this recommendation is that Wales has won more than twice as many medals as Northern Ireland with less than twice the population (1.74 times) and less than twice the GDP (1.73) times.

Key points

- Northern Ireland overall has won medals in 8 sports between 1950 and 2002.
- Men have won medals in 7 of these sports; women have won medals in 4 of these sports; and, medals have also been won in 1 sport (shooting) in which men and women compete on equal terms.
- Following the expansion of the Commonwealth Games in 1998 and 2002 Northern Ireland has not won medals in a significantly increased number of sports in absolute terms and relative to the dominant and emerging nations. These findings help in part to explain Northern Ireland's long term reduction in market share and reliance on 4 sports for 92% of all medals won.
- Relative to population and GDP comparator nations, Northern Ireland performs as well against its peers as might reasonably be expected.

4.5 Market concentration

The term 'market concentration' in the context of elite sport is used to describe the extent to which nations are reliant on a limited number of sports for overall medal winning success. The top three sports and the extent to which Northern Ireland and the sample nations are reliant on them is shown in Table 4.7.

Table 4.7: Market concentration for Northern Ireland and comparator nations

	Most Successful	2nd Most Successful	3rd Most Successful	Total
India	38% Weightlifting	26% Wrestling	20% Shooting	84%
Northern Ireland	43% Boxing	20% Athletics	19% Lawn Bowls	82%
Malaysia	42% Badminton	21% Weightlifting	11% Shooting	74%
Australia	30% Swimming	22% Athletics	8% Cycling	60%
Wales	26% Weightlifting	21% Athletics	11% Lawn Bowls	58%
South Africa	25% Athletics	20% Swimming	11% Lawn Bowls	56%
England	29% Athletics	17% Swimming	8% Shooting	54%
Canada	24% Swimming	18% Athletics	9% Shooting	51%
Scotland	19% Athletics	18% Boxing	14% Swimming	51%
New Zealand	22% Athletics	14% Cycling	13%Swimming	49%

In Table 4.7 it can be seen that India is reliant on weightlifting (38%), wrestling (26%) and shooting (20%) for 84% of all the medals it has won since 1950. Northern Ireland has a 3 sport market concentration of 82%. Furthermore it is dependent on boxing for 43% of its medals and this is the highest market concentration for any of the sample nations’ most successful sport. Nations with a high (greater than 60%) market concentration in their top three sports are examples of nations pursuing a strategy of specialisation (albeit intentionally or unintentionally).

Aggregate figures can mask the fact that some countries choose to specialise not just in, for example, weightlifting generally but in women's weightlifting specifically. In 2002, India won 11 gold medals out of 21 available in women's weightlifting and achieved a market share of 39% in the overall women's weightlifting competition. By contrast male athletes representing India won 0 gold medals and achieved a market share of 6% in the men's weightlifting competition. This finding would suggest a deliberate strategy on the part of India to focus specifically on women's weightlifting rather than weightlifting generally. The number of medals available in weightlifting in 2002 was 46 and has been reduced to 16 for 2006. It would therefore be reasonable to expect India's women athletes to perform less well in 2006 than they did in 2002.

The nature of the Commonwealth Games programme is that some sports are compulsory and must be included in the programme of events and other sports are optional and there is a degree of choice regarding the overall balance of the programme. Thus one obvious strategy for long term success in the Commonwealth Games would be to target sports that are compulsory and which have a high number of medal winning opportunities, for example athletics, swimming and shooting. These sports will contain 46, 44 and 40 events respectively in 2006 and thereby account for 57% of the overall programme. It is perhaps something of a surprise that Northern Ireland has never won an aquatics medal at the Commonwealth Games and serious consideration should be given to reviewing the nation's strategy towards the production of elite swimmers and divers.

Key points

- Northern Ireland's top three most successful sports generate 82% of all medals won at the Commonwealth Games. This is the second highest level of market concentration relative to the comparator nations. Only India (84%) has a higher three sport market concentration percentage.
- Targeting sports which are compulsory components of the Commonwealth Games programme and which have a relatively high number of events, for example athletics, swimming and shooting, is an obvious strategy to pursue for nations wishing to improve their medal table performance.

4.6 Analysis of medals won by gender

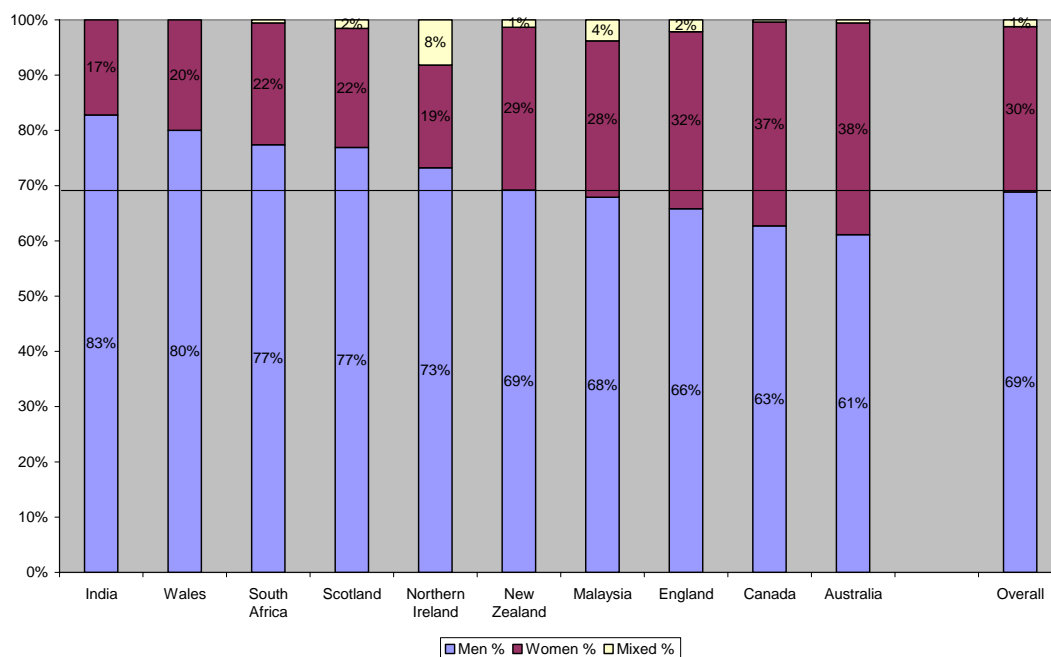
Previous research (UK Sport 2003²) has indicated that examining the overall success of a nation can mask considerable differences in performance by gender. For example, East Germany's success in the Olympic Games between 1968 and 1988 was predominantly attributable to women athletes. In the more modern era, much of the success of the Netherlands in Sydney 2000 and Athens 2004 is as a result of female athletes rather than males.

By contrast, Italy, France and the United Kingdom are heavily dependent on male athletes for their success in the Olympic Games. To a certain extent this has already been demonstrated in the case of Northern Ireland where men typically perform better

² UK Sport (2003) European sporting success: A study of the development of medal winning elites in 5 European countries, UK Sport, London.

than women (Graph 4.12). Graph 4.17 shows the number and the proportion of medals won by gender for Northern Ireland and the comparator countries.

Graph 4.17: Number and proportion of medals won by gender 1950 - 2002



The reference line in Graph 4.17 is drawn at the break point between medals contested by men and women / open categories 1950 - 2002. During this time 69% of medals have been contested by men, 39% by women and 1% by mixed teams. Any nation with blue above the reference line is over reliant on men for its medals; and any nation with burgundy below the reference line is over reliant on women / mixed categories for its success. It can therefore be seen that India, Northern Ireland, Wales, South Africa and Northern Ireland have a disproportionately higher percentage of their medals won by men and consequently a relatively low percentage of their medals won by women. In the case of Northern Ireland the spectacular success of David Calvert is illustrated with 8% of all medals won in the ‘open’ sport of shooting. Interestingly, the three dominant countries, Australia, England and Canada, win a disproportionately high percentage of medals from women athletes.

There is a logic to concentrating on winning women’s medals as much of the growth in the number of events contested has been driven by an increase in medal winning opportunities for women. The extra detail provided by Graph 4.14 enables a more precise diagnosis to be made about Northern Ireland’s recent performance. That is, market share has been lost because Northern Ireland has been unable to maintain its share of medals contested by women as the number of events for women has increased. In a UK context this is not an issue confined to Northern Ireland as the same is true for Great Britain & Northern Ireland at the summer Olympic Games. However, women’s sport at elite level in Northern Ireland is identified as an area for further research to establish if there are any systematic factors which are preventing women athletes from realising their potential.

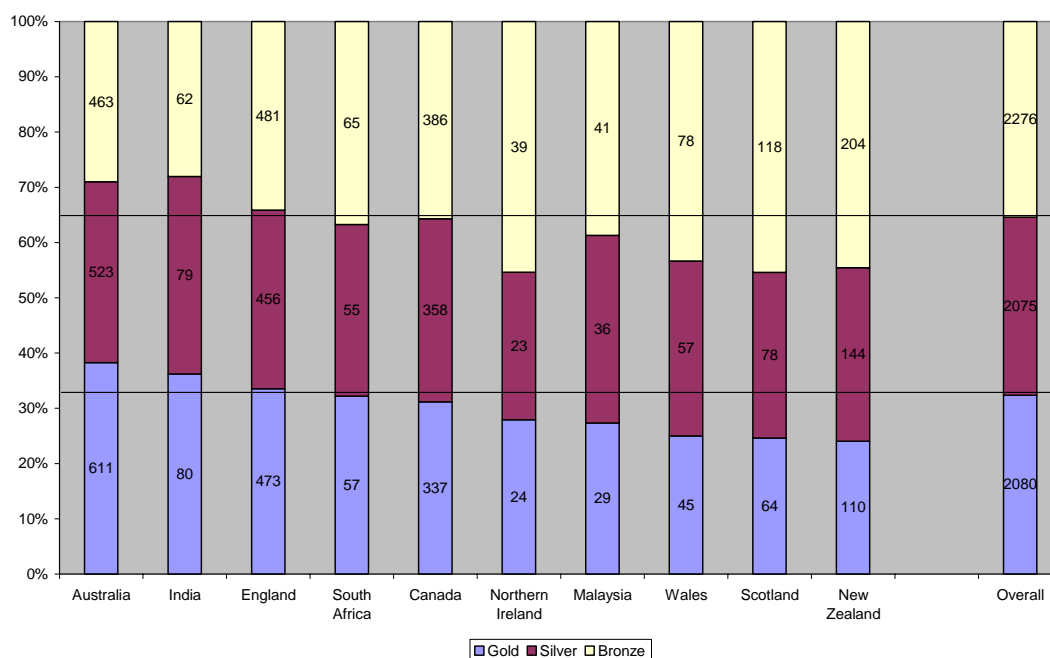
Key point

- Northern Ireland is over reliant on male athletes for its medal winning success.

4.7 Analysis of medals won by type

In the same way that it is possible to analyse the number and proportion of medals won by gender, so too it is possible and worthwhile to look at the number and proportion of medals won by type. In the UK Sport (2003) research Great Britain and Northern Ireland was identified as having the lowest gold medal percentage (22%) of the entire sample of five countries. The relevant data for Northern Ireland and the comparator nations are shown in Graph 4.18.

Graph 4.18: Number and proportion of type of medal won



Since 1950, 6,431 medals have been contested of which 32.3% have been gold, 32.3% silver and 35.4% bronze. The reason why there are more bronze medals contested than gold and silver is because of the practice of awarding two bronze medals in combat sports such as boxing and judo. In boxing, the two losing semi-finalists receive a bronze medal and in judo all first round losers take part in a repechage competition for a bronze medal.

Thus in boxing for example, where there are typically 12 events (11 in 2006), the number of medals contested is 48 (12 x 4) rather than 36 (12 x 3). Similarly in Judo where 14 events were contested in 2002 (0 in 2006) the distribution of medals was 14 gold, 14 silver and 28 bronze. The two reference lines are drawn at the points which equal the proportion of medals awarded by type between 1950 and 2002 i.e. at 32.3% for gold, 32.3% for silver and 35.4% for bronze.

Australia (38%), India (36%) and England (34%) all achieve a higher percentage of gold medals won relative to the percentage of gold medals awarded (32.3%). Consequently these nations also win a lower proportion of silver and bronze medals. By contrast, Canada, Northern Ireland, Malaysia, Wales, Scotland and New Zealand all score a disproportionately low level of gold medals and consequently a disproportionately high level of silver and bronze medals. Northern Ireland has a below average gold medal percentage (27%) and the second highest bronze medal

percentage (45.3%). Many of the bronze medals won by Northern Ireland (20/39 or 51%) have been won in boxing in which two bronze medals are awarded in each event.

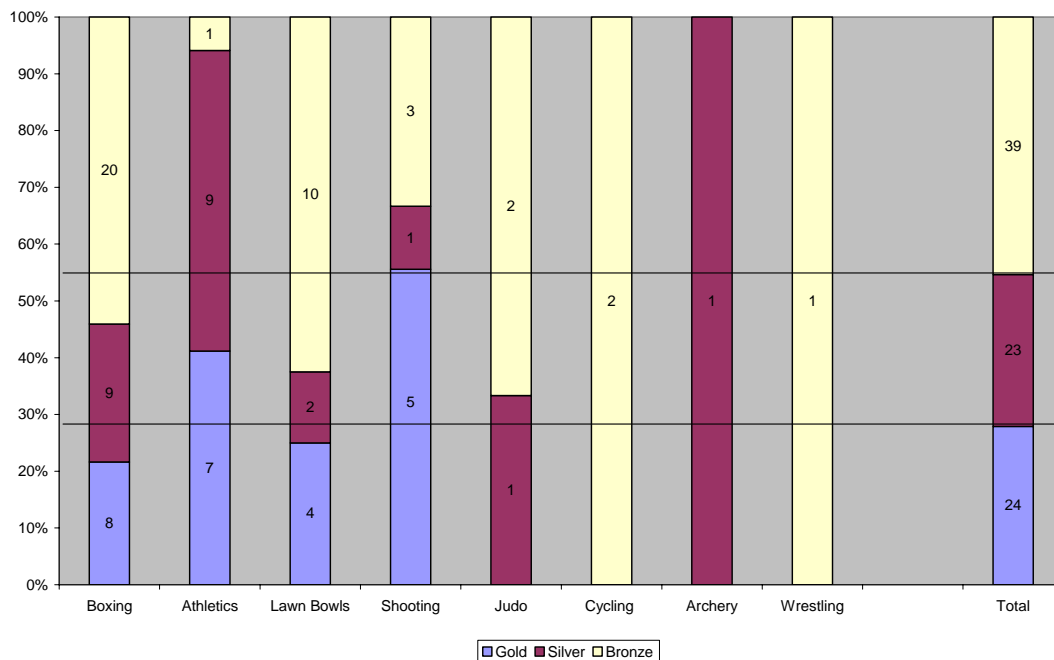
Key point

- Northern Ireland has a below average gold medal percentage and the second highest bronze medal percentage in the sample of comparator nations.

4.8 Breakdown of success by sport

Graph 4.19 provides an analysis of the medals won in each of the 8 sports in which Northern Ireland has won at least one medal between 1950 and 2002. Reference lines have been drawn to coincide with the proportion of gold medals (27%) and silver medals (28%) won by Northern Ireland overall.

Graph 4.19: Analysis of medal winning success by sport



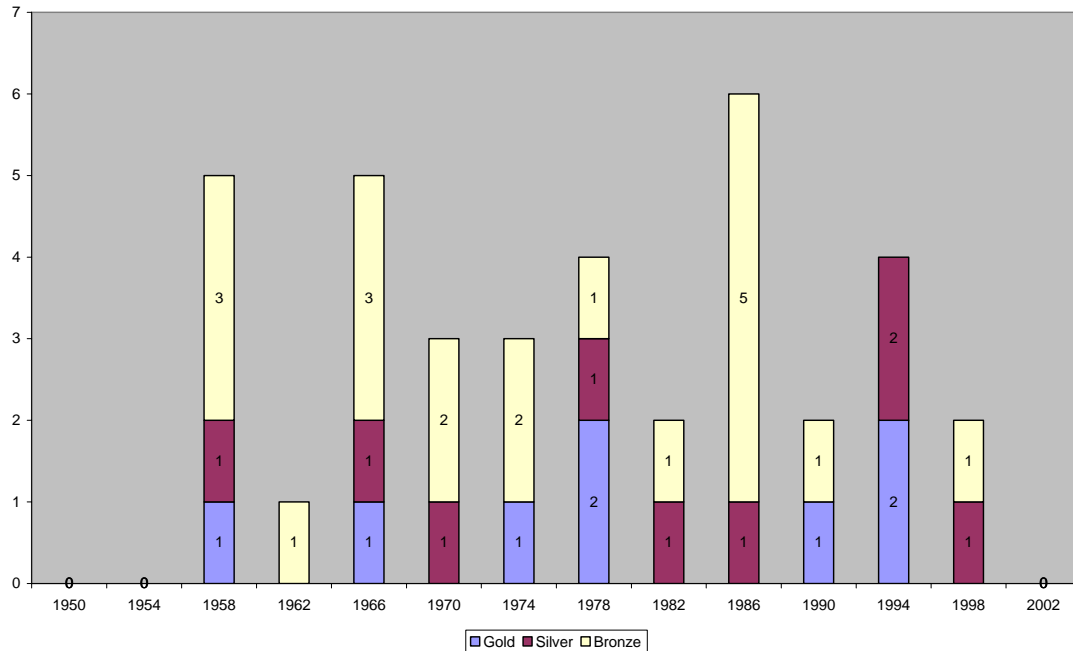
There are three key findings from Graph 4.19 that are worth highlighting. First, all of Northern Ireland’s gold medals to date have been won in boxing, athletics, lawn bowls and shooting. As has been noted earlier, 92% of all medals won by Northern Ireland have been won in boxing, athletics, lawn bowls and shooting. Graph 4.19 reveals that these four sports contribute 100% of Northern Ireland’s gold medal tally. Second, the proportion of gold medals won in athletics and shooting is higher than the overall Northern Ireland gold medal average (see reference line); whilst for boxing and lawn bowls the gold medal percentage is below average. Third, four of the five gold medals won in shooting have been won wholly or in part by one athlete, Peter Calvert. In 2002 Calvert won both of Northern Ireland’s gold medals to maintain the long term average of around 2 gold medals per edition.

Given the importance of boxing, athletics, lawn bowls and shooting to Northern Ireland’s overall success, we now examine performance and trends in these sports on a sport by sport basis.

4.9.1 Performance in boxing

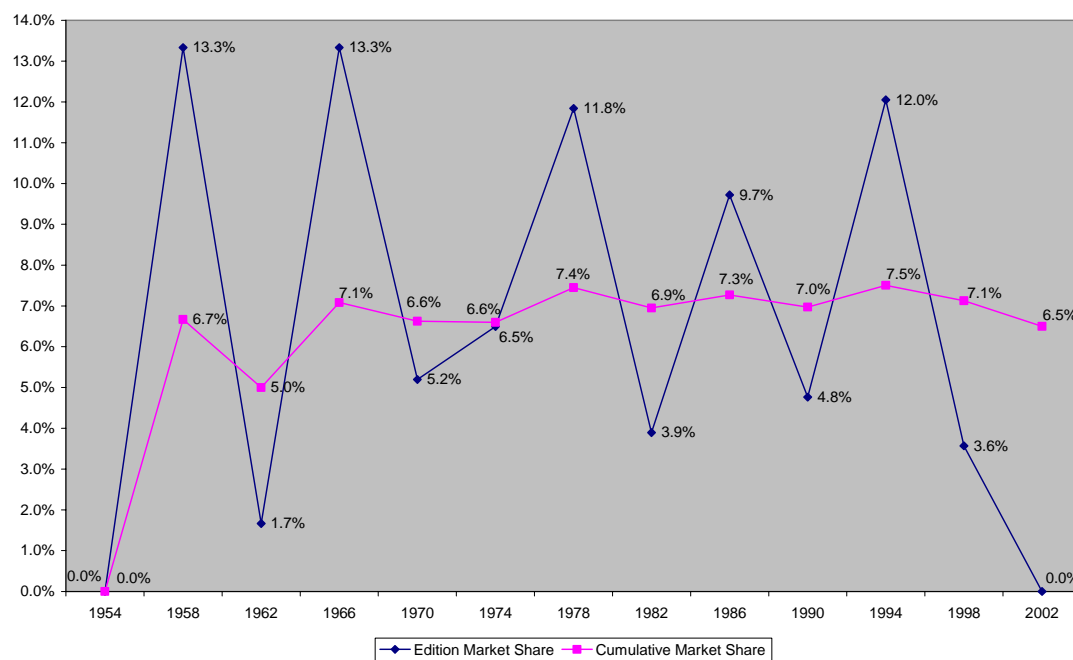
The total number of medals won in boxing by Northern Ireland is shown in Graph 4.20 and the market share achieved in athletics is shown in Graph 4.21.

Graph 4.20: Absolute achievement in boxing



Northern Ireland has an impressive record in boxing at the Commonwealth Games with unbroken record of medal winning success from 1958 to 1998. However, apart from 1994 when 2 gold medals were won and 1986 when 6 medals were won in the boycotted Games, the post 1978 era has seen something of a decline in Northern Ireland's performance in boxing.

Graph 4.21: Market share in boxing

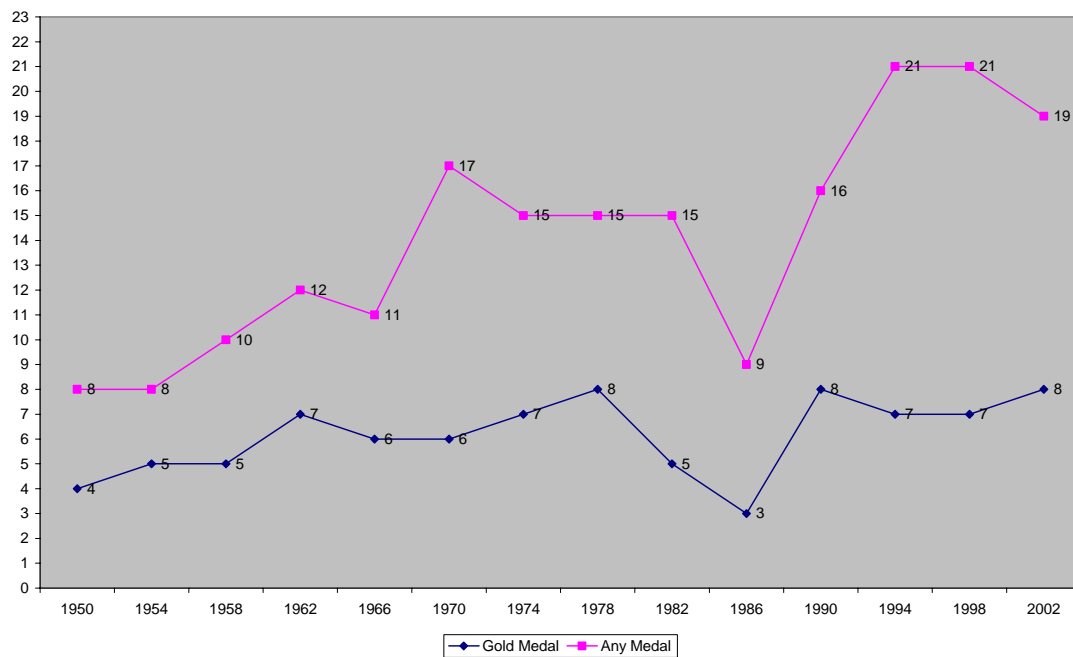


As the number of boxing events has increased and Northern Ireland's performance has deteriorated, it would be expected that market share in boxing would also decline. This is confirmed in Graph 4.18 where cumulative market share in 2002 (6.5%) is the lowest it has been since 1962 (5.0%) and the trend line can be seen to be on a downward slope.

One potentially worrying trend in boxing is the two consecutive reductions in market share in 1998 and 2002. Northern Ireland's performance has typically fluctuated up and down randomly, but it has never declined in consecutive Games until 2002. In 2002 boxers representing Northern Ireland contested 10 of the 12 events in boxing and between them won a total of 1 bout.

It is our view that one reason why Northern Ireland's performance in boxing is in decline is because competition for boxing medals is increasing as more and more nations develop a genuine medal winning capability. This point is illustrated in Graph 4.22

Graph 4.22: Evidence of increased competition in boxing



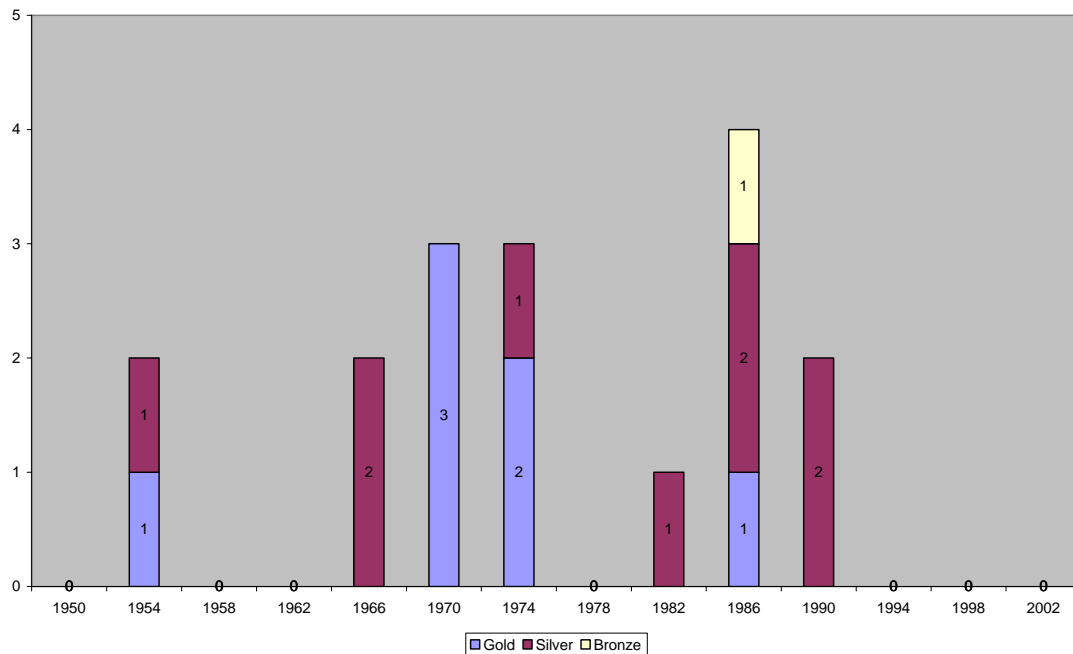
In 1950 4 nations won a gold medal and 8 nations won a medal of any hue in a boxing competition comprising of 8 events and a total of 3 medals per event (i.e. no extra bronze for losing semi-finalists). By 2002 the boxing programme had grown to 12 events and 48 medals (4 per event). In 2002 8 nations won a gold medal in boxing and 19 won any medal. This evidence suggests that as more nations have developed the ability to win medals so too competition for such medals must have increased.

Therefore Northern Ireland's relative decline in recent Commonwealth Games' boxing tournaments must be seen in the context of the external environment of increasing competition from other nations. By not responding to changes in the external environment and not altering the systems and structures that produce elite boxers, Northern Ireland's performance in boxing at the Commonwealth Games will continue to be below its historical average.

4.9.2 Performance in athletics

The total number of medals won in athletics by Northern Ireland is shown in Graph 4.23 and the market share achieved in athletics is shown in Graph 4.24.

Graph 4.23: Absolute achievement in athletics



Graph 4.23 indicates that most of Northern Ireland's success is historical with the most successful period being between 1966 and 1974 when both Mary Peters (3 gold and 1 silver) and Michael Bull (2 gold and 2 silver) were at their competitive peaks. Since 1974 Northern Ireland has won 1 gold medal in the boycotted Games of 1986 when competition was reduced. In the most recent past, no athlete representing Northern Ireland has won a medal in athletics at the Commonwealth Games since 1990. Further analysis of performance reveals that Northern Ireland's success in athletics has been achieved by 8 athletes of whom 4 have won a gold medal as shown in Table 4.8

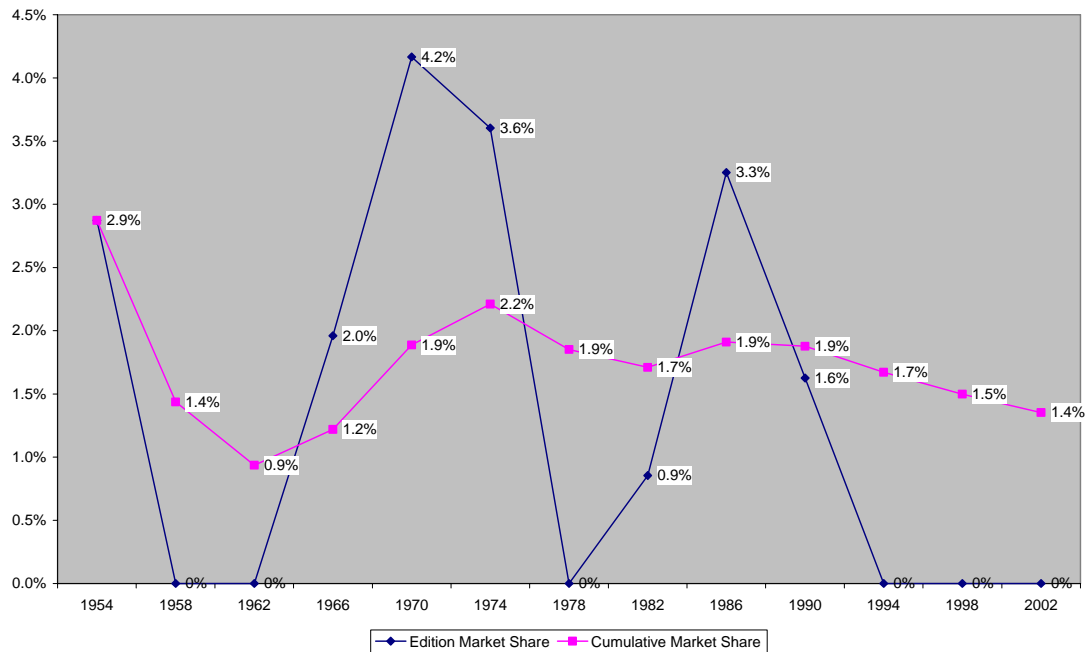
Table 4.8: Northern Ireland's success in athletics by name

Name	Gold	Silver	Bronze	Total
Mary Peters	3	1	0	4
Michael Bull	2	2	0	4
Thelma Hopkins	1	1	0	2
Phillip Beattie	1	0	0	1
Martin Girvan	0	2	0	2
Janet Boyle	0	1	1	2
Sharon Hutchings	0	1	0	1
Jackie McKernan	0	1	0	1
Totals	7	9	1	17

Table 4.8 suggests that Northern Ireland has been reliant on a minority of athletes for its success in athletics. These athletes tend to be 'one-offs' rather than the products of

a system. It would be reasonable to expect that if Northern Ireland's performance in athletics has been in decline, then this would be reflected in market share analysis.

Graph 4.24: Market share in athletics

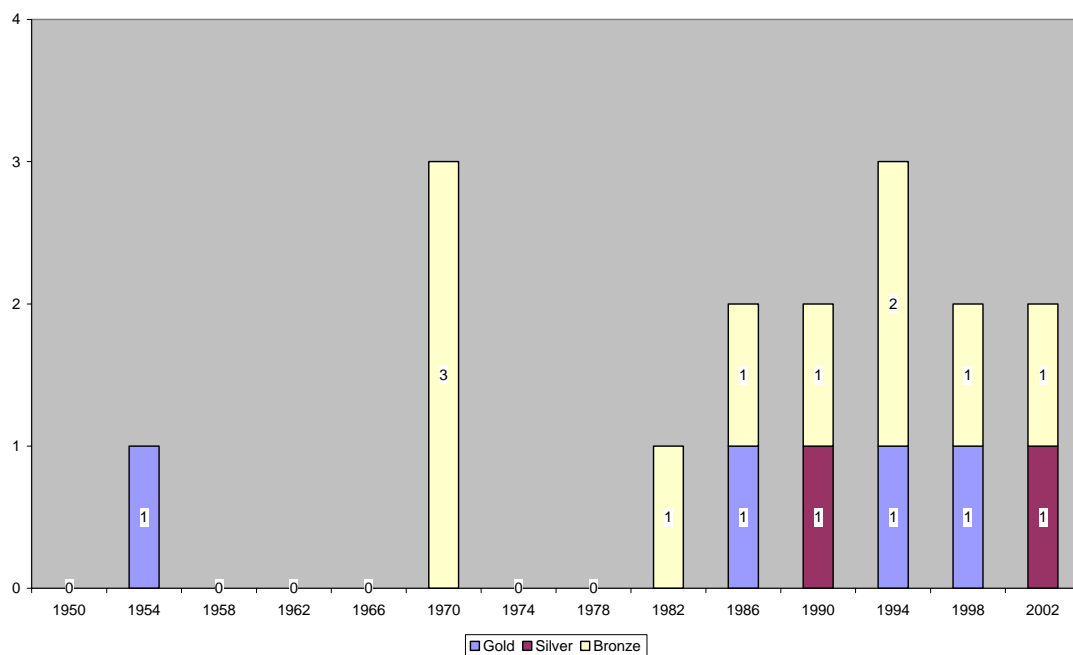


In Graph 4.24 the result of no medal wins since 1990 is that the cumulative market share trend line is on a downward slope. Northern Ireland's performance in athletics peaked in the 1970s and apart from a flourish in 1986, has been in decline since.

4.9.3 Performance in lawn bowls

Lawn bowls has been contested in 13/14 editions (not 1966) of the Commonwealth Games between 1950 and 2002. Northern Ireland's absolute performance in lawn bowls is shown in Graph 4.25.

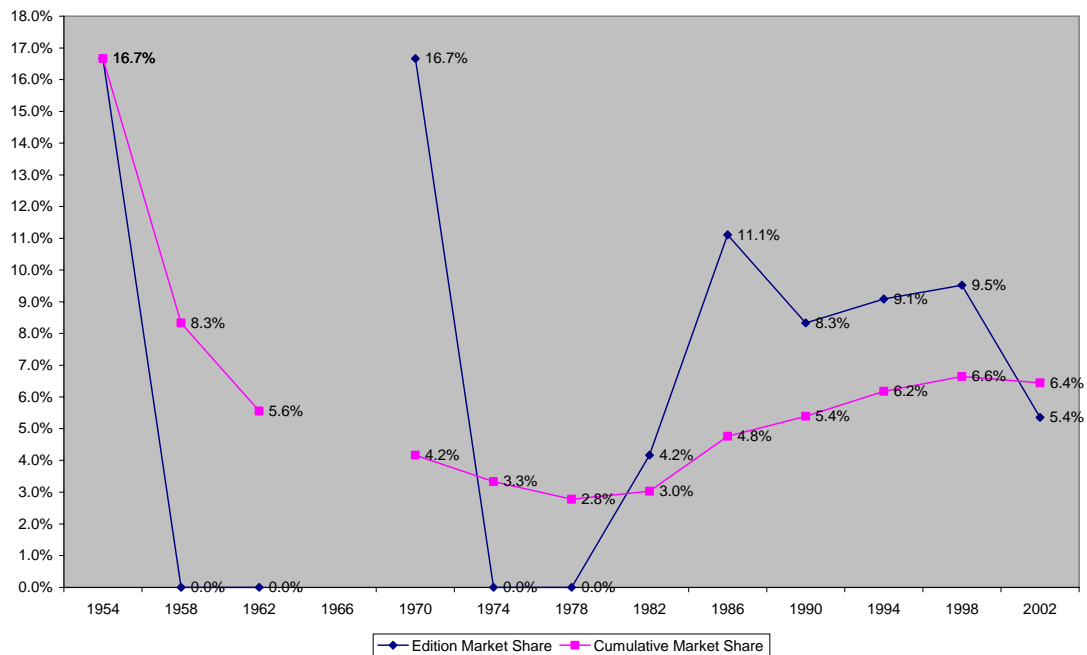
Graph 4.25: Absolute achievement in lawn bowls



The number of lawn bowls events has varied from 3 (1950 to 1978) to 4 (1982) and more recently 6-8. In 2006 there will be 6 lawn bowls events. Since 1994 it has been the policy in lawn bowls for 4 medals (2 bronzes) to be awarded in each event.

Graph 4.25 makes an interesting comparison to boxing (Graph 4.20) and athletics (Graph 4.23) as it indicates that the majority of Northern Ireland's success in lawn bowls has been contemporary rather than historical. If the proposition that success has been more recent than in the past is accepted, it would be reasonable to expect to see a rising market share trend line. Market share and cumulative market share for Northern Ireland in lawn bowls is shown in Graph 4.26.

Graph 4.26: Market share in lawn bowls



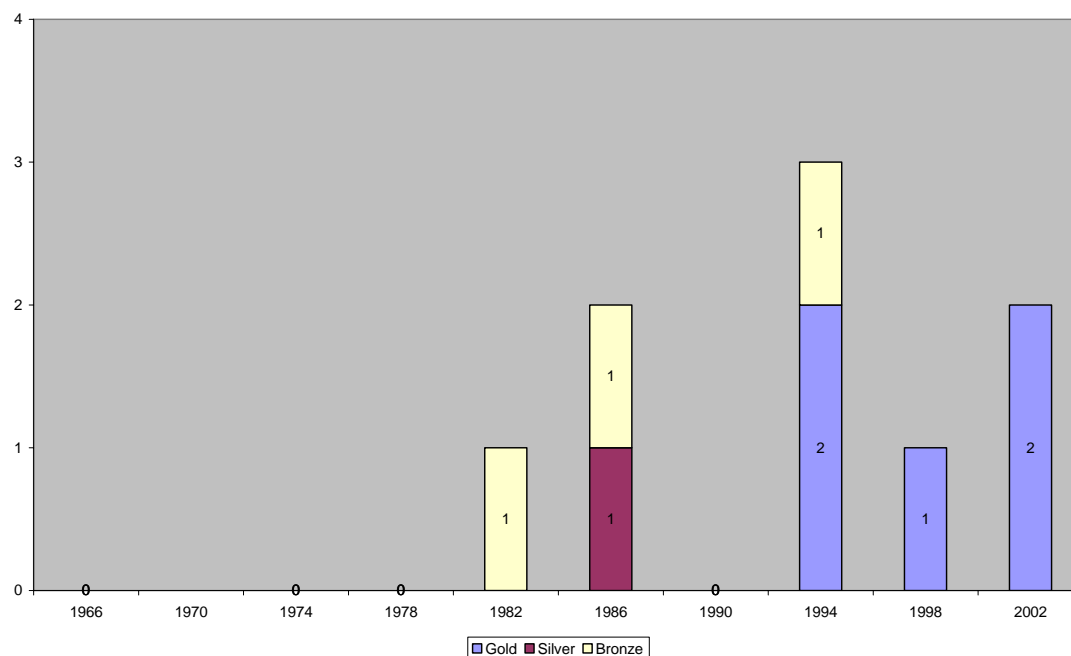
Since 1982 Northern Ireland has achieved a market share in lawn bowls ranging from a minimum of 4.2% (1982) to a maximum of 11.1% (1986). Achievement between 1990 and 1998 was remarkably consistent rising from 8.3% market share to 9.5% in the period. As the number of events increased in 2002 from 6 to 8 it proved difficult for Northern Ireland to maintain market share at its previous levels. Nonetheless, the point that success has been more recent than in boxing and athletics is well made by the data. This phenomenon is reflected in the rising trend line for cumulative market share which shows an upward slope from 1982 to 1998 with a marginal tail off in 2002.

4.9.4 Performance in shooting

Shooting has been Northern Ireland's fourth most successful sport in terms of medals won (9) and the third most successful in terms of gold medals won (5/24). The sport was first introduced to the Commonwealth Games programme of events in Kingston 1966 where 5 events were contested. After a break in 1970, shooting returned in 1974 with 6 events and has featured in every Games since, growing from 6 events in 1974 to 40 in 2002. In total shooting has been contested in 9/14 of the last editions of the Games.

In 2006 shooting will continue to contain 40 events in an overall programme that has been reduced from 281 to 227 events. Therefore, shooting will represent an increased proportion of total medals (17.6% in 2006 v 14.2% in 2002). Northern Ireland's performance in the sport is shown in Graph 4.27.

Graph 4.27: Absolute performance in shooting



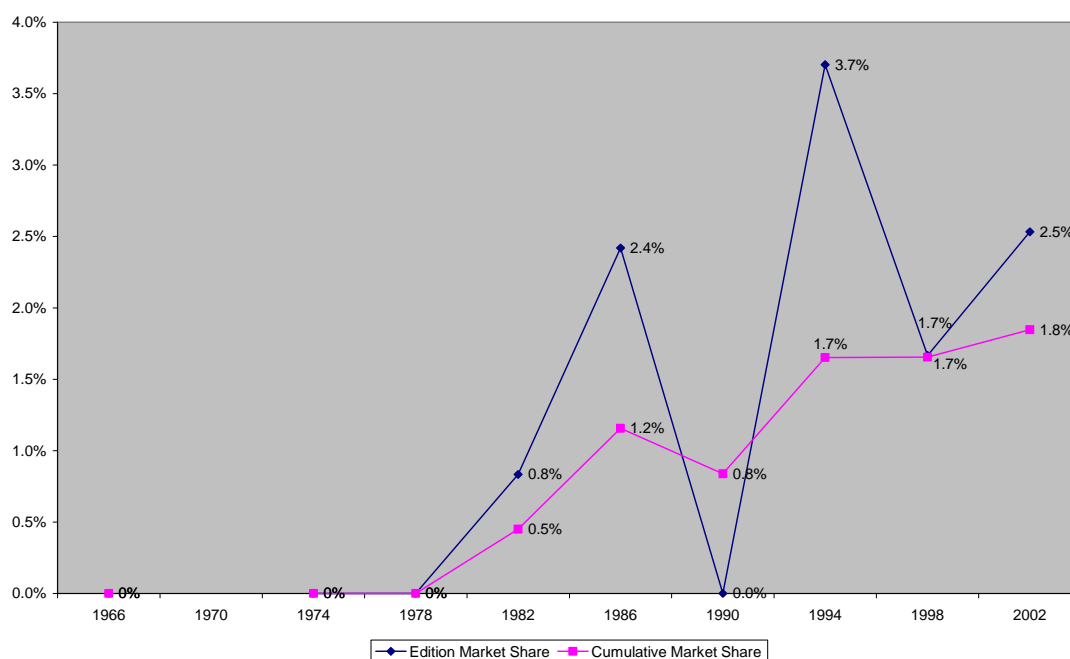
Graph 4.27 illustrates that Northern Ireland's success in shooting has been predominantly in the three most recent editions of the Games (6/9 medals won and 5/5 gold medals won). Although there have been a minimum of 30 and a maximum of 40 shooting events contested at each Games it should be noted that all of Northern Ireland's medals have been won in just 3 events, namely:

- Fullbore Rifle Queen's Prize (Ind) (2 gold);
- Fullbore Rifle Queen's Prize (Pair) (2 gold, 3 bronze);
- Men's Olympic Trap (Team) (1 gold, 1 silver).

No doubt ably assisted by partners (Hazel Mackintosh and Martin Millar) in the pair's event, the common element to all of the Fullbore Rifle medal wins has been the involvement of David Calvert. Calvert is widely regarded as one of the most enduring Commonwealth Games' competitors of all time. His record is such that he has contributed 4/24 (17%) of Northern Ireland's gold medals in the Commonwealth Games since 1950 and 7/86 (8%) of all medals won in the same period.

As a result of the recent successes in shooting, it would be reasonable to expect the market share and cumulative market share trend lines to be on an upward path. This is shown to be the case in Graph 4.28.

Graph 4.28 Market share in shooting



As can be seen in Graph 4.28 the predicted cumulative market share trend line is upwards sloping and confirms that like lawn bowls, and unlike boxing and athletics, performance in shooting has been better in the more recent editions of the Games than in the more distant editions. Whether the positive performances in lawn bowls and shooting are the result of a successful strategic approach to produce elite athletes in these sports cannot be answered by the analysis of historical data in isolation. However, data such as that presented in this report can help to ensure that the correct questions are asked when evaluating performance.

Key Points

Boxing

- Boxing has been Northern Ireland's most successful sport in the Commonwealth Games. The evidence suggests that most of this success has been historical and in recent times the number of medals won in boxing has been in decline.
- Northern Ireland has been successful in terms of boxers reaching semi finals and therefore winning bronze medals, but less successful in getting to finals and winning silver or gold. There is clear evidence that competition for medals in boxing has increased.

Athletics

- Northern Ireland's performance in athletics is predominantly historical with the most successful period being the Peters and Bull era between 1966 and 1974. No Northern Ireland athlete has won a medal of any sort in athletics since 1990.

- The 17 medals won in athletics by Northern Ireland have been won by 8 different athletes. In our view, this indicates an over reliance on a talented minority rather than evidence of a successful system of 'production'.

Lawn Bowls

- Lawn Bowls is a sport in which Northern Ireland's success has been contemporary rather than historical. Medals have been won in every edition of the Games from 1982 to 2002. Consequently, the cumulative market share trend line for lawn bowls is on an upward slope.

Shooting

- Northern Ireland has enjoyed considerable success in shooting events since 1982, winning 5 gold, 1 silver and 3 bronze medals. This success has been achieved in just 3 events and the same individual has had a hand in 7/9 medals won to date.

4.10 Elite Athletes with a Disability (EAD)

In Manchester 2002, events for Elite Athletes with a Disability (EAD) were integrated within the overall programme for the first time. A total of 10 events in 5 different sports was contested as listed below.

<p>Athletics Men's 100 Meters EAD Women's 800m Wheelchair</p> <p>Weightlifting Men's EAD Event</p> <p>Swimming Men's 100m Multi Disability Freestyle Women's 100m Multi Disability Freestyle Men's 50m Multi Disability Freestyle Women's 50m Multi Disability Freestyle</p> <p>Lawn Bowls Men's Triples EAD Women's Singles Blind</p>
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The 10 EAD events accounted for 3.6% of the overall programme and in Melbourne 2006 12 of the 227 events will make up 5.3% of the overall programme. EAD events in Melbourne will exceed the number of boxing events (11) and should therefore be regarded as an increasingly important part of the Commonwealth Games programme. Clearly, there exists an opportunity for nations to capitalise on the medal winning opportunities available in EAD events by ensuring that people eligible to take part in EAD events are given the opportunity to fulfil their potential and to contribute

meaningfully to Northern Ireland's future success in the Commonwealth Games' medal table.

In order to analyse performance in the 10 inaugural EAD events in 2002 we have produced an EAD medal table which is shown in Table 4.9.

Table 4.9: Manchester 2002 EAD medal table

Rank	Nation	Gold	Silver	Bronze	Total	Points	Mkt Share %
1	Australia	2	2	1	5	11	18.3%
2	South Africa	2	2	1	5	11	18.3%
3	England	2	0	1	3	7	11.7%
4	Nigeria	2	0	0	2	6	10.0%
5	Canada	1	3	3	7	12	20.0%
6	Scotland	1	0	0	1	3	5.0%
7	Malaysia	0	1	3	4	5	8.3%
8	Wales	0	1	1	2	3	5.0%
9	Zimbabwe	0	1	0	1	2	3.3%
	Totals	10	10	10	30	60	100.0%

Australia, South Africa, England and Nigeria all won 2 gold medals in 2002 and Canada secured a 20% market share by virtue of winning 1 gold, 3 silver and 3 bronze medals. In the case of Nigeria the importance of EAD events can be appreciated by the fact that the 2 gold medals won in EAD events represents 2/5 (40%) of Nigeria's total gold medals in 2002. The profile of EAD events and competitors has the potential to be high as manifest by the South African swimmer Natalie du Toit who was presented with the David Dixon Award for outstanding athlete of the 2002 Commonwealth Games as well as being named South Africa's top Sportswoman of 2002.

From a planning perspective, it should be noted that there appears to be considerable variability in the EAD events included in the Commonwealth Games. The Melbourne 2006 programme will be: Swimming (4 events), Athletics (6), Table Tennis (1) and Powerlifting (part of the Weightlifting programme) (1). Thus it is more difficult to take a long term strategic approach to EAD events than it is to the compulsory sports because the planning horizons are much shorter. Nonetheless, EAD events do present a new opportunity for nations seeking to achieve success in the Commonwealth Games.

Key point

- EAD events are a recent addition to the Commonwealth Games programme and in Melbourne 2006 the 12 EAD events will represent 5.3% of the overall programme. There will be more EAD events than boxing events (11 events in 2006).

5. CONCLUSIONS

The data presented in this report, and the limited interpretation of it, are designed to stimulate debate amongst those charged with delivering medal winning success for Northern Ireland in the Commonwealth Games. It is not possible to comment meaningfully on future policy without first analysing current policy and being aware of public opinion in Northern Ireland.

In the case of public opinion there are interesting precedents that have been set by UK Sport and **sportscotland**. UK Sport commissioned three public Sporting Preferences surveys in 2000, 2001 and 2002 to find out the public's attitudes towards sporting success and to obtain a feel for the sport in which people would most like to see success achieved. It might be interesting to conduct similar research in Northern Ireland notably given that the previously successful sports of boxing and athletics are in relative decline, whereas lawn bowls and shooting are sports which have followed an upward path in recent editions of the Games.

The most recent of these reports can be accessed via the following hyperlink:
<http://www.uk sport.gov.uk/template.asp?id=1262>

In Scotland a similar programme of national level research conducted before the 2002 Commonwealth Games found that 80% of adults felt that it was important to them that Scotland was successful in the Commonwealth Games. Consequently, **sportscotland** considers that it has a public mandate to achieve success at national level and uses its resources to that end accordingly.

Within the confines of our brief, this report should be viewed as a contribution to the overall debate about elite sport in Northern Ireland using an independent analysis of data freely available in the public domain.

The key points emerging from the entire report are restated in summary form below. The rationale for these points is contained within the report and it is important that snippets of information are not taken or used out of context.

Context

- The number of nations contesting the Commonwealth Games has increased from 12 in 1950 to 72 in 2002 and future editions of the Games are explicitly targeting representation of all nations (currently 71).
- The number of athletes contesting the Commonwealth Games has increased from 590 in 1950 to 3,690 in 2002 and a predicted 4,500 in 2006.
- The number of sports has increased from 9 in 1950 to 17 in 2002. Melbourne 2006 will have 16 sports and Delhi 2010 has 15 sports already confirmed.
- The number of events increased from 88 in 1950 to 281 in 2002. 2002 was likely to be the peak year and in 2006 only 227 events will be contested.
- In 2006 4 sports (athletics, swimming, weightlifting and shooting) will account for 64.3% of all events.
- The number of events contested by women will have grown from 17 (19%) in 1950 to 100 (44%) in 2006.

Evidence of increasing competition

- Competition, defined by the number of countries capable of winning medals, has increased thereby making medals increasingly difficult to win.
- Some of the increase in competition can be explained by nations taking a state sponsored strategic approach towards the 'production' of medal winners.
- There is a very strong relationship ($r = 0.91$) between the number of nations contesting the Commonwealth Games and the number of nations winning any medal.

Northern Ireland's performance in the Commonwealth Games

- Four sports, boxing, athletics, shooting and lawn bowls account for 92% of all medals won by Northern Ireland in the Commonwealth Games between 1950 and 2002.
- Northern Ireland has averaged 6 medals per Commonwealth Games between 1950 and 2002. Despite the increasing number of events the last two editions of the Games have both yielded 5 medals (i.e. a below long term average performance).
- Northern Ireland's best Commonwealth Games was 1986 when 15 medals were won. This edition was boycotted and only 26 nations took part. 5/15 medals won were bronze medals in boxing, a sport in which 2 bronze medals are awarded per event to the losing semi-finalists.

Market concentration

- Northern Ireland's top three most successful sports generate 82% of all medals won at the Commonwealth Games. This is the second highest level of market concentration relative to the comparator nations. Only India (84%) has a higher three sport market concentration percentage.
- Targeting sports which are compulsory components of the Commonwealth Games programme and which have a relatively high number of events, for example athletics, swimming and shooting, is an obvious strategy to pursue for nations wishing to improve their medal table performance.

Medals won by gender

- Northern Ireland is over reliant on male athletes for its medal winning success.

Medals won by type

- Northern Ireland has a below average gold medal percentage and the second highest bronze medal percentage in the sample of comparator nations.

Medals won by sport: Boxing

- Boxing has been Northern Ireland's most successful sport in the Commonwealth Games. The evidence suggests that most of this success has

been historical and in recent times the number of medals won in boxing has been in decline.

- Northern Ireland has been successful in terms of boxers reaching semi finals and therefore winning bronze medals, but less successful in getting to finals and winning silver or gold. There is clear evidence that competition for medals in boxing has increased.

Medals won by sport: Athletics

- Northern Ireland's performance in athletics is predominantly historical with the most successful period being the Peters and Bull era between 1966 and 1974. No Northern Ireland athlete has won a medal of any sort in athletics since 1990.
- The 17 medals won in athletics by Northern Ireland have been won by 8 different athletes. In our view, this indicates an over reliance on a talented minority rather than evidence of a successful system of 'production'.

Medals won by sport: Lawn Bowls

- Lawn Bowls is a sport in which Northern Ireland's success has been contemporary rather than historical. Medals have been won in every edition of the Games from 1982 to 2002. Consequently, the cumulative market share trend line for lawn bowls is on an upward slope.

Medals won by sport: Shooting

- Northern Ireland has enjoyed considerable success in shooting events since 1982, winning 5 gold, 1 silver and 3 bronze medals. This success has been achieved in just 3 events and the same individual has had a hand in 7/9 medals won to date.

Events for Elite Athletes with a Disability

- EAD events are a recent addition to the Commonwealth Games programme and in Melbourne 2006 the 12 EAD events will represent 5.3% of the overall programme. There will be more EAD events than boxing events (11 events in 2006).

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