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EVALUATING THE REPRESENTATION OF THE DIFFERENT WORLD STATES ON INTERNATIONAL FOIL MEN CONTESTS, BASED ON OBJECTIVE CRITERIONS

INTRODUCTION

Fencing is one of the few sports disciplines which were included in the official program of the first modern Olympic Games in 1896 (1, 4, 14). The tournaments in fencing are held in a knockout format by rules. According to the official rules, points for the international range-list are given to the first 62 competitors while the rest do not receive any points (8, 12). For any contest the most prestigious ranking is the top 16 ranking. Every year there are several tournaments of classes A, and Grand Prix(GP) and one World championships(CH). If we consider the Olympic games once in four years and the fact that each contest is held for three kinds of arms, the great variety of rankings in fencing becomes obvious. That fact makes the objective evaluation of the achievements of the different states very difficult.

MATERIALS AND METHODS

The **purpose** of this study is to determine the most successful nations in the foil men tournaments for the last 10 years.

On figure 1 we present the probability density function (PDF) of the number of participations of the different countries in the tournaments of classes A and GP, along with the best fit (lognormal PDF) (2, 5, 9, 11). We show this graph only to give a visualization of the skewness and the kurtosis of the PDFs we estimated for all variables we studied(9, 11, 13). For example:

1. In the tournaments of the classes A and GP, the 3 leading nations – Italy, Germany and France – with 24, 7 % of the participations won 32. 8 % of the medals;
2. In the CH the same 3 countries with 42% of the participations won 67% of the medals.

We have introduced two indexes for better determination of the most successful nations in a previous article of ours (3). Here we will use a combination of them to further refine our conclusions concerning the success rate in the fencing tournaments. The new index we constructed is called the Medal Index (MI) and represents the ratio between the medals won and the top 16 rankings for each nation for every kind of contest for the last 10 years (2003-2012). The meaning of the index, accordingly, is to show how many medals won each of the rankings in the top 16. In this way the greater the value of the index, the better the success rate. On figures 2- 7 we introduced the

ranking of the countries based on the Index of efficiency of the first 16(EP) and the Index of efficiency of the medals won(EM) (3).

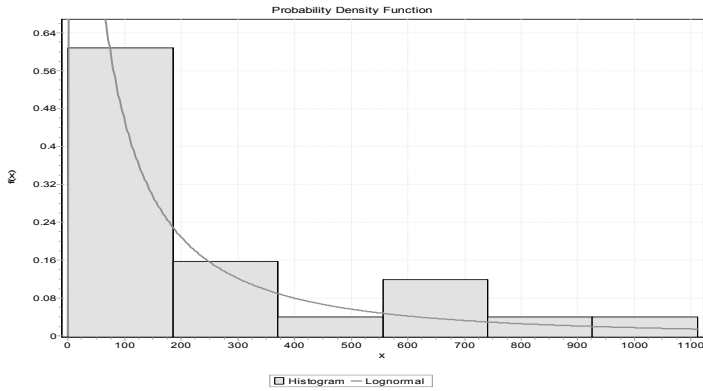


Fig. 1

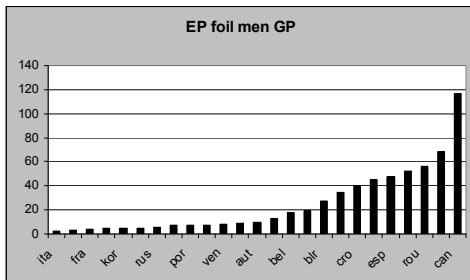


Fig. 2

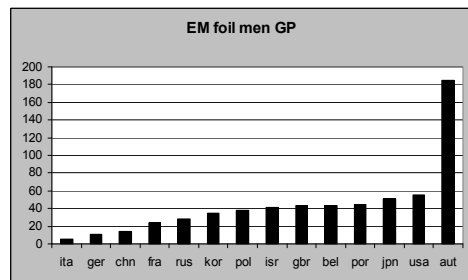


Fig. 3

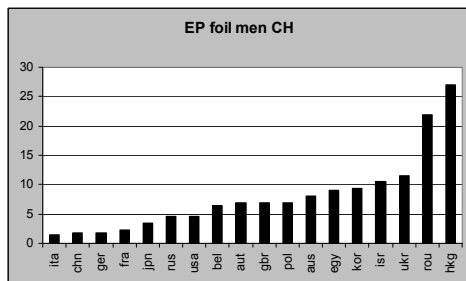


Fig. 4

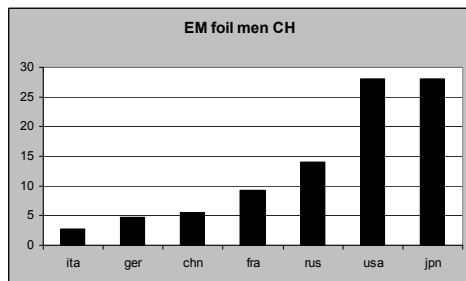


Fig. 5

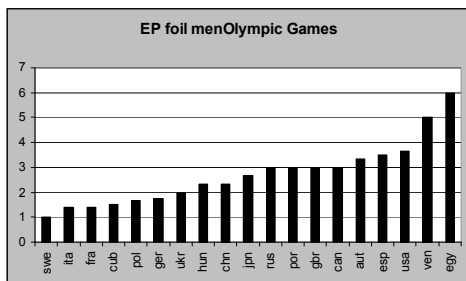


Fig. 6

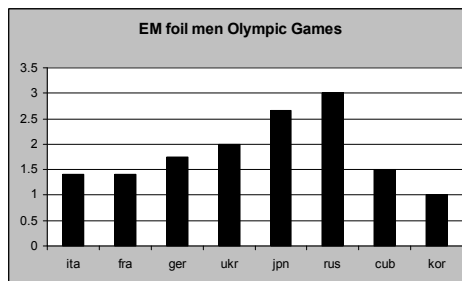


Fig. 7

RESULTS AND DISCUSSION

It is obvious that there are several nations which take the top rates in each graph – Italy, France, Germany, Russia, China, Japan, USA. The invariable winner (with only one exception – EP-index for the Olympic games) is Italy. The other leading nations in the top three were determined to be Germany and France (3). On figures 8-11 we present the rankings of nations according to the MI for different kinds of contests. According to this efficiency indicator the results are not so undisputable. We invariably find Italy in the top 3 places in every kind of contest, but nevertheless the results are not as explicit, especially concerning the other two countries – France and Germany. In almost every different kind of tournament we detect nations which are relatively bad performers on the whole (such as Croatia and Great Britain) to rate at leading places.

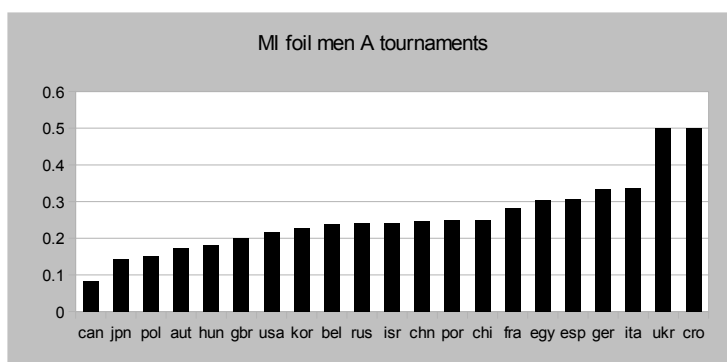


Fig. 8

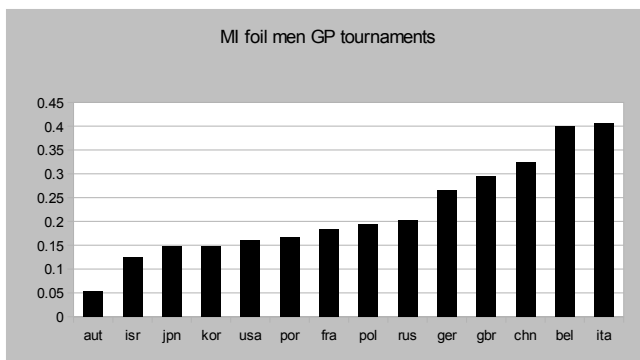


Fig. 9

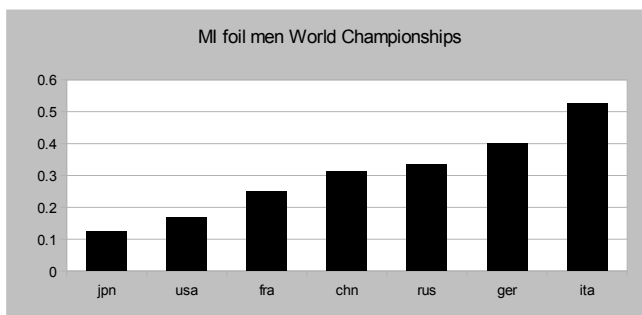


Fig. 10

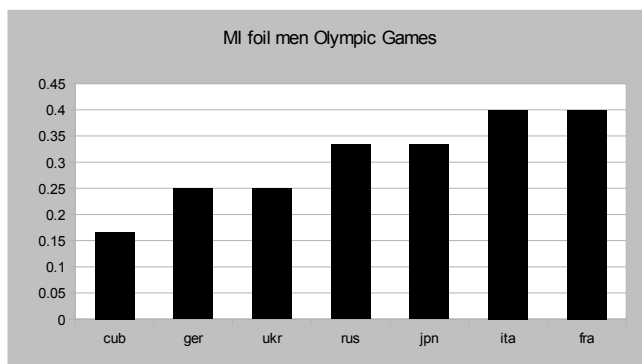


Fig. 11

Conclusions

1. The statistical distribution of the number of participations in foil men contests is strongly skewed. This fact indicates the great segregation that exists between the leading nations and the lagging ones in this sports discipline.
2. We found that the 3 leading nations – Italy, France and Germany – won disproportionately big percent of the medals if taken into account the number of their participations. We think the explanation of that fact is the existence of “a hard core” in these states’ teams – a relatively large number of very well trained competitors who participate in a lot of contests and rank between the first 16 (and win medals) accordingly.
3. The values of MI show that nations which are relatively bad performers on the whole are rated at leading places. This probably means that whenever a lagging nation succeeds in “raising” (a) good competitor(s) he(they) is(are) so well trained that he(they) penetrate(s) to the medals and defeat the leaders. This fact shakes our previous proposal for the existence of some kind of positive monotonous dependence (6, 10, 13) between the medals won and the rankings up to 16-th place and the total number of participations.

LITERATURE

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The development of the foil sports discipline was analyzed, using the data for the ratings of the international competitions managed by FIE through the last 10 years. We estimated the probability density functions /PDF/ of the number of participations of the world states in all kinds of contests and found that they are very leptokurtic and skewed. We reached the same results for the PDFs of the rankings up to 16-th place and the medals won. We found that three states – Italy, Germany and France - dominate over the others with comparatively few contestants who won disproportionately large number of the medals and top 16 rankings. For example these three states won 32.8% of the medals with 24.7% of the participations on class A and Grand Prix contests and with 42% of the participations they won 67% of the medals on World championships . Additionally to this raw data and the two indexes we constructed based on the ratings – EP and EM we introduced Medals Index /MI/ - the ratio between the medals won and the top 16 rankings for each nation for every kind of contest for the last 10 years (2003-2012). Using the first two of the indexes we found that the most successful state in almost all competitions /with one exception – the Olympic games/ is Italy. The MI results are not so undisputable – there are lagging (on the whole) countries which penetrated to the medals in almost every kind of foil men tournament. We also recognized that the previously established preliminary evidences for the existence of a positive monotonous dependence between the medals won and the rankings up to 16-th place and the total number of participations is not unquestionable.

Key words: *fencing, foil, rankings, medals, probability density function, rank-list, objective evaluation.*