

Letter to the Editor

How Many Athletes Qualified for the London Olympic Games?

Dear Sir,

The rule for fixing the size of the group of athletes a National Olympic Committee (NOC) may select for each individual event (like, for example, the Men's Marathon) at the Olympic Games is specified as follows (IAAF, 2012): A NOC may enter a set of maximum three qualified athletes in each individual event if all entered athletes meet the A qualification standard for the respective event, or one athlete per event if they have met the B qualification standard only. Although there is an athlete quota (for London 2012 the target number was 2,000 athletes), the exact number of eligible participants cannot be fixed in advance.

Athletes must reach the qualification standards as set by the International Association of Athletics Federations (IAAF) for each event in a specified period to be eligible to participate in the athletic events of the Olympic Games. For example, at the London Olympic Games for the Marathon competition the A standard for men was set to 2:15:00 and the B standard to 2:18:00, while for women the A standard was set to 2:37:00 and the B standard to 2:43:00. (In addition, a list of qualifying competitions for the Marathon event, which meet the IAAF's qualifying criteria, was produced by the IAAF.)

Let us attach to each athlete a grade: he gets grade a if he achieved the A qualification standard; grade b if he achieved the B qualification standard, and grade 0 in all the other cases ($a > b$). Then the size rule¹ used by IAAF is simply this:

A NOC selects n athletes for an individual event if there are n athletes who received a grade $\geq n$ and all the other athletes received a grade $\leq n$ when $a = 3$ and $b = 1$. (Note that this procedure also works in cases when not only two, but $m \geq 2$ achievement standards A_1, A_2, \dots, A_m are taken into account. In these cases the achievement of a standard A_i is associated with a grade a_i , where $a_i > a_{i+1} > 0$.)

The definition of the size rule used by NOCs immediately brings to one's mind an analogy with the h-index (Hirsch, 2005). In the framework used here the athletes considered by a NOC are the counterparts of a researcher's published papers, while the grade attached to an athlete as a result of his achievement of a standard corresponds to the number of

citations received by a paper. So, to calculate the size of the group of athletes a NOC may select for some individual event is to determine the NOC's h-index for that event.

This analogy between bibliometric indexes and sporting rules should not be surprising. As Edwards (2005) noticed, a h-type measure was used decades ago by the geophysicist Harold Jeffreys as a method of recording his cycling prowess, where n is the highest number of days during which he had cycled at least n miles.

References

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¹This rule determines only the number of athletes to qualify, but does not select certain athletes from among those who achieved the standards.