

# The wonderful world of cricket

P McCrory

Cricket geeks love numbers. It is amazing that there are only 42 rules of cricket but the statistics on the game fill libraries. I wonder whether the late Douglas Adams had that number in mind when he wrote the *Hitchhiker's Guide to the Galaxy* and the planet-sized super computer "Deep Thought" came up with the same answer to the question of the meaning of life.

What is it about cricket that brings out the nerdy statistician? The only thing that seems to be lacking in the sports medicine literature is a meta-analysis correlating the success rate of the Australian team with the numbers of papers written proposing a new way of calculating cricket statistics that relegate Australian players to lower positions on the performance tables.

The latest piece that crossed my desk is some actuarial research that reduces the effect of "not out" innings in the calculation of batting performance.<sup>1</sup> Strangely, Michael Bevan (who tops the one-day cricket batting averages) drops from an average of 53.6 to 38.7 and Michael Clarke from 44.2 to 34.7. To cap it off, Steve Waugh doesn't even make it into the table. How fair can that be? Surprisingly, no English batsman is in the top 16 ranking even after fiddling with the statistics. Perhaps the International Cricket Council (ICC) could work on similar statistical methods of adjusting the overall team rankings when playing against inferior opposition teams. Anyone remember England's performance in the most recent Ashes series?

But I was struck by another recent paper on the economic analysis of cricket<sup>2</sup> that listed no fewer than 17 papers on this topic published over the past 50 years, from the seminal pioneering work by Elderton<sup>3</sup> and Wood<sup>4</sup> to the present time. The paper itself proudly discusses the impressive effects of various strategies to improve the performance of the English national cricket team. Just goes to show that statistics can prove anything you want it to.

There is a website ([www.cricinfo.com](http://www.cricinfo.com)) that not only has scores and statistics but also has 3D animations, using little cricket avatars, of shots played in real-life matches. Get a life, a real one that is.

For our American and Canadian sports medicine cousins reading this article,

some explanation of cricket is required. The traditional (but correct) version often seen printed on comical tea towels is as follows: *You have two sides, one out in the field and one in. Each man that's in the side that's in goes out, and when he's out he comes in and the next man goes in until he's out. When they are all out, the side that's out comes in and the side that's been in goes out and tries to get those coming in, out. Sometimes you get men still in and not out. When a man goes out to go in, the men who are out try to get him out, and when he is out he goes in and the next man in goes out and goes in. There are two men called umpires who stay out all the time and they decide when the men who are in are out. When both sides have been in and all the men have been out, and both sides have been out twice after all the men have been in, including those who are not out, that is the end of the game.*

An alternative version (also correct) doing the rounds goes like this: *Two aliens were visiting Earth to research the local customs. They split up so that they could learn more in the time allowed. When they met to share their knowledge, the first alien told of a religious ceremony it had seen. "I went to a large green field shaped like a meteorite crater. Around the edges, several thousand worshippers had gathered. Then I saw two priests walk to the centre of the field to a rectangular area and they hammered six spears into the ground, three at each end. Then eleven more priests walked out, clad in white robes. Then two high priests wielding clubs walked to the centre and one of the other priests started throwing a red orb at the ones with the clubs."*

"Gee," replied the other alien, "what happened next?"

"Then it began to rain."

If that seems normal on the planet where you live then let me try and explain the Duckworth-Lewis (DL) method of calculating scores in one-day cricket when it rains. I recently looked this up to try and understand what the commentators were going on and on and on about whilst watching the recent cricket World Cup.

The traditional game of cricket is somewhat inexplicably played over 5 days, and to prevent pressure sores in spectators shorter versions of the game exist—a 50 over per side one-day match and, for those with even shorter attention spans, a 20 over per side match.

Even the most casual observer can appreciate that when it rains, the ability to complete the allotted number of overs is problematic unless you want to keep playing in darkness (as they did in the 2007 cricket World Cup final) in order to finish. They could of course play the game at a ground with lights so the viewers could see Australia claim the trophy, but perhaps that might be too much to ask.

Fortunately a couple of statistics boffins have come to the rescue and developed a fairer system of score-adjustment for these rain-affected games. The system is known as the Duckworth-Lewis system.<sup>5</sup> Frank Duckworth is a consultant statistician and editor of the Royal Statistical Society's monthly news magazine *RSS NEWS*. Tony Lewis is a lecturer in Quantitative Methods in Management in the Business School at Oxford Brookes University. The method was developed in the early 1990s when Tony was working at the University of the West of England, Bristol. The rule was first introduced in 1997, and by 1999 it was used in the cricket World Cup hosted in England, and modifications based on ongoing analysis of games have been used since that time.

For those who cannot sleep, there is computer software available so you can do your own calculations and check the TV pundits. For the complete insomniac, the book explaining this system cannot be too highly recommended. Unfortunately the wonderfully titled explanatory book *Your comprehensive guide to the Duckworth/Lewis method for resetting targets in one-day cricket*<sup>6</sup> by Frank Duckworth and Tony Lewis is temporarily out of print, pending an update to incorporate the new 2007 tables.

Before the DL system, the most widely used system was adjusting the target according to "average run rate", which decided the winner according to which team got the most runs per over. This simple system was better than the somewhat farcical "most productive overs" system used in some tournaments during the 1990s. The most productive overs system worked by setting the team batting second a target of the runs scored by the team batting first in their  $x$  most productive overs, where  $x$  is the number of overs faced by the team batting second. This system heavily favours the team batting first.

The DL method uses wickets lost and overs left to decide what proportion of a team's "resources" remain. At the beginning of a match, a team has 100% of its resources—10 wickets standing, 50 overs remaining. However, in the event of a rain delay, one or both teams will end up with fewer resources left. These resources are calculated by a complex mathematical

formula, with 100% resources being 50 overs and 10 wickets remaining. If their innings are shortened, they lose resources; for example, if they reach 40 overs (10 remaining) with seven wickets lost, they have 17.9% of their resources remaining. Both teams' targets are recalculated dependent on the resources they have. The full details and regulations governing play can be found on the ICC website ([www.icc-cricket.com](http://www.icc-cricket.com)).

I am just wondering how you plug in the laptop in the pouring rain to calculate the DL formula. Perhaps they should play indoors?

*Br J Sports Med* 2007;**41**:467–468

## REFERENCES

- 1 Maini S, Narayanan S. The flaw in batting averages. *The Actuary* 2007;May:30–31. Available at [http://www.the-actuary.org.uk/pdfs/07\\_05\\_07.pdf](http://www.the-actuary.org.uk/pdfs/07_05_07.pdf) (accessed 19 June 2007).
- 2 Paton D. The parallel worlds of economics and cricket. *Newsletter of the Royal Economic Society* 2005;**131**(Oct):5–7.
- 3 Elderton WP. Cricket scores and some skew correlation distributions. *J R Stat Soc Ser A Stat Soc* 1945;**108**:1–11.
- 4 Wood GH. Cricket scores and geometrical progression. *J R Stat Soc Ser A Stat Soc* 1945;**108**:12–22.
- 5 Duckworth FC, Lewis AJ. A fair method of resetting the target in interrupted one-day cricket matches. *J Oper Res Soc* 1998;**49**:220–7.
- 6 Duckworth F, Lewis T. *Your comprehensive guide to the Duckworth/Lewis method for resetting targets in one-day cricket*. Bristol: University of the West of England, 1999.

## BMJ Clinical Evidence—Call for contributors

*BMJ Clinical Evidence* is a continuously updated evidence-based journal available worldwide on the internet which publishes commissioned systematic reviews. *BMJ Clinical Evidence* needs to recruit new contributors. Contributors are healthcare professionals or epidemiologists with experience in evidence-based medicine, with the ability to write in a concise and structured way and relevant clinical expertise.

### Areas for which we are currently seeking contributors:

- Secondary prevention of ischaemic cardiac events
- Acute myocardial infarction
- MRSA (treatment)
- Bacterial conjunctivitis

However, we are always looking for contributors, so do not let this list discourage you.

### Being a contributor involves:

- Selecting from a validated, screened search (performed by in-house Information Specialists) valid studies for inclusion.
- Documenting your decisions about which studies to include on an inclusion and exclusion form, which we will publish.
- Writing the text to a highly structured template (about 1500–3000 words), using evidence from the final studies chosen, within 8–10 weeks of receiving the literature search.
- Working with *BMJ Clinical Evidence* editors to ensure that the final text meets quality and style standards.
- Updating the text every 12 months using any new, sound evidence that becomes available. The *BMJ Clinical Evidence* in-house team will conduct the searches for contributors; your task is to filter out high quality studies and incorporate them into the existing text.
- To expand the review to include a new question about once every 12 months.

In return, contributors will see their work published in a highly-rewarded peer-reviewed international medical journal. They also receive a small honorarium for their efforts.

If you would like to become a contributor for *BMJ Clinical Evidence* or require more information about what this involves please send your contact details and a copy of your CV, clearly stating the clinical area you are interested in, to [CECommissioning@bmjgroup.com](mailto:CECommissioning@bmjgroup.com).

### Call for peer reviewers

*BMJ Clinical Evidence* also needs to recruit new peer reviewers specifically with an interest in the clinical areas stated above, and also others related to general practice. Peer reviewers are healthcare professionals or epidemiologists with experience in evidence-based medicine. As a peer reviewer you would be asked for your views on the clinical relevance, validity and accessibility of specific reviews within the journal, and their usefulness to the intended audience (international generalists and healthcare professionals, possibly with limited statistical knowledge). Reviews are usually 1500–3000 words in length and we would ask you to review between 2–5 systematic reviews per year. The peer review process takes place throughout the year, and our turnaround time for each review is 10–14 days. In return peer reviewers receive free access to *BMJ Clinical Evidence* for 3 months for each review.

If you are interested in becoming a peer reviewer for *BMJ Clinical Evidence*, please complete the peer review questionnaire at [www.clinicalevidence.com/ceweb/contribute/peerreviewer.jsp](http://www.clinicalevidence.com/ceweb/contribute/peerreviewer.jsp)

## ***Expression of concern about content of which Dr Paul McCrory is a single author***

---

This paper is authored by Dr Paul McCrory. During 2021 and 2022 there was an investigation by BJSM and BMJ which found that some of his work was the product of publication misconduct. Such misconduct includes plagiarism, duplicate publication, misquotation and misrepresentation in publications in respect of which he was listed as the sole author.<sup>1</sup> We are placing a notice to readers on all content in relation to which he is identified as the sole author to alert them to the conclusions of our investigation.

© Author(s) (or their employer(s)) 2022. No commercial re-use. See rights and permissions. Published by BMJ.  
*Br J Sports Med* 2022;0:1. doi:10.1136/bjsports-2022-106408eoc



### **REFERENCE**

- 1 Macdonald H, Ragavooloo S, Abbasi K. Update into the investigation of former BJSM editor-in-chief Paul McCrory. *Br J Sports Med* 2022.