



The Implications of Colour Blindness for Sport



What is colour blindness?

We see colour through 3 types of cone cells in our eyes, which absorb red, green or blue light. With colour blindness (colour vision deficiency, CVD) one type doesn't operate normally. Most types of colour blindness involve defects in red or green cones, meaning **many** colour combinations can be confusing.



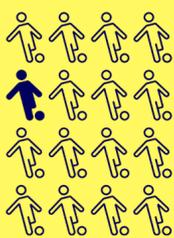
Normal vision



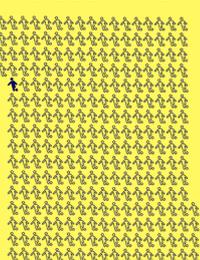
Colour blind simulation

Colour blindness is one of the world's most common inherited conditions. Statistically it affects...

1 in 12 men



1 in 200 women



Approximately 300 million people



worldwide

Why is it an issue in sport?

Almost 33 million people in Europe have some form of inherited CVD. Many are undiagnosed or unaware they have it. For people with no deficiency it can be hard to imagine the difficulties this can cause but everyday in sport we use signs, symbols, maps, we visit websites and use smartphones. All of these activities can be more challenging when the difference between colours isn't obvious.

Colour blindness is a particularly important issue in sport as colour is key to distinguishing between players and athletes and in seeing kit and equipment.

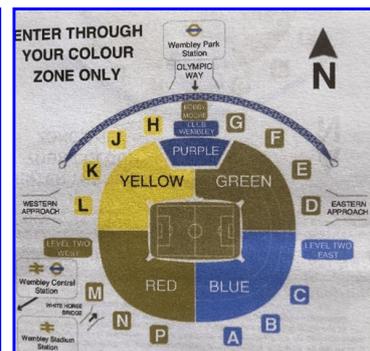
On a matchday, for example, CVD can affect up to 6% of people in a football stadium including:

- **Players**
- **Coaches**
- **Fans**
- **Staff e.g. stewards**
- **Media**
- **Emergency services**

Normal vision



Colour blind simulation





Normal vision

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How CVD can affect players/athletes from grass roots to elite level

Although people with CVD lead perfectly normal lives (which is why the condition often goes undiagnosed), colour blindness can put them at a distinct disadvantage in some sporting situations. The greatest problems for colour blind players in team sports are:

In team matches

- Distinguishing between kit colours
 - between teams
 - within teams (e.g. outfield with goalkeeper kits)
 - with match officials
 - with players' kit 'disappearing' against the colour of the pitch e.g. all red kits
- Following the ball against the pitch/stands
- Confusion created by different types of lighting e.g. moving from shade into sunlight, floodlighting

In training

- Distinguishing between bib colours
- Distinguishing equipment from the pitch/other equipment, e.g.
 - balls
 - cones/pancakes
 - Line markings
 - Corner flags/mannequins

Tactical training

- Telling the difference between
 - team colours on/against magnetic boards
 - distinguishing between pen colours on flipcharts and information in graphics
 - presentations, session plans, videos, etc.

Issues for coaches

- Identifying colour blind players because most hide their condition and many are unaware of it
- Selecting appropriate equipment for colour blind players

What does this mean for Governing bodies and clubs?

Addressing colour blindness simply means applying some basic principles to the way information is designed and presented and being aware that:

- Information presented using colour alone may not be accessible for up to 6% of people
- Solutions are usually simple and common sense, such as adding text, symbols, shapes and patterns
- Club colours don't necessarily need to change, being accessible is about how colours are used

Common problems at venues include:

- Distinguishing coloured wayfinding information
- Reading text against certain background colours, especially on websites
- Spotting emergency signage and equipment against some background surfaces
- Software and warning systems in control rooms/ gate information

There can also be a commercial impact for:

- Merchandising, if people are unable to understand colour information in colour
- Ticket sales, if information to highlight seats or price information is in colour only
- Sponsors, if people are unable to read information on big screens, logos on shirts, or pitchside hoardings
- Broadcasters, when fans turn off TV coverage because they can't make sense of the team colours or graphics.



Normal vision



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Normal vision



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Further information and resources
www.tacbis.eu/about