

The Safe Management of Persistent Standing in Seated Areas at Football Stadia

Final report for the SGSA by CFE Research

With Professor Geoff Pearson and Professor Keith Still

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Glossary

Concourse: the internal area of a stadium between the turnstiles and the entrance to the seating or standing area.

Gangway: the stepped passages between the rows of seating via which spectators access their seats.

Migration (inter-area): the movement of spectators *into* an area or stand from elsewhere in the stadium which can increase the total number of people in that area.

Migration (intra-area): the movement of spectators *within* an area or stand which does not increase the total number of people in that area but can increase the number of people in a particular block or row.

Migration (lateral): the movement of spectators sideways from their row, into either the gangway or another area of the stand.

Persistent standing: standing to watch live sport in seated areas for prolonged periods of time, not just at moments of excitement (such as a goal celebration).

Progressive crowd collapse: where a spectator is pushed forward due to force exerted by a spectator on the row behind and as a result exerts unintentional force on a spectator or spectators in the row in front, thus creating a ‘domino effect’ which results in spectators in at least three rows falling down on top of each other.

Rail seating: dual purpose individual metal seats with a rail incorporated, which together form a continuous rail along the length of the row. The seats can be locked in an upright position to create a standing area, or unlocked to provide a seat.

Rake: in this context, refers to the gradient or steepness of a stand, and is measured in degrees.

Safe standing: a term largely used by campaigners to refer to standing in modern (non-terrace) stands or areas that contain seats with integrated barriers or rails.

Seats with integrated safety bars: purpose-designed and built seats with an integrated safety bar, which together form a continuous rail along the length of the row.

Terrace: refers to an area of a stadium where there are no seats, usually concrete steps with intermittently spaced crush barriers.

Tolerated standing area: an area of a stand or stadium where persistent standing occurs in large numbers and safety management teams accept that enforcing sitting is impossible, usually a discrete area where safety risks are low.

Vomitory: the opening or entrance to a stand, usually a short passageway accessed via a concourse.

Executive summary

The all-seater policy was introduced in the top two tiers of the English football league in 1994. Despite the legislation, and clubs' efforts to enforce the policy, significant numbers of spectators persistently stand throughout matches. Persistent standing in areas that are not designed for this purpose presents potential risks to safety, but enforcing sitting in areas where spectators choose to stand in large numbers is very challenging. In recent times, stadium safety teams have shifted from enforcing sitting to managing standing in discrete areas of stadia where the safety risks are deemed to be lower. Some clubs have installed additional infrastructure, including rail seats and barriers, as part of their management strategies. However, to date, there is little evidence on the effectiveness of these approaches and the residual risks to safety.

This study by CFE Research, in partnership with Professor Geoff Pearson and Professor Keith Still, examines the implementation of different safety management strategies in a range of settings and regulatory environments in order to identify effective practice. Case study research was conducted over the 2019/20 football season¹ in six UK clubs identified for their distinct strategies for managing the safety of spectators who persistently stand in their home stadia. Further insights were captured from documentary evidence, crowd modelling, a survey and interviews with spectators, observations and interviews with staff at other clubs in the English, French and German football leagues and English rugby league.

Key findings

Attempts to enforce the all-seater policy can be a source of conflict between spectators who persistently stand and those who wish to sit, as well as between spectators and stewards. The introduction of areas where standing is tolerated appears to have reduced the potential for conflict, and the associated risks.

A range of behaviours are associated with persistent standing that can present a risk to safety including migration within and between stands, blocking gangways, and exuberant, unstable celebrations. If migration leads to overcrowding, the risk of injuries caused by trips, falls and surges is heightened. Overall, low levels of risk behaviours were evident in standing areas at the clubs in this research.

The level of risk also depends on the rake or steepness of the stand where spectators are persistently standing. Designated areas where standing is tolerated are typically of a lower rake (23 degrees or lower at clubs in this research). Strategies to manage the safety of spectators in tolerated standing areas are nuanced to take account of the physical features of stadia, the behaviour of spectators, and the match context.

Effective management strategies are characterised by the presence of high-quality CCTV monitoring, specific risk assessments, distancing between tolerated home standing areas

¹ Match observations ceased when the football season was suspended on 13th March 2020 in response to Covid-19. However, the consultation with club staff, stakeholders and supporters continued until June 2020.

and away sections, ticketing strategies that take spectators' preferences into account and enhanced levels of stewarding by experienced staff. Supporter engagement and the co-operation of away clubs are also integral to successful management strategies.

Installing barriers or rails has had a positive impact on spectator safety in these areas, particularly in mitigating the risk of a progressive crowd collapse. The barriers almost completely eliminate the possibility of forwards or backwards movement during goal celebrations and the risk of a surge that could cause injury to those in front. Standing on unlocked seats, seat backs and barriers is, however, possible and could cause injuries, but these would likely be a result of a deliberate act and other spectators remain better protected against this where barriers have been installed. Spectators and staff are satisfied that barriers have improved safety.

The installation of barriers or rails is perceived to have wider, positive effects on spectator behaviour. Police have not been deployed to areas with barriers operated by the case study clubs this season. Barriers also help to enhance spectators' feelings of safety which increases their enjoyment of the game.

Areas where standing is tolerated are popular with spectators because of the atmosphere that is created. Wheelchair platforms have been successfully integrated into tolerated standing areas to provide a more inclusive experience.

Creating areas where standing is tolerated (with or without barriers) does not appear to encourage or increase the likelihood that spectators will engage in the risk behaviours that pose a threat to safety. It does not appear to increase standing elsewhere in a stadium, but neither does it eradicate it. Strict enforcement of the seating policy in other areas can be effective, but can take time to embed.

Persistent standing amongst away spectators, particularly from high-risk opposition which varies by club, remains the biggest challenge. The combination of behaviours that contribute to an increased risk of falls forward are generally more prevalent in away areas, suggesting that these should be a priority when considering barriers as a mitigation measure. Having an enforced seating area for away spectators, who are more likely than home spectators to have to stand in order to see rather than through choice, can enhance the safety and experience of those who prefer to sit.

The findings in this report start to address the gaps in understanding about the risks of persistent standing and how to manage them² in the context of the 2019 Conservative and Unionist Party manifesto pledge to "*work with fans and clubs towards introducing safe standing*".³ In the event of any change in legislation, it will be important to monitor the implementation and evaluate the success of strategies to manage spectator safety in in order to fully understand the potential risks and the most effective management strategies for these areas.

² Welford, J., Beard, A., Corley, A., Birkin, G., Francis, N., and Lamb, H. (2019) *Standing at Football: A rapid evidence assessment*. Published by Department for Digital, Culture, Media and Sport: <https://www.gov.uk/government/publications/standing-at-football-evidence-review-report>

³ The Conservative and Unionist Party Manifesto 2019. Published at: <https://www.conservatives.com/our-plan>

1. Introduction

1.1 Background and context

Since 1st August 1994, all clubs in the top two tiers of English football have been required to provide all-seated spectator accommodation. This change came about in response to the recommendations of the Taylor Report following the 1989 Hillsborough Disaster. The all-seater policy, primarily intended to address the safety, behaviour and crowd management of spectators at football matches, has been delivered through the licensing of only all-seater accommodation in the top two divisions (currently the English Football League Championship and Premier League).

Despite the introduction of this legislation, a number of spectators continue to choose to stand in seated areas throughout football matches. This is referred to as ‘persistent standing’. Football supporters have increasingly called for their desire to stand to be recognised with a change to legislation, such as the introduction of ‘safe standing’ areas. Large numbers of spectators persistently standing in areas that are not designed for this purpose presents potential safety risks that are an ongoing cause of concern for clubs, safety staff, police, spectators and the regulator. Although there has not been a major disaster in UK stadia since Hillsborough, there have been a number of serious injuries and fatalities in other parts of the world. This includes incidents in South Africa, where 43 people lost their lives in Johannesburg’s redeveloped, modern all-seater stadium Ellis Park⁴ and in France where five spectators were seriously injured after a barrier collapsed during goal celebrations in a Ligue 1 match between Amiens and Lille.⁵

Enforcing sitting in areas where spectators choose to stand in large numbers is very challenging. Stadium safety teams have adopted a range of measures to discourage persistent standing, though none have been completely successful. In more recent times, ground management teams have sought to introduce new approaches to reduce the risks associated with standing in seated areas. This represents a shift from *enforcing sitting* to *managing standing* in certain discrete areas of stadia where the safety risks are deemed to be lower. More recently, engineering solutions which incorporate barriers to mitigate the risk of falling forward have been introduced in some stadia. These solutions are recognised in the most recent release of the Green Guide.⁶ Following the incident at Amiens, new approaches to the management of standing in France have also been piloted. However, to date, there is little evidence on the effectiveness of these approaches and the residual risks to safety.⁷

⁴ See <https://www.gkstill.com/Support/Links/Documents/2002-ngoeppe.pdf>

⁵ <https://www.bbc.co.uk/sport/football/41456324>

⁶ The Green Guide refers to the Guide to Safety at Sports Grounds, produced by the SGSA. It provides guidance on spectator safety at sports grounds. The 6th edition was released in 2018 and was the first to include guidance on installing seats incorporating barriers.

⁷ Welford, J., Beard, A., Corley, A., Birkin, G., Francis, N., and Lamb, H. (2019) *Standing at Football: A rapid evidence assessment*. Published by Department for Digital, Culture, Media and Sport: <https://www.gov.uk/government/publications/standing-at-football-evidence-review-report>

This study by CFE Research, in partnership with Prof Geoff Pearson, Professor of Law at the University of Manchester Law School, and Prof Keith Still, crowd risk analysis specialist, begins to address gaps in current understanding about the risks of persistent standing and effective ways to manage it.

1.2 Approach to the research

The research set out to identify the risks of persistent standing and the ways in which football clubs in a range of settings and regulatory environments in the UK and Europe address them through management strategies. The effectiveness of these strategies, in terms of mitigating potential risks and assuring the safety of spectators, is explored along with the extent to which standing affects spectator behaviour and creates any wider safety concerns. A key challenge in addressing questions of safety in this context is the inability to test theoretical assumptions about the scale and severity of risk at different clubs in a real-world setting. However, by bringing together empirical observations, expert opinion and existing research with objective measures, it is possible to provide new insights into current risks and effective management strategies, as well as any potential risks to safety in the event that the all-seater policy is relaxed.

Case study research was conducted over the 2019/20 football season with six clubs: three in the English Premier League, two in the English Football League Championship and one in the Scottish Premier League. These clubs were purposefully selected because they are adopting different approaches to the management of persistent standing in a range of settings (Figure 1) and are recognised for their strong safety and stadium management teams. The case study approach presented an opportunity to observe and identify good practice in the management of persistent standing. As such, the findings are not representative of all football clubs.

Evidence for the case studies was gathered from a range of sources, including analysis of club safety documentation, match-day observations, a spectator survey, crowd modelling simulations and interviews with club staff, stakeholders and spectators. Data from the case study clubs was supplemented with information on comparative management strategies implemented at five football clubs in English lower leagues, France and Germany, and one club in English rugby league. Further details of the full methodology are provided in Appendix 1.

Club	League	Management approach ⁸
Tottenham Hotspur FC	English Premier League	Barriers in two seated areas (one area for home spectators and one area for away spectators)
Wolverhampton Wanderers FC	English Premier League	Barriers in two seated areas (one area for home spectators and one area normally used by home spectators but also used for away spectators, usually in cup fixtures)
Brighton & Hove Albion FC	English Premier League	Tolerated standing area for home spectators, no barriers (a section of one stand); seating option for away spectators
Cardiff City FC	EFL Championship	Tolerated standing area for home spectators, no barriers (the majority of one stand), with strict enforcement of seating in other home seated areas; seating option for away spectators
Brentford FC	EFL Championship	Terracing in two areas (one area for home spectators and one area for away spectators); seating option for away spectators
Glasgow Celtic FC	Scottish Premier League	Barriers in one area for home spectators, with lockable rail seats ⁹

Figure 1: Case study clubs and management approaches

1.2.1 Impact of Covid-19

Fieldwork with both the case study and supplementary clubs was scheduled to take place throughout the course of the 2019/20 season to ensure the implementation of club management strategies was observed in a wide range of match contexts. Unfortunately, professional football was suspended on 13th March 2020 in response to Government measures to contain the spread of Covid-19. This, along with similar measures which led to the suspension of rugby league and professional football in France, impacted on fieldwork scheduled for the remainder of March, April and May 2020. A number of field visits, which were to include match-day observations, interviews with staff, on-site viewing of CCTV footage and supporter focus groups, could not go ahead as planned. A total of 21 of the planned 30 observations had been conducted at the point the leagues were suspended. Instead, staff, stakeholders and spectators were interviewed individually by telephone. This mitigation strategy helped to minimise the impact of Covid-19 on the research findings.

1.3 This report

This report, in conjunction with wider evidence, is designed to begin to address the identified gap in evidence relating to the risks of persistent standing in seated areas and the potential for ‘safe standing’ areas or other technological solutions to enhance the safety of spectators who stand. The issue gained further political strength when the 2019

⁸ Clubs describe these areas in different ways; however, this report uses ‘tolerated standing areas’ to describe areas where standing is tolerated without barriers, and ‘areas with barriers’ to describe areas where standing is tolerated and barriers in whatever format (independent, rail seating, integrated) have been installed.

⁹ Celtic are not subject to the all-seater policy but the Scottish Premier League voluntarily adopted the policy.

Conservative and Unionist Party manifesto¹⁰ pledged to “*work with fans and clubs towards introducing safe standing*” in view of growing opposition from supporters’ groups that advocate standing is not inherently unsafe and adds to the atmosphere and enjoyment of the game.¹¹ Interim findings from this research were released in February 2020 as the Minister for Sport stated his willingness to deliver on their manifesto pledge.¹²

The challenges and risks to safety of persistent standing are considered in this report along with current strategies for their mitigation. The management of persistent standing and the effectiveness of these strategies are discussed, with a particular focus on evidencing the impact of installing barriers and learning from clubs who have taken these steps to enhance the safety of spectators who persistently stand. The report then examines the impact of these approaches on spectator behaviour both within the areas where standing is tolerated and elsewhere in stadia. It concludes with an evidence-informed summary of the development and effective implementation of management strategies to enhance the safety of spectators who choose to stand.

¹⁰ The Conservative and Unionist Party Manifesto 2019. Published at: <https://www.conservatives.com/our-plan>

¹¹ <https://thefsa.org.uk/our-work/stand-up-for-choice/>

¹² <https://commonslibrary.parliament.uk/research-briefings/sn03937/>

2. Risks of persistent standing

2.1 The extent of persistent standing

Persistent standing occurs in seating areas at the vast majority of grounds. A conservative estimate in 2018 suggests that 40,000-60,000 spectators persistently stand each weekend across all four professional leagues, and that the percentage of spectators persistently standing is significantly higher amongst away spectators.¹³ However, low overall numbers of persistent standing by home spectators mask areas where observed persistent standing is much higher.

Observations at case study clubs showed that in almost all areas where standing is tolerated, with or without the addition of barriers, spectators persistently stand in large numbers. The only observed exception to this is one quadrant of seating with barriers at Wolverhampton where home spectators primarily remained seated.

In tolerated standing areas, the proportion of spectators standing during normal play was estimated to be between 75-100%; these figures varied between clubs but also between matches at each club. Levels of persistent standing were generally higher at derbies and other high-profile matches. There was also more persistent standing during periods of rain. In away areas, levels of persistent standing were usually 90-100%.

Survey data: What is the extent of self-reported persistent standing by spectators?

One in five respondents to the survey reported that they chose to stand at home matches. A small number had to stand in order to see. Those who went to away matches stood in larger numbers, both through choice and in order to see.

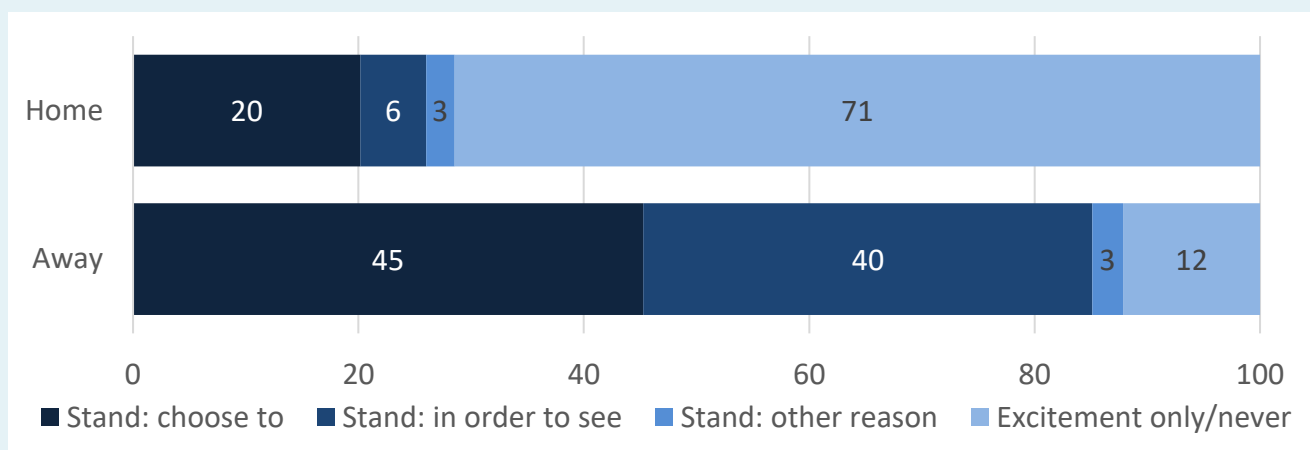


Figure 2: Proportion of spectators who stand at home & away matches, and reasons why (% , base = 3094)

¹³Welford, J., Beard, A., Corley, A., Birkin, G., Francis, N., and Lamb, H. (2019) *Standing at Football: A rapid evidence assessment*. Published by Department for Digital, Culture, Media and Sport: <https://www.gov.uk/government/publications/standing-at-football-evidence-review-report>

2.2 Reasons spectators persistently stand

Understanding more about why spectators continue to persistently stand at football matches despite all-seater regulations helps to explain why clubs are finding it challenging to enforce sitting and are striving to provide a safe environment for those who continue to stand. Whilst some spectators have to stand in order to see, most choose to stand at home matches, primarily because of a perceived association between standing, atmosphere and overall enjoyment of the experience.

The main benefit [of being in a standing area] is the improvement in atmosphere in the ground, which is just, undoubtedly improved when people can stand up... the improvement in atmosphere and the generation of the noise.

— Spectator

Staff at clubs in this research also acknowledge that standing is associated with passion, singing and therefore atmosphere, and that this is important to them.

Passion is the DNA of football, it's almost tangible sometimes, certainly in our stadium, in terms of the desire and the passion that's there from the supporters, and it's hard to do that when you're sitting down.

— Safety officer

2.3 Risks of persistent standing in different contexts

Persistent standing is perceived to present a *direct* risk to safety, for example, by increasingly the likelihood of conflict between spectators, such as those who have their sightline blocked by those who are standing, and stewards enforcing the all-seater policy. It can also present an *indirect* risk to safety by increasing the likelihood of other behaviours that present safety risks to spectators and staff. Some of these risks are present in all areas where spectators persistently stand; others vary in both likelihood and potential impact depending on whether the persistent standing occurs in standard seating areas, areas with barriers/rails, or traditional terracing. Prior to conducting any match observations, insights into these behaviours, the associated risks and variance by context were identified from the interviews with stakeholders, safety officers and SGSA inspectors, and a review of safety documentation at all clubs in the study. These are summarised in Figure 3 overleaf.

Risk behaviour	Potential impact on safety	Variance of likelihood and impact by location of persistent standing
Intra-area migration: migration within a specific area/stand	<p>Overcrowding of certain rows/blocks resulting in increased likelihood of injury as a result of tripping and falling and conflict arising between spectators and between spectators and staff; groups may cause others to fall forwards or a collapse</p> <p>Can result in blocking aisles, gangways and exits, with impact on access routes</p>	<p>Possible in all areas where spectators stand</p> <p>Impact likely to be greater where standing occurs in areas without barriers to protect against any resultant falls/collapse, and upper tiers</p> <p>Assessed by clubs as more likely in areas occupied by away spectators</p>
Inter-area migration: migration into a specific area/stand	<p>Overcrowding of a whole area resulting in increased likelihood of injury as a result of tripping and falling and conflict arising between spectators and between spectators and staff; groups may cause others to fall forwards or a collapse</p> <p>Can result in blocking aisles, gangways and exits, with impact on access routes</p>	<p>Possible in all areas where spectators stand that are not isolated with their own turnstiles</p> <p>Impact likely to be greater where standing occurs in areas without barriers to protect against any resultant falls/collapse, and upper tiers</p>
Falls over seats	<p>Considered more likely where spectators are standing or jumping and unbalanced; spectators can fall over seats in front and injure either themselves or those they land on; may cause others to fall forwards or a collapse</p>	<p>Possible in all areas with seats, not just where persistent standing occurs, but more likely where spectators celebrate exuberantly and in groups, or are likely to be unsteady on their feet</p> <p>Impact likely to be greater where standing occurs in areas without barriers to protect against any resultant falls/collapse, and upper tiers</p>
Blocking aisles, gangways and exits	<p>Swift egress of spectators and/or ease of entry for staff, including emergency services, is inhibited or prevented in the event of an incident</p> <p>Increased likelihood of injury as a result of tripping and falling in gangways</p>	<p>Possible in areas where spectators stand</p> <p>More likely in areas where migration occurs</p> <p>Impact of any tripping and falling greater in upper tiers</p>
Standing on seats, seat backs and barriers, particularly by children	<p>Increased likelihood of injury to individual perpetrator and those around them as a result of falls; elevated position may trigger a crowd collapse if falling forward</p>	<p>Possible in all areas where seats and/or barriers are present</p> <p>Impact of any collapse greater in upper tiers</p>
Conflict between spectators due to blocking view	<p>Increased likelihood of conflict and injury to spectators and staff</p>	<p>Only possible in areas not licensed as standing areas</p>

Conflict between spectators and stewards due to enforcing sitting	Increased likelihood of conflict and injury to spectators and staff	Only possible in areas not licensed as standing areas
Anti-social behaviour and/or crowd disorder	There is a perception that some spectators who choose to persistently stand will wish to engage in transgressive behaviour that breaches ground regulations	Possible in all areas Assessed by clubs as more likely in areas occupied by away spectators at high-profile matches

Figure 3: Potential risks associated with persistent standing

In addition, persistent standing in seated areas presents a customer service risk. Spectators who stand can negatively impact the experience of others when blocking their sightlines. This is relevant to all spectators in seated areas but is particularly pertinent for disabled spectators, the elderly and others who are unable to stand for long periods. Some stakeholders consider this to be more central to the current standing debate than any safety risks, given the large numbers who stand in both seated areas and on terraces every weekend and the lack of reported safety incidents directly associated with persistent standing.

2.3.1 The risk of progressive crowd collapse

One spectator falling over seats into the row in front has the potential to trigger a collapse in the crowd, resulting in spectators further down the stand being injured. An incident where individuals in three or more rows are involved is referred to as a ‘progressive crowd collapse’ which presents a significant risk to life and limb.

Fortunately, this type of incident is rare, but consequently it is difficult to fully understand the extent of this risk and its relationship to persistent standing. It has been acknowledged that this is a theoretical risk when spectators stand in seated areas.¹⁴ All safety teams at clubs in this research recognise that the potential impact of any risk behaviours triggering a collapse of any scale is higher where spectators stand in steeper upper tiers.

Steepness is measured in terms of gradient or rake; a flat surface is 0 degrees, lower tiers at the clubs in this research are largely between 15 and 25 degrees and upper tiers up to 33 degrees. Clubs will have a specific risk assessment and strategy for standing in areas over a certain rake in recognition of not necessarily the increased likelihood of a fall or collapse, but the potential impact of this. In particular, the risk of conflict escalating and triggering a fall forwards if stewards enter an area with a steep rake to enforce sitting is considered a higher safety risk (to both spectators and staff) than leaving spectators to persistently stand. This is based on not necessarily the increased likelihood of a fall or

¹⁴ Frostdick, S (2019) *Management of persistent standing at the Cardiff City stadium: Update ten. Policy statement for 2019/2020.* IWI Associates Limited.

stumble in steeper areas but the significantly more serious impact if this was to lead to a fall from height.

Modelling the risk of progressive crowd collapse

As the risk and impact of a progressive crowd collapse cannot be tested in real-life conditions, crowd modelling simulations have been used to theoretically test the risk of progressive crowd collapse in seated areas under different conditions.

Simulations were run multiple times and varied by rake (steepness of the stand), initial thrust (what action might trigger a collapse) and height of the seat in front. Simulations concluded that in areas where barriers were not present:

- There is a **present but relatively low risk** of a progressive crowd collapse occurring in areas with a **shallower rake**; the lower the rake, the less likely a collapse would occur following a trigger.
- At a 23 degree rake, the maximum rake where clubs in this research tolerate standing in areas without barriers,¹⁵ a collapse only occurred in simulations with that were triggered by a significant push (20Kn, equivalent to **more than one person falling forwards at the same time**). When a collapse did occur, the number of people involved was low when compared with tests at a steeper rake.
- As the rake is increased, the risk of collapse increases and the number of people involved in a collapse increases, even with a smaller initial thrust. Repeated simulations with randomly distributed body sizes, run at 28 degrees, showed that thrust roughly equivalent to a two handed shove (8Kn) triggered a collapse 1 in 4 times. **Progressive crowd collapse therefore remains the highest risk areas with a steeper rake.**

Tolerating standing only in areas with a rake of 23 degrees or lower does therefore reduce the risk of a collapse happening in seated areas, but does not remove the risk completely. Rake, however, is only one contributing factor and **a low rake in itself does not ensure a low risk**. It is just as important to consider the likelihood of behaviour that may lead to a collapse being triggered in an area of persistent standing.

Full results can be found in Appendix 2.

Figure 4: Modelling the risk of progressive crowd collapse

Modelling a crowd in this way can give an indication of the likelihood of an individual or group fall (or deliberate push) creating a progressive crowd collapse that could cause significant injury to a large number of people. The finding that less force is required to

¹⁵ The *Green Guide* cites 25 degrees as the maximum rake considered safe for any standing accommodation, even where this is equipped with barriers.

trigger a collapse as the rake increases means that this must be considered a greater risk in steeper areas. The modelling does not consider whether a fall or other behaviour that could trigger a collapse is any more or less likely in certain areas. Whilst this could result from an accidental fall, the risk of a collapse happening is also dependent on the likelihood of certain risk behaviours (see section 2.5.3).

2.4 The extent of risk behaviours in standing areas

We investigated the prevalence of these risk behaviours at the clubs in this research in three different types of accommodation: standard seating areas, seats incorporating barriers, and traditional terracing. Overall, safety management teams are acutely aware of these risks. They regularly assess them in different match contexts and have developed robust plans to limit their occurrence and impact.

Based on our fieldwork, the prevalence of the risk behaviours associated with persistent standing is relatively low at the clubs in this research, as summarised in Figure 5 below. Findings suggest that at these clubs, management strategies are largely being effectively implemented, although this can be more challenging in high-profile matches (explored further in Chapter 3).

Risk behaviour	Terraces	Tolerated standing areas without barriers	Areas with barriers/rail seating
Intra-area migration	Observed areas behind the goal most full, but no overcrowding	Some migration with minor overcrowding in home areas (usually during rain); more common in away areas	Some migration with minor overcrowding in home areas, more extensive overcrowding at high-profile matches; more common in away areas
Inter-area migration	Minor migration between seated area and terrace within away end but capacity allows for this so no overcrowding	Minor migration observed at one club but overall minimal prevalence	Some migration with minor overcrowding in home areas; more extensive overcrowding at high profile matches; not possible in away areas and one home area where stands/sections are isolated
Falling over seats during goal celebrations	Not possible	One incident observed, isolated incidents reported, more prevalent in away areas	None observed or reported
Blocking aisles, gangways and exits	Minor prevalence	Minor prevalence overall, more extensive at higher risk games and in away sections, less extensive where regular steward patrols are undertaken	Minor prevalence overall, more extensive at higher risk games and in away sections, less extensive where regular steward patrols are undertaken

Standing on seats, seat backs and barriers, particularly by children	Standing and sitting on floodlight bases where present; no climbing on crush barriers	Minor prevalence of standing on seats during goal celebrations; children standing on seats at most matches during normal play in order to see	Minor prevalence of standing on seats or seat backs during goal celebrations, more extensive and during normal play in away areas when occupied by spectators of European opposition; children standing on seats at most matches during normal play in order to see Some standing/sitting on barriers, mostly in away areas when occupied by spectators of European opposition
Conflict between spectators due to standing ¹⁶	Not possible	None observed or reported	None observed or reported
Conflict between spectators and stewards due to standing	Not possible	Minor prevalence of abuse in home areas where stewards asked spectators to sit; not evident in away areas as stewards usually do not enforce sitting	Minor prevalence of abuse in home areas where stewards asked spectators to sit; not evident in away areas as stewards usually do not enforce sitting
Anti-social behaviour and/or disorder (see Chapter 5)	Isolated prevalence, usually in away areas at high profile matches	Isolated prevalence, mostly in away areas at high profile matches	Isolated prevalence, mostly in away areas at high profile matches

Figure 5: Evidence of risk behaviours in different types of accommodation

Conflict between spectators as a risk of standing in seated areas was not observed or considered an issue by safety staff in areas where persistent standing is tolerated, with or without barriers. This was, however, an issue at some grounds where spectators persistently stood in other seated areas and blocked the view of those who wished to sit.

2.4.1 Inter-area migration

Home areas where standing is tolerated are typically popular and are associated with the best atmosphere and overall experience for many spectators. Safety staff recognised that migration is a risk with any standing area; if spectators are not using their seats, extra bodies can be accommodated in rows. Inter-area migration occurs as a result of spectators with a ticket for elsewhere in the stadium moving into the standing area. The extent of this appears to depend almost entirely on two factors:

¹⁶ This was observed in other seated areas.

- the **physical layout of the stadium**: if an area is isolated with its own turnstiles, migration is not possible;
- **demand for tickets** in these areas: if spectators who want to be in this area have a ticket or the ability to buy a ticket for the area, migration will be much less likely.

Where the above makes migration possible, it was observed to a greater extent in **high-profile matches**. This is only a risk in **home areas** as away areas are physically isolated from the rest of the stadium.

Although this can occur, regardless of whether a standing area is in traditional seats, barriers are installed or a terrace, inter-area migration was only observed to lead to noticeable overcrowding in the **two areas with barriers that were accessible from elsewhere in the stadium**, both occasions in high-profile matches. Safety staff at Tottenham indicated that this behaviour had increased as the season progressed.

2.4.2 Intra-area migration

In all areas where spectators persistently stand there is the opportunity for individuals to move from one block or row to another. This is perceived as a risk only when resulting in overcrowding; even then, this varies depending on location. It is a greater concern in upper tiers where any increase in bodies in a particular row could contribute to a fall. Certain areas can be popular, such as where singing starts or certain groups congregate, and migration for this reason often results in overcrowding.

- Noticeable overcrowding due to migration was observed, but mostly in **away areas**, as ticketing strategies may mean that friends cannot buy tickets in the same row so move to be with each other.
- This was greater when away areas were occupied by **spectators of European opposition** with spectators migrating to the front of the stand to be closer to the orchestrator of the singing.
- In home areas only minor migration was observed in most cases, with an extra body or two in some rows, though this was thought to be more common at **cup fixtures** with a larger proportion of non-regular attendees.
- At one **high-profile** Celtic match, home spectators also migrated to the front rows of the rail seating section as the spectators at the front also orchestrate the singing.

2.4.3 Blocked aisles and gangways

All clubs in this research identify blocked gangways as a risk in areas where spectators stand, regardless of the presence of barriers. This can result in the blocking of emergency access routes, as well as those spectators in the gangway being at risk of being pushed or tripping. Where stewards were concentrating on keeping gangways clear, this was largely successful. However, once a gangway becomes blocked it can be difficult to clear.

Observations reported this on some occasions; contexts where this appears to be a higher risk include:

- At **high-profile matches**, standing is not only more widespread, but stewards can also be diverted from patrols to deal with other situations resulting in them 'losing' the gangways.
- On occasions where **stewards left their position** at the top of gangways (usually by being moved to the front of the stand to prevent pitch incursion 5-10 minutes before the end of the match).
- **In the lead up to half time and full time.**
- Where consistently blocked gangways were observed, this was almost always **in away areas**.
- If rows or blocks become **overcrowded** then spectators are more likely to spill into the gangways; controlling migration makes it easier to keep gangways clear.

2.4.4 Standing on seats and other infrastructure

Seats, or other infrastructure such as low walls, can be stood on to gain extra height. Flip-up plastic seats are inherently unstable to stand on and so present a risk of falls. This was observed in the following situations in tolerated standing areas:

- **Children standing on seats** or being held whilst standing on the seat backs during normal play.
- Spectators standing on seats in **home and away areas during goal celebrations**, which was usually isolated and short-lived.
- Visiting spectators from **European teams** standing on seats during normal play.
- Spectators, mostly children, **sitting and standing on floodlight bases** at Brentford during normal play.
- Occasional **standing on seat backs and barriers during goal celebrations** in areas where barriers have been installed (discussed further in section 3.2.2).

Incidences of spectators standing on seats were not commonly reported by either staff, stakeholders, or spectators themselves at clubs in this research. This reinforced that these incidences typically only occur for short periods of time during moments of excitement. These are times, however, when the crowd is more likely to be jumping around and be unstable, increasing the risk of falls from a higher position.

Conflict between spectators and the risk of anti-social behaviour and disorder is covered in more depth in Chapter 5.

Survey data: What is the prevalence of risk behaviours in standing and seated areas?

Overall, **low levels of most risk behaviours were reported by spectators**, with minimal differences between standing and seated areas. Falling over seats during goal celebrations and spectators moving from their own seat to another location showed the biggest difference between standing and seated areas.

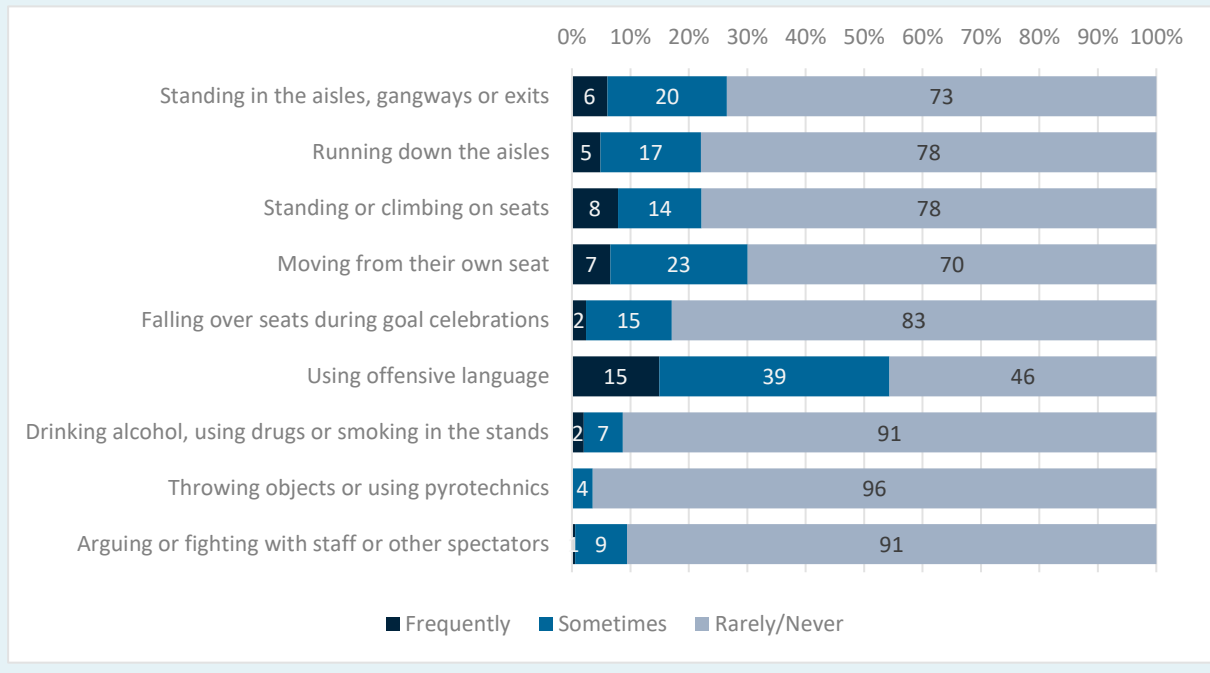


Figure 6: Prevalence of various risks reported by spectators

2.5 Injuries associated with persistent standing

Previous ethnographic research¹⁷ alongside evidence gathered through interviews and the spectator survey indicates that there is an underlying risk of injury to spectators in traditional seated areas caused by spectators falling over the seat in front. Most injuries appear to be minor; the risk of serious head or neck injuries thankfully seems to be low. The most serious risk is that a spectator positioned at the front of an upper tier may fall over the seat in front and down into the lower tier, resulting in potentially fatal injuries. Any fall over the seat in front has the potential to cause injury to themselves and/or others.

Forward falls in traditional seated areas are most likely to occur due to two situations. First, the spectator may be pushed by a spectator behind them. Second, a spectator may trip over the lip of the seat-back in front, where this protrudes above the step down. While these risks exist at a low level at all points in the match where a spectator is standing in these areas, they increase dramatically when spectators jump up from their

¹⁷ Pearson, G. (2012). *An Ethnography of English Football Fans: Cans, cops and carnivals*. New Ethnographies, Manchester University Press.

seats at moments of high excitement, or where those standing in these areas celebrate goals or other meaningful events (e.g. red cards, penalty misses, final whistle etc.). Celebrations for some spectators in traditional seated areas involve occasionally jumping or moving sideways to celebrate with others, or leaning forwards or back to celebrate with spectators in front or behind. Celebrations of this nature will invariably increase the risk of a spectator tripping over a seat in front, losing their balance, or being pushed forwards by another celebrating spectator, whether accidentally or recklessly.

If your team scores and everyone's jumping around, I've seen people go down a step or two, over seats, and end up a couple of rows in front. Just because everyone's off-balance when they're jumping around, so people can tend to fall forwards. Also, you tend to get grazes on your shins as a result from the seats in front as well, because everyone's lobbing each other, so you get pushed around a bit. Those sorts of injuries can occur, but they tend to be quite minor.

— Brighton spectator

2.5.1 Prevalence of injuries

Current understanding of the extent and nature of injuries that occur in football grounds is impeded by a lack of evidence caused by under-reporting.¹⁸ Interviewees at all clubs in this research acknowledged this difficulty, and did discuss spectators falling on occasion during celebrations, but it was felt that this was not a significant source of injuries. In an attempt to understand this further, spectators surveyed were asked if they had seen this happen in their stand, and whether and how they had been injured themselves, or seen others injured, in their *home* stadium in the last two years.¹⁹

¹⁸ Welford, J., Beard, A., Corley, A., Birkin, G., Francis, N., and Lamb, H. (2019) *Standing at Football: A rapid evidence assessment*. Published by Department for Digital, Culture, Media and Sport: <https://www.gov.uk/government/publications/standing-at-football-evidence-review-report>

¹⁹ Whilst this likely misses injuries sustained at away matches where standing is more widespread, the survey aimed to understand the extent of injuries in areas where management strategies were put in place to minimise risks associated with persistent standing.

Survey data: What is the extent of spectator injuries in football grounds?

Spectators were asked whether they witnessed people falling over seats during goal celebrations in their area of the stadium this season. A higher proportion of respondents in tolerated standing areas than non-standing areas report this. Overall numbers are low, but data suggests that this does happen in home stadia.²⁰

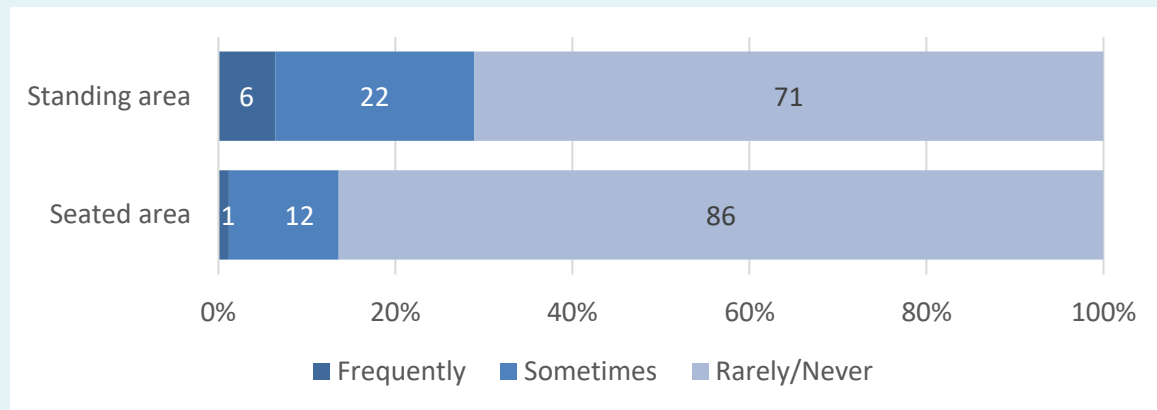


Figure 7: Extent of spectators reporting seeing people fall over seats during goal celebrations in different areas (% , base = 3080)

Respondents were also asked if they had been injured themselves, or seen others injured, in their area of the stadium in the last two seasons. 3% reported being injured themselves (97 respondents). Of these:

- Almost half (48%, 47 respondents) were during celebrations. Although based on small numbers, the proportion of injuries attributed to goal celebrations was higher for those in standing areas (68%) than non-standing (37%)
- 28% were due to pushes or trips, slips and falls (not described as happening during goal celebrations)
- 6% were from being struck by a ball
- 3% were due to fighting/an altercation
- 2% were hit by a missile.

8% report seeing others get hurt over the same time period (232 respondents):

- 14% of these were during goal celebrations
- 28% were a result of fighting/an altercation; the most common explanation for this was conflict as a result of away spectators being in home areas
- 37% were due to pushes or trips, slips or falls (largely in the gangways)
- 4% were from being struck by a ball
- 7% were hit by a missile.

Although a higher proportion of injuries to others were categorised as due to fighting or missile throwing, this is impacted by multiple people reporting the same single incident.

Where explanations of the extent of the injuries were received these were almost all minor (i.e. bruised shins, grazes, sore limbs – one broken hand). This data suggests that although overall numbers are very low, minor injuries do happen due to falls during goal celebrations in home seated areas and were reported more by those who persistently stand. It also shows that this *can* happen in any seated area; at the moment of a goal celebration, it seems immaterial to the level of risk of a fall whether the celebrating spectator was previously seated or standing.

Interviews with spectators gave the opportunity to ask more about how these injuries are sustained and explore whether there are any factors that appear to make a fall more likely. These incidents were most commonly reported as occurring **in away areas**. This suggests that the very small number of incidents reported in home areas in the survey may mask a larger number experienced at away matches.

It's pretty common at an away game, to be fair. It's happened on a couple of occasions, it's usually people behind you that launch themselves forward or have had five pints too many, stand up out of their seat, go tumbling, and it's a bit of a domino effect from there. Nothing particularly serious, just cuts and bruises... everyone peels themselves up off afterwards.

— Cardiff spectator

I have seen people tumble, the reason behind that is again it's the narrowness of the seating, the distance between the seats in front is very small, so if you do lose your footing jumping up, it's easy to fall forwards over the seats in front, and I have seen that happen on a couple of occasions.

— Wolverhampton spectator

This was at away matches... you've got people falling over the seats, they knock into you. Multiple times, I've had shins and stuff. You have less place to go when you've scored a goal, especially if it is a big game like with Swansea... Michael Chopra in the last minute, you can only imagine what that meant. We were right next to the Swansea fans at the time. It goes with the flow.

— Cardiff spectator

A number of contributing factors were highlighted that might increase the risk of this occurring at away matches. Individually these factors may not enhance the risk, but in combination, it is easy to see how falls are more likely.

- Increased levels of **alcohol** consumption, particularly on long trips, making spectators more boisterous but also less steady on their feet.

²⁰ The age of survey respondents (see Appendix 1) was largely over 55, with 12% 35 or under. Combining this demographic with the higher prevalence of risk behaviours that could lead to injury observed in away areas, figures here are still likely to be an under-representation of minor injuries resulting from falls during goal celebrations.

- The **‘away day’ experience** making spectators more excitable.
- Some away spectators perceived as **‘celebrating harder’**.
- Being **close to opposing spectators**.
- Spectators **moving** to stand with their friends in other rows.
- **Narrow row depths** and other physical features of some away areas.
- Larger numbers of spectators **standing**, including those who might not choose to stand normally and be less stable on their feet.

Where spectators had not experienced a fall themselves but still felt like this could potentially happen to them, this was always when discussing perceptions of safety in away areas.

It can get a bit mad with people jumping about and getting knocked and stuff like that. I definitely feel safer at home games. An away day is an away day, isn't it? You've had people who've been in the pub for quite a few hours, and probably have drunk a few more than they possibly should have done.

— Wolverhampton spectator

2.5.2 The relationship between standing, migration, falls and injuries

The risk behaviours described above that can lead to a fall are perceived as more likely in away areas. These are also areas where almost all spectators stand. The relationship between persistent standing and falls over seats may therefore be more than an association.

Firstly, spectators choosing to stand are likely to be more physically mobile than those who remain seated, and may therefore be more likely to celebrate goals and other incidents more exuberantly, actively, and socially. Amongst certain groups, it may be accepted practice to engage in wild celebrations that involve activities that increase the risk of falls, e.g. standing on seats and jumping on others. Across all of the match observations, there was only one incident of spectators in an area of persistent standing who jumped on each other and fell over the seats in front. They were grouped together with some empty seats around them, so did not fall on anyone outside of their group, or cause a collapse. All picked themselves up afterwards with no noticeable injuries sustained.

A second explanation is that where spectators persistently stand, there is also the opportunity for intra-area migration. This is where spectators choose to leave their seat and gather together in more popular areas of the stand (often directly behind a goal). This means that spectators will sometimes be clustered so that the ratio of people per seat increases above 1:1 (and seats in less popular areas in the section will become empty). This type of migration cannot happen in areas where spectators remain seated for large parts of the game. Where spectators are clustered together in groups and ratios of person/seat go above 1:1, it stands to reason that there is an increased chance of a

spectator's foot coming into contact with the lip of a seat back, a person losing their balance, or being pushed. This migration was observed in away areas, and spectators also reported this happening at away matches. In combination with other risk behaviours, this can be a concern.

Some of the older stadiums, especially when you stand up, because when there are a few big people around, it's not the best sometimes, when you're sometimes half overlapping each other, especially, obviously, when you're standing up, if people have got tickets in different areas of the ground and they come and sit with their mates then quite easily you can end up with twelve on a row of ten, but because you're all standing up no one knows and it's not great really.

— **Wolverhampton spectator**

The only thing that concerns me sometimes when I go to away games is it seems to be less controlled. So, quite often you won't be in a seat you're allocated and it's quite often a bit chaotic. You know, if a few of the lads have had a few more beers than they should have done or whatever ... that falling over type thing, you know, quite often it's been a long journey. You know, a few beers on the bus, on the train or whatever. A few beers before the game and yes, they're just a bit more excitable. And yes, not a huge risk but you've just got to, again particularly as a father when the boys are smaller, just keep an eye on the potential risks around.

— **Cardiff spectator**

Although spectators and staff were consistent in their belief that falls were much more likely in away areas, the one incident of people falling over seats in a group observed during this study was in an area of home spectators. Overall, survey data suggests that falls can happen in home seated areas, but they are more likely to be isolated incidents; in away areas, the risk behaviours that can increase the likelihood of a fall are more prevalent and so this is considered a greater risk.

2.5.3 Risk behaviours and progressive crowd collapse

There were no incidents observed of spectators falling onto others in the row in front and causing others to fall forwards themselves, and no surges witnessed. One group were observed falling over seats and each other during a goal celebration but this did not result in them falling forwards onto others not in their group. During celebrations, spectators largely moved laterally (sideways) when hugging and jumping with others, with occasional leaning on the person in the row in front.

Safety staff interviewed did not consider that progressive crowd collapse was a significant risk in areas where large numbers of spectators persistently stood as they felt that management strategies effectively minimised this risk. Staff and other stakeholders at the three clubs in this research who have installed barriers or rails were more likely to acknowledge that surges were an issue prior to this.

It tends to be a bit more when you get a late goal away, that's where we see issues where, there have been small surges and people have got knocked over from the person behind.

— Club staff

A surge would involve more people than the individual instigator and could therefore generate enough force to trigger a crowd collapse at a lower rake, Again, although this is reported as being more likely in away areas, one spectator described this happening in a home area, prior to the installation of barriers.

If there's a surge and as we've had at other games, people come over the top of the seats to celebrate, God knows why they do it, and you get pushed over in your seat and injured. My mum got injured at that one, a guy came from five rows back with a group of fans over the top of the seats to celebrate the goal.

— Wolverhampton spectator

The overall low prevalence of the majority of the risks associated with persistent standing is largely due to comprehensive and holistic management strategies employed at each club in this research.

3. Managing persistent standing

Football clubs vary in their stadium location, size and design, as well as spectator behaviour, history and demand that asserts the need for club- and context-specific persistent standing management strategies. Approaches also differ depending on whether clubs offer areas with barriers or tolerated standing areas for those spectators who persistently stand. Management strategies for terracing differ due to these being licensed standing areas, but cover some of the same risks that are prevalent wherever spectators stand. Despite the context-specific nature of club risk assessments and standing management plans, there are some common features management strategies.

- A **specific risk assessment** for areas where spectators persistently stand in large numbers, and the implementation of additional controls where risks are identified.
- Only tolerating standing in areas of the stadium **with a low rake** (steepness).
- Ensuring that these areas for home spectators are **positioned away from segregation lines**.
- **Consistent stewarding personnel** from match to match where possible.
- **Extra stewards** for these areas to enable management strategies to be implemented effectively (see Figure 8 below for examples).
- **Ticketing sales strategies** that ensure as far as possible that spectators in these areas are those who want to be there.
- **Ongoing communication** with spectators in these areas to emphasise expected behaviours and deal individually with any concerns.
- **High quality CCTV monitoring** of these areas before and throughout the game to identify any emerging risks and inform dynamic management strategies.

These strategies were observed at all clubs in this research where they formed part of their management plans. Data from interviews with spectators suggests that these strategies do not have a noticeable negative impact on the overall supporter experience. Across case study grounds where spectators were interviewed, the most common strategies raised were related to stewarding of the areas. Some felt that steward requests to ask people to sit were futile and often counter-productive to safety management, and demonstrated a need for the all-seater policy to be reviewed.

3.1 Management of specific risk behaviours

Migration (either inter-area or intra-area) that results in overcrowding is a risk at all areas with standing, regardless of the presence of barriers. As discussed in Chapter 2, the potential impact of overcrowding is perceived as greater where there are no barriers as this could contribute to a collapse. Management strategies to control migration and

prevent overcrowding are consistent across clubs in this research, with and without barriers.

3.1.1 Inter-area migration

Clubs in this research have put the following strategies in place in an attempt to overcome the risk of overcrowding as a result of migration:

- **Isolating the area and limiting access:** Areas are isolated either by being a self-contained stand with exclusive turnstiles, or physically divided (as is the case with away areas in most stadia).
- **Additional access controls:** Where the physical layout of the stadium makes isolating the area impossible, stewards are positioned by the vomitory from the time the turnstiles open to undertake secondary ticket checks. These checks are repeated for spectators leaving and re-entering the area. Different coloured tickets for different section can also mitigate against movement between areas.
- **CCTV cameras and operators fixed on risk areas at all times:** This enables staff to identify and monitor overcrowding, including an overhead camera for the rail seating area which makes it easier to identify extra bodies in rows.
- **Ensuring that the size of the area is sufficient to meet the demand:** Although only a small area in comparison to the top-flight clubs, and rarely at full capacity, the size of the rail seating area at Shrewsbury Town was designed to meet the demand of those who want to use it. Along with having the same price point for rail and standard seating within the same stand, this removes the need for inter-area migration.

Aside from controlling migration at Celtic (see Figure 11), which has been an ongoing challenge that predates the installation of rail seating, these measures were largely observed and reported to be effective. However, implementing additional controls and checks presents some challenges:

- At times of peak flow into the stand (from 15 minutes before kick-off) it can be **difficult for vomitory stewards to check all tickets**. Additional stewards can be moved over to these areas at peak flow times to help.
- Spectators **can become annoyed** if they are held on the concourse while tickets are checked, particularly if they are re-entering the area having already shown their ticket and/or play is underway.
- Spectators have found ways to **migrate into these areas without the relevant ticket** despite these secondary checks.
- Thorough ticket checks **can take longer for inexperienced stewards**. Those who are new to the stadium or the particular stand can experience difficulties.

3.1.2 Intra-area migration

Strategies to discourage and/or manage migration at clubs in this research include:

- Where possible, working with spectators on a case by case basis to **accommodate any wishes to move tickets** and limit the need for migration.
- **Reducing the away capacity** for high-risk opposition to allow for some movement without increasing the risk of overcrowding.
- **Extra ticket checks** in place in gangways leading to particular blocks or rows where migration has occurred previously.
- **Different coloured tickets** for different areas or blocks to aid secondary ticket checking.
- **Extra stewards occupying gangways** at the back of stands to discourage lateral movement between blocks and keep gangways clear.
- At Cardiff, the drummer for the Canton Stand was **relocated** to an area above the stand, removing what was considered ‘a natural draw’ for migrating spectators.

Overall, the extent of intra-area migration experienced where home spectators persistently stand is low. All of the above strategies have been observed consistently at Cardiff and appear to be effectively managing the risk of migration to the back of the Canton Stand. At Brighton these have been observed more sporadically, but no significant migration has been evident in home areas. Where migration has been witnessed it has been due to adverse weather conditions, rather than other factors, and was not addressed by stewards. However, implementing these strategies and addressing migration and overcrowding brings its own risks, including creating conflict between spectators and stewards if spectators are challenged for being in the wrong place. This can present a subsequent risk to the safety of stewards.

3.1.3 Falls, injuries and progressive crowd collapse

Where spectators persistently stand in seated areas without a barrier in front of them, clubs in this research have employed a number of strategies to reduce the risk of any falls triggering a progressive crowd collapse. These strategies represent steps taken to limit the likelihood of behaviours that might trigger a collapse.

- Only tolerating standing in **areas with a low rake**. This includes **moving away spectators** to low-risk areas.
- Increased stewarding and access controls to **limit migration and overcrowding**, which could contribute to a collapse. This can include **removing individual seats** from sale (usually end seats) if deemed necessary.
- **Positive engagement and relationship building** with spectators to limit any potential conflict with staff.
- Combining **tolerating standing in one area with enforcement of sitting elsewhere** to minimise the risk of conflict between spectators.

Cardiff have installed three lateral barriers in their away section primarily to divide the away quadrant into sections as a customer service strategy (see Figure 17); these also prevent people in these rows from falling forwards.

The full effectiveness of these strategies are difficult to measure as there have been no instances of progressive crowd collapse. These strategies minimise the likelihood and impact of a fall leading to a collapse, but do not remove the latent risk.

Two clubs in this study accommodated away spectators in upper tiers with a rake of 30 degrees, where less force is needed to trigger a crowd collapse. In these situations, the following strategies are employed to minimise the risk of a fall or a collapse in this area leading to a fall from height.

- These areas are **risk assessed separately** to highlight the need for additional management strategies.
- If deemed necessary, **front row seats are taken off sale** to limit the risk of a fall over the front barrier.
- Balancing the risk of tolerating persistent standing with the risk of conflict that might result from attempts to enforce sitting.
- Further, police and safety staff are instructed **not to go into areas in a way that might cause or escalate conflict**. Any incidents requiring intervention are dynamically risk assessed and, where appropriate, perpetrators are not approached until they leave the area.
- **Education and communication strategies** on the risks of persistent standing in steep areas.

If home spectators are accommodated in an area with a steep rake, alternative enforcement and engagement strategies can be utilised and have been shown to be effective in reducing levels of persistent standing in a high-risk area (see Chapter 4). These have less effectiveness with away spectators, as sanctions are not a deterrent and relationships cannot be built. For example, a video containing clips of collapses was shown to away spectators before kick-off at Sunderland to demonstrate the risks to spectators and encourage them to sit down. This was not successful and spectators stood for the majority of the match.

Again, these strategies cannot be judged as effective or not without a history of collapses to measure against, which thankfully does not exist. Observations supported claims that it is impossible during a match for stewards and response teams to enforce sitting amongst away spectators, regardless of where they are accommodated. The increased prevalence of risk behaviours such as migration, overcrowding, excessive alcohol consumption and standing in gangways amongst spectators of some away clubs suggests that falls remain more likely in these areas. It would be logical to suggest that when combined with a steep rake where a lower force is needed to trigger a progressive crowd collapse that the risk of this is therefore higher.

3.1.4 Blocked aisles and gangways

All clubs in this research have a clear management strategy for ensuring that standing spectators do not migrate into gangways. These include:

- **Stewards positioned at the top of gangways** from the time the gates open, giving them a clear view down the gangway.
- **Regular patrols** by stewards to keep the gangways clear.
- **Removing seats from sale** if migration into gangways is considered a risk.

Club safety documentation suggests steward patrols should happen every 5-10 minutes; during observations these were more sporadic. When undertaken from the start of the match and regularly throughout, steward patrols were generally successful at keeping gangways clear in home areas. In away areas, steward patrols were less frequent or did not happen. Children were also observed standing in the gangways in order to see.

3.1.5 Conflict between spectators

Tolerating standing in certain areas and encouraging spectators who wish to stand into these areas is in itself the primary management strategy for reducing conflict between spectators as there are fewer complaints due to others not being able to see. This also appears to have helped to control persistent standing elsewhere, further reducing the risk of conflict. Persistent standing management strategies are combined with a customer-service focused approach to stewarding to build positive relationships between spectators and safety staff and de-escalate situations where possible.

The combination of these strategies appear to be successful at all clubs in this research with very few reports of conflict due to standing in any area by staff or spectators. Where these did occur they were in seated areas where the majority of spectators sat and were dealt with swiftly by stewards, either by enforcing sitting, moving the perpetrator or moving the complainant.

Aside from reducing conflict, staff stressed that creating and encouraging spectators into areas where standing is more likely to be tolerated was part of a customer service-focused approach to stadium management – a strategy to try to ensure as far as possible that spectators are in the correct stand for them and to offer a range of ticket options for spectators to choose from.

Stewarding plans for standing areas

Clubs ensure that stewarding numbers are sufficient to manage any additional risk behaviours that may arise in standing areas.

Celtic have a stewarding plan specific to the rail seating area, developed in conjunction with an independent safety advisor. The number of stewards has not changed since the rail seating area opened.

- **28 stewards and 2 section managers** are deployed to the 2,975 capacity rail seating area (1 steward per 106 spectators).
- This compares to 84 stewards for the adjacent North Stand (27,000 capacity, 1 steward per 321 spectators) and 65 for the smaller West Stand (13,000 capacity, 1 steward per 154 spectators).

Shrewsbury Town has a smaller rail seating area but this also has a specific stewarding plan and team:

- **6 stewards, 1 supervisor and 1 deputy supervisor** for the 555 capacity rail seating area (1 steward per 93 spectators).
- This compares to 10 stewards for the seated area of the same stand (1,400 capacity, 1 steward per 140 spectators).

Peterborough United have a stadium stewarding plan with:

- **9 stewards and 1 supervisor** for the 2,100 capacity London Road terrace (1 steward per 133 spectators).
- This compares to 12 stewards for the Main Stand (5,000 capacity, 1 steward per 417 spectators) and 19 stewards for the 2,500 seated away stand (1 steward per 131 spectators).

Cardiff City deploy 2 extra static stewards to each of the gangways in the Canton Stand (**8 additional stewards in total**) to manage the risk of lateral migration and keep the gangways clear.

Although these figures give an indication of the level of stewarding these clubs deploy for standing compared to seating areas, this is also dependent on the level of anticipated risk as well as physical features of the stand such as additional access points to manage and the number of vomitories and gangways. As this is dynamic, additional stewards can be deployed as needed.

Figure 8: Stewarding plans for standing areas

3.2 Impact of installing barriers

Three of the six case study clubs in this research have installed rail seating, safety bars or barriers as a strategy for enhancing the safety of spectators who persistently stand. In all cases, **crowd density ratios remain at 1:1** to match the maximum crowd density in seating areas. Whilst Celtic have had their rail seating area since 2016, and Shrewsbury

Town installed a small crowd-funded area of rail seating in 2018, the barriers installed at Tottenham and Wolverhampton represent a new direction in safety measures for spectators who persistently stand in the top level of English football. As such, learning from this experience is crucial to inform any increase in interest in this type of accommodation following its inclusion in the most recent release of the Green Guide.²¹

3.2.1 Impact on the safety of spectators who persistently stand

All interviewees at the three clubs who have introduced seating with barriers believe that the main impact on the safety of spectators in these areas is that this has **removed the risk of progressive crowd collapse**. As one stand manager stated:

The issue with standing, how it was last year, is, it's easy for a surge in people to, sort of, fall into the next row and have that knock-on effect, and the barriers stop that.

— Club with barriers

Modelling the risk of progressive crowd collapse in areas with barriers

Crowd modelling simulations comparing the risk of collapse between areas with a standard seat height and those with a barrier height of 800mm or 900mm found that **the barriers eliminated all progressive crowd collapses in the simulation**. This was demonstrated in tests on a steep rake with a significant initial thrust, equivalent to several people pushing or falling at the same time. (See Appendix 2 for full results).

It should be noted that although barriers prevent a fall from progressing to a surge or a collapse, there remains a risk of an individual using the barrier to gain height and launch themselves onto spectators below. In this case the barrier would be a hazard for people to fall against. This would however require deliberate, reckless behaviour from an individual or group. What the barriers do mitigate against is this type of behaviour causing injuries to those lower down the stand.

Figure 9: Modelling the risk of progressive crowd collapse in areas with barriers

When asked about this in interviews, spectators in these areas felt that the barriers added an extra level of safety rather than this meaning that areas were unsafe without barriers. Those who stood overwhelmingly felt safe in home areas, regardless of the presence of barriers, and reiterated the claim that falls during celebrations are generally associated with away sections anyway.

²¹ The Green Guide refers to the Guide to Safety at Sports Grounds, produced by the SGSA. It provides guidance on spectator safety at sports grounds. The 6th edition was released in 2018 and was the first to include guidance on installing seats incorporating barriers.

Having that barrier, when you're stood up, it does improve the safety, in my opinion, for standing, because I've been at away games where you get a last-minute winner and everybody piles on top of each other. You end up three rows ahead. Having those barriers there can stop that sort of thing.

— Tottenham spectator

With the rail, it's a firm, unmovable object that keeps you in your position. So, you can celebrate all you want, but you're unlikely to cause injury. I was always quite sceptical of-, I would never want to see terraces returned to major football or anything like that ... I've been to probably 40 football stadiums in my lifetime, and the safest I've felt while standing is in the South Stand at Molineux, because it's got the proper facilities, it's had the proper railings put in, it's made it a hell of a lot safer.

— Wolverhampton spectator

Spectators in these areas did not report any negative impact on overall enjoyment, and some indicated that the introduction of rails had also made the experience more comfortable with 'something to lean on' both in front of them and behind.

Survey data: Do barriers increase perceptions of safety when standing?

Survey respondents from both clubs in this research with barriers largely felt safer standing as a result of their introduction.

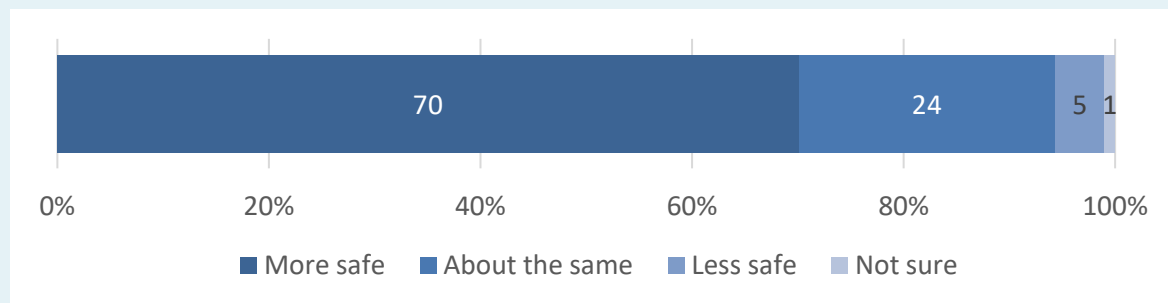


Figure 10: 'How safe do you feel compared to before barriers?' (% , base = 388)

Safety staff and spectators further suggest that as a result of the introduction of barriers in these areas:

- **Celebrations are more orderly** with no opportunity for surging or forwards and backwards movement between rows, reducing the risk of injury.
- **Egress is more uniform** and bulging at exits reduced because the barriers prevent spectators from climbing over seats to push in front of others exiting.
- **Conflict between spectators** due to people wishing to sit is minimal as spectators in these areas largely understand that those around them will stand.
- Some staff and spectators reported that the **behaviour of spectators** had improved.

- **Migration to the front or back of stands** is potentially limited as it is more difficult to move between rows and pockets of overcrowding are more easily identifiable by stewards and CCTV.
- Where installed on the front row, **barriers prevent spectators leaning over the perimeter fence** and entering the pitch area.

Observation of spectator activity generally supports these assertions. Spectators in the areas with barriers were largely observed standing for the entire duration of the games and there was no forwards or backwards movement. For the most part, spectators were observed exiting these areas in an orderly fashion, with virtually no instances of spectators climbing over barriers.

Although staff did not report this to any extent, all three Wolverhampton spectators interviewed who had tickets in the Sir Jack Hayward stand felt that behaviour of those around them had improved this season. This was in relation to a decrease in movement between rows during goals and otherwise, but also overall behaviour.

I actually feel the behaviour in the stand has been a lot better. I think you have less problems with-, I think because the rails act as a barrier between the different rows, so I don't think you have any problems with people. I think people stand slightly differently. So, if people shout something that might be a bit, abrupt and someone takes umbrage with it, you don't hear it as well, if that makes sense? That's one thing I've noticed, is people stand differently. You're not having people leaning back on chairs ... it makes people safer but I think the behaviour's been better in the stands as well.

— Wolverhampton spectator

Staff at clubs in this research feel that installing barriers has not had a significant impact on the standing preferences of spectators in those areas. At Wolverhampton, where two areas of barriers have been installed, those who previously stood continue to stand (in the Sir Jack Hayward stand) and on the whole, those who previously sat continue to sit (in the Stan Cullis stand). When occupied by away spectators, these largely stand as expected based on previous behaviour. Barriers in the latter area do not appear, so far, to have encouraged standing in that area.

We haven't had any issues, for example, of people who saw that barrier as a green light to stand and then it's caused issues with somebody not wanting to.

— Club staff

Interviews with spectators did highlight that there has been some misunderstanding where others have assumed that these areas are now standing areas and responding angrily to any steward requests to sit. Some suggested that installing barriers without standing being licensed had contributed to this misunderstanding and, although clubs had communicated clearly that these were still seated areas, tolerating standing could be interpreted as contradicting that communication.

Results from the 'safe standing' pilot in France

Four clubs in the French Ligue 1 and Ligue 2 took part in a safe standing pilot during the 2018/19 season to evaluate the impact these areas had on the safety of spectators who stood. This was in response to the injuries sustained when a barrier collapsed in an away section in Amiens, alongside increasing protests from spectators who wanted to be able to stand. The 'safe standing' areas did not have to be rail seating but had to meet a list of regulations, including the following:

- Installation of anti-surge barriers, that met current safety standards, in staggered rows, at least every five rows depending on the rake.
- Allocated, identified spaces for spectators that related to a ticket number.
- Seating provided, but this did not have to be traditional seats (bleachers were permitted).
- Spaces for 'people with reduced mobility' provided close to these areas.

The four clubs provided quarterly reports on various matches to include information on spectators in the area, any accidents/incidents, and feedback from the club, spectators and emergency services. Results were positive, including:

- Improved safety due to barriers stopping or limiting the movement of crowds down the stands.
- Reduction in the number of recorded accidents.
- Removal of seats making areas more accessible for stewards.
- Quicker emptying of the stands after the match.
- Positive impact on atmosphere.
- No incidents requiring police deployment.
- Reduction in the costs of maintaining the areas (no damaged seats).

Some challenges were reported, including:

- Security teams needed re-organising and training.
- Difficulties in access for emergency services in crowded areas.
- Central areas could become more crowded.
- Blocking of evacuation stairs.
- Access controls needed to be strengthened to prevent migration.
- CCTV needed to be modified/upgraded for necessary monitoring of the areas.

The working group monitoring the pilot **regarded this as a success and recommended that this be extended** to other clubs who could demonstrate that they met the required regulations.

Figure 11: The 'safe standing' pilot in France

3.3 Ongoing challenges and latent risks

The introduction of barriers in grounds presents some ongoing management challenges and does not remove all risks. Clubs in this research continue to develop their management strategies in response to these challenges.

3.3.1 Migration and overcrowding

Areas with barriers can be popular with spectators and they may attempt to migrate in, resulting in overcrowding. The Sir Jack Hayward stand at Wolverhampton is physically isolated from other areas of the stadium with exclusive turnstiles, so migration into this stand is not an issue. Where physical isolation is not possible, inter-area migration can occur. It was suggested at Tottenham that this behaviour had increased over time, and was more likely in the second half when the team was kicking towards the standing area. At all clubs in this research this was more likely in high-profile matches. Given this was not observed in areas without barriers, it may be that the addition of barriers has added a 'status' to this as a potential standing area. Where migration has occurred, further secondary access controls have been implemented.

Celtic: Example of extra measures to control access to the rail seating area

At Celtic Park, spectators are required to use specific turnstiles and vomitories to access the rail seating area. It is not permitted to enter through the adjacent seated accommodation – and lateral barriers limit this – but in practice spectators are able to find ways to move between the seated and rail seating areas. The club has implemented several strategies in an attempt to control entry to the area.

- **Extra barriers were installed in the lateral gangways** on the boundary of the area to limit movement from adjacent blocks. Stewards occupy the access points at each end of these barriers.
- Season tickets for this area are **visibly different** to those for other areas of the stadium making them easier to identify quickly.
- Attempts are made to ensure **experienced stewards work this area**, particularly on ticket checks.
- The club's **Supporter Liaison Officer provides a bridge between the club and the spectators** in that area encouraging positive dialogue.
- To address the problem of spectators passing tickets for the rail seating area on to others without the relevant ticket, **hand stamps were trialled**. These were given at the turnstiles, and were required to be shown alongside a ticket to access the lower rail seating area. The trial had mixed success.
- **Images are shown to staff during the safety briefing** to ensure they understand what different levels of overcrowding look like. Heads and shoulders should be clearly visible. This is supported by CCTV monitoring.

- The club is clear with spectators that there will be **penalties for non-compliance with the code of conduct in that area**, and the lower section was closed for two games this season as a result of overcrowding and other safety concerns.

Safety staff at the club, as well as the police and SAG²² representatives interviewed, have stressed that controlling migration into this area of the stand was a challenge prior rail seating being installed. This challenge reinforces their belief that rail seating enhances safety in the area as this migration and overcrowding cannot result in a crowd collapse or surge.

Figure 12: Extra measures to control access to the rail seating area at Celtic

3.3.2 Standing on seats and barriers

At Tottenham and Wolverhampton, areas with barriers are still licensed as seating areas so the seats are not locked in place. Celtic operate their rail seating area as a standing area and lock the seats in an upright position, apart from UEFA matches where seating accommodation only must be provided. For these matches seats are unlocked and, due to the weight of the metal seat, these do not flip up so settle in the down position regardless of if they are being sat on or not.

Where seats are unlocked, observed risks include:

- Children standing on seats or being held whilst standing on the seat backs during normal play, often using the barrier in front to balance.
- Spectators standing on seats:
 - In **home areas**, this was **isolated and short-lived**, usually in goal celebrations.
 - When areas with barriers were occupied by away spectators, this was also usually isolated to goal celebrations but was **considerably more widespread when occupied by spectators of European opposition**.
 - Barriers were **occasionally used to balance**, with one foot on the seat base and one on the barrier.
 - Spectators very occasionally **standing on top of barriers during goal celebrations** (only observed when areas were occupied by spectators of European opposition).

Whether seats are locked or unlocked, *seat-backs* can be used to stand on during goal celebrations, usually using the barrier in front to lean on. At Celtic, where seats are usually locked in an upright position, this was more common, although it was also observed on a minor scale at clubs in this research where seats remained unlocked.

²² Safety Advisory Group: a multi-agency group which exists to provide specialist advice to the local authority. See <https://sgsa.org.uk/safety-advisory-groups/>

There is not a clear management strategy for this, other than for stewards to intervene. As most instances were short-lived, steward interventions were not usually observed, and those that were had mixed success. During a prolonged period of standing on seats by away spectators (from a European club) at one Tottenham match, stewards made several attempts to persuade spectators to stand down with limited success.

Locking seats in an upright position removes the risk of using this to stand on, either by adults or children. However, as the seat back can be used to gain height in the same way, this does not mitigate against this totally. In areas with barriers where seats are unlocked, these were observed being used before the match and at half time (the times where those who remain seated during the game stand up). Seats were also used at times by people in the front rows, and in other areas during normal play, such as when spectators were eating or little was happening on the pitch.

3.3.3 Injuries due to trips and falls

Barriers or rails were considered by staff and spectators to have removed the risk of people falling forwards or backwards over seats during goal celebrations. However, it must be acknowledged that the barrier represents an extra hazard to spectators, either for accidents or by those who misuse them. One respondent to the survey reported seeing others bang their heads on the barrier when they forget it is there. There remains a latent risk that spectators may stand on the barrier and fall or propel themselves off, injuring themselves or others. Managing this risk is inherent in wider behaviour management strategies. No club in this research with barriers made specific reference to the risk of climbing and falling from a barrier.

Celtic, Tottenham and Wolverhampton each manage large and full areas with barriers. Clubs in the English Football League (EFL) are likely to have smaller areas which require different management considerations, for example, Shrewsbury Town.

Managing areas with barriers: Shrewsbury Town's rail seating area

In 2018 Shrewsbury Town opened a rail seating area comprising of 555 seats, which occupies the back six rows of the South Stand behind the goal. The club is not subject to the all-seater policy and so seats are locked in an upright position. As the rail seating area is a 'stand within a stand', it requires extra access controls to prevent migration into the area.

- Safe standing ticket holders are given wristbands on entry. This is usually once through the relevant turnstiles, but at busy times the supervisor stands outside to help with wristband distribution to prevent spectators bunching in the concourse.
- Stewards are positioned at the entry point to the standing area on each gangway and check wristbands on entry. Those without wristbands are sent back to get them.
- 555 wristbands are held by stewards for each game to prevent overcrowding; once all wristbands have been given out, no more people are allowed in the area.

Whilst it is possible for a spectator with a safe standing ticket to collect a wristband then pass their ticket to someone else who could also collect a wristband, there has been no evidence of this taking place. The area is usually at 75-80% capacity and with safe standing tickets priced the same as the rest of the stand, there is little reason for spectators to attempt to migrate to the area without a ticket. On the occasions where the safe standing area has been sold out, the exact number of wristbands have been issued, suggesting that this system is effective at this club.

Stewards felt it took six months for the system to be embedded and spectators to get used to it, and felt that wider management strategies have aided this process.

- An experienced stand supervisor was selected (relocated from the away stand) to manage this area, and a dedicated team of club-employed stewards were also selected for their experience and confidence. A team of eight manages this area.
- An empty row of seats between the standing and seated area allows steward movement easily across the stand if needed.
- Signs explain clearly why wristbands are necessary and communicate that spectators benefit from this as it is quicker to show a wristband than produce a ticket.
- A wheelchair platform is above one end of the safe standing area; flags are not permitted here to avoid impacting sightlines.

Persistent standing in other areas of the stadium has been reduced but not eradicated. A number of spectators did not want to move to the safe standing area and so continue to stand in the block closest to the segregation line.

Figure 13: Shrewsbury Town's rail seating area

3.4 Managing terraced areas

Many football clubs up and down the country are not subject to the all-seater policy and are licensed to accommodate spectators in traditional terracing. All stakeholders and the majority of football spectators interviewed felt that there was still a place for terracing in small grounds at lower levels of football. Some spectators reported that they particularly enjoyed playing against opposition with terracing, and others attended non-league matches to experience standing on a terrace.

Brentford, with two areas of terracing at their ground up to the end of the 2019/20 season²³, is the only case study club in this research with this option for spectators. The **home terrace** is an isolated stand but shares a turnstile entrance with the adjacent seated stand. The **away terrace** is the lower part of a two-tier stand, with a seated area above.

One-off visits were also undertaken to Peterborough United and Borussia Dortmund in Germany to identify and understand varying management approaches to maintaining spectator safety in these areas. A visit was also planned to Emerald Headingley Stadium, where Leeds Rhinos play Rugby Super League matches, which was not possible due to Covid-19. Interviews were instead carried out with safety staff to understand how the large terraced areas are managed in an alternative sporting context (see Figure 14).

3.4.1 Ongoing challenges and risks

Managing a terraced area has many of the same risks and management strategies as areas where spectators persistently stand. Inter-area migration is possible where stands do not have their own turnstiles, and gangways and emergency routes can become blocked. These are managed in the same way as areas of persistent standing, with secondary ticket checks where required and sufficient stewarding with regular gangway patrols to keep them clear.

However, some risks differ:

- More spectators can occupy one square metre, giving **less tolerance for overcrowding**.
- Tickets are purchased **unallocated** for the stand (rather than a specific block), giving an increased risk of overcrowding in popular areas.
- Both of these factors can make it **difficult to identify individuals** over CCTV as tickets cannot be traced and it can be easier to move around and become obscured.

At Brentford and Peterborough, the terraced areas are relatively small (approx. 2600 home/1000 away, and 2100 respectively) and are rarely at full capacity. This reduces these risks as spectators who wish to stand can usually buy a ticket for the terrace so do not need to migrate there without a ticket, and there is less chance of overcrowding with

²³ Brentford were given dispensation to continue to use their terrace beyond the three-year period dictated by the all-seater policy due to their planned move to a new all-seater stadium. This will be complete for the start of the 2020/21 season.

below-capacity numbers. Both clubs did report that this could be more of an issue during bad weather where people would move away from the front and sides in order to stay dry. Other safety management issues in these terraces are related to the age of the infrastructure rather than their role as standing accommodation, such as dated and limited facilities, narrow concourses and few entrances and exits.

3.4.2 Management strategies

Particular management strategies observed at clubs in this research to manage these differing risks with terracing include:

- **Reducing capacity** to limit the risk of overcrowding (at Brentford this is applied to the away terrace to allow for some migration from the seated to standing area).
- Close **monitoring by stewards and CCTV** to look for pockets of overcrowding, which is communicated to stewards.
- Stewards will **prevent access to central blocks** if they are deemed to be at capacity.

Brentford and Peterborough did not have particularly increased stewarding levels in these areas compared to seated areas to manage standing spectators unless there was a specific risk that required extra resource.

Overcrowding and migration requires more considered management at Borussia Dortmund where the capacity of the terrace is 24,454 – three times the seated capacity for UEFA matches. **Additional fencing** has been installed to split the stand into sections which are closely monitored for capacity, and **strengthened ticket checks** are in place in an attempt to limit access to the most popular areas (see Appendix 3 for more detail).

Overall, this research did not reveal any concerns about the current management of the terracing or the safety of spectators who occupy the terracing at the two English clubs. No evidence of surges or other concerns were observed or highlighted by safety staff. However, it should be noted that the relatively small size of the terraced areas and the lower overall number of spectators involved makes management easier. This becomes naturally much more challenging at clubs with very large terraces.

Managing terracing at Rugby League: Leeds Rhinos

Leeds Rhinos are a professional Super League rugby club who play at the Emerald Headingley Stadium. When used for rugby, the stadium has a capacity of just under 20,000, though crowds of 11,000 to 13,000 are usual, with three terraced areas. The newly rebuilt South Stand has a 5,500 capacity terrace below a 1,800 seating area. It is an example of a new terrace built to modern safety specifications, and includes wheelchair viewing areas at two levels.

Identified risks

As with football terracing, the main identified risk is the potential for overcrowding in the popular central areas of the South Stand terrace section.

- As tickets are unallocated, spectators entering the central vomitories can't see the space to the sides, so squeeze in the closest area or stand in the gangways.
- Gangways can become blocked and cause bottlenecks at entrances.
- Occasionally this causes conflict if people who arrived early end up being pushed out.

Although it is acknowledged that spectators who attend rugby do not generally engage in significant risk behaviour, there have been incidents with pyrotechnic use, missile throwing, underage drinking and general anti-social behaviour. The safety team has to be prepared for this, particularly for Friday night matches.

Management strategies

A particular strategy has been developed to manage the risk of overcrowding:

- Overhead CCTV cameras monitor central areas of the South Stand terrace and communicate to supervisors when they appear to be full.
- 15 minutes before kick-off (or sooner if needed), spectators are not permitted to enter via the two central vomitories and are instead directed to the ends.
- Spectators who leave the central areas after this time are given a 'pass-out' ticket (coloured raffle ticket) on exiting to allow them to re-enter.
- Stewards in the stand encourage spectators in the central areas to move to the sides, walking them to pockets of space identified on CCTV if necessary.
- Stewards are instructed to keep the gangways clear from the gates opening.

This is supported by a staffing strategy to help implement this effectively:

- Consistent supervisors and stewards who are used to identifying full areas.
- Extra stewarding when the stand is at capacity.
- Positive engagement with spectators to reduce the risk of conflict arising.

As the season was suspended it was not possible to attend a match and see this in practice. Both staff interviewed felt that this was largely successful but, as with football, most challenging at high-profile matches and with fuller crowds.

Figure 14: Managing terracing Leeds Rhinos

4. Persistent standing elsewhere in the stadium

4.1 The extent of persistent standing elsewhere

Persistent standing amongst home spectators outside of tolerated areas has been observed to varying degrees at most clubs in this research. Observations at most matches suggest that standing on back rows is common at some and tends to be tolerated. This typically involves only a small number of spectators and safety staff view this as low risk as they were generally stable in their standing and were not blocking the view of others.

Where persistent standing was observed in other areas of the stadium in larger groups, this was more prevalent in high-profile matches, in blocks adjacent to away spectators and in bad weather where front row seats become wet from the rain.

All interviewees felt that having an area where standing is tolerated, with or without barriers, reduces persistent standing elsewhere. It allows safety stewards to be more confident in enforcing sitting in the rest of the stadium and gives those who wish to stand an option to move out of areas where those around them wish to sit. In most cases, it was not felt that having a tolerated standing area, with or without barriers, encouraged spectators to stand elsewhere. The noticeable exception was at Tottenham, who were also managing a move to a new ground that provides its own challenges in terms of locating spectators where they want to be and embedding new management procedures and behaviour expectations.

4.2 Managing persistent standing elsewhere

Risk assessments and management plans at all clubs in this research include the need to manage persistent standing elsewhere in the stadium by home spectators. Approaches to this are club- and context-specific. Two clubs in this research had specific strategies to target persistent standing in particular areas of the ground.

At Tottenham, where barriers are installed on Level 1 of the South Stand, large numbers of spectators initially stood in the upper levels where standing is not tolerated due to the increasingly steep rake. The club has worked closely with the security firm managing the stand since opening to develop an effective management strategy, which has gradually reduced levels of standing but it is acknowledged that this is an ongoing process.

- **Consistency of agency supervisors and staff** where possible, to ensure consistency of approach and help to build a relationship with spectators.
- Stewards are **positioned at the top of the gangways before the turnstiles open** and perform **regular patrols** during play to keep gangways clear. A small number of stewards (more at the start of the season, reduced as this became under control) have specific responsibility for dealing with persistent standing.

- The club operates a **‘three strikes and out’ policy**, with spectators receiving two warnings to sit, with a response team and CCTV called in on the third occasion. A number of **ejections** have occurred in this area as a result, with some receiving a three-match ban, emphasising that the club takes this seriously.
- Spectators can use a **text service** to report problematic behaviour, including persistent standing. This data is used to create a **‘heat map’ of areas with high levels of persistent standing** and the club can communicate with spectators in problematic areas in advance of the next home match and instruct staff to target that area on a match-day.

Observations found that successfully implementing these strategies is highly dependent on the type of match – standing was much more prevalent in this area in the higher-profile match.

Cardiff City have succeeded over a number of years in moving most spectators who wish to stand into the Canton Stand, so have few problems with persistent standing elsewhere. This is helped by having more space to move spectators around this season as they do not sell out the stadium every week (though the Canton Stand is usually close to capacity). However, there is occasionally persistent standing in the Ninian Stand in the block adjacent to the away spectators. Their strategy to manage this includes:

- Spectators who do not wish to sit are encouraged to **purchase tickets in the Canton Stand**. This has taken time and requires ongoing management from the Supporter Liaison Officer as preferences change.
- A **strict management plan is in place for the Ninian Stand** where there is a risk of small numbers persistently standing. Stewards are instructed to **strictly enforce seating** in this area and escalate those who do not comply.
- Where their details are on the club database, spectators standing in the Ninian Stand have on occasion been **sent a text message instructing them to sit down** for the rest of the match or risk ejection.
- If deemed necessary the club will **take a number of seats in that block off sale**; this reduces the density and aids management.

Observations and feedback from spectators suggest that this strategy, as part of their wider management approach, is effective at limiting persistent standing elsewhere in the stadium. At one high-profile match, two spectators were ejected at half-time in response to their behaviour, which included refusing to sit following complaints from those around them.

As already discussed, almost all spectators attending away matches choose to stand. This was observed at all clubs in this research. Survey data showed that a much larger proportion of away spectators stand through necessity than home spectators, suggesting that many would prefer to sit if they had the choice. Brighton and Cardiff have taken steps to address this and provide spaces for away spectators who wish to sit (see Figure 18).

5. Standing and spectator behaviour

The association of a standing crowd with conflict, disorder and anti-social behaviour is a concern to some stakeholders, and any move towards licencing standing areas needs to consider the risk of problematic behaviour in these areas. Where ‘standing areas’ are referred to in this section, this includes areas with barriers and tolerated standing areas.

In **home** areas, safety staff and local police from each club in this research acknowledged that standing areas could be attractive to younger or boisterous spectators, and had management plans to deal with any antisocial behaviour or disorder in these areas. However, all refuted any notion of a causal relationship between standing and disorder – there was no recognition of a link between the two. In their standing sections, what incidents occurred were limited to a small number of individuals and isolated incidents and, therefore, did not result in crowd disorder. Further, staff were clear that having a standing area did not increase the risk of these behaviours.

We've had no real issues in the years we've been here, that you could associate because they stand and they don't sit, not at all. It's for your fans who want to jump around a lot more and sing... I wouldn't say behaviour is any better or any worse because of it, not here, anyway.

— Safety officer

Away spectators stand in large numbers and are also the spectators who require the most risk management. Some away spectators can present challenging behaviour to manage and clubs will have dynamic risk assessments for away sections dependent on the opposition, the context of the match, and any other specific intelligence received in advance. In reviewing these risk assessments and management plans, clubs expect away spectators to stand and concentrate their efforts on maintaining segregation, keeping gangways clear and managing any particular risks such as alcohol in the stand and identifying pyrotechnics.

5.1 Antisocial behaviour and disorder in standing areas

Match-day observations monitored these areas for incidents of conflict, disorder and anti-social behaviour in order to assess the prevalence of these behaviours in the different areas of the stadium (Figure 15). We acknowledge that these incidents may go unnoticed during observations, particularly alcohol use that can be undertaken discreetly. In order to further understand the prevalence of these behaviours this season, spectators were also asked whether they observed different behaviours in their stand during home matches (Figure 16).

Type of behaviour	Number of UK matches where this was observed (out of 20)		
	Home standing area	Home non-standing area ²⁴	Away areas
Alcohol/smoking in the stand	3	2	5
Missile thrown	2	2	4
Pyrotechnic use	1	0	1
Racist/homophobic language	2	1 ²⁵	4 ²⁶
Physical violence towards staff/other spectators	1	0	2
Total matches with 1+ incident	6	4	10

Figure 15: Number of matches where there was an observed incident of anti-social behaviour or disorder in different locations

Type of behaviour	Home standing areas		Home non-standing areas	
	Frequently	Sometimes	Frequently	Sometimes
Alcohol/drugs/smoking in the stand	3.1%	8.5%	1.7%	6.2%
Missile/pyrotechnic use	0%	4.2%	0%	3.3%
Arguing/fighting with staff/other spectators	0.8%	9.1%	0.5%	8.9%
Using offensive language	20.1%	39.9%	13.5%	39.6%

Figure 16: Respondents who reported that they saw each type of behaviour either frequently or sometimes during the 19/20 season in their stand (% , base =3079)

²⁴ Observers were not watching all seated areas, but could monitor blocks adjacent to either home standing areas or away areas.

²⁵ All home area incidents refer to Yid chants by Tottenham spectators. One observation at the Tottenham stadium had an incident of racism reported by a player and stadium announcements were made. However, investigations found no evidence of racist abuse from the home spectators, so this incident is not counted in these figures.

²⁶ Two individual incidents of homophobic abuse directed to players and spectators; one individual incident of racist abuse directed at a player; one homophobic chant. All individual incidents observed resulted in ejection and arrest.

During follow-up interviews, spectators were asked about the prevalence of the above incidents at home and away matches. All interviewees stated that they had not witnessed these behaviours in home areas. Interviewees also felt that, should it occur, racist abuse would not be tolerated by other spectators in the area and would quickly be reported to safety staff. Those who attended away matches felt that anti-social behaviour was more likely in away sections, but that this was unrelated to standing behaviour and more likely associated with excessive alcohol consumption and being close to rival spectators at segregation lines.

Overall, evidence suggest that whilst disorder and anti-social behaviour can occur in areas where spectators persistently stand, these are usually isolated incidents and they do not occur frequently. Crowd disorder is not a concern in home areas; where individual incidents do occur, they are more likely to be observed in away areas.

5.2 The impact of installing barriers on spectator behaviour

Safety staff and stakeholders at clubs in this research all reported that installing barriers has not led to an increase in problematic behaviours in these areas.

I don't think that it saw an increase of any antisocial behaviour or encouraged it, there would be people standing on the chairs before the barriers were installed.

— Stand manager

Some interviewees also thought it likely that the introduction of barriers had led to some positive impacts on behaviour of spectators. As well as those mentioned in section 3.2.1, changes observed by staff in these areas include:

- Spectators **standing more uniformly** in their row than they did when standing in a seated area, as the barrier gives them a 'space' with their own section to lean on.
- Less **surging forwards** to the front of the stand during goal celebrations.
- Less **leaning on or pushing** spectators in rows in front.

Local police perspectives on standing and spectator behaviour at football

Six police representatives were interviewed from five case study clubs in this research to understand whether strategies to manage persistent standing caused them any particular concerns or challenges.

Standing and behaviour

All claimed that high-risk spectators tend also to be those who choose to stand. This was rationalised as a non-conformist behaviour type. The association of these areas with a lively, boisterous atmosphere can make these areas more appealing to risk spectators. However, any disorder in home areas of grounds is felt to be largely confined to individual and isolated acts that clubs in this research were well-positioned to manage, with police support only needed if a situation escalates into a public order offence. All felt that this behaviour is not made worse or any more likely to occur by the spectator choosing to stand, or the type of accommodation offered.

“It’s very difficult to differentiate the type of supporter who wants a rail seating environment and what are the challenges that the supporters bring... A lot of the issues that remain in the safe standing area at [ground] remained no matter what because of the group of supporters who are predominantly in there... I don’t think there’s any additional challenges, the rail seating itself doesn’t cause us any issues whatsoever, which I suppose is the important point.”

Away spectators, who largely choose to stand, were thought to bring the highest risk of disorder and cause the biggest policing challenges, but this was largely policed outside the stadium and associated with particular high-risk opposition. European visiting spectators were felt to be more likely to engage in anti-social behaviour inside the stadium, with reports of standing on and damaging barriers in one case.

The impact of tolerated standing areas on the policing of football spectators

Officers who worked at the two clubs in this research with tolerated standing areas felt that the introduction of these areas did not have a negative impact on the behaviour of spectators or the policing of the ground. Both were of the opinion that there were some benefits to this approach – grouping non-conforming spectators together in one area avoids having to spread police resources through the stadium and reduces the risk of conflict with either staff or other spectators.

“The fact that all those people are together, they’re not upsetting anybody because they’re standing with other people and everybody can see, reduces tension. From a policing perspective, if you were to move them all around the stadium, to try and disperse them and get rid of that standing culture, that would create greater problems.”

“We’ve not had any issues or any incidents since the grounds opened, in persistent standing in the [stand], which has resulted in a public order situation. Anything

that needed to be dealt with has been dealt with by the club... from a policing area, from a public order point of view, it seems to work well.”

The impact of rail seating/areas with barriers on the policing of football spectators

Tottenham and Wolverhampton had no evidence about the potential impact of installing barriers in an English context to draw upon. Police at both clubs understood this was an unknown but felt that they had no objections to proposals from a policing perspective as safety teams were responsible for putting management plans in place to ensure that these areas could be managed effectively.

No concerns were raised by police over the areas with barriers since their installation. Both felt that they had had no impact on the behaviour of spectators in those areas of the policing operation more widely, and acknowledged that these areas were now deemed a safer environment for standing spectators.

“We haven't had anything that we've had to deploy into the stand for, for public safety reasons, and [stand] is not without its challenges, as far as the demographic who attend it... we don't get any different issues this year, because it's rail seating, than we did last year when it was seated, and persistently standing. I can say that with the confidence of first-hand experience of this season.”

At Celtic, where the rail seating area has had a section temporarily closed in response to safety concerns, it was felt that the installation of rail seating had not had a negative impact on spectator behaviour, and had been a success in enhancing the safety of the spectators in that area who wish to stand. Residual risks, such as overcrowding, were already identified prior to the rail seating being installed.

“My own view is, if you have an ultra-style group who are going to stand for all ninety minutes anyway and are going to look and engage in coordinated movement within the stadium, then safe standing is at times actually a safer option than having a whole bunch of seats in between them... it is safer within that rail seating section on a day-to-day basis.”

All respondents felt that if current tolerated standing areas at their clubs were to become licensed standing areas at some point in the future, this would give no concerns from a policing perspective and anticipated no additional challenges in these areas. Standing is not considered a police matter and all would defer to club safety teams and SAGs to ensure that an effective management strategy was in place to limit any need for police involvement. Most acknowledged that this change would be beneficial for overall stadium safety management as clubs could be explicit about what spectators buying tickets in those areas would expect.

Figure 17: Local police perspectives on standing and spectator behaviour at football

5.3 Managing behaviour in standing areas

5.3.1 Managing conflict

Clubs in this research do not appear to have particular issues with conflict, either between spectators themselves or between spectators and stewards, in areas where persistent standing is managed, with or without barriers. This is likely because stewards' attempts to enforce sitting in these areas are minimal. It was reported at one club that an increase in stewards asking spectators to sit this season has created some incidences of conflict between spectators and stewards. However, safety staff generally believed that the risk of conflict has been reduced in these areas for a number of reasons:

- Standing areas have been **positioned far away from segregation lines** (with the exception of Wolverhampton).
- Ongoing **supporter engagement and ticketing strategies** to ensure that spectators who wish to sit during play do not purchase tickets in these areas.
- Spectators in these areas **understand there is a high chance of people standing** around them - there have been no observations of conflict between spectators due to the blocking of views.
- **Wheelchair bays in these areas are of a sufficient height** so that their sightlines are not interrupted by spectators standing in front of them. At Wolverhampton this has involved increasing the height of the wheelchair platform in the Sir Jack Hayward stand.

Safety staff have reported that in away areas, spectators are unlikely to be asked to sit down because of the potential risk of conflict this can create. This also applies to areas where spectators are persistently standing in upper tiers, though there was little evidence of this during observations.

Minimising conflict as a result of persistent standing in away sections

Both Cardiff and Brighton have taken a proactive approach to away ticket sales in an attempt to accommodate the wishes of away spectators who prefer to sit. This is primarily a strategy to enhance customer service, but this also reduces the risk of conflict due to spectators who wish to sit having their view blocked. The two clubs differ slightly in their management strategies because of differences in their capacity level in away sections.

Cardiff City has a capacity of 3,300 in the away section, with 270 of these in front of the vomitories in a lower section divided by an independent barrier. These 270 seats are designed to accommodate away spectators who wish to sit.

- Some visiting clubs agree to sell the front 270 seats only to spectators who wish to sit. This is encouraged if clubs wish to take the full allocation, which happened on a small number of occasions when the club was in the Premier League.
- In most cases in the Championship, away clubs do not take the full allocation so the front section is not sold and is used to relocate spectators whose view is obstructed as a result of persistent standing. When spectators arrive who wish to sit, they are offered seats in these areas even if their ticket is nearer the back. Stewards approach families, the elderly and the less mobile at the vomitories to offer them this option.
- As well as visibly dividing the blocks into two sections, the independent barrier also acts to prevent those standing behind it from falling forward onto those sitting in the row in front of them.
- Away spectators were observed sitting in the front area during visits.

Brighton and Hove Albion have a similar strategy, but because Premier League clubs regularly sell their full allocation of away tickets, the club is much more reliant on the compliance of away club ticket systems.

- A small raised section of 74 seats at the back of the away stand is reserved for spectators who wish to sit. Signage makes it clear that standing will not be tolerated in this area.
- This policy can only be enforced (and stewards will only be instructed to enforce it) if the away club has sold these tickets on this basis. Of the two observations at this club, one away club had, and the other had not.
- Away spectators were observed all sitting in this section at one match where tickets had been explicitly sold as seating tickets. It was reported by a spectator that the ticket arrived in the post with a note stapled to it reinforcing that this was a sitting ticket and standing would not be tolerated in this area. In this case the strategy was successfully implemented.

Both clubs combine this approach with attempts to create a welcoming atmosphere for away spectators, such as a family area at Cardiff and the away club logo and colours lighting the away concourse at Brighton.

Figure 18: Minimising conflict as a result of persistent standing in away sections

5.2.2 Managing anti-social behaviour and crowd disorder

All safety teams at clubs in this research have management strategies to identify and deal with anti-social behaviour throughout the stadium, with some reference to areas where standing is managed if they feel that spectators in these areas are high-risk. Where incidents of anti-social behaviour have been observed they have been isolated (and usually in away areas) and dealt with by security teams. At local derbies, police have occasionally been deployed on segregation lines to deter disorder. The following management strategies are utilised:

- Comprehensive and high-quality **CCTV coverage and monitoring** of areas of risk spectators. This allows identification and tracking of any spectators engaging in anti-social behaviour and disorder and a basis for response team intervention.
- Specific direction to supervisors during safety briefings on **picking out racism and other abusive language** from 'banter'.
- Some safety teams have **reciprocal stewarding arrangements** where away clubs bring a small number of stewards to help with managing away areas.
- Clear procedures for **reporting and de-escalating incidents** to response teams.
- Having **clear and utilised sanctions** for those who continue to engage in unacceptable behaviour.
- Balancing the threat of season ticket suspension with **educating spectators on risks and engaging positively with them**, even during ejections.
- **Extending segregation areas for high-risk matches** and positioning tolerated standing areas **away from segregation lines**.

Aside from the final point, all of these strategies are employed across the stadium as part of broader risk and behaviour management plans and are not associated specifically with areas or spectators at high risk of persistent standing.

6. Conclusions

Clubs in this research **recognise a number of safety risks associated with persistent standing and risk assess areas where large numbers of spectators stand in relation to this.** Although some of these risks are not present when all spectators remain seated, persistent standing per se does not create these risks; they are largely a result of spectators engaging in risk behaviours in these areas. In particular, this includes migrating, standing in gangways, crowd disorder, and over-exuberant celebrations. Risks to safety are considered greater when these behaviours occur in combination. This is more likely in away areas. **Overall, low levels of risk behaviours were evident** in standing areas at the clubs in this research. It is accepted that as clubs in this research were purposefully included due to their strong safety management approach, this might not be the case for other clubs.

The introduction of standing areas appears to have reduced the potential for conflict, and the associated risks. Enforcing the all-seater policy has been a source of conflict between spectators who persistently stand and those who wish to sit, as well as between spectators and stewards. As spectators who buy tickets in these areas largely understand and accept that those around them will stand, the potential for conflict is reduced. Ticketing and communication strategies to ensure spectators are located in the right area of the stadium are crucial.

Injuries can occur due to falls over seats during goal celebrations, particularly if this creates a surge forwards. These appear to be rare, but can happen in home and away areas. A combination of risk behaviours can make a fall more likely. The number of injuries caused by celebrations, whilst largely minor, is likely to be higher than those reported to us or clubs. Where barriers have been installed, the risk of injury due to falls in seated areas has been reduced considerably.

The combination of behaviours that contribute to an increased risk of falls forward are generally more prevalent in away areas, suggesting that away areas should be included as a priority in any consideration of barriers as a mitigation measure.

All clubs in this research **have developed management strategies appropriate for their particular stadium's layout.** These include high-quality CCTV monitoring, specific risk assessments, siting these areas far from away sections where possible, and employing appropriate levels of stewarding. Clubs commonly engage with spectators to ensure expectations of behaviour in areas where standing is tolerated (as well as in areas where it is not) are clear.

While most management strategies share a common set of characteristics, there is no 'one size fits all' approach. Strategies to assure the safety of spectators are nuanced to take account of the physical features of the stadium, the behaviour of spectators who occupy areas where standing is tolerated, and the match context. In **high-profile matches**, spectators are more likely to stand during play,

crowds may be bigger and stewards are required to deal with a range of issues in addition to persistent standing. Extra measures are often implemented in the context of these matches, such as additional stewards or response teams, to ensure the safety of spectators.

Despite these management strategies, there remains a risk of progressive crowd collapse where standing occurs in seated areas without barriers or rails. The extent of this risk depends on the rake, that is, the steepness of the slope within the stand, and therefore varies between stadia. **The movement of spectators into or within areas where standing is tolerated can lead to pockets of overcrowding and an increased risk of injury or a crowd collapse in some circumstances.** Management strategies to reduce the risk of migration can reduce the potential of a collapse being triggered. The crowd modelling suggests that the risk of an individual fall instigating a progressive crowd collapse is low in stands with a shallower rake. Multiple people falling together (e.g. a surge, or a fall in an overcrowded area) would increase the risk of this.

Installing barriers has had a positive impact on spectator safety in these areas, particularly in mitigating the risk of a progressive crowd collapse. The barriers almost completely eliminate the possibility of forwards or backwards movement during goal celebrations and have removed the risk of a surge causing injury to those in front or triggering a crowd collapse. Spectators overwhelmingly report that they have felt safer in these areas since rails were installed and staff are satisfied that barriers have improved safety.

Installing barriers has had wider benefits, including encouraging more orderly egress, reducing the number of people leaning on or over perimeter fencing and making it more difficult for spectators to migrate between rows by climbing over seats. There is also the suggestion that behaviour has improved because spectators have ‘ownership’ of their space with a barrier in front of them. All of these contribute to improved safety and enjoyment. Further, the introduction of barriers has not led to an increase in standing in these areas.

Barriers do not eliminate the risk of injury by misadventure, as climbing on the infrastructure, including unlocked seats, seat backs and barriers is still possible. Standing on barriers has the potential to cause serious injury and should be considered an ongoing risk in these areas. However, any injuries sustained this way are likely a result of a deliberate act and other spectators remain better protected against this where barriers have been installed.

Standing areas are associated with atmosphere and are therefore attractive to some spectators. Where standing areas are accessible from other parts of the stadium, and demand is higher than the number of tickets available, migration is a risk. Where both of these factors are present, secondary access controls are needed to help prevent migration and mitigate the associated risks. Determining the likely demand for tickets in a standing area can inform decisions about location and capacity as well as the strategies and resources required to manage it effectively.

Managing migration can be challenging in high-profile matches. CCTV is effective in identifying overcrowding which can be cascaded to staff on the ground. Removing a small number of seats from sale to reduce density in these areas can help to prevent overcrowding in the event that a small amount of migration does occur.

Stewarding fulfils a crucial role in strategies to manage standing areas. It appears to be most effective when teams are sufficiently large and comprise experienced staff who are consistently deployed to these areas. Building positive relationships with spectators who attend regularly helps to ensure management strategies are effective. Regular steward patrols and the presence of stewards at the top of gangways appear to be effective ways to keep gangways clear, particularly when they are implemented from before the start of the match. However, this is more challenging in high profile matches and in areas with away spectators.

Creating areas where standing is tolerated (with or without barriers) does not appear to increase standing elsewhere in a stadium, but neither does it eradicate it. A high level of supporter engagement at the point of ticket sale and strict enforcement of the seating policy outside the standing area on match day can effectively reduce persistent standing elsewhere in a stadium, but this approach takes time to establish and embed. Clubs in this research with tolerated standing areas still need strategies to manage persistent standing elsewhere in their stadia.

There has been no reported negative impact on the behaviour of spectators in either tolerated standing areas or areas where barriers have been installed. Some spectators can be more difficult to manage than others, but no club in this study reported significant problems with the behaviour of home spectators regardless of whether they sit or stand. Local police teams reported that they have not been deployed to areas with barriers this season and had no concerns with the continuing operation of these areas. Away spectators from certain risk opposition (which varies by club) remain the biggest challenge, primarily outside the stadium.

Incorporating wheelchair platforms into areas with barriers has allowed disabled ticket holders to be part of this experience. The platform ensures disabled spectators can safely observe the match without their view being blocked by those who are standing. This is important for the development of progressive and inclusive approaches that encourage and enable a diverse range of people to engage with football. The platforms that are in place in two case study clubs are popular with spectators and are well managed.

Ticketing strategies have been implemented to accommodate the preferences of away spectators, who are typically more likely to have to stand in order to see rather than through choice at away matches. The success of strategies designed to ensure away spectators' preferences are accommodated relies on the co-operation of away clubs when selling tickets, as well as a proactive stewarding approach. This is more straightforward if away sections are not at capacity.

This report represents an important step towards addressing the gaps in understanding about the risks of persistent standing and the effectiveness of strategies

to manage these risks.²⁷ The findings, along with wider evidence, are designed to inform the 2019 Conservative and Unionist Party pledge to “*work with fans and clubs towards introducing safe standing*”.²⁸ In the event of any change in legislation, it will be important to monitor the implementation and evaluate the success of strategies to manage spectator safety in order to fully understand the potential risks and the most effective ways to mitigate them. As management strategies are developed and tested, it will be crucial to continue to build this evidence base, particularly as advances in seating design and other engineering solutions continue to develop. The good practice and ongoing challenges identified in this report can usefully help to shape the development of these strategies.

²⁷ Welford, J., Beard, A., Corley, A., Birkin, G., Francis, N., and Lamb, H. (2019) *Standing at Football: A rapid evidence assessment*. Published by Department for Digital, Culture, Media and Sport: <https://www.gov.uk/government/publications/standing-at-football-evidence-review-report>

²⁸ The Conservative and Unionist Party Manifesto 2019. Published at: <https://www.conservatives.com/our-plan>

Appendix 1: Methodology

CFE Research and partners developed a mixed-methods approach for the research into the safe management of persistent standing in seated areas during the 2019/20 football season. The approach combines observations with qualitative research into the perceptions and experiences of those with a stake in crowd safety and quantitative measures of risk. The methodology was delivered in four stages. Details of the first three stages, including the profile of respondents, are set out below. Details of stage 4, crowd modelling, are provided in Appendix 2.

Stage 1: Initial scoping

This stage involved:

- A desk-based review of documentation relating to case study clubs' approaches to assessing and managing risk and crowd safety.
- Initial interviews with the SGSA inspectors and safety officers at each of the case study clubs to identify the particular risks and challenges they face in relation to persistent standing and crowd safety; the rationale for the strategies manage these risks; and perceptions of their effectiveness.
- Interviews with representatives from stakeholder organisations to explore their perspectives on the risks of persistent standing. The organisations consultation were: The Football Association, The Premier League, The English Football League, The UK Football Policing Unit, The Football Supporters Association and Level Playing Field.

Stage 2: Primary fieldwork with case study and other clubs

2.1: Case study clubs

Six case study clubs were selected in conjunction with the SGSA to reflect the diversity of management approaches currently in operation. The sample includes one club with rail seating, two clubs with seats with safety barriers; two clubs with a designated area where standing is tolerated but where no additional infrastructure has been installed, and one club with a traditional terrace.

A series of match-day visits were completed at each club up until the suspension of the 2019/20 season on 13th March 2020. The primary purpose of the visits was to observe:

- The extent to which the risks of persistent standing identified during the scoping stage were evident in the stadia.
- The extent to which the strategies for managing these risks were being implemented.
- The effectiveness of these strategies in managing identified risks.
- The ways in which spectators responded to these strategies.

Typically two members of the team attended each match to independently observe the management of the crowd. Data were recorded using an observation schedule and crossed checked to ensure consistency. Photographic evidence of the behaviour observed was captured during the matches and CCTV footage of key incidents was viewed following the matches to supplement the observation data.

During the fieldwork, 17 matches were observed. The matches were selected in conjunction with the case study clubs to ensure different types of match were attended. Police risk category and competition were taken in account when selecting the matches as summarised in Figure 19. Varying kick-off times were also taken into account where possible.

Club	Competition			Police category ²⁹				Total visits
	League	Cup	Europe	A	B	C	C-IR	
<i>Case study club observations</i>								
Brentford	3	1	N/A	2	2			4
Brighton	2		N/A	2				2
Cardiff	3		N/A	2		1		3
Celtic	1		1		1		1	2
Tottenham	1	1	1		2		1	3
Wolverhampton	1	1	1		2	1		3
Total	11	3	3	6	7	2	2	17

Figure 19: Match observations at case study clubs

It is important to note that all observations were conducted during the 2019/20 football season. There has not, therefore, been the opportunity to compare current approaches with management practices or spectator behaviour in previous years. The findings relating to the impact of either installing barriers or creating areas where standing is tolerated on the safety of spectators are, therefore, based on the perceptions of interviewees and observers as well as comparisons with other clubs and areas of the stadia.

²⁹ A standardised set of categories used by the police in relation to the risk of disorder associated with individual football matches. Categories take into account the potential for disorder inside and outside the stadium, with Category C-IR (Increased Risk) the highest risk category. <https://www.app.college.police.uk/app-content/public-order/policing-football/#football-event-categories>

2.2: Individual site visits to supplementary clubs

The field visits to the six case study clubs were supplemented with one-off visits to lower league English clubs and one club in the Bundesliga to observe standing in alternative contexts. Planned visits to one lower league English club, a Rugby League club and two clubs in France could not take place because of Covid-19 restrictions.

Club	Competition			Police category				Total visits
	League	Cup	Europe	A	B	C	C-IR	
Shrewsbury	1			1				1
Sunderland	1				1			1
Peterborough	1			1				1
Borussia Dortmund	1							1
Total	4	0	0	2	1	0	0	4

Figure 20: Match observations in other contexts

2.3: Interviews with club staff and stakeholders

A total of 45 interviews were undertaken with key individuals with direct involvement in safety management at each club (Figure 21). The purpose of the interviews was to explore the impact of management strategies and ongoing issues and concerns relating to standing at football stadia. The interviews were conducted during case study visits or by telephone.

Safety officers	Stand managers	SAG	Local police	SGSA inspectors	SLOs ³⁰	Other	Total
11	8	5	6	8	4	3 (league official – France, safety consultant – Germany, Government – Scotland)	45

Figure 21: Number of interviews completed with club staff and other stakeholders

Stage 3: Supporter consultation

This involved a large-scale survey of spectators who currently attend matches at five of the six case study clubs and a series of follow-up interviews.

3.1: Spectator survey

An online survey exploring perceptions and experiences of safety at football matches and attitudes towards the all-seater policy was administered in March and April 2020. Cardiff, Wolverhampton and Brighton disseminated the link to the survey to

³⁰ Supporter Liaison Officer, see <https://thefsa.org.uk/our-work/slos-and-dlas/>

their season ticket holders. Tottenham and Brentford did not distribute to their season ticket holders due to concerns over Covid-19. The FSA distributed the link to members who were registered as supporters of the case study clubs in England and Wales.

Club	No.	%
Wolverhampton	1305	42.1
Brighton	919	29.6
Cardiff	813	26.2
Tottenham	48	1.5
Brentford	17	0.5
Total	3102	100.0

Figure 22: Response rate by club

One in ten respondents indicated that they had a disability and just 1.4 per cent reported that they were from a Black, Asian and Minority Ethnic (BAME) background.

Age group	No.	%
56+	1653	53.3
36 - 55	1058	34.1
16-35	388	12.5
Total	3099	100.0

Figure 23: Respondent profile by age group

Gender	No.	%
Male	2723	88.0
Female	349	11.3
I describe myself in another way	3	0.1
I prefer not to say	20	0.6
Total	3095	100.0

Figure 24: Respondent profile by gender

Respondents were categorised as either ‘standing’ or ‘non-standing’ for the purposes of analysis (Figure 25). The ‘standing’ group comprises those who report that they usually ‘chose to stand’ or ‘have to stand in order to see’ and have a ticket in one of the areas where particular strategies for managing persistent standing are in place (e.g. the installation of barriers or an area where standing is tolerated).

Viewing behaviour	No.	%
Standing	740	23.9
Non-standing	2362	76.1
Total	3099	100.0

Figure 25: Respondents who stand and do not stand

The standing group was further disaggregated, into those who stand in an area with rail seating/safety barriers and those who stand in a designated area where standing is tolerated but no additional infrastructure is in place, for the purposes of analysis.

Standing accommodation	No.	%
Rail seating / safety barriers	354	48.4
Tolerated standing area	378	51.6
Total	732	100.0

Figure 26: Type of accommodation where respondents stand

The report focuses on the results where any differences in the perception and experiences of different groups of survey respondents is statistically significant, that is, where the difference is likely to be caused by something other than chance.

3.2: Follow-up interviews

Telephone interviews were conducted with a sub-sample of 30 survey respondents who agreed to be re-contacted. The sample was purposively selected to ensure representation from each of the clubs that participated in the survey and diversity in terms of respondents' personal characteristics and behaviours. The interviews provided an opportunity to explore the issues raised in the survey in more depth, as well as issues not covered in the survey.

Club	Gender		Age group			Attendance at away matches		Behaviour		Total
	Male	Female	16-35	36-55	56+	Yes	No	Stand	Do not stand	
Tottenham	6	0	2	2	2	4	2	3	3	6
Wolverhampton	5	3	3	4	1	7	1	5	3	8
Brighton	5	1	0	5	1	3	3	3	3	6
Cardiff	6	0	2	2	2	5	1	2	4	6
Brentford	4	0	1	0	3	2	2	0	4	4
Total	26	4	8	13	9	21	9	13	17	30

Figure 27: Profile of follow-up interviewees

Appendix 2: Crowd modelling method and results

1. Background

Progressive crowd collapse is where multiple people fall forwards onto those in front, causing a crowd collapse which can gather momentum (and more people) as it progresses. As it is not possible to assess this risk in real-world conditions, a computer simulation of a crowd was developed to evaluate the potential risks of progressive crowd collapse in a safe and controlled environment. This modelled conditions to determine which parameters (variables) increase or decrease the risk of a progressive crowd collapse.

This simulation software was first used in 2008. Simulation results showed that there is a relationship between the steepness of the stand (gradient or rake) and the extent of crowd collapse. 'Toppled' means that a member of the crowd ('agent') has been pushed but has not fallen over. 'Fallen' means a member of the crowd has hit the seats or floor, presenting a significant risk of injury or, in the worst-case scenario, fatality. The risk of injury was found to increase when the gradient of the stand is above 25 degrees and significantly rises above 28 degrees. Two key factors were found to give rise to a risk: excitement (e.g. a goal celebration) and thrust (e.g. a push, punch or kick).

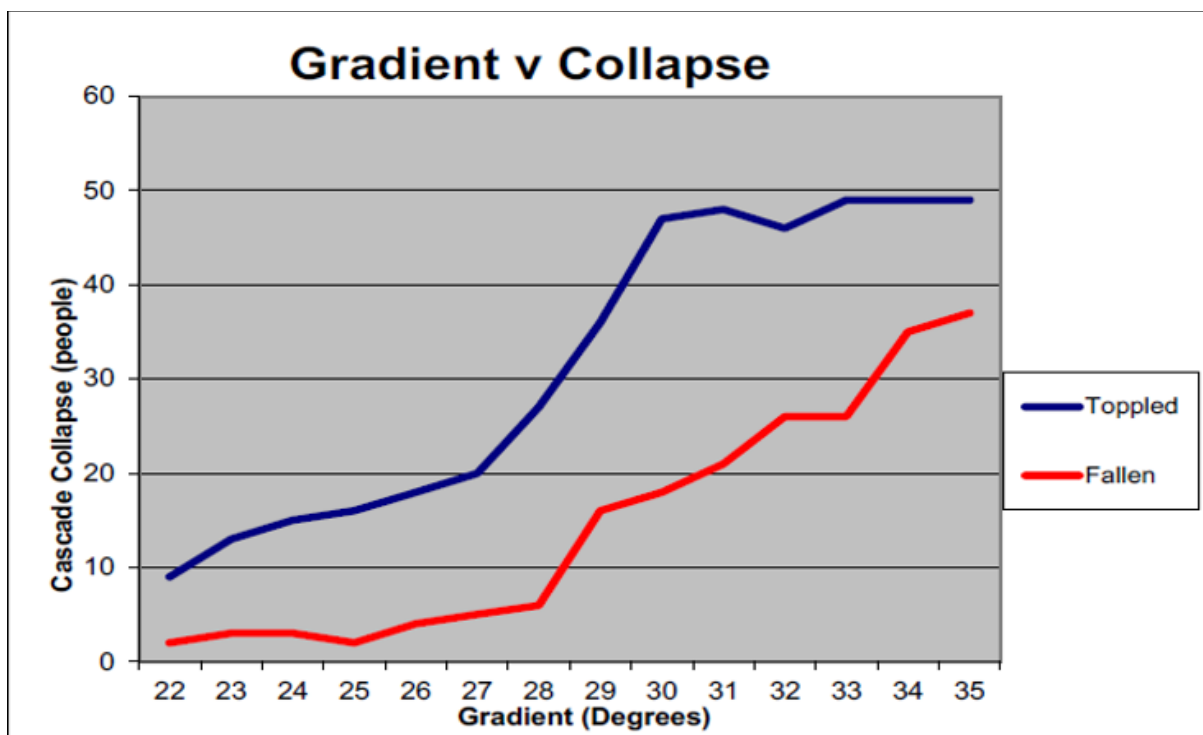


Figure 28: 2008 crowd modelling analysis results

Since this work was undertaken, the modelling has been tested extensively and in different scenarios and has been enhanced to take account of a range of additional parameters (variables). This research builds on the previous work by:

- applying this modelling to the physical features of stands where persistent standing occurs in large numbers
- examining the impact of management strategies on the risk of progressive crowd collapse, particularly the installation of barriers, and
- relating this modelling to observed spectator behaviour at these grounds.

2. Method

Modelling the person

The modelling is carried out using the Newton physics engine,³¹ used by most commercial software companies. Modelling the human frame (the person, or ‘agent’ in the simulation) and the way a person falls uses the HumanCAD³² database to model the segmented body of the human frame and centre of gravity for a tipping point. The dimensions of the agents are proportional to the human frame. Human characteristics and the individual physics of a person falling are applied to the agents in the model. The simulation randomly assigns mass (65kg – 100kg) and height (1.6m – 1.9m) to the agents. A heavier, taller person will fall harder on those in front than a smaller lighter person. This randomisation prevents agents from falling all in the same way and creates variation in the model to more closely reflect real life.

Modelling the stands

All simulations are run using areas of 28 seats x 20 rows. Each agent acts independently and can be visualised as a series of segmented dominos on a stepped surface. The simulation system allows a range of variables to be adjusted and tested, including seat width, height and depth, capacity of the area, rake, and initial force to trigger a collapse. The system built on that developed in 2008 by adding barrier height and the ability to group agents together randomly to assess the impact of within-stand migration. The physics engine was also enhanced to model the agents more closely to human bodies. Any variable can be adjusted to test how this impacts on the likelihood of a simulated collapse.

³¹ <http://newtondynamics.com/forum/newton.php>

³² <http://www.nexgenergo.com/ergonomics/humancad.html>

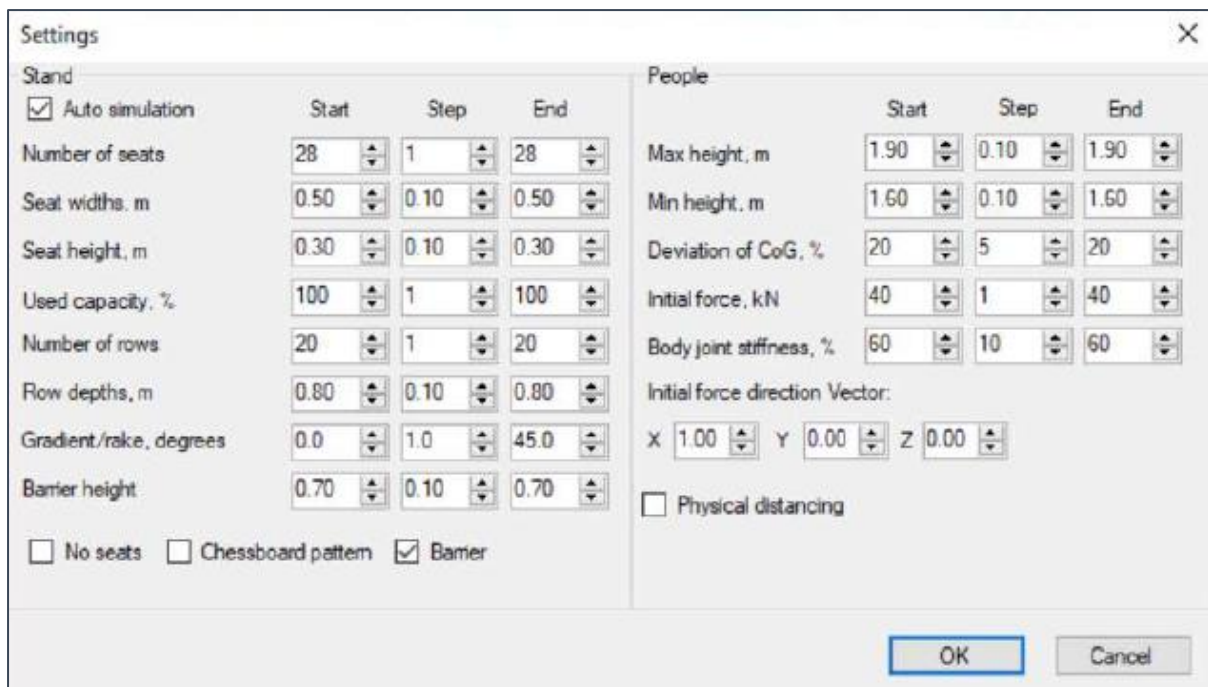


Figure 29: 2020 simulation parameter screen

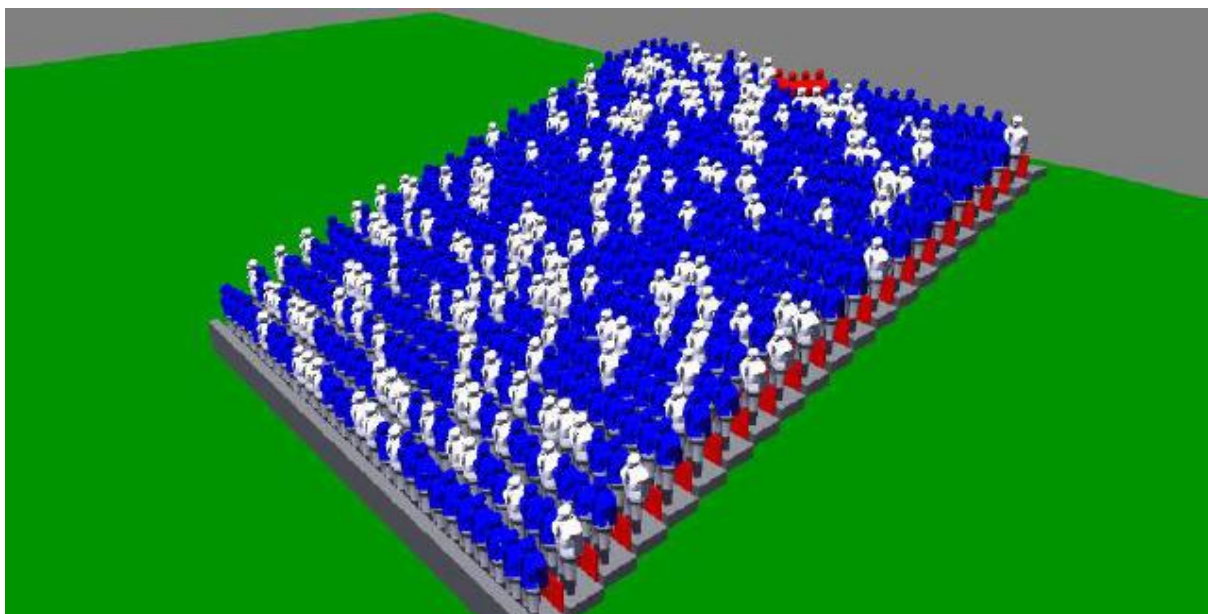


Figure 30: Set up image of a stand area – initial thrust (trigger) in red at the rear

Thrust as a potential progressive crowd collapse trigger

The simulated force is always started at the centre back of the area to provide comparable analysis from one simulation run to the next. Previous testing has shown the same phenomena regardless of initial starting position. The initial force (thrust) can be set from 1 – 75Kn. To relate this to behaviours, a punch can be as much as 5Kn, a push 10Kn and several people diving forward as one can be up to 75Kn. This is based on the forces of a body falling being 2.5x their body mass. An individual deliberately throwing themselves forward can generate individual impulse forces

between 10Kn – 40Kn per person; the heavier individual, the greater the force generated.

Limitations

Modelling humans as simulated agents does not take into account the individual variance in behaviours, for example there is no allowance for people reacting to a collapse or fall behind them by bracing themselves to make them more stable. It also assumes a level of uniformity in the positioning of agents in front of their own seat and facing (and therefore falling) forwards. To disturb the uniformity of positioning, a grouping variable was added (see below) to take into account extra bodies in rows.

3. Results

A number of variables were tested to assess the impact different conditions and triggers on the risk of progressive crowd collapse. Results show the percentage or number of agents that fall to the ground in each simulation. Even where low numbers fall, and a crowd does not collapse significantly, those that do fall to the ground are still at risk of injury.

Thrust v rake

Initial thrusts from 10Kn to 40Kn were used to evaluate the impact of this on the risk of progressive crowd collapse at different rakes. A 57cm seat height is used (standard seating area without barriers installed). The results are shown below.

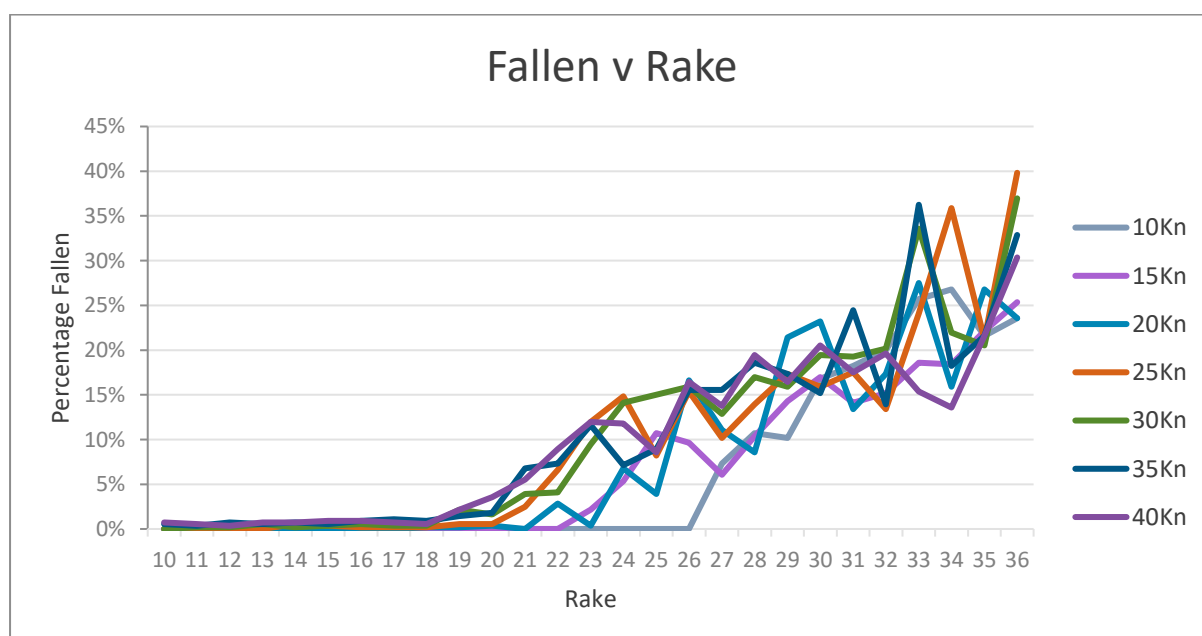


Figure 31: % of fallen agents by rake when adjusted for initial thrust

This series of tests show that progressive crowd collapse is observed at a lower rake with higher forces (several people lunging), and at lower forces for higher rakes. A

collapse did not result from a 10Kn thrust (individual punch or fall) at a rake below 26 degrees, however a 40Kn thrust caused a simulated collapse on a rake as low as 18 degrees. Interestingly, as the rake increases beyond 28 degrees, the rake appears to have a greater effect on the percentage of agents that fall than the force of the initial thrust.

Thrust v rake: Sensitivity testing

As agents are randomly assigned a body mass and height, multiple simulations are run in the same conditions to average the results. Tests were run at 25 degrees to assess the amount of initial thrust that could create a collapse at this rake.

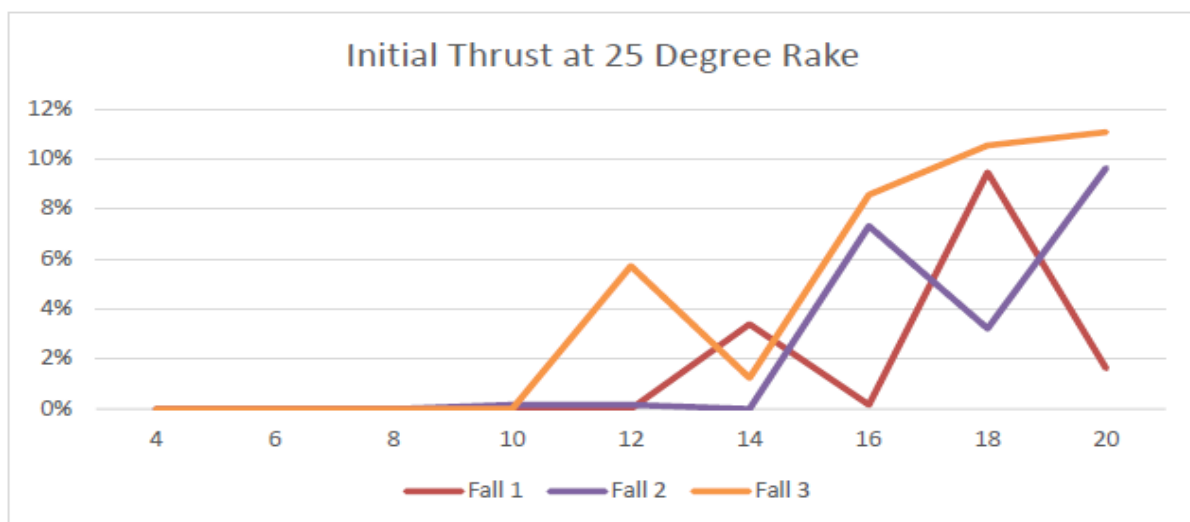


Figure 32: % of fallen agents by thrust at 28 degree rake, 3 runs

At around 10Kn the simulation starts to show the risks of a progressive crowd collapse. This highlights the random location of body sizes on the results and how that can affect a progressive crowd collapse. The trends are clear, that the thrust (at one fixed rake) are proportional to the effect (interacted/fallen). This is more visible when we run many (10 +) simulations at a fixed angle and vary the thrust from 2 – 50kn, then average the results. Over 15 runs at a fixed rake of 28 degrees, the likelihood of a collapse resulting from an 8Kn thrust (for example, a two handed shove) at this rake is 1 in 4. By the time this thrust is increased to 16Kn (for example, a large person deliberately throwing themselves forwards), this created a collapse every time. The number of agents involved in the collapse also increases from an average of 6 agents at 6Kn to 64 at 16Kn.

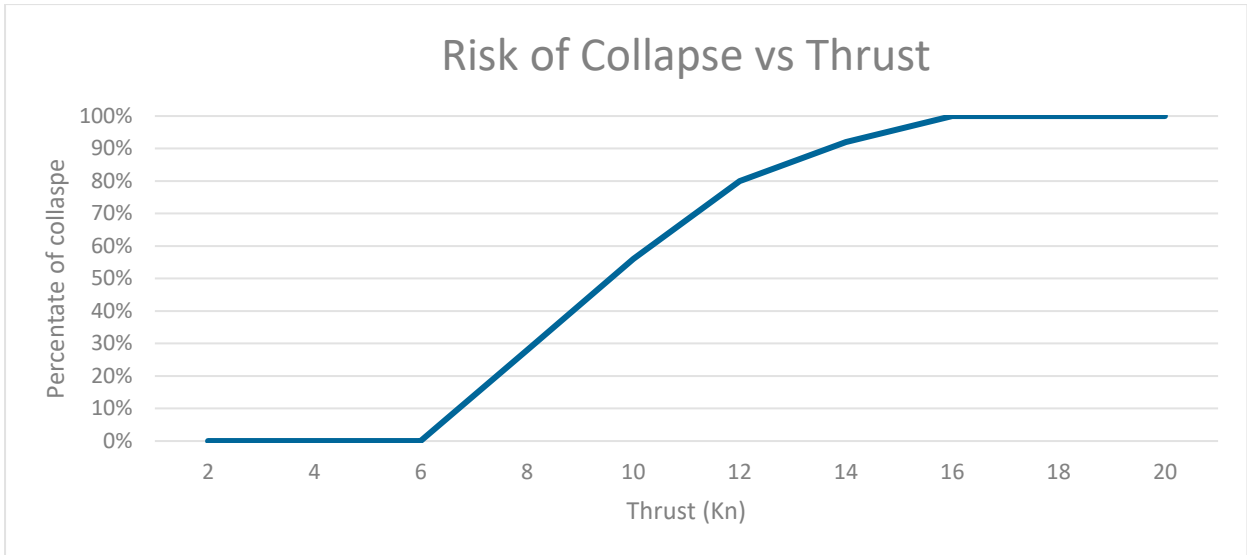


Figure 33: Likelihood of collapse by thrust at 28 degrees, 15 runs

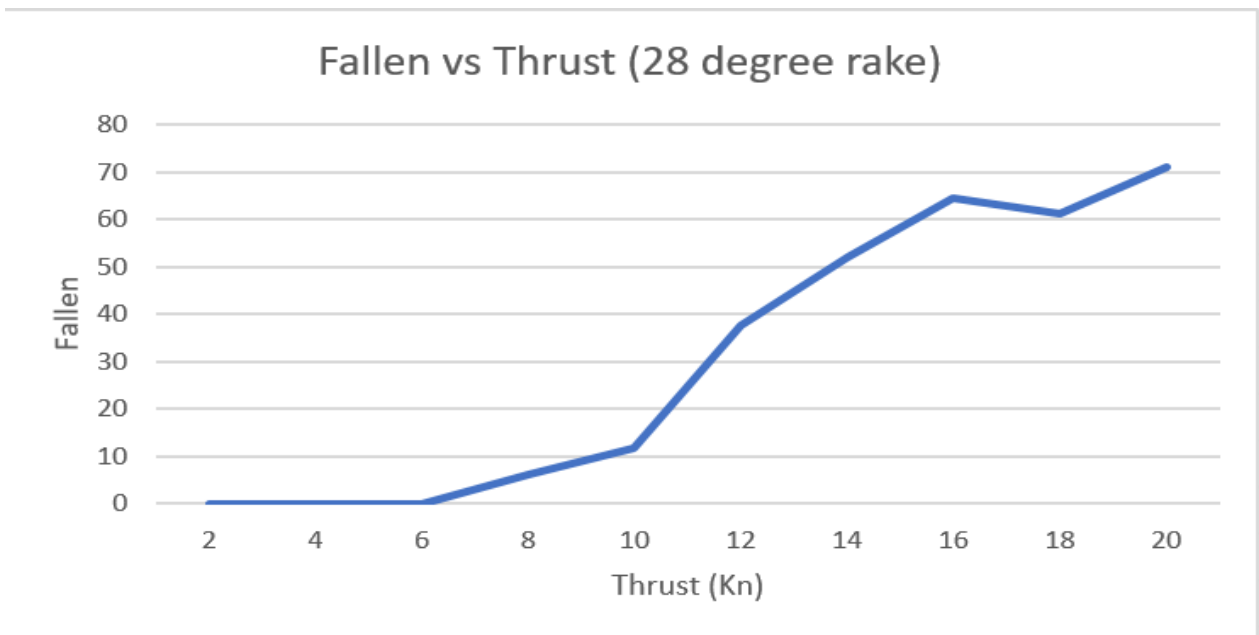


Figure 34: Average number of fallen agents by thrust at 28 degrees, 15 runs

Grouping

It was noted in the match observations that in some instances (primarily in away sections) migration occurred within the stand as spectators moved to a popular area. This created pockets of overcrowding in some places and empty seats in others (in away areas, this was not a result of extra people in an area so the capacity remained at 100% or less). The crowd did not therefore occupy a uniform distribution across the stand. In order for the simulation to allow for this, the model was enhanced to include a grouping function. This could be varied from 0-100%; 0 has every agent in front of their own seat, and changing this to 50% moves 50% of the agents to an

already occupied seat and leaves their seats empty. The grouping function is random, so is different for each simulated run.



Figure 35: Set up image of stand area with 50% grouping

A 28 degree rake was used to test this effect on progressive crowd collapse. This was necessary to produce a more consistent collapse to test the grouping effect than a lower rake. Although tolerated standing at clubs in this study are all in areas with a rake lower than 28 degrees, given this was a phenomenon observed primarily in away areas, it could be applicable to other clubs.

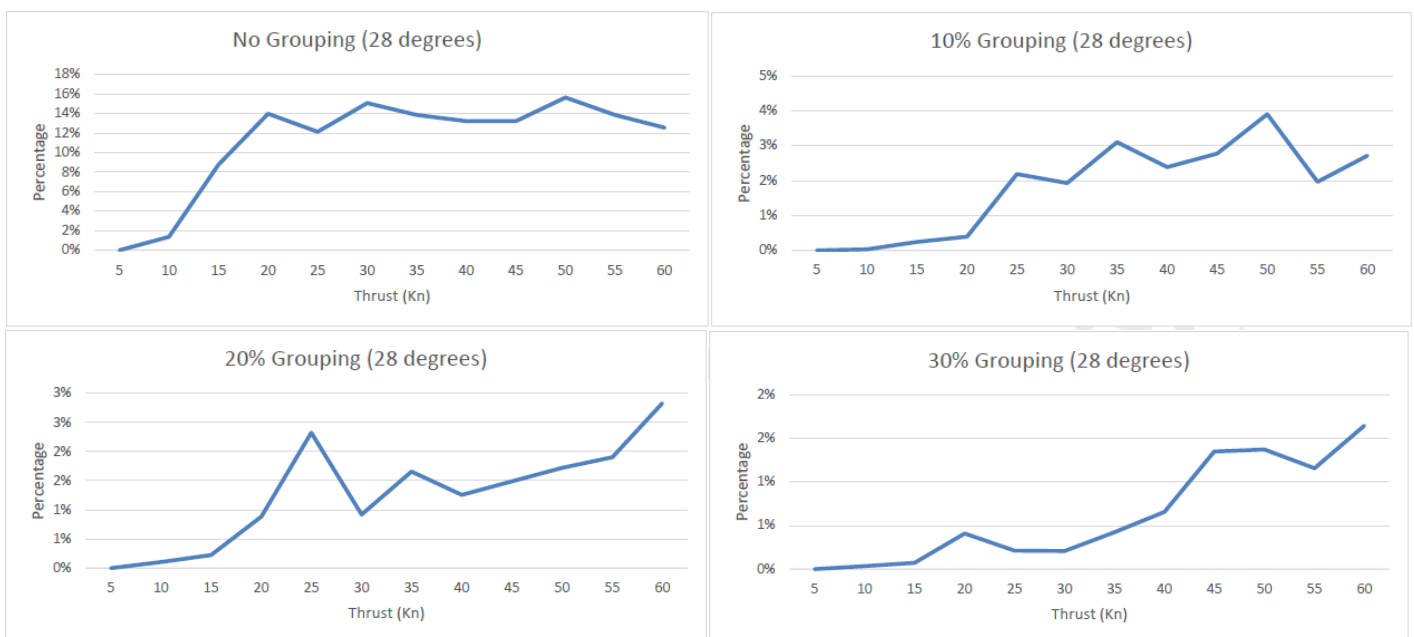


Figure 36: % of fallen agents by thrust when adjusted for grouping

As the level of grouping is increased, the percentage of agents falling is shown to decrease. This result seemed counter intuitive at first, as we had expected a higher percentage of fallen in a grouped environment. However, in the simulation, we observe the spaces left by the moving agents were acting as a break, halting the progressive crowd collapse. The overall stand impact is lower where grouping is simulated, however the agents still fall into the gaps causing risk of significant injury. It should also be acknowledged that grouping causes pockets of overcrowding; in this situation, a fall forward may be more likely which could in itself trigger a further collapse. Where a group is close to the source of the trigger, the effect is larger.

The impact of barriers

The 2020 simulation also allowed the seat height to be increased to a rail seating height to assess the impact of installing barriers on the risk of progressive crowd collapse. A 30 degree rake was used to test this, as again this creates a more consistent collapse to isolate the effect the seat height makes. A 40-70Kn initial thrust was used to test the effectiveness of this in high-risk conditions.

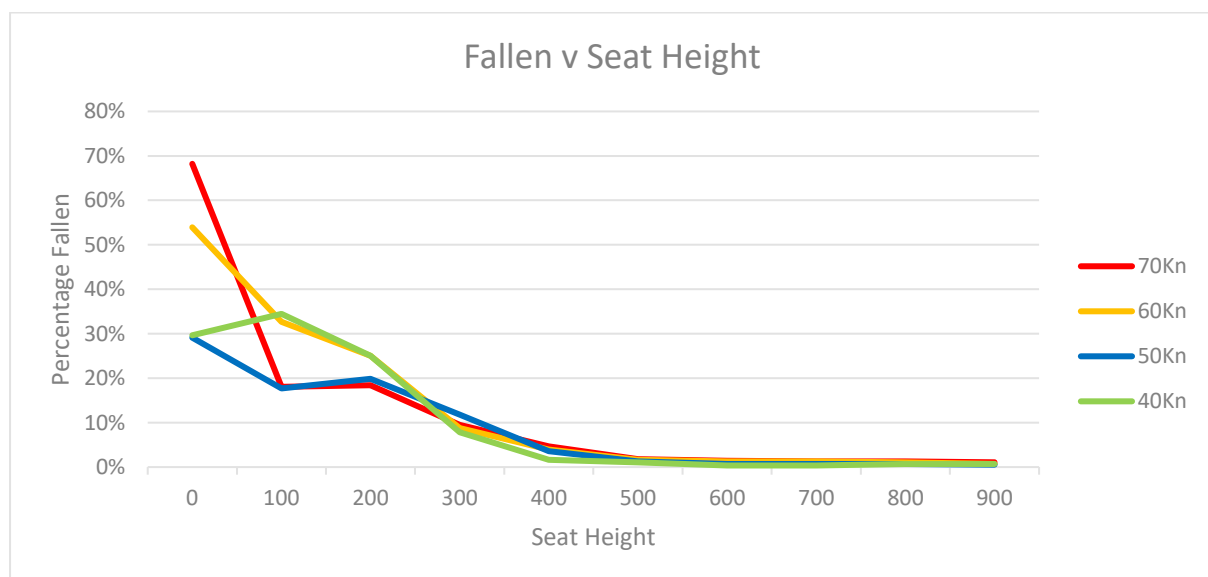


Figure 37: % of fallen agents by seat height when adjusted for thrust

As the thrust increases we observe more fallen agents at higher forces, but less of an overall effect with higher seatback. There is an exponential decrease in the number of people interacted/fallen as we raise the height of the seat back (up to rail seating height) as it would take more thrust to raise the centre of gravity above the barrier height. At a height of 800mm – the equivalent to those installed at Wolverhampton (Sir Jack Hayward) and Tottenham – the barriers prevents the progression of a crowd collapse. At higher thrusts, there was more lateral (sideways) movement – as the agents are stopped from falling forwards, the energy goes sideways and pushes people laterally.

Although installing barriers arrests all risks of progressive crowd collapse, there is a risk of injury resulting from being pressed against a bar, depending on the force and duration of that force. Sustained pressure can cause significant risk to life and limb. Rail seating and barriers are also an extra hazard for spectators who engage in aggressive behaviour, occupy areas at more than 1:1 (one person per seat) and might attempt to launch themselves off the barriers.

4. Summary

As with the original analysis from 2008, a deliberate lunge can produce enough thrust to start a progressive crowd collapse. All statistical outliers were checked and typically a low level thrust collapse was a result of heavier set agents impacting on smaller agents. The risk of progressive crowd collapse increases with the moment of excitation (small jumping motions) and a thrust.

The risk of progressive crowd collapse increases with the initial thrust but was observed as low as 5 – 8Kn (a punch/deliberate shove) in areas with higher (over 28-degree) rake. The frequency of collapse at low level thrust (using our 28-degree rake datum) was less than 10% (1 in 10). Where this occurred, it was noted to be a combination of heavier agents pushing on smaller agents (force multiplier). As the rake increases, the risk of progressive crowd collapse increases.

Rail seating eliminated all progressive crowd collapses in the simulation.

Appendix 3: Borussia Dortmund and standing at football in the Bundesliga, Germany

Borussia Dortmund: Signal Iduna Park

Stadium design

The stadium was initially built in the 1970s with a second upper addition added in the 1990s. The Südtribüne, the south side stand, has standing accommodation for 25,000 spectators (80 percent of whom are season-ticket holders). The stadium has two further rail seating areas, one for away spectators and another for young adults, designed as a transition space between the family stand and the Südtribüne.

As result of the two stage construction within the Südtribüne there is a combination of two types of design: rail seating in the higher terrace and traditional standing areas in the lower terrace. In order to meet UEFA requirements, for European games seats are reinstalled in this area.

The Südtribüne contains eleven self-contained blocks with 170 crush barriers. Spectators are allocated a ticket in a block and are free to stand where they please within this. Each row has two steps to allow for a greater standing capacity than seating. In practice, the blocks immediately behind the goal are most popular and the area where drummers and flags are most prominent. After a serious incident in 2008 the club established restrictions on total numbers of spectators within each block and fences were heightened to stop spectators migrating to other blocks.

The lower tier, built before requirements for gangways were introduced consequently do not have either. In order to assist with safety, the club has been trialling extendable flags for stewards to make it easier to identify where an incident is taking place and direct stewards and/or emergency services.

Crowd management

Rail seating accommodation requires specific management through the match-day operation both via the stewards and supervisors and through the control room. The Südtribüne has 92 stewards on a match-day, as well as a number of undercover stewards deployed wearing plain clothes.

However, stewarding is largely limited to ensuring that clearly marked vomitories are kept clear. There are two camera systems that monitor standing areas, as well as four on-duty Supporter Liaison Officers at every match. Stewards are responsible for ensuring ticket holders enter the correct block on their ticket, which are checked at the entrance to each block. Strict penalties (spectators will lose their season ticket at the end of the season) are imposed for 'pass backs' to prohibit migration of spectators to other blocks. During the observation, spectators were seen entering areas without showing their tickets whilst stewards' attention were diverted.

Crowd behaviour

German football differs from the UK in a number of ways. Alcohol is allowed in the stadium, and supporter groups are numerous and are organised and politically

active. The club employs 10 staff in the SLO team to manage the relationship between the club and supporters.

Blocks are unofficially policed by spectators and incidences of large scale disorder are uncommon. Pyro and other disorder is not considered a risk at home matches as spectators have ownership of and respect for their home ground. Pyrotechnics can be a risk with travelling spectators. However, there can be some conflict between newer and older spectators about particular areas in which spectators choose to stand. This has led in one instance to the SLOs working to relocate groups of spectators within other areas of the South Stand.

The club asserts that injuries are no higher in the Südtribüne than in other areas of the stadium. The capacity of the Südtribüne is reduced by two thirds when converted to seating, so standing can get fairly packed.

Signal Iduna Park is an old stadium and faces particular challenges associated with this. Migration is difficult to manage as the stadium is open and as developments have increased capacity, the flow of increased numbers of spectators in and out of the stadium is challenge. The Allianz Arena in Munich is an example of a stadium with a modern approach to managing standing. The large terraced area has electronic turnstiles on entrances to the stand to effectively control the number of spectators in each section.