

from Hillsborough...



A policeman monitors a screen displaying the Maracana stadium in Rio de Janeiro

CORBIS

...to

Río de Janeiro



Just weeks before the start of the football World Cup, deadly clashes have broken out in the Brazilian city of Rio de Janeiro and organisers complain of security shortfalls. Will 2014's biggest sporting event be safe?
By **Crispin Andrews**

ON 15 APRIL 1989, 96 Liverpool FC fans were crushed to death at the FA Cup semi-final against Nottingham Forest at Hillsborough. A further 766 people were injured.

Hillsborough was Britain's worst sporting disaster, but there have been similar tragedies elsewhere in the world. In Glasgow, Kathmandu, Cairo, Brussels, Buenos Aires and Guatemala City, to name but a few, people have died at football matches during riots, stampedes, crowd crushes, or when a stand collapsed. In 1982, 66 were crushed to death when fans leaving a UEFA Cup match at the Luzhniki stadium in Moscow, tried to re-enter the stands after a last-minute goal. More than 300 fans died during a riot at a 1964 Olympic qualifying match between Argentina and Peru in Lima.

Twenty-five years after Hillsborough, football's world governing body FIFA insists that security and safety features are part of stadium design. However, World Cup 2014 organisers have a whole host of security issues with which to contend.

A safe World Cup

This June and July, over 600,000 international visitors will arrive in Brazil, many without match tickets.

Brazil also has its share of football hooligans. Last December, rioting fans stopped a league game between Atletico Paranaense and Vasco da Gama. In March, a Santos fan was killed by rival Sao Paulo supporters. There were 30 fatalities at Brazilian football matches in 2013 and 23 in 2012. Organised gangs linked to crime cartels are behind much of the violence.

Outside the stadiums things are potentially even worse. "Any international event is open to people who want to make a political statement," says Dave Orłowski, senior architect at Populous, the sports architects who designed the new Arena das Dunas stadium in Natal.

During the Confederations Cup in June 2013, more than one million Brazilians >

1902
Ibrox Park, Glasgow
 25 killed and 517 injured when the West Stand collapses during an international between England and Scotland.

< demonstrated against the government for spending billions of dollars on a football tournament while public services were underfunded. A secret government report, leaked earlier this year, highlighted official fears about disgruntled Brazilians or politically motivated groups disrupting the World Cup with strikes and demonstrations.

Last November, a Brazilian Public Safety Forum report said that murder rates were up 7.8 per cent on the previous year. In August 2013, 400 people were murdered in Rio alone. Muggings were up 37 per cent and public transport robberies by almost 50 per cent. In April this year Scottish businessman Peter Campsie was murdered by carjackers. There's also the threat of terrorist attack.

Malcolm Tarbitt, director of security and risk advisory with the International Centre for Sport Security (ICSS), says that "World Cup organisers need to carry out a proper threat assessment prior to a tournament. Work out what are the most likely risks and how best to mitigate them".

Stadium security

Security and safety is the responsibility of the government and host cities as well as the organising body and host stadiums. Orlowski says that a stadium has three main security zones. "The general security zone is the whole stadium," he says, "then there's access and the VIP zone."

Orlowski explains that each zone must have its own security arrangements. To guard against another Hillsborough-type disaster, these security systems have to be able to handle the unexpected.

"At each point of entry, stadium operators must be able to deal with the people who'll be there," Orlowski says. "There has to be space for people to queue, and to get in and out quickly. Also an operational support area, which is a location for emergency vehicles, paramedics, police, military and security."

Tarbitt adds that stadiums need wide walkways between seats for people to get in and out, and that toilets and vendors should be located where queues don't cause obstruction. Ben Veerbrink, from the Stadium Consultancy, explains that a stadium must have its exit gates open all the time and that turnstiles need to let through 660 people per hour. "Tickets with barcodes, on mobile devices, or print-at-home tickets can make entering the stadium quicker and more convenient," he says.

Some smartphone apps cross-reference with the ticket holder's retina or fingerprint. "These are scanned when the person enters an access point," Tarbitt says. At the Arena da Baixada, Curitiba, the access control system designed by US firm Johnson Controls links the Web portal where fans purchase tickets and register to attend games with local law enforcement databases. Known trouble-makers will be refused entry.

Pyrotechnics can also be a problem. "Fans have all sorts of sneaky ways of getting them into grounds," Tarbitt says, adding that millimetre wave scanners like the ones found in airports would quickly check underneath clothes and inside people's bodies. If

1946
Burnden Park, Bolton
 33 die and 500 are injured when a wall collapses during a cup tie between Bolton and Stoke.

1967
Turkey
 A disallowed goal in a Turkish game leads to a riot. Forty-one die and 600 are hurt.

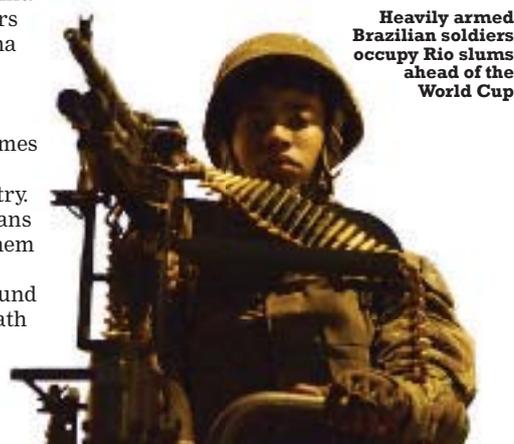
1968
Buenos Aires, Argentina
 74 die after a match between River Plate and Boca Juniors when fans, trying to escape burning newspaper being thrown down from an upper tier, rush towards a gate pushed shut by fans on the other side.



something shows up, security personnel can then carry out further investigation.

Veerbrink warns that this sort of technology could slow down the flow of people into a stadium which could cause problems. "People can get impatient if they have to wait for long periods, particularly if they think they're going to miss the start."

Security personnel need central surveillance systems to spot emergencies. In line with FIFA directives, operators at World Cup stadiums will monitor the video from separate security stations. Orlowski says that stadium designers have to make sure there are no hidden areas, with key locations visible to cameras and monitors. Tarbitt adds that security and safety must be built into the stadium design. "Don't go for the apache solution, which is designing your stadium and then patching it up with security measures afterwards," he says.



Heavily armed Brazilian soldiers occupy Rio slums ahead of the World Cup

Veerbrink warns that it's hard to test a stadium's safety management systems when, like in Brazil, a stadium is finished very close to the start of the tournament. He adds that the National Football League in the USA is experimenting with facial recognition cameras. "Do you want extra security or to protect people's right to privacy?" he says.

Preemptive action

Surveillance and access control is becoming increasingly high tech. At the recent Sochi Winter Olympics, people had to apply for a spectator pass when they bought a ticket. "That pass contained a chip which stored personal data, enabling security personnel to verify a person's identity and keep track of who entered and left the main park and individual stadiums," Tarbitt says.

Sochi 2014 also used a new technology to check a person's emotional state. VibraImage uses computer analytics of live video images to measure muscle vibrations in a person's head and neck. If someone is stressed or anxious, the camera picks it up and they're taken in for questioning. Just as long as some poor soul isn't arrested because they're afraid of crowds, Tarbitt thinks Brazilian authorities might have VibraImage for the World Cup, but this has yet to be confirmed.

Last year, the Brazilian authorities announced they would spend \$900m on security for the World Cup. That's one police officer for every 50 people at matches and one for every 80 at the big screens in host cities. That's an estimated 150,000 officers and

- 1971 Ibrox Park, Glasgow**
66 people die in a crowd crush when fans leaving the stadium are met by a group trying to return after hearing that Rangers had scored a late equaliser.
- 1982 Moscow, USSR**
66 people are crushed to death and 280 injured after a crowd of leaving fans tried to re-enter the stands after a last-minute goal
- 1985 Valley Parade, Bradford**
A fire, which started in rubbish underneath a stand, kills 56 fans.
- 1988 Kathmandu, Nepal**
70 fans killed in a stampede towards locked exits during a hailstorm.
- 1996 Guatemala City, Guatemala**
84 people died and about 150 others were injured during a stampede before a World Cup qualifying match between Guatemala and Costa Rica.
- 2001 Johannesburg, South Africa**
43 people killed and 155 injured during a league match between Kaizer Chiefs and Orlando Pirates at overcrowded stadium.



Brazil's National Security Force practice crowd control ahead of the 2014 World Cup

CASE STUDY THE HILLSBOROUGH DISASTER

Back in 1989, FA Cup semi-finals were played at neutral grounds. Fans were segregated to prevent violence, wire fencing stopped people getting on the pitch.

Thousands of Liverpool fans turned up for the game. They were told to use one manual turnstile, but many went to other turnstiles to try and get in before kick off. The area outside the stadium entrance became overcrowded.

An estimated 5,000 people were trying to get in. Rather than delay the kick off to give people time to get to their allocated areas, the police opened an exit gate to allow those gathered outside to get into the stadium quicker.

Fans rushed in through this gate, along an unmanned tunnel and made their way, without direction from police or security services, into two already over-crowded



terrace pens.

People standing at the front were crushed against the front of the pen, crush barriers inside the terraces broke. When some fans forced open a gate at the front of the pen, police tried to stop them from spilling on to the pitch.

After six minutes, the referee called the game off. Forty-four ambulances tried to get in to help the injured. Police let only one in. Of the 96

people who died, only 14 made it to hospital.

In September 2012, the Hillsborough Independent Panel report, commissioned by the government three years earlier, found that no Liverpool fans were responsible for the disaster.

The report said that the main cause was the lack of police control and that crowd safety had been compromised at every level.

20,000 additional security personnel. President Delma Rousseff has also put the army on standby, and the Brazilian Navy has conducted its first World Cup training exercises. In March, police drug squads raided the Mare favela, a slum near Rio Airport, as part of a slum pacification policy designed to drive drug dealers out.

"It's harder to manage large numbers of people around a football stadium when there is public disorder nearby," Veernbrink says.

There'll be a 7.2km no-fly zone around all stadiums on match day. Commercial flights will be cancelled or rerouted, while Air Force fighter jets, helicopters and UAVs will conduct fly-overs using high-resolution, night-vision and thermal cameras to monitor what's going on down below.

On the ground, police officers will have high-tech facial-recognition camera glasses to spot potential trouble-makers. The tiny camera can capture 400 facial images per second, comparing them against 13 million images in a central database. Should it scan a known offender, a red light will alert the officer. The goggles are effective from around 50 metres, but in extreme cases they can recognise a specific target up to 19km away.

The Brazilian government has also bought 30 US PackBot-510 military robots to check for bombs and other suspect devices. These units are equipped with cameras and operated remotely. They have a top speed of 14km/h, can rotate 360 degrees, climb slopes up to 60 degrees, and are fitted with GPS, temperature sensors and video display.

'Don't go for the apache solution, which is designing your stadium and then patching it up with security measures afterwards,'
Dave Orlowski, Populous

Fan-friendly zones

Many of last year's Confederation Cup demonstrations took place around the big screens. Sponsors' logos made these fan fest areas a target for groups who believe that the government should be spending public money on health and education, not football tournaments. One protest group, Black Bloc, has already said that it plans to disrupt World Cup gatherings. FIFA says that it will relocate fan fests at the last minute to make it harder for groups to coordinate protests.

FIFA first used fan zones at the 2006 World Cup in Germany. Two years later, UEFA did the same at the European Championships in Austria and Switzerland. At Euro 2008, each host city had its own zone and despite some bad weather, they proved to be a success.

Over one million visitors entered the Fan Zone in Vienna. The zone was 100,000 square metres and fenced off with five large entrances, each consisting of 30 safety gates with video surveillance. The zone had 46 emergency exits, each 6m wide. An additional 20 emergency exits at the entrance gates could be opened within seconds. Throughout the matches, emergency

personnel were in direct contact with the integrated mission control leadership at the police control centre. The zone had information points near the entrances, multilingual staff to answer questions, and 8m-high towers directing visitors to facilities and information points.

"We wanted visitors to feel welcome, trusted and safe, and to create a friendly, tolerant atmosphere," says Euro 2008 tournament director Christian Mustchler. "Police and all the security forces involved followed the 3D Strategy, which means dialogue, de-escalation and, as a last resort, drastic action."

Tarbitt says that common sense application of integrated incident management technology is the key to keeping people secure in both fan zones and stadiums. This requires common sense people too. "You don't want coppers wading in when people celebrate a goal or stewards gathering in places that obstruct the flow of people," he says.

Tarbitt adds that there tends to be less security around fan fests than at the stadiums themselves. "I don't understand this," he says, "there are many more people at a fan fest than in a stadium, terrorists could cause much more damage."

To date, it has cost Brazil \$3.47bn to build and develop their World Cup stadiums. Heads of state don't go to fan fests. Neither do FIFA dignitaries, nor multimillion dollar assets like Lionel Messi and Cristiano Ronaldo. Money follows money. *