RISK ASSESSMENT

Brazil 2014 FIFA World Cup, 12 June – 13 July 2014

28 May 2014

Conclusions

Over the last years, Brazil has managed to eliminate many infections like measles and rubella, which are still endemic in many other countries and could be imported to Brazil by international visitors [1].

Visitors to Brazil should consult the advice for vaccinations issued by the Brazilian health authorities [2] and WHO/PAHO (Pan American Health Organization) [3]. EU citizens visiting the 2014 World Cup in Brazil should:

- have completed their vaccinations according to the schedule in the EU country of residence including: poliomyelitis, diphtheria, tetanus, pertussis, measles, mumps and rubella;
- be aware that there is an increased risk of hepatitis A and hepatitis B in Brazil compared to the EU and ensure that their vaccination status against these two diseases are up to date;
- be aware that there is yellow fever in parts of Brazil, and follow the vaccination recommendations for these areas [4];
- be aware that there is rabies in Brazil and avoid all contact with stray dogs and cats, consult a doctor regarding the need for post-exposure prophylaxis if they are bitten by an animal, and consider vaccination against rabies before travelling if they plan to stay longer than one month and in rural areas.

EU citizens visiting the 2014 World Cup in Brazil will be most at risk of gastrointestinal illness and vector-borne infections. Therefore, they should pay attention to standard hygienic measures to reduce the risk of gastrointestinal illness and protect themselves against mosquito and other insect bites using insect repellent and/or wearing long-sleeved shirts and trousers in regions where vector-borne diseases are endemic.

EU citizens visiting the 2014 World Cup in Brazil should seek pre-travel assessment and consider malaria chemoprophylaxis if planning to travel to areas at risk for malaria transmission, and vaccination against influenza (preferably with the 2014 southern hemisphere seasonal vaccine) because the event takes place at the peak of the influenza season in the southern and south-eastern regions of Brazil.

EU travellers to the Brazil 2014 World Cup tournament should avoid sexual risk behaviours to decrease the risk of sexually transmitted infections, blood-borne infections, and HIV. If healthcare is needed, travellers should contact Brazil's healthcare system (Sistema Único de Saúde – SUS) through local hospitals or use their private health insurance at any healthcare provider [5]. Travellers who require hospitalisation in the EU after having been hospitalised in Brazil should report their previous hospitalisation in order to accelerate the possible

Erratum

The text in the green box was amended on 11 June 2014 to clarify the conclusions, as the original formulation was found to be unintentionally misleading.

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ascertainment of recent healthcare-associated infections. EU travellers to Brazil, and particularly to the large metropolitan areas of Rio de Janeiro and Sao Paulo, should exercise caution, pay close attention to their personal security, and monitor the media for events that may affect their safety.

Surveillance for communicable diseases should be sensitive enough to detect threats at a stage when interventions are likely to prevent or reduce the impact of outbreaks. There is a possibility that returning travellers will export communicable diseases, for example vector-borne diseases such as dengue, and introduce them to their country of residence.

There are a number of diseases and infections that are highly unlikely to occur during the 2014 Brazil World Cup, but are still important to get monitored because of their severity and high case-fatality ratio. These include viral haemorrhagic fevers and diseases that could result from intentional release, such as anthrax, plague and smallpox. Outbreaks and spread of vaccine-preventable diseases are of particular concern during mass gatherings but there are no indications that the risk is higher than usual.

Based on the epidemiological profile for infectious diseases for Brazil and the profile of the visiting populations, it is recommended that ECDC should conduct enhanced epidemic intelligence surveillance for communicable diseases from 5 June to 20 July 2014.

Source and date of request

ECDC internal decision, 19 March 2014.

Public health issue

International mass gatherings pose a risk for communicable disease outbreaks and rapid spread around the world. The aim of this document is to assess the health risks related to communicable diseases and other health threats for European citizens during their stay in Brazil for the 2014 FIFA World Cup ('Brazil 2014') and the public health implications for European countries after the travellers' return to Europe. In addition, the document assesses the risk of disease importation from Europe to Brazil. This assessment provides the basis for ECDC's monitoring of health threats during the 2014 Brazil World Cup.

Authors and consulted experts

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The World Health Organization (WHO) was consulted on this document. Jonas Brant, General Coordinator for Surveillance and Response to Public Health Emergencies, Ministry of Health of Brazil. Brasília, was also consulted. The views in this document do not necessarily represent the views of WHO or the Brazilian Ministry of Health.

Health risks associated with mass gatherings

The World Health Organisation (WHO) defines a mass gathering as 'an event attended by a sufficient number of people to strain the planning and response resources of a community, state or nation' [6]. International mass gatherings increase the risk of communicable disease transmission and pose a challenge to public health response [7]. For host countries, these challenges are associated with the introduction of communicable diseases, influx of susceptible individuals, crowding, outbreaks of endemic or imported infectious diseases, opportunistic and often uncontrolled sale of food and beverages, increased risk behaviour associated with alcohol and other recreational drugs, language barriers for the dissemination of public information, increased pressure on sanitary facilities, and heightened security levels. The increased sensitivity for identifying potential health threats, coupled with heightened media attention and political pressure, can place a considerable burden on public health functions and decision-making [8].

Documented infectious disease threats associated with mass gatherings in the EU include *Escherichia coli* O157 cases at a music festival in the United Kingdom in 1997 [9], Legionnaires' disease cases during the football Euro Cup in France 1998 [10], a measles outbreak in Germany originating from a religious gathering in France 2010 [11], and a salmonellosis outbreak following a street festival in Newcastle with more than 400 associated cases [12].

The public health risks associated with mass gathering events can be classified as follows:

- risks associated with the movement of people to the host countries;
- risks to the visiting population and the local population due to increased international travel activities due to the mass gathering event;
- risks associated with being a participant/spectator at the mass gathering event;
- risks associated with the return of participants and spectators from the host country (export of communicable diseases).

Factors that determine the level of risk include:

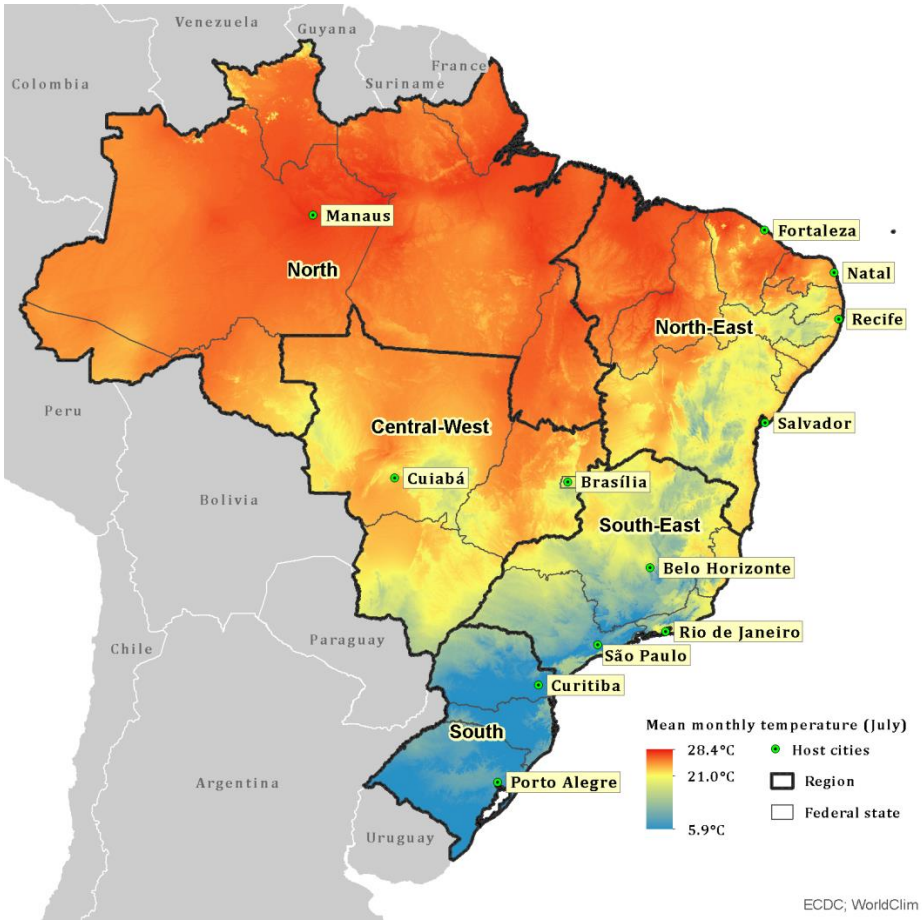
- demographics, epidemiology and behaviours of the population attending the mass gathering (e.g. age, health status, risk behaviour before and during the event, movement and interaction between host and visiting populations, etc.);
- demographics, epidemiology and behaviour of the host population;
- environment, climate, time of year, seasonality of endemic diseases at the location;
- risk assessments, planning, preparation, surveillance and preventive public health interventions: pre-travel advice, on-site information at the mass gathering venue (e.g. information campaigns, food inspection, etc.).

Event background information

Brazil 2014 FIFA World Cup

Brazil is expected to attract an estimated 600 000 international tourists and three million domestic travellers [8] during the football World Cup from 12 June to 13 July 2014. Most European travellers will reach Brazil using commercial airlines and will for the most part visit only the host venues for the football matches (12 host cities, see Figure 1), but may also visit other parts of Brazil. Domestic travel in Brazil will be mostly by commercial aircraft or by public/private ground transportation near the sport venues. The 2014 Brazil World Cup will take place during the austral winter, with tropical heat in the north and chilly temperature in the south of the country; some areas will be dry while it will be rainy season in others [9].

Figure 1. Cities hosting the Brazil 2014 FIFA World Cup and average monthly temperature in July



Brazil: Communicable disease epidemiology

Food- and waterborne diseases

Although access to safe water and sanitation in Brazil has made important advances in the last decades, gastrointestinal infections remain a public health concern in Brazil [5, 13]. From 2000 to 2013, the Brazilian Ministry of Health reported an average of 665 foodborne outbreaks per year [14]. Causative agents of these infections were, in order of frequency, *Salmonella* sp., *Staphylococcus aureus*, *Escherichia coli* and *Bacillus cereus.* The settings most often associated with these outbreaks were private residences, followed by food outlets and pastry shops [5]. A study in travellers returning from Brazil identified *Campylobacter* and *Giardia* spp. as the most frequent pathogens associated with gastrointestinal illness [15]. Furthermore, in the last two decades, the cause of diarrhoeal diseases in the general population shifted from bacterial infections through faecal-oral transmission to viral infections through person-to-person transmission [1].

WHO classifies Brazil as a country with intermediate endemicity of hepatitis A and therefore prone to such outbreaks [16]. Typhoid and paratyphoid fevers are rarely reported in Brazil, and if so, the disease is mostly reported in the northern region of the country [15, 17, 18]. Brazil has been cholera-free since 2005 [19].

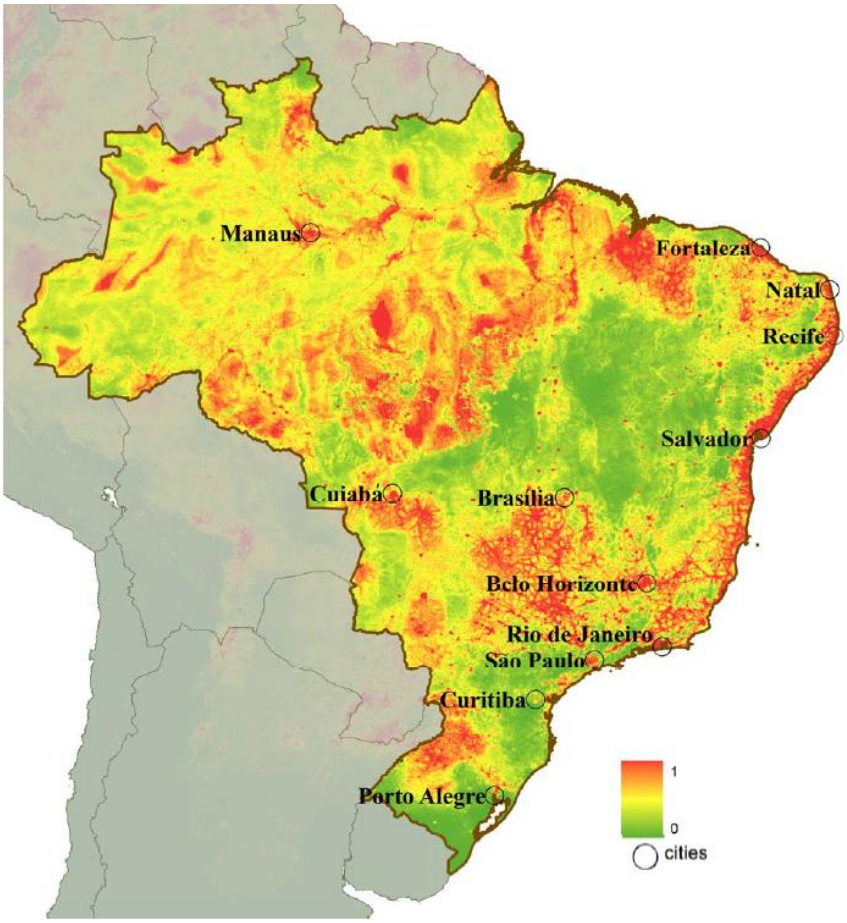
Emerging and vector-borne diseases

Dengue fever is a major public health concern in Brazil. Disease incidence and severity have increased in the past two decades. From 2000 to 2009, 3.5 million cases of dengue fever were reported [1]. Dengue transmission occurs all year round but is most intense from February through June. There is considerable seasonal variation in the dengue risk in Brazil, depending on the part of the country and its climate zone. In the southern coastal cities and cities in central-western Brazil, the dengue season usually peaks between March and April with the number of reported cases declining to low levels before June and July. In contrast, in the north-eastern coastal cities, the dengue season tends to peak later and lasts longer [20, 21].

According to a modelling study conducted by Lowe et al. [22], the risk of dengue varies according to location. The study concludes:

> 'For June, 2014, dengue risk was forecast to be low for the micoregions Brasília, Cuiabá, Curitiba, Porto Alegre, and São Paulo. A medium risk level was assigned to Rio de Janeiro, Belo Horizonte, Salvador, and Manaus. High-risk alerts were triggered for the north-eastern cities of Recife, Fortaleza, and Natal, with a probability of exceeding the high-risk epidemic threshold of 19% for Recife, 46% for Fortaleza, and 48% for Natal. For these high-risk areas, particularly Natal, followed by Fortaleza, the forecasting system did well for previous years (2000–2013).'

Figure 2. Cities hosting the 2014 FIFA World Cup and probable areas of dengue occurrence



Source: Simon Hay [20, 21]

Legend: Probability of dengue occurrence (red = 100%, green = 0%)

Malaria is present in the Brazilian Amazon, northern and central-western regions (Figure 3), with around 300 000 cases reported annually. *Plasmodium vivax* accounts for 85% and *Plasmodium falciparum* for 15% of all cases [15, 23].

Figure 3. Cities hosting the 2014 FIFA World Cup and areas of malaria transmission in Brazil

Source: US CDC [16]

Yellow fever is endemic in most parts of Brazil (Figure 4) [4]. While Brazil reports a low number of yellow fever cases annually, cases do still occur despite the implementation of vaccination programmes. From 1973 through 2008, the mortality rate for the 831 notified cases of yellow fever in Brazil was 51%. The most affected groups were migrant labourers, farm workers and tourists [24].

On average, around 28 000 cases of cutaneous leishmaniasis are reported annually in Brazil [25]. Visceral leishmaniasis is a growing problem, with an average of two cases per 100 000 population reported each year [1]. Between 2001 and 2011, 38 808 cases of visceral leishmaniasis were recorded in the Americas, and Brazil accounted for 96.6% of all cases [26].

The implementation of an intensive vector control programme in 2006 has eliminated the main vector of Chagas disease in Brazil and interrupted vector-borne transmission. Around 3.5 million people in Brazil still have the chronic form of the disease and congenital transmission continues because of Chagas disease's long latency period [1, 27].

An estimated four to six million individuals are infected with *Schistosoma mansoni* in Brazil [28], and the north-eastern region of the country is the area with the highest endemicity. Over recent decades, there has been an increasing incidence of schistosomiasis cases in urban and coastal areas [29].

Human rabies in Brazil has been associated with transmission by dogs, cats, foxes, monkeys and vampire bats, with most human cases transmitted by wildlife [30, 31]. PAHO recently issued an alert on rabies recommending prompt use of post-exposure prophylaxis to respond to possible human cases [31].

Lymphatic filariasis remains a public health problem in the metropolitan Recife region (north-eastern region) [32].

Figure 4. Cities hosting the 2014 FIFA World Cup and areas of yellow fever transmission in Brazil

Source: Jentes et al. [4]

Tuberculosis (TB)

WHO defines Brazil as a TB high-burden country [33]. It is estimated that there were 92 000 new cases of TB in 2012 (48 cases per 100 000 population) [33, 34]. Harling and Castro, in a spatial analysis of the determinants of TB in Brazil, identified higher TB rates associated with urban areas, population density, poor economic conditions, household crowding, and non-white population [35]. Patients co-infected with HIV account for a high proportion of all cases [36]. Six percent of individuals with TB in Brazil are estimated to be infected with strains resistant to isoniazid and 1.4% with strains resistant to both isoniazid and rifampicin [6].

HIV/AIDS

In Brazil, HIV notifications have remained stable since 2000. The estimated mean national sero-prevalence is less than 0.6%, with approximately 600 000 people infected. Since 1996, Brazil provides universal access to antiretroviral therapy, free of charge. In large urban areas, the incidence of AIDS-related illnesses declined remarkably, but in small and medium municipalities, low-level transmission is still ongoing [1]. Between 1996 and 2006, the HIV incidence in the northern and north-eastern regions increased from 2.7 to 4.6 per 100 000 population, and from 3.0 to 3.3 per 100 000, respectively [37].

Sexually transmitted and blood-borne infections

Notification of sexually transmitted infections (STIs) in Brazil is mandatory for AIDS, HIV in pregnant women and exposed children, syphilis, and urethral discharge syndrome in men. Despite the compulsory notification, there is considerable underreporting of cases. A multicentre sero-prevalence study from the Brazilian Ministry of Health estimated that the sero-prevalence of either syphilis, gonorrhoea or chlamydia was 13.5% in pregnant women, 6.2% in industry workers, and 19.7 % in people attending healthcare clinics for STI [38, 39]. The GeoSentinel study identified three cases of syphilis, three cases of urethritis, one case of lymphogranuloma venereum and one undefined case of STI in travellers returning from Brazil [16].

A hepatitis B survey conducted among a representative sample of the population in the north-eastern and central-western regions and in the Federal District of Brasília showed a prevalence of HBsAg of less than 1%. There was

no statistically significant difference in prevalence between the geographical areas. According to these results, Brazil is a country with low endemicity for hepatitis B [40].

A Brazilian nationwide hepatitis C (HCV) sero-prevalence study conducted in 2005–2009 in the state capitals of the five Brazilian regions showed a weighted prevalence of HCV antibodies of 1.38% (95% CI 1.12%–1.64%). Sero-positivity varied from 0.7% in the northeastern region to 2.1% in the northern region. Based on this population-based survey and according to WHO criteria, Brazil can be classified as a country with low HCV endemicity (prevalence below the 2.5%) [41].

Vaccine-preventable diseases

According to WHO, the endemic transmission of measles was interrupted in 2002 in Brazil and the transmission of rubella in 2009. However, measles continues to circulate elsewhere in the world, and countries in the Americas frequently report imported cases (42). In 2014 there have been 388 suspected cases of measles reported in Ceará, north-eastern region, which capital is Fortaleza, one of the Brazil 2014 venues (43).

From 2000 to 2009, Brazil reported 1.5 to 2 cases of meningococcal disease per 100 000 population. Since 2002, a substantial increase has been observed in the proportion of cases attributed to *Meningococcus* serogroup C, currently responsible for most cases of meningococcal disease in Brazil [44]. Several outbreaks of meningococcal disease have been reported in Brazil in the last decades, some of which with a very large number of cases [1, 45]. Brazil has been polio-free since 1990 [1].

Influenza and respiratory virus infections

Influenza cases occur throughout the year in Brazil. In the northern and north-eastern regions, influenza viruses circulate without clear seasonality. In the central-western, south-eastern and southern regions, the number of cases reported increases from May to August, peaking in June and July in the south-eastern and southern regions [46]. Influenza A (H7N9) and Middle East respiratory syndrome coronavirus (MERS-CoV) cases have never been reported in Brazil.

Antimicrobial resistance and healthcare-associated infections

Although there is paucity of data on antimicrobial resistance and healthcare-associated infections, there are several publications regarding ESBL-producing *Enterobacteriaceae* and methicillin-resistant *Staphylococcus aureus* (MRSA) isolated in Brazilian hospitals [1, 47, 48]. Carbapenem resistance is widespread among strains of *Pseudomonas aeruginosa.* Half of these carbapenem-resistant strains harbour Sao Paolo metallo-beta-lactamase (SPM). Thus, infections due to antimicrobial resistant strains seem to represent an important problem in Brazil.

Other health risks

Accidents and injuries, mostly caused by motor vehicle crashes, are the leading cause of death among travellers under the age of 55. Flash floods and landslides, especially in urban areas, have been a frequent cause of accidents. Travellers to Brazil frequently report sunburns.

ECDC threat assessment

Ten EU national teams will participate in the 2014 World Cup in Brazil, and a large number of EU travellers will visit the country during the event. The tournament takes places in the southern hemisphere winter, and climate/weather conditions will vary significantly between the Brazilian venues, ranging from the tropical warmth in the northern and north-eastern regions to chilly weather in the southern region.

The following health threats and their associated risks were assessed (Annex, Table 1):

- an infection imported to Brazil by EU travellers;
- an infection imported to Brazil from an ongoing event of international concern;
- a disease affecting an EU traveller during their stay in Brazil;
- an infection imported to the EU after a traveller's return to Europe.

Risks of infection importation to Brazil from the EU by travellers to the 2014 FIFA World Cup in Brazil

The overall risk of food- or waterborne disease importation from Europe to Brazil is very low. There is a low risk of importation of vaccine-preventable diseases through infectious EU travellers from countries where transmission is ongoing. Finally, there is a very low risk of importation of antimicrobial resistant strains to Brazil through infected EU travellers; the risk of importation increases slightly if those travellers are hospitalised.

Risk of infection importation to Brazil from events of international concern

Recently, there have been five infectious disease-related events raising wide concern at the international level: the influenza A(H7N9) outbreak in China; the Ebola virus disease outbreak in Western Africa; the MERS-CoV outbreak in the Middle East; the international spread of wild poliovirus from Afghanistan, Syria and Cameroon in 2014; and the chikungunya introduction in the Caribbean.

The A(H7N9) influenza outbreak in China started in February 2013. As of 16 May 2014, there have been 435 cases, all linked to China. At current, the weekly number of new reported cases is very low. So far, EU Member States have not reported any cases. In addition, China is not participating in the World Cup. The risk of introducing A(H7N9) to Brazil is considered very low (49, 50).

Since 2014, a large outbreak of Ebola virus has been affecting Guinea, Liberia and Sierra Leone. In May 2014, the number of new reported cases appears to be lower than in the previous month. As these three countries do not participate in the World Cup, and as no other countries reported cases associated with this outbreak [51], the risk of exportation of Ebola virus disease to Brazil is considered very low.

Since 2012, Saudi Arabia, the United Arab Emirates, Jordan, and Qatar have reported non-travel related MERS-CoV cases. In April and May 2014, the number of cases reported in Saudi Arabia doubled, and new travel-related cases were reported by previously unaffected countries (EU countries, USA, south-east Asian countries) [52]. Saudi Arabia, the United Arab Emirates, Jordan and Qatar are not participating in the 2014 World Cup. Of the countries with new travel-related cases, Algeria, Greece, Iran, the Netherlands and the USA are participating in the World Cup. Despite the recent travel-related cases reported by previously unaffected countries, there is a very low risk of importation of MERS-CoV to Brazil.

A total of 10 countries world-wide still reports poliovirus transmission, among them Cameroon and Nigeria, which both participate in the Brazil World Cup. The risk of a visitor to Brazil from one of these 10 polio-affected countries introducing wild polio virus to Brazil is considered very low due to the high vaccine coverage and the lack of wild polio virus circulation [1]. It is nonetheless important that people travelling from polio-affected countries to Brazil are vaccinated according to the recommendations made by WHO [53].

Chikungunya virus, previously absent in the Americas, was recently introduced in the Caribbean and in South America. Due to the presence of competent *Aedes* mosquito vectors in Brazil, there is a high to moderate risk of introduction of chikungunya in Brazil through infected travellers with subsequent autochthonous transmission. A similar occurred in Italy in 2007 [54].

Health risks for EU travellers during their stay in Brazil

The high incidence of gastrointestinal infections in Brazil suggests that further foodborne outbreaks may occur during the 2014 World Cup. EU travellers to Brazil 2014 may encounter locally endemic infections and challenges related to mass gatherings, e.g. salmonellosis, STEC infections, campylobacteriosis, giardiasis, and viral gastrointestinal illness [15]. To reduce this risk, a Brazilian multidisciplinary group developed an evaluation instrument to be applied to food services in order to prevent gastrointestinal infections [55]. However, limited foodborne outbreaks due to bacterial and viral infections are expected, especially in the warmest part of the country, where high temperatures increase the risk. The risk to be affected by gastrointestinal illness will be reduced by standard hygienic measures: use of bottled drinks and mineral water, use of factory-produced ice cubes, consumption of thoroughly cooked meat and fish, serving mixed meals such as *feijoada* (a typical Brazilian dish) or lasagne at temperatures above 60 °C, serving salads at below 5 °C, and sanitising all fruits and vegetables before consumption. Travellers should consider the general hygienic conditions when consuming common local products, such as freshly made fruit juices, coconut water, drinks and cocktails [5].

EU travellers to Brazil 2014 are at risk of hepatitis A infection. The majority of European countries are classified by WHO as very low or low HAV endemicity countries. Brazil is an intermediate endemicity country and prone to HAV infection outbreaks [1, 16].

The risk of being infected with *Salmonella* typhi in Brazil is very low and mostly related to unvaccinated travellers from the EU visiting the northern and north-eastern regions [17, 18, 56]. There is virtually no risk of cholera infection to travellers [19].

During the 2014 World Cup, the risk of dengue infection for EU travellers is likely to be high in Fortaleza, Natal and Salvador (Figure 2) in the north-eastern region of the country. The risk will be moderate in the northern and north-eastern regions, low in the south-eastern region, and very low in the southern and central-western regions [21, 22].

The malaria risk is moderate; only travellers to the northern and central-western regions run a risk of infection.

The risk of yellow fever is very low but it is present in rural and peri-urban areas in most of the country.

The risk of leishmaniasis (both cutaneous and visceral), schistosomiasis and lymphatic filariasis is mostly associated with rural and deprived areas of the north-eastern region. It should be very low for travellers visiting and staying in non-deprived urban areas.

The risk of being infected with rabies during the 2014 World Cup is very low for EU travellers, but can be moderate for unvaccinated travellers visiting rural areas or deprived urban areas where canine vaccination is low [31].

There is a very low risk of TB transmission for EU travellers, unless they stay in overcrowded indoor spaces in deprived communities.

There is a very low risk of HIV infection for EU travellers to Brazil 2014, mostly limited to travellers exposed to risk behaviours (unprotected sex and injecting drug use) [57].

There is also a low risk of HBV transmission, mostly limited to travellers who have unprotected sex.

There is a very low risk of meningococcal disease and other vaccine-preventable diseases for EU travellers to Brazil. The risk of influenza will be low and mostly restricted to travellers to the southern region of the country. Influenza vaccination may be available for travellers to Brazil. The 2014 southern hemisphere seasonal vaccination is preferable since the strains in the 2013/2014 northern hemisphere seasonal vaccination are slightly different [58].

EU travellers requiring hospitalisation for medical care in Brazil have a low risk of acquiring healthcare-associated infections; this includes infections caused by antimicrobial-resistant strains.

Visiting or staying in deprived urban areas may increase the risk of communicable disease transmission.

Risk of infection importation from Brazil to the EU after a traveller's return

A study based on the GeoSentinel information system identified dengue as the first cause of febrile systemic infections in returning travellers from Brazil [15]. Dengue and malaria were also among the most common reasons for hospitalisation in the same study population. Travellers will return during the European summer when vectors are present and active. Consequently, there is a very low risk of introduction of dengue or malaria in Europe. The risk of introduction of other vector-borne diseases into Europe is very low as well.

There is a low risk of importing antimicrobial-resistant strains, including those novel to the EU, e.g. Sao Paulo metallo-beta-lactamase [60]. This risk is higher for EU travellers hospitalised in Brazil.

ECDC's mass gathering surveillance support

The overall approach to surveillance during the 2014 Brazil World Cup will be 'enhanced business as usual' as during previous mass gathering monitoring. We will adapt ECDC's routine epidemic intelligence process for a defined period of time starting on 5 June (one week before the beginning of the 2014 World Cup) and ending on 20 July (one week after the closing ceremony). Routine epidemic intelligence activities will be enhanced by expanding the information sources, using a targeted and systematic screening approach, tailoring tools (i.e. MediSys), determining validation sources, establishing a daily analysis and communication process with regular and specific public health partners, and developing topical reports. ECDC will also issue daily reports of information gathered through scanning a wide range of sources. ECDC will share these reports with the European Commission, WHO headquarters, WHO Regional Office for Europe, PAHO, and the Brazilian Ministry of Health.

The following criteria will be used to evaluate information regarding public health relevance for the tournament:

- Suspected or confirmed cases of communicable diseases of public health relevance in Brazil (risk to EU visitors/participants, risk of importation to the EU)
- Incidents in Brazil related to international security, such as the possible intentional release of biological agents or nuclear and chemical events
- Suspected or confirmed cases of communicable diseases of public health relevance for the World Cup in countries with national teams participating in the World Cup and in countries bordering Brazil (risk of exportation to Brazil and local spread)
- Incidents in Brazil which attract media attention in the EU, such as outbreaks in tourist areas, crowd injuries, spread of communicable diseases among visitors or participants.

Conclusions

Over the last years, Brazil has managed to eliminate many infections like measles and rubella, which are still endemic in many other countries and could be imported to Brazil by international visitors [1].

Visitors to Brazil should consult the advice for vaccinations issued by the Brazilian health authorities [2] and WHO/PAHO (Pan American Health Organization) [3]. EU citizens visiting the 2014 World Cup in Brazil should:

- have completed their vaccinations according to the schedule in the EU country of residence including: poliomyelitis, diphtheria, tetanus, pertussis, measles, mumps and rubella;
- be aware that there is an increased risk of hepatitis A and hepatitis B in Brazil compared to the EU and ensure that their vaccination status against these two diseases are up to date;
- be aware that there is yellow fever in parts of Brazil, and follow the vaccination recommendations for these areas [4];
- be aware that there is rabies in Brazil and avoid all contacts with stray dogs and cats, consult a doctor regarding the need for post-exposure prophylaxis if they are bitten by an animal, and consider vaccination against rabies before travelling if they plan to stay longer than one month and in rural areas.

EU citizens visiting the 2014 World Cup in Brazil will be most at risk of gastrointestinal illness and vector-borne infections. Therefore, they should pay attention to standard hygienic measures to reduce the risk of gastrointestinal illness and protect themselves against mosquito and other insect bites using insect repellent and/or wearing long-sleeved shirts and trousers in regions where vector-borne diseases are endemic.

EU citizens visiting the 2014 World Cup in Brazil should seek pre-travel assessment and consider malaria chemoprophylaxis if planning to travel to areas at risk for malaria transmission, and vaccination against influenza (preferably with the 2014 southern hemisphere seasonal vaccine) because the event takes place at the peak of the influenza season in the southern and south-eastern regions of Brazil.

EU travellers to the Brazil 2014 World Cup tournament should avoid sexual risk behaviours to decrease the risk of sexually transmitted infections, blood-borne infections, and HIV. If healthcare is needed, travellers should contact Brazil's healthcare system (Sistema Único de Saúde – SUS) through local hospitals or use their private health insurance at any healthcare provider [5]. Travellers who require hospitalisation in the EU after having been hospitalised in Brazil should report their previous hospitalisation in order to accelerate the possible ascertainment of recent healthcare-associated infections. EU travellers to Brazil, and particularly to the large metropolitan areas of Rio de Janeiro and Sao Paulo, should exercise caution, pay close attention to their personal security, and monitor the media for events that may affect their safety.

Surveillance for communicable diseases should be sensitive enough to detect threats at a stage when interventions are likely to prevent or reduce the impact of outbreaks. There is a possibility that returning travellers will export communicable diseases, for example vector-borne diseases such as dengue, and introduce them to their country of residence.

There are a number of diseases and infections that are highly unlikely to occur during the 2014 Brazil World Cup, but are still important to get monitored because of their severity and high case-fatality ratio. These include viral haemorrhagic fevers and diseases that could result from intentional release, such as anthrax, plague and smallpox. Outbreaks and spread of vaccine-preventable diseases are of particular concern during mass gatherings but there are no indications that the risk is higher than usual.

Based on the epidemiological profile for infectious diseases for Brazil and the profile of the visiting populations, it is recommended that ECDC should conduct enhanced epidemic intelligence surveillance for communicable diseases from 5 June to 20 July 2014.

Useful links

Ministry of Health Brazil website on the World Cup:
http://www.brasil.gov.br/saude/2014/05/estrangeiros-precisam-ter-atencao-com-vacinas-para-copa

Health Guide issued by the Ministry of Health of Brazil:
http://www.sbim.org.br/noticias-sbim/destaques/guia-de-saude-viagens-grandes-eventos

WHO/PAHO vaccination recommendations:
http://www.paho.org/hq/index.php?option=com_content&view=article&id=9484%3Aopsoms-llama-a-vacunarse-contra-el-sarampion-y-la-rubeola-para-proteger-a-las-americas-durante-la-copa-mundial-2014&catid=740%3Anews-press-releases&Itemid=1926&lang=en

NaTHNaC travel advice for Brazil World Cup:
- http://www.nathnac.org/pro/factsheets/documents/WorldCupFactsheet.pdf
- https://www.gov.uk/government/news/health-advice-for-fans-heading-to-brazil-for-the-world-cup

MedISys enhanced criteria (please open in Google Chrome browser):

- FIFA_PC_All: 32 countries and a list of diseases: http://medusa.jrc.it/medisys/filteredition/en/FIFA_PC_All.html
- FIFA_PC_Airborne: http://medusa.jrc.it/medisys/filteredition/en/FIFA_PC_Airborne.html
- FIFA_PC_FoodAndWaterborne Diseases: http://medusa.jrc.it/medisys/filteredition/en/FIFA_PC_FoodAndWaterborne.html
- FIFA_PC_HIV/STI: http://medusa.jrc.it/medisys/filteredition/en/FIFA_PC_HIV.html
- FIFA_PC_Non-InfectiousCauses: http://medusa.jrc.it/medisys/filteredition/en/FIFA_PC_Non-InfectiousCauses.html
- FIFA_PC_Other: http://medusa.jrc.it/medisys/filteredition/en/FIFA_PC_Other.html
- FIFA_PC_VDP: http://medusa.jrc.it/medisys/filteredition/en/FIFA_PC_VDP.html
- FIFA_PC_Vector borne: http://medusa.jrc.it/medisys/filteredition/en/FIFA_PC_Vectorborne.html
- FIFA_PC_Zoonoses: http://medusa.jrc.it/medisys/filteredition/en/FIFA_PC_Zoonoses.html

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Annex

Table 1. Focus of ECDC surveillance activities during the 2014 FIFA World Cup (12 June–13 July) and one week before/after the event

Diseases	Risk import to Brazil?	Risk transmission /outbreaks during FIFA CUP?	Risk of export to EU?	Enhanced surveillance required?	Remarks + Very low or no risk ++ Low risk +++ Moderate risk ++++ High risk
	(+, ++, +++, ++++)	(+, ++, +++, ++++)	(+, ++, +++, ++++)	(Yes / No)	
Antimicrobial resistance and healthcare-associated infections					
Resistant *Pseudomonas aeruginosa*[#]	+	++	++	Yes	Visitors returning from Brazil who have received in-hospital care should be considered for testing for AMR strains.
Carbapenem–resistant *Klebsiella pneumoniae*[#]	+	++	++	Yes	
Food- and waterborne diseases					
Salmonellosis[£]	+	+++	++	Yes	
Campylobacter infections[£]	+	+++	++	Yes	
Hepatitis A	++	++	++	Yes	
Norovirus[£]	++	+++	++	Yes	Frequent cause of outbreaks during mass gatherings
VTEC/STEC/*E. coli* infections[£]	++	+++	++	Yes	
Food poisoning, unspecified	-	+++	+	Yes	Frequent cause of outbreaks during mass gatherings
Yersiniosis[£]	+	+	+	Yes	
Dysentery/bloody diarrhoea	+	++	+	Yes	
Shigellosis	+	++	+	Yes	
Botulism[#]	+	+	+	Yes	
Legionnaires' disease[#]	+	++	+	Yes	
Zoonoses					
Rabies	+	++	+	Yes	Rabies endemic
Leptospirosis	+	+	+	Yes	
Trichinosis	+	+	+	No	Low risk of local transmission, no human-to-human transmission
Avian influenza (A(H7N9), A(H5N1), others	+	+	+	Yes	
Vector-borne diseases					
Malaria	+	++	++	No	
Dengue	+	++	++	Yes	Moderate in northern and north-eastern regions; very low in the southern and central-western regions
Yellow fever	+	+	+	Yes	Yellow fever is endemic in parts of Brazil
Chagas	+	+	+	No	
Leishmaniasis	+	+	+	No	
Schistosoma mansoni	+	+	+	No	
Lymphatic filariasis	+	+	+	No	
Chikungunya	++	+	+	Yes	Due to the ongoing outbreak
Sexually transmitted diseases					
HIV	+	++	++	No	Long incubation, no use of event surveillance
Syphilis	+	++	++	No	Long incubation, no use of event surveillance
Gonorrhoea	+	++	++	No	
Chlamydia	++	++	++	No	Very common STI across EU, limited benefit of monitoring.
Hepatitis B	+	++	++	Yes	
Hepatitis C	+	+	+	Yes	
Vaccine-preventable diseases					
Polio	+	+	+	Yes	
Rubella	+	++	+	Yes	
Measles	++	+	+	Yes	
Mumps	+	+	+	Yes	
Pertussis	++	++	++	Yes	

Diseases	Risk import to Brazil?	Risk transmission /outbreaks during FIFA CUP?	Risk of export to EU?	Enhanced surveillance required?	Remarks + Very low or no risk ++ Low risk +++ Moderate risk ++++ High risk
	(+, ++, +++, ++++)	(+, ++, +++, ++++)	(+, ++, +++, ++++)	(Yes / No)	
Invasive meningococcal disease	+	++	++	Yes	
Typhoid fever	+	+	+	Yes	
Respiratory diseases					
Upper respiratory tract infections	+++	+++	+++	Yes	
Influenza-like illness	++	+++	++	Yes	Moderate in the southern and south-eastern regions
Tuberculosis	+	+	+	Yes	
Leprosy	+	+	+	No	

[#] *Surveillance due to implications of severity, but low risk*

[£] *Higher risk than indicated incidence rate, takes into consideration increased probability of temporary food providers and increased risk due to season.*