



# **Rio-de Janeiro-2016 Olympic Event and Potential Risk of Zika Virus Outbreak for Africa**

July 2016

## Executive Summary

With the current Zika virus disease (ZIKV) outbreak, the observed autochthonous transmission, risk of human-to-human transmission and associated complications are substantial. The clinical prognosis of those neurological complications and birth defects are posing a huge social and economic burden in affected countries in Latin America and the Caribbean. The lifetime direct medical cost of each microcephaly and GBS is estimated to be US\$91,102 and US\$28,818, respectively. With high attack rate of ZIKV during outbreaks, as high as 77% of total population, the number of complicated cases will be too high and so is the cost of outbreak response, direct medical care, and impacts other economic sectors. It will affect tourism and trade in the continent with substantial socio-economic impact.

In Africa, there are favorable conditions for the ZIKV outbreak to sustain, including favorable climate and long seasons of mosquito activities, wider distribution of transmitting mosquitos, limited health infrastructure and capacity to detect and contain ZIKV outbreak. And hence, importation of even few cases from affected countries may end up in explosive outbreak in the continent, with high social, economic impacts. As much as half a million people is expected to attend the Rio-de Janeiro-2016 Olympic event, which may pose a threat of global spread of the disease and potential importation to the African continent. This is a pressing threat currently pending over the continent as ZIKV has started circulating in Cabo Verde and Guinea- Bissau.

Strictly following simple and appropriate preventive measures before, during and after travel to affected countries will help to reduce the risk of ZIKV importation form affected countries [especially Brazil following the Rio-2016 Olympic event] and probable explosive outbreak into the continent.

This document discusses preventive measures that need to be taken by travelers and health and other relevant authorities of Olympic event participating countries. These preventive measures includes: *exposure prevention* (mosquito bite prevention, safe sexual practice, postponing travel to affected countries especially women who are pregnant or planning to become pregnant), *importation prevention* (enhanced surveillance and diagnostic capacity), *post-event surveillance* (tracking and follow-up of returnees and early diagnosis of symptomatic travelers), *protection of women in the reproductive age group and pregnancy* (safe sex practice, including correct and consistent use of condoms, or abstaining from sex for the duration of the pregnancy, wait at least 8 weeks before trying to conceive).

# Rio-de Janeiro-2016 Olympic Event and Potential Risk of Zika Virus Outbreak for Africa

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## Introduction

The 2016 Olympics and Paralympics will take place from 5-21 August and 7-18 September 2016 in Brazil, Rio de Janeiro with more than 15,000 athletes from more than 206 countries from all over the world<sup>1</sup>. In addition to Rio de Janeiro, Belo Horizonte, Brasília, Salvador, São Paulo, and Manaus will also host some of the matches. It is estimated that more than 500,000 tourists will attend this sport event in Brazil. Nearly all African countries are going to be part this sport event.<sup>2</sup>

Currently Brazil is affected by the Zika Virus (ZIKV) outbreak, a mosquito-borne disease which can cause of fetal microcephaly and other neurologic complications. This disease was declared a Public Health Emergency of International Concern (PHEIC) on 1 February 2016 by the World Health Organization (WHO). A PHEIC declaration means the disease has potential for international transmission and needs extraordinary effort and international cooperation to curb the disease.<sup>3</sup>

The risk for ZIKV outbreak is considered to be the function of two main components: (1) the likelihood of local Zika virus transmission and (2) the capacity of countries to contain transmission at an early stage<sup>4</sup>. This document will discuss i) the likelihood of infection with ZIKV for athletes and tourists who will travel to Brazil for the Rio-2016 Olympic event, ii) the potential risk for importation and local transmission of ZIKV in Africa, and iii) measures to be taken by traveling athletes, tourists and their countries before, during and after this athletic event.

## Zika Virus Infection

ZIKV infection is caused by a virus and is transmitted by *Aedes* mosquitos (*A. Aegypti* and *A. alpoiticus*) and sometimes human-to-human via sexual route and blood transfusion. It is considered to be a mild disease (four of five infected individuals will not have any

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<sup>1</sup> <http://www.rio2016.com/en>.

<sup>2</sup> [www.olympic.org/national-olympic-committees](http://www.olympic.org/national-olympic-committees)

<sup>3</sup> <http://www.who.int/ihr/publications/9789241596664/en/>

<sup>4</sup> [http://www.euro.who.int/data/assets/pdf\\_file/0003/309981/Zika-Virus-Technical-report.pdf?ua=1](http://www.euro.who.int/data/assets/pdf_file/0003/309981/Zika-Virus-Technical-report.pdf?ua=1)

symptoms). However, ZIKV infection in pregnancy can cause fetal microcephaly and birth defects such as eye defects, hearing loss, and impaired growth. ZIKV can also cause GBS and other neurologic complications in adults. To date, the disease has no specific treatment nor a preventive vaccine.<sup>5</sup>

Starting from early 2015, autochthonous transmission of ZIKV was reported in Brazil and the disease is currently a major public health concern for Brazil and for the international community. In this ongoing outbreak, southern and central America and the Caribbean regions are the most affected (**Figure 1**). As of 07 July 2016, 62 countries and territories have reported continuous mosquito transmission of ZIKV and 11 countries have reported evidence of human to human transmission. Thirteen (13) countries reported microcephaly and other fetal malformations potentially associated with ZIKV infection.<sup>6</sup>

Brazil has been most heavily impacted by this outbreak. The Brazilian Ministry of Health has estimated that as many as 1.5 million people were infected by ZIKV in 2015, and as of 07 July 2016, more than 1,650 infants born have confirmed ZIKV-associated microcephaly. The north-eastern region of the country, Rio de Janeiro and Bahia are states most affected.

Moreover, yellow fever, dengue fever, Chikungunya are also transmitted by the same species of mosquitoes, and yellow fever and dengue fever are known major public health problems in Brazil.



Figure 1. All Countries and Territories with Active ZIKV Transmission, as of 30 June 2016.

(Source: US Centers for Disease Control and Prevention, accessed on 17 May 2016 at: <http://www.cdc.gov/zika/geo/active-countries.html>)

<sup>5</sup> [www.who.int](http://www.who.int)

<sup>6</sup> <http://apps.who.int/iris/bitstream/10665/246180/1/zikasitrep7Jul16-eng.pdf?ua=1>

## The Risk of Importation and Local Transmission of ZIKV in Africa

The Rio-2016 Olympic and Paralympics event will be during the winter season of Rio de Janeiro, Brazil. The mosquito population is expected to be lower in the winter season and theoretically, risk of mosquito-borne disease transmission will be at its lowest.<sup>7</sup> With appropriate precautions for both athletes and tourists, ideally, the sporting event will be uneventful.<sup>8</sup> A modeling study has shown that the chance of acquiring ZIKV infection in the particular three (3) weeks of this sporting event (August 2016) is estimated to be very low (1.8 cases per 1,000,000 tourists), though it could be as high as 3.2 cases per 100,000 tourists<sup>9</sup>. However, as stated previously, the risk of sustained ZIKV outbreak depends on: (1) the likelihood of local transmission and (2) the capacity of countries to detect and contain transmission at an early stage. In turn, these two factors depend on different variables like climate and vector activity, population density, goods and human traffic and health system capacity on vector control, surveillance and diagnostic capacity and outbreak responses, and so on.<sup>10</sup>

In African countries that have an abundance of competent mosquitos for effective transmission and are poised to enter rainy seasons, the importation of even a few cases may lead to an uncontrolled outbreak. This reality, coupled with weak surveillance system, limited diagnostic capacity for early detection and rapid response, and limited health care infrastructure, multiplies the risk of an explosive outbreak of ZIKV in the African continent.

## The Impact of ZIKV Outbreak in Africa

On 20 May 2016, WHO reported the ZIKV circulating in Cabo Verde is the Asian type most likely imported from Brazil.<sup>11</sup> The Asian type is associated with neurological disorders and microcephaly and is currently circulating in the Americas. Though ZIKV has been previously identified and is circulating in Africa, the Asia strain is a new threat to the continent. This is the first time that the ZIKV strain responsible for the outbreaks linked to neurological disorders and microcephaly has been detected in Africa.

The clinical presentations and complication of ZIKV infection are diverse, including microcephaly, ocular lesions, intrauterine growth restriction, fetal death, still birth, impaired cognitive and motor functions in congenital infections, GBS and other neurologic complication in adults.<sup>12</sup>

<sup>7</sup> European Centre for Disease Prevention and Control. Potential risks to public health related to communicable diseases at the Olympics and Paralympics Games in Rio de Janeiro, Brazil 2016. Stockholm, 2016. © European Centre for Disease Prevention and Control, Stockholm, 2016

<sup>8</sup> [http://www.thelancet.com/pdfs/journals/laninf/PIIS1473-3099\(16\)30069-X.pdf](http://www.thelancet.com/pdfs/journals/laninf/PIIS1473-3099(16)30069-X.pdf) (Published online May 10, 2016 [http://dx.doi.org/10.1016/S1473-3099\(16\)30069-X](http://dx.doi.org/10.1016/S1473-3099(16)30069-X))

<sup>9</sup> Burattini Mn, Coutinho Fab, Lopez Lf, Ximenes R, Quam M, Wilder-Smith A, et al. Potential exposure to Zika virus for foreign tourists during the 2016 Carnival and Olympic Games in Rio de Janeiro, Brazil. *Epidemiology & Infection*. 2016; FirstView: 1-3.

<sup>10</sup> [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0003/309981/Zika-Virus-Technical-report.pdf?ua=1](http://www.euro.who.int/__data/assets/pdf_file/0003/309981/Zika-Virus-Technical-report.pdf?ua=1)

<sup>11</sup> <http://www.who.int/mediacentre/news/releases/2016/zika-cabo-verde/en/>

<sup>12</sup> Brasil P, Pereira JP Jr, Raja Gabaglia C, Damasceno L, Wakimoto M, Ribeiro Nogueira RM, et al. Zika Virus Infection in Pregnant Women in Rio de Janeiro—Preliminary Report. *N Engl J Med*. Mass Medical Soc; 2016; Available: <http://www.nejm.org/doi/full/10.1056/NEJMoa1602412>

The attack rate of ZIKV infection, as witnessed in Yap Island outbreak in 2007, can reach up to 77% of the total population.<sup>13</sup> Based on the available incidence data from Brazil and Colombia, the probability of microcephaly in infants born to ZIKV-infected women is estimated to be 4.9 to 21 per 1,000 birth; and that of GBS from ZIKV infection is 2 to 8 per 10,000 cases.<sup>14, 15</sup> This could result in significant burden for countries with large populations and high fertility rates (a reality observed in many African countries), likely resulting in high negative socio-economic effect.

The negative impact of ZIKV infection on the economy includes (1) direct investment for control and prevention and surveillance of the outbreak, (2) direct medical cost, (3) loss of productivity of affected population, (4) effect on macro economy of the country especially on tourism and foreign direct investment.<sup>16</sup> For example, in the study conducted in the current outbreak in Brazil and Colombia, the life time direct medical costs of each microcephaly case and each GBS case is estimated to be US\$91,102 and US\$28,818, respectively for Latin America and the Caribbean. However, this is a conservative estimate without incorporating the reduced productivity, quality of life, and other indirect costs like cost of education and support for developmental delay.<sup>17</sup> The indirect costs and associated loss of productivity of both patients and caregivers of affected child are much more substantial because of future repercussions to the country's development. For example, in Puerto Rico (total population of 3.5 million) for an average scenario, the estimated total direct medical costs for microcephaly and GBS is US\$104 million. However, upon inclusion of both direct non-medical costs and productivity losses, the values rise to \$736 million, without including items like specialized child-care support, and productivity losses of care givers and psycho-social strain of families with children with special needs, which are all substantial, yet difficult to quantify.<sup>18</sup>

Another cost of a potential ZIKV outbreak on the African continent is compulsory costs for outbreak control and surveillance and diagnostics. Outbreak response actions such as different mosquito control measures, laboratory diagnosis and surveillance, community awareness and social mobilization demand huge financing for effective control and prevention of a ZIKV outbreak. For example, the National Development Bank of Brazil has committed US \$136.6 million for outbreak response. For current ZIKV outbreak preparedness and response, the US government estimated total budget of US\$1.8 billion.<sup>19</sup>

During such public health and/ or natural disaster events, people tend to and are encouraged to minimize their risk by avoiding travel to the affected countries; travel alerts are issued

<sup>13</sup> Duffy MR, Chen T-H, Hancock WT, Powers AM, Kool JL, Lanciotti RS, et al. Zika Virus Outbreak on Yap Island, Federated States of Micronesia. *N Engl J Med.* 2009; 360: 2536–2543. doi: 10.1056/NEJMoa0805715 PMID: 19516034

<sup>14</sup> Alfaro-Murillo JA, Parpia AS, Fitzpatrick MC, Tamagnan JA, Medlock J, Ndeffo-Mbah ML, et al. (2016) A Cost-Effectiveness Tool for Informing Policies on Zika Virus Control. *PLoS Negl Trop Dis* 10(5): e0004743. doi:10.1371/journal.pntd.0004743

<sup>15</sup> In 2000, SINASC (Brazilian Live Birth Information System) reported that the prevalence of microcephaly in Brazilian newborns was 5.5 cases/ 100,000 live births and in 2010 it was 5.7 cases / 100,000 live births. Between 2010 and 2014, on average, between 150 and 200 children per year were born with microcephaly in Brazil.

<sup>16</sup> <http://www.jhsph.edu/research/centers-and-institutes/ivac/IVACBlog/the-potential-economic-impact-of-the-zika-virus>

<sup>17</sup> Alfaro-Murillo JA, Parpia AS, Fitzpatrick MC, Tamagnan JA, Medlock J, Ndeffo-Mbah ML, et al. (2016) A Cost-Effectiveness Tool for Informing Policies on Zika Virus Control. *PLoS Negl Trop Dis* 10(5): e0004743. doi:10.1371/journal.pntd.0004743

<sup>18</sup> Alfaro-Murillo JA, Parpia AS, Fitzpatrick MC, Tamagnan JA, Medlock J, Ndeffo-Mbah ML, et al. (2016) A Cost-Effectiveness Tool for Informing Policies on Zika Virus Control. *PLoS Negl Trop Dis* 10(5): e0004743. doi:10.1371/journal.pntd.0004743

<sup>19</sup> The White House Office of the Press Secretary. Fact Sheet: Preparing for and Responding to the Zika Virus at Home and Abroad [Internet]. The White House, United States Government; 2016 Feb. available: <https://www.whitehouse.gov/the-press-office/2016/02/08/fact-sheet-preparing-and-responding-zika-virus-home-and-abroad>

frequently. For ZIKV infection, travel alerts and advises have been issued by different public health agencies including WHO, US CDC, European CDC. On such occasions, economic activities associated with significant population and commodity movement like tourism and trade will possibly suffer significantly. This coupled with enormous financing demand of outbreak, as mentioned above, without replenishing revenue could pull down the economy of any affected country. The situation is worse for those countries which have substantial economic sources from tourism and foreign direct investment. A 2009 study done on impact of Chikungunya and dengue fever (diseases transmitted by the same mosquito that carries ZIKV) on tourism in three (3) Asian countries (Malaysia, Thailand and the state of Gujarat in India) revealed a substantial loss of tourism revenues: an estimated 4% decline, which represents at least US\$ 8 million for Gujarat, US\$ 65 million for Malaysia and US\$ 363 million for Thailand.<sup>20</sup> The 2003 Severe Acute Respiratory Syndrome (SARS) outbreak in China is another good example. Mainland China encountered a decline of US\$ 2.7 billion; in Hong Kong, foreign direct investment inflows fell 62% in one quarter. Hence, with all its potential for explosive outbreak, associated severe complication and long term disabilities, the socio-economic impact of ZIKV may even be worse.

In the Latin American and the Caribbean region, the World Bank estimated the short term cost of ZIKV since the outbreak. It has cost the region a total of \$3.5 billion USD; which is equivalent to 0.06% of the average GDP of the region. In this estimate, countries which depend much on tourism economy suffered significantly with as high as 1.6% of their GDP.

### **The African Context:**

In the context of African continent, conditions favoring ZIKV infection and its possible outbreak include favorable environment for mosquito activities, high birth rate and relatively large populations, limited diagnostic, clinical, and surveillance capacity and so on. Moreover, there are travel and trade relations between African countries and the affected American countries, such as multiple commercial trans-Atlantic flights. Hence, (1) the risk of importation of the current outbreak strain to the mainland of the continent is imminent, since it is already in Cabo Verde, (2) the risk of importation of ZIKV in the Rio-2016 Olympic event is predicted to be low for the reasons mentioned above, but even having as few cases as possible may lead to explosive outbreak in the continent.

According to a recent WHO-African Regional Office (WHO-AFRO) ZIKV transmission risk assessment<sup>21</sup>, all AFRO-African countries are at some risk of ZIKV outbreak. With the above estimated attack rate and incidence of complications, African countries due to their high birth rates, large population size and extended risk period in a year (longer seasons favorable for elevated mosquito activity) will likely suffer a substantial burden of complications related to ZIKV microcephaly and other neurologic complication like GBS.

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<sup>20</sup> Indian Institute of Management, Mavalankar et al, Quantifying the Impact of Chikungunya and Dengue on Tourism Revenues, Report Ahmedabad, India, 2009.

<sup>21</sup> Zika Virus Risk Assessment in the WHO African region: <http://www.afro.who.int/en/clusters-a-programmes/dpc/epidemic-a-pandemic-alert-and-response/epr-highlights/4869-zika-virus-risk-assessment-in-the-who-african-region.html>

And hence, with limited health infrastructure and resources, the costs associated with ZIKV outbreak including direct cost of medical care, outbreak response, and associated loss of productivity and impact on trade and tourism could press the marginal economy of most African countries.

## **Prevention and Control Measures**

To break the human-mosquito-human and human-to-human (primarily sexual) transmission cycles of ZIKV, prevention and control measures include enhanced surveillance, early treatment, vector control measures and personal protection. There is no specific treatment, nor a vaccine for disease prevention.

Therefore, participating tourists and countries in Rio-2016 need to prioritize exposure prevention, importation prevention, post-event surveillance, protection of women in the reproductive age group and pregnancy. The following sections will provide these individuals with general recommendations as provided by the World Health Organization to be considered before, during, and after travel to Rio-2016.

### **1. Athletes and spectators**

#### **Before travel to Brazil:**

To date, based on available evidence, no general restrictions on travel to or trade with countries, areas and/or territories with ZIKV transmission have been issued; however, as a precautionary measure, some national governments may make public health and travel recommendations to their own populations, based on their assessment of the available evidence and local risk factors. Hence,

- Travelers are advised to follow WHO and their own country's health authorities travel recommendations, (*See annex: participating countries and number of Athletes*). These include up-to-date advice on potential risks and appropriate measures to reduce the possibility of exposure to mosquito bites and upon return, what appropriate measures to take, such as safe sex to reduce the risk of onward transmission.
- Pregnant women should be advised not to travel to areas of ongoing ZIKV outbreaks. Pregnant women and women who are planning to become pregnant should consider postponing non-essential travel to affected areas until after delivery.

#### **While in Brazil:**

All travelers, including pregnant women, should adhere closely to steps that can prevent mosquito bites during their stay in Brazil. These include:

- Wearing clothes (preferably light-coloured) that cover as much of the body as possible;



- Using insect repellent: repellents may be applied to exposed skin or to clothing, and should contain DEET (diethyltoluamide) or IR 3535 or Icaridin. Repellents must be used in strict accordance with the label instructions;
- Using physical barriers such as screens, closed doors and windows, and use air conditioner;
- Sleeping under mosquito nets, especially during the day, when Aedes mosquitoes are most active;
- Using physical barriers such mesh screens or treated netting materials on doors and windows; and
- Identifying and eliminating potential mosquito breeding sites, by emptying, cleaning or covering containers that can hold even small amounts of water, such as buckets, vases, flower pots and tires.
- Practice safe sex (use condoms appropriately and consistently)

#### **After returning from Brazil:**

- Returnees are advised to use condoms appropriately and consistently to reduce the risk of sexual transmission<sup>22</sup>;
  - all returning men and women- especially pregnant women, women planning to become pregnant, and their partners - should practice safe sex, including correct and consistent use of condoms, or abstaining from sex for the duration of the pregnancy
  - Sexual partners of pregnant women, living in or returning from affected countries (Brazil), should practice safe sex or abstinence from sexual activity for at least the whole duration of the pregnancy.
  - Couples or women planning a pregnancy who are returning from affected countries (Brazil), are strongly recommended to wait at least 8 weeks before trying to conceive to ensure that any possible Zika virus infection has cleared; and 6 months if the male partner was symptomatic.
- Pregnant women and women who plan to get pregnant should seek advice and close follow-up with their health care provider.
- Returnees are advised to rapidly seek diagnostic test and medical care for any form of “ill-feeling” (because ZIKV is a mild disease mainly with no symptoms or mild flu-like illness) and protect him/herself from mosquito bites using all appropriate methods, like physical barriers and repellants
- Identify and eliminate potential mosquito breeding sites, by emptying, cleaning or covering containers that can hold even small amounts of water, such as buckets, vases, flower pots and tyres.

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<sup>22</sup> WHO Interim Guideline of for Prevention of sexual transmission of ZIKV:  
<http://www.who.int/csr/resources/publications/zika/sexual-transmission-prevention/en/>

## II. Countries

The health authorities of participating countries in the Rio-2016 Olympic and Paralympic Rio-2016 sporting event (*see annex*) should work on ZIKV importation prevention, early detection and rapid response to avoid local transmissions and outbreaks. Hence,

- Develop and provide up-to-date travel advice based on WHO recommendations and their local and seasonal context
- Assess country-level risk of local transmission (ecology, vector distribution, and seasonality) and global situation, and produce travel recommendations and alerts regularly
- Enhance surveillance, entomology and vector control and diagnostic capacity for ZIKV
- Conduct post-event surveillance and follow-up mechanism; this includes identifying and closely following athlete or spectator returnees in order to detect ZIKV importation early, then to prevent ongoing local transmission especially for those countries with high burden of *Aedes* mosquitoes
- Enhance vector control and community awareness and engagement, especially in areas in which there are athlete or spectator returnees
  - a. For Athletes:
    - Prior to travel, conduct workshops on situation awareness and prevention and control measures to all athletics crew
    - Encourage athletes to have appropriate dressing code and insect repellent
    - Identify and secure safe place to stay like rooms with protective mesh and insect repellent, air conditioned and no open-window policy
    - Implement surveillance system with temperature monitoring and follow-up of athletes upon return
    - Set-up reporting, diagnostic and isolation, and treatment unit for suspected symptomatic athletes and other participants
  - b. For Tourists:
    - Various groups of people will go to any of the affected countries for leisure or business. It is typically difficult to get them in a single group and to follow through with travel preparations or post-event monitoring. Ministries of health, migration authorities, travel agencies and all others and the community should be engaged in identification and follow-up. General recommendations at individual- and country-level include:
      - Strong community awareness and social mobilization
      - Develop and distribute information, education and communication materials at the ports of entry/exit especially focusing for those travelers to any of ZIKV-affected countries
      - Identify a designated site to report and to undergo diagnostic testing for any suspicion of having acquired ZIKV

**Conclusion:**

With the current ZIKV outbreak, the risk of autochthonous transmission, human-to-human transmission, and associated complications are substantial. The clinical prognosis of those neurological complications and birth defects has already placed a huge social and economic burden on affected countries in Latin America and the Caribbean. The lifetime direct medical cost of each microcephaly and GBS is estimated to be US\$91,102 and US\$28,818, respectively. With high attack rate of ZIKV during outbreaks, as high as 77% of total population, the number of complications could be extremely high; correspondingly a substantial financial impact upon outbreak response, direct medical care, and other economic sectors is anticipated. It could also affect the tourism and trade on the continent with substantial socio-economic impact. This is a pressing threat currently pending over the continent as ZIKV is circulating in Cabo Verde and Guinea-Bissau.

Strictly following simple and appropriate measures will help to reduce the risk of ZIKV importation and probable explosive outbreak into the continent, where environmental and an extended risk period in a year are favorable for competent mosquito activities.

Africa CDC will continue to monitor the situation and will update relevant stakeholders as information becomes available.

## Annex:

Countries Participating in 2016 Rio Summer Olympics <sup>23</sup>					
S. No	Participating Country	No of Athlete	S. No	Participating Country	No of Athlete
1	Algeria	68	26	Malaysia	22
2	Angola	20	27	Mali	1
3	Benin	3	28	Mauritius	8
4	Botswana	5	29	Morocco	51
5	Burkina Faso	1	30	Mozambique	4
6	Burundi	6	31	Namibia	10
7	Cameroon	22	32	Niger	2
8	Cape Verde	3	33	Nigeria	63
9	Central African Republic	1	34	Papua New Guinea	3
10	Congo	5	35	Rwanda	4
11	DR Congo	1	36	São Tomé and Príncipe	1
12	Djibouti	4	37	Saudi Arabia	6
13	Egypt	114	38	Senegal	18
14	Eritrea	8	39	Seychelles	5
15	Ethiopia	34	40	Somalia	1
16	Gabon	4	41	South Africa	128
17	The Gambia	1	42	Sudan	1
18	Ghana	6	43	Tanzania	4
19	Guinea-Bissau	3	44	Togo	1
20	Ivory Coast	10	45	Tonga	3
21	Kenya	76	46	Trinidad and Tobago	25
22	Lesotho	4	47	Tunisia	56
23	Liberia	1	48	Uganda	15
24	Libya	3	49	Ukraine	172
25	Madagascar	1	50	Zambia	3
			51	Zimbabwe	29
<b>Total</b>					<b>1040</b>

Last updated on: 15 June 2016:

Total of 206 countries will compete in Summer Olympics 2016. South Sudan and Kosovo would be participating in the event for the first time.

<sup>23</sup> <http://www.mapsofworld.com/sports/olympics/summer-olympics/participating-nations.html>