GEVANBIOL

Government of the Federal District
State Department of Health
Secretariat of Health Surveillance
Directorate of Environmental Health Surveillance
Management of Environmental Monitoring Biological factors not
Core Surveillance of Air Quality, Soil, of Contaminants
Chemical Accidents and Dangerous Products

Saúde Para Todos Copa

Newsletter VIGIAR/DF

Special Edition

Year 02 Number Nº 17

07/02/2014

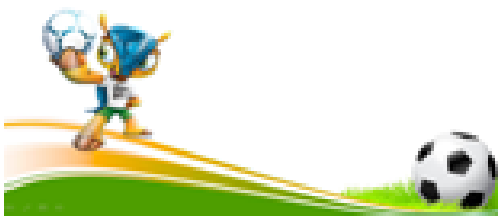
Objective: Report to the Federal District's population and visitors about the risks of air pollution and its relationship to human health during the World Cup 2014.

1 – AIR QUALITY CLOSE TO LOCAL AGGLOMERATION WORLD CUP 2014 (Source:IBRAM)

	Smoke			PTS		
Date	Rod	Scs	Tag	Rod	Scs	Tag*
June 11	19,43	4,66	*	131,86	**	*
June 16	17,52	**	*	119,94	**	*
June 24	38,3	15,88	*	162,55	141,9	*

* On 11/26/2013, equipment was involved in a traffic accident, without further sampling. Triggered the insurer liable.
** No sampling
*** Material for laboratory analysis

The monitoring points featured in this issue are located in the vicinity of Mane Garrincha Stadium, Bus Station Plano Piloto, Hotel Sector and FIFA Fanf Fest. Overall, air quality, as assessed by parameters Brasilia-IBRAM Environmental Institute in June 2014, regarding the smoke is good, reaching levels of care for Total Suspended Particle - PTS and may lead to sensitive groups (children, the elderly and people with respiratory and cardiac) disease, symptoms such as dry cough and tiredness, although the population in general is not affected.



1.1 - FORECAST FOR THE PERIOD FROM 02 TO JULY 04 (Source: INPE)

	Carbon monoxide - CO	Particulate matter - MP	Ozone - O3	Nitrogen oxides - NOx
July 02	Good	Good	Good	Moderate
July 03	Good	Good	Good	Moderate
July 04	Good	Good	Good	Moderate

Table 1: There is no variation of the emission of carbon monoxide during the study period. The highest predicted to particulate matter emission will give 03h, ozone at 18h and nitrogen oxides at 00h, as the mapping of the National Institute for Space Research - INPE.

2 - FOCI OF FIRES IN FEDERAL DISTRICT

2.1 - OUTBREAKS OF FIRE OBSERVED FROM JUNE 28 TO JULY 02 2014 (Source:INPE)

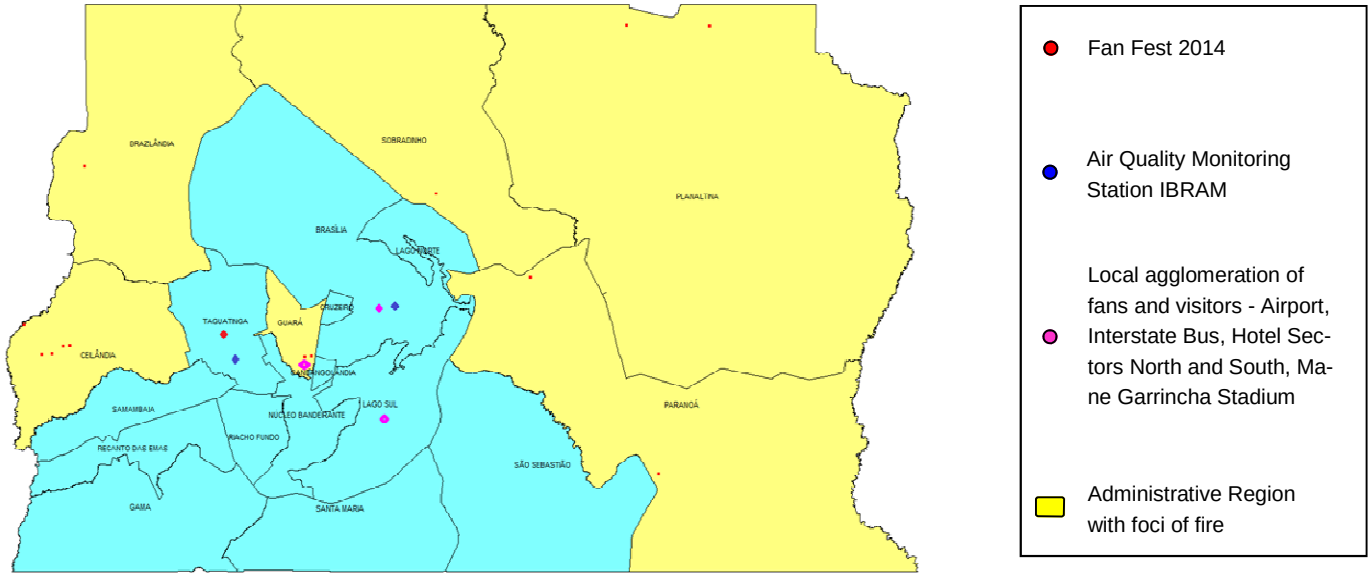


Figure 1. Foci of fires in the DF in the period from june 28 to July 02 2014.

2.2 - RISK OF FIRES FOR THE PERIOD FROM 02 to JULY 04 2014 (Source:INPE)

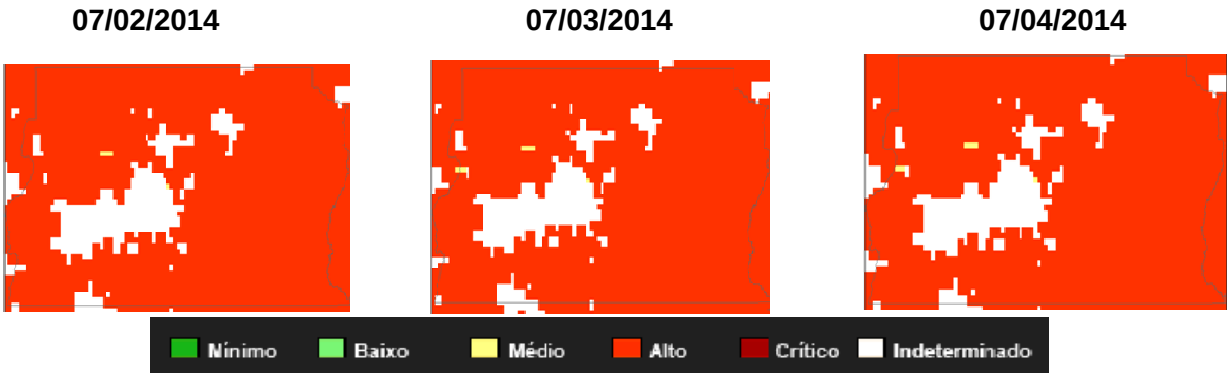


Figure 2. Risk of fire in the Federal District.

The risk of fire planned for a period from 02 to July 04, 2014 shows a high level in the Federal District, with some areas of indeterminacy or null. Thus, it is important to keep attention to the picture presented in order to trigger actions to prevent and control when necessary, in accordance with Decree No. 17,431, of June 11, 1996, establishing the Plan for Prevention and Control of Forest Fires in the Federal District and other measures.

3 - WEATHER

3.1 - METEOROLOGICAL OBSERVATIONS: June 27 to July 01 2014 (Source: INMET)

The meteorological conditions for the period of 27.Jun.2014 a 01.Jul.2014, from conventional meteorological station of Brasilia (15.79 ° S, 47.93 ° W and altitude of 1159.54 meters relative to mean sea level) the National of Meteorology Institute -INMET.

Date	Temperature (°C)	Temperature (°C)	Temperature (°C)	Precipitation (mm)	Humdity (%)
	Mean	Maximum	Minimum		
27.Jun	21,6	26,4	11,6	0	50
28.Jun	21,9	26,3	11,9	0	44
29.Jun	21,9	27,4	12,3	0	48
30.Jun	20,5	26,3	12,8	0	57
01.Jul	21,8	27,0	13,0	0	52

3.2 - WEATHER FORECAST FOR THE PERIOD: 02.July.2014 to 04 July 2014

Data	Condições	Tempera-	Umidade		Vento	
02.Jul	*Clear to party cloudy with haze*	27º 13º	Umidade Máxima 90%	Umidade Mínima 30%	*Weak to mode-rate*	*Direction: SE-NE*
03.Jul	*Clear to party cloudy with haze*	27º 14º	Umidade Máxima 73%	Umidade Mínima 55%	*Weak to mode-rate*	*Direction: SE-NE*
04.Jul	*Clear to party cloudy with haze*	27º 13º	-	-	*Weak to mode-rate*	*Direction: SE-NE*
05.JuL	*Clear to party cloudy with haze*	26º 12º	-	-	*Weak to mode-rate*	*Direction: SE-NE*

4 - ULTRAVIOLET INDEX

4.1– UVI MAXIMUM EXPECTED FOR July 2 2014 (Source:INPE)

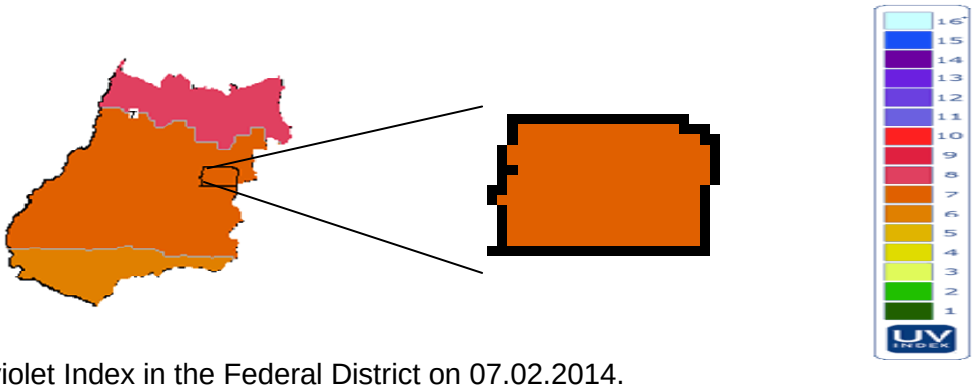


Figure 8 - Ultraviolet Index in the Federal District on 07.02.2014.

5 - CLIMATOLOGY WORLD CUP 2014

Brazil is divided in five distinctive administrative regions and, in each of these regions, there will be World Cup events (figure 1 illustrates the spatial localization of the host cities). The host-cities and their respective regions are:

North Region: Manaus (AM);

Southeast Region: Rio de Janeiro (RJ), São Paulo (SP) and Belo Horizonte (MG);

Northeast Region: Natal (RN); Fortaleza (CE); Recife (PE) and Salvador (BA);

Midwest Region: Brasília (DF) and Cuiabá (MT);

South Region: Curitiba (PR) and Porto Alegre (RS).

Southeast Region

The Southeast region probably presents the greater climatic contrasts in Brazil due to the diversity of factors acting in it: maritimity /continentality, depressions and coastal lowlands, semi-arid areas (north of the State Minas Gerais) and mountainous regions, with high precipitation levels throughout the year. Frontal systems are predominant during the winter (June to September) with low rainfall and frequent frosts. In the summer (December to March) the high temperatures and abundant rainfall associate themselves, mainly, to surface warming and to instability lines. The relief is an important factor in the distribution of temperature and precipitation, intensifying the fronts and the instability lines. The region is also under the influence of large scale atmospheric systems: South Atlantic Anticyclone, Chaco Low, Bolivian High, Polar Highs and Jet Streams. The South Atlantic Convergence Zone (SACZ), persistent band of cloudiness oriented from NW to SE, associated with the convergent flow in the lower troposphere of southern Amazonia to South-Central Atlantic, particularly well-characterized in the summer, is also an important element in defining certain situations of atmospheric weather in southeast Brazil, creating conditions of particular instability.

The area of the Southeast region is of 924.935 km², occupying 10,85% of Brazilian territory, extending from approximately 14° to 25° S latitude. It is located on the eastern edge of South America, crossed by the Tropic of Capricorn, and has most of its area in the tropics, bordering the Northeast region to the north, the Atlantic Ocean to the east and south, and also borders the South region of Brazil to the southeast, and the Midwest region to west and northwest. It is a transition area between the Northeast and South regions of Brazil. Three cities of this region were selected to host World Cup events: Rio de Janeiro (RJ), São Paulo (SP) and Belo Horizonte (MG).

Host City – RIO DE JANEIRO (RJ),

Capital of the State Rio de Janeiro (RJ), located at the western margin of Guanabara Bay, geographical coordinates 22°54'S and 43°12'W, on an altitude of around 10 meters above mean sea level. The latitudinal position of the region favors its broad exposure to solar radiation which favors the occurrence of intense convective motions. Convective rains, registered throughout the year, mainly in the semester spring-summer, are favored by the maritimity, which contributes for the permanent humidity and high temperatures. Precipitations of frontal origin that occur due to the clash between tropical and extratropical masses are common in the area and, in certain parts of the southeast region, are dynamized by the position of the relief that, in this area, is opposite to the advancement of extratropical systems when these present a more maritime trajectory. Temperature along the cost presents small variations due to the latitude; that happens as a result of the influence of the ocean, powerful thermal regulator, which decreases thermo gradient sources. Rainfall in this region is a reflection of its almost entirely intertropical position.

Rio de Janeiro is a coastal city, the annual-mean temperature is 23.8°C; the highest average occurs during the summer, peaking in February (26.6°C) and lowest in July at 21.3°C (winter). The same behavior can be seen for maximal and minimum temperature. Referring to the maximal temperature, the annual-mean is of 27.3°C, the higher average is in February (30.2°C) and the lowest in July (25°C). The annual-mean for minimum temperature is 21.0°C, the lowest average occurs in July (18,4°C) and the highest minimum in February (23.5°C). From this information we can infer that the hottest month of the year is February and the coldest July. The annual-mean of insolation is 2181.8 hours, the highest average occurs in January (211.9 hours) and the lowest in September (146.2 hours).

The average annual accumulated precipitation is of 1069.4 mm, with rainfall surpassing 100 mm from December to March, maximum in January (137.1 mm) and, throughout the year, the precipitation is uniform; in the winter the lowest precipitation index can be found, 41.9 mm in July. The annual average of days with precipitation greater than or equal to 1 mm is 93 days; the highest average occurs in December and January (11 days), and the lowest in July (4 days). The average humidity of the air is of 79.1% and, throughout the year is superior to 75% varying very little each month in a way that, in October, March, April and May it reaches 80% and in June and July 77%.

Summer is marked for being a hot and humid season, in which February is the hottest month; winter has more mild temperatures and less rainfall, and has July as the coldest month. Basically the two seasons are well-defined; spring and fall act more as transition seasons. In terms of wind, the annual average of the resulting direction is 141°, whereas the mean prevailing wind direction (cardinal and collateral points) is predominately calm.

Climatology for the period of 1961-1990 - RIO DE JANEIRO - RJ						
Annual Mean Temperature	**Annual Minimum Temperature**	**Annual Maximal Temperature**	**Annual Precipitation**	**Record of Most Intense Rain in 24h**	**Record of Minimum Temperature**	**Record of Maximal Temperature**
23,8 ºC	21,0 ºC	27,3 ºC	1069,4 mm	167,4 mm 01/1962	10,1ºC 10/1977	39,0ºC 12/1963

Extremes for the period of 1991-2013 - RIO DE JANEIRO			
Months	**Maximum Pluviometric Precipitation (mm)/year**	**Absolute Maximum Temperature (°C)/ year**	**Absolute Minimum Temperature (°C)/ year**
June	50,0/2002	35,9/2012	14,8/2011
July	37,2/2010	34,9/2003,2010	13,1/2007

According to Köppen classification, the climate in Rio de Janeiro is Tropical Atlantic (Aw), characterized for being megathermal, with average temperature above 18°C throughout the year, and a dry season in which the annual-mean of precipitation is inferior to 60 mm in at least one month of the year.

Host City – BELO HORIZONTE (BH),

Capital of the State Minas Gerais (MG), has a diverse geography, with hills and lowlands. The city is surrounded by Serra do Curral which, during the colonization of the State, served as geographical landmark for travelers. It is located around 850 m above mean sea level at coordinates 19°49'S and 43°57'W. It lies around 716 Km far from Brasília, 586 Km from São Paulo and 444 km from Rio de Janeiro.

The climate in Belo Horizonte can be defined in two very distinctive periods: Rainy, from October to March and Dry, from April to September. However, during the transition period from April through September, the occurrence of extreme events is common, especially during the transition from the dry season to the rainy.

Due to the relevant difference between the months of the rainy and dry seasons, it should also be noted that the prolonged absence of constant rains, which begin in mid-April and extend through mid-October, favors the occurrence of low levels of relative humidity the air during the months of winter. The average annual accumulated precipitation is of 1463.7 mm, with rainfall superior to to100 mm from October to March, peaking in December (292 mm); the winter is dry, with minimum rainfall in June (11.5 mm). The annual average of days with precipitation greater than or equal to 1 mm is 93 days; the highest average occurs in December (16 days), and the lowest during the winter (2 days). From this information we can infer the city has a climate with dry winters and mild temperatures (lower average in medium, maximum and minimum temperature) and hot and rainy summers (February is the hottest month); September and May are considered transition months. The average humidity of the air is of 72.2%; January is the most humid (79%) and August the least humid (64.5%). However, there are days in which the humidity of the air reaches values inferior to 20%, remaining between 20% and 30% on specific times during the

months of June, July, August and early September.

During the months of winter it is quite common the occurrence of thermal inversion associated to the presence of a cold mass of air over the central region of Minas Gerais. This phenomenon favors a greater concentration of pollutants, particularly during business days (i.e. Mondays through Fridays), due to the large number of vehicles on the roads which emit pollutant particles. The annual-mean temperature is 21.1°C, with the highest average in February (23°C) and the lowest In July (18°C). The same behavior can be found in maximum temperatures, February has the highest average (28.8°C) and July the lowest (24.6°C); the annual-mean of maximum temperature is 27.1°C. in terms of minimum temperature, the summer has the highest average, reaching 19°C in February; the lowest average is found in July (13.1°C). The annual-mean of insolation is of 2569.3 hours, the highest average occurs in July (256.5 hours) and the lowest in December (171.7 hours). Regarding the wind, the annual average of the resulting direction is 83°, whilst the mean prevailing wind direction (cardinal and collateral points) is predominately east .

Climatology for the period of 1961-1990 - BELO HORIZONTE - MG						
Annual Mean Temperature	**Annual Minimum Temperature**	**Annual Maximal Temperature**	**Annual Precipitation**	**Record of Most Intense Rain in 24h**	**Record of Minimum Temperature**	**Record of Maximal Temperature**
21,1ºC	16,7 ºC	27,1ºC	1463,7 mm	164,2mm 02-/1978	3,1ºC 06/1979	-

Extremes for the period of 1991-2013 - BELO HORIZONTE			
Months	**Maximum Pluviometric Precipitation (mm)/year**	**Absolute Maximum Temperature (°C)/ year**	**Absolute Minimum Temperature (°C)/ year**
June	23,0/2013	29,3/2010	8,0/1997
July	19,8/2004	31,3/2013	8,7/2000

According to Köppen classification, the climate in Belo Horizonte is Tropical of Altitude (Cwa), characteristic derived from the city's medium altitude of around 860 meters above mean sea level. The winter is predominately mild and dry, and the summer hot and rainy. The temperature is mild throughout the year, varying around 18°C and 23°C; the annual-mean is of 21.1°C.

Host City – SÃO PAULO (SP),

Capital of the State São Paulo (SP), located at geographical coordinates 23°33'S and 46° 38'W, with altitude if 760 meters above mean sea level. Borders the States of Minas Gerais, Mato Grosso do Sul, Paraná and Rio de Janeiro. Moreover, the city has an area of 248.176,69 Km². The relief is composed of narrow coastal plains limited by the Serra do Mar, and plateaus and

depressions in the rest of the territory. The climate is relatively well-defined for presenting, throughout the year, the coldest and dry period between May and September, and the warmest and rainiest between November and March.

In the winter the climate is usually more cold and dry, with frequent consecutive days without rain and predominance of sun. However, is quite common the entry of cold fronts that can cause abrupt changes in temperature and brief rain showers, with the occurrence of the traditional São Paulo drizzle, particularly on neighborhoods located in the south and east of the city.

The annual-mean temperature in São Paulo is of 19.2°C, with monthly averages that oscillate between 15.8°C in July and 22.4°C in February. The highest averages of maximum temperature occur in January (27.3°C) and February (28°C). Minimum temperatures reach the lowest averages between June (12.4°C) and July (11.7°C); these are the coldest months of the year, in which average precipitation is between 43.5 and 51.2 mm, with around 6 to 7 rainy days in each month. In terms of total monthly precipitation, July is the second driest month of the year, only surpassed by August.

The annual-mean of total pluviometric precipitation is of 1441.0 mm. There is an important contrast in rainfall distribution throughout the year, with higher concentration in spring and summer, and lower concentration in the winter; the highest monthly average was registered in January (237.4 mm) and the lowest in September (39.6 mm). The average humidity of the air is high throughout the year, varying between 74% and 80%. Important to point out that, in certain years, the relative humidity of the air can fall under 50% in a small number of days during the year, especially in August and September.

Climatology for the period of 1961-1990 - SÃO PAULO -SP						
Annual Mean Temperature	**Annual Minimum Temperature**	**Annual Maximal Temperature**	**Annual Precipitation**	**Record of Most Intense Rain in 24h**	**Record of Minimum Temperature**	**Record of Maximal Temperature**
19,2ºC	15,5 ºC	24,9ºC	1441,0 mm	151,8 mm 12/1988	1,5 07/1975	35,3°C 11/1985

Extremes for the period of 1991-2013 - SÃO PAULO			
Months	**Maximum Pluviometric Pre-**	**Absolute Maximum Tempera-**	**Absolute Minimum Tempera-**
June	48,3/2013	28,8/1992	1,2/1994
July	47,4/2007	30,2/2006	0,8/1994

According to Köppen classification, the climate in São Paulo is Subtropical, with more mild temperatures during the winter and more intense rainfall during the spring and summer

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6 - RECOMMENDATIONS FOR HEALTH

Beware of dry air!

Due to differences in amount of green areas, built-up areas and soil sealing, both the temperature and humidity vary widely from one location to another.

Relative humidity is defined as the ratio of water in the ambient air for the total amount of moisture in the air can be carreada a particular temperature, expressed as a percentage. For example, 40% relative humidity means that the ambient air contains only 40% of the capacity of this air humidity carrear a given temperature.

The humidity is lower mainly in late winter and early spring, in the afternoon, between 12 and 16 hours. The humidity is highest:

- Whenever it rains due to evaporation that occurs later
- In forested or near the rivers or dam areas
- When the temperature decreases (dew).

Accordance with the World Health Organization (WHO), indices of relative humidity below 60% air are not suitable for human health!

Health effects:

-Dryness of mucous membranes of the nose and throat;

-Stuffy nose or bleeding, sneezing, coughing, difficulty breathing, rhinitis, asthma attacks;

-Increased risk of respiratory infections;

-Worsening of pre-existing respiratory diseases such as asthma, bronchitis, rhinitis, emphysema, and other;

-Dryness of the skin;

-Eye irritation with dryness, redness, burning, gritty feeling in the eyes, itching and increased allergic conjunctivitis

Psychometric scale - classification of states of criticality:

Between 20 and 30% - State Attention

Between 12 and 20% - Alert Status

Below 12% - State of emergency

What to do to protect yourself

-Avoid moderate and intense physical activity, especially in high-traffic routes;

-If you are elderly or people with respiratory and cardiovascular diseases, avoid moderate and intense exercise anywhere;

-Unless there is a medical contraindication, drinking increased fluids, especially if children, elderly or if you usually stay in places with air conditioning;

-Avoid crowds and keep airy indoor environments, avoiding drapes and carpeting that accumulate dust;

Do not take bath with hot water, it causes skin dryness. Pocure use moisturizer and lip balm;

-Clean the house with damp cloth;

-Humidify the environment with wet towels, water containers, water gardens, humidifiers, etc.. But do not forget that the use of air humidifiers should be done for short periods of time (1-2 hours), and as soon as possible, try to ventilate the room to prevent the proliferation of fungi and mites. You need to wash and dry well and the appliance after use.

Sources:

http://www.defesacivil.df.gov.br/defesa-civil/alertas-preventivos/baixa-umidade-do-ar.html

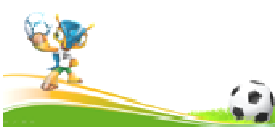
http://www.prefeitura.sp.gov.br/cidade/secretarias/upload/ar_seco_1259604098.pdf

Referral hospitals SUS # Host City of the World Cup - Brasília / DF

HOSPITAL DE BASE DO DISTRITO FEDERAL -3315-1200
HMIB - HOSPITAL MATERNO INFANTIL DE BRASILIA -(61)34457500 AV L2 SUL QUADRA 608 MÓDULA A. ASA SUL. CEP 70203-900
HRAN - HOSPITAL REGIONAL DA ASA NORTE- (61)33254313 SMHN, QD. 101. ASA NORTE. 70710-905.
HRC - HOSPITAL REGIONAL DA CEILÂNDIA- (61) 33713444 QNM, 17. CEILÂNDIA SUL.CEP: 72215-170
HRT - HOSPITAL REGIONAL DE TAGUATINGA- (61)33531006 SETOR C NORTE, ÁREA ESPECIAL 24. TAGUATINGA cep 72155-000
HRS - HOSPITAL REGIONAL DE SOBRADINHO -(61)34879200 QUADRA 12, ÁREA RESERVADA 01. SOBRADINHO 73020-412
HRG - HOSPITAL REGIONAL DO GAMA- (61) 33859700 ÁREA ESPECIAL S/N. SETOR CENTRAL. GAMA. CEP 72405-150

Sources: Ministry of Health, 2014, available at www.saude.gov.br

Health Department of the Federal District, available at www.saude.df.gov.br



Electronic address Newsletter VIGIAR/ DF:

http://www.saude.df.gov.br/outros-links/informes-epidemiologicos/768-2013-12-09-17-11-36.html

Questions and / or suggestions

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