



# MURKY WATERS

*Why the cholera epidemic in Luanda (Angola) was a disaster waiting to happen*

MSF  
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## **Executive Summary**

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Since February 2006, Luanda is going through its worst ever cholera epidemic, with an average of 500 new cases per day. The outbreak has also rapidly spread to the provinces and to date, 11 of the 18 provinces are reporting cases.

The population of Luanda has doubled in the last 10 years, and most of this growth is concentrated in slums where the living conditions are appalling. Despite impressive revenues from oil and diamonds, there has been virtually no investment in basic services since the 1970s and only a privileged minority of the people living in Luanda have access to running water. The rest of the population get most of their water from a huge network of water trucks that collect water from two main points (Kifangondo at Bengo river in Cacuaco and Kikuxi at Kuanza river in Viana) and then distribute it all over town at a considerable profit. Water, the most basic of commodities, is a lucrative and at times complex business in Luanda, with prices that vary depending on demand.

Without sufficient quantities of water, and given the lack of proper drainage and rubbish collection, disease is rampant in the vast slums. This disastrous water and sanitation situation makes it virtually impossible to contain the rapid spread of the outbreak.

Médecins Sans Frontières is already working in ten cholera treatment structures, and may open more in the coming weeks. Out of the 17,500 patients reported in Luanda (the figure for all of Angola is 34,000), more than 14,000 have been treated in MSF centres. Despite significant efforts to ensure that patients have access to treatment, very little has been done to prevent hundreds more from becoming infected.

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## Luanda

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As most African cities, Luanda has experienced rapid population growth in the last 3 decades. After independence in the 70s and as the Portuguese abandoned some of the small farms around the city, the outward spread of the improvised and precarious settlements and slums, also known as *musseques*<sup>1</sup>, started and was continuous from then onwards compounded by the constant arrival of people fleeing the fighting in the provinces. By 2000, the *musseques* extended 13 kilometers out of the city (Cain et al, 2002). The end of the war in 2002, made it possible to move safely around the country, and with this a new wave of arrivals settled in the capital city. Population density has not ceased to increase, and the population of Luanda is currently estimated to be between 4,5 and 5,5 million people<sup>2, 3</sup>.

The “concrete city”, which is the area that comprises the old colonial town, the business and wealthy residential areas, is well serviced and occupies part of Ingombotas and Maianga municipalities. It is estimated that around 400,000 people live in the concrete city<sup>4</sup>, which would mean that around 90% of the population of Luanda live in the *musseques*, areas that have grown without planning and where there has been virtually no investment in terms of water, sanitation, drainage and waste disposal. This has led to appalling living conditions and a disastrous health situation with rampant disease and high mortality.

### The worst ever recorded cholera outbreak in Luanda

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Since the 13<sup>th</sup> of February, there is a cholera outbreak raging in Luanda. By 14<sup>th</sup> of May, there were more than 17,500 cases reported and 245 deaths, but registration of deaths in the community is highly deficient so accurate mortality is almost impossible to ascertain (of the 245 deaths reported, only 96 were deaths in the community. See below for more details on mortality).

Cholera is endemic in Luanda. In the late 80s and up to 1991, there was a cholera outbreak every year, the largest being in 1991 with over 8,000 cases reported. The next one was in 1994 with over 4,000, and there have been no more reported since.

The current outbreak has quickly spread to the other provinces, and on 14<sup>th</sup> of May, 11 of the 18 provinces were reporting cases. The rise in the number of cases in some of these large provincial towns has been extremely rapid and marked by very high mortality (over 15% case fatality rate<sup>5</sup> in some places). Currently the most affected cities after Luanda are Benguela and Malange, and there is a worrying increase of cases in Lubango.

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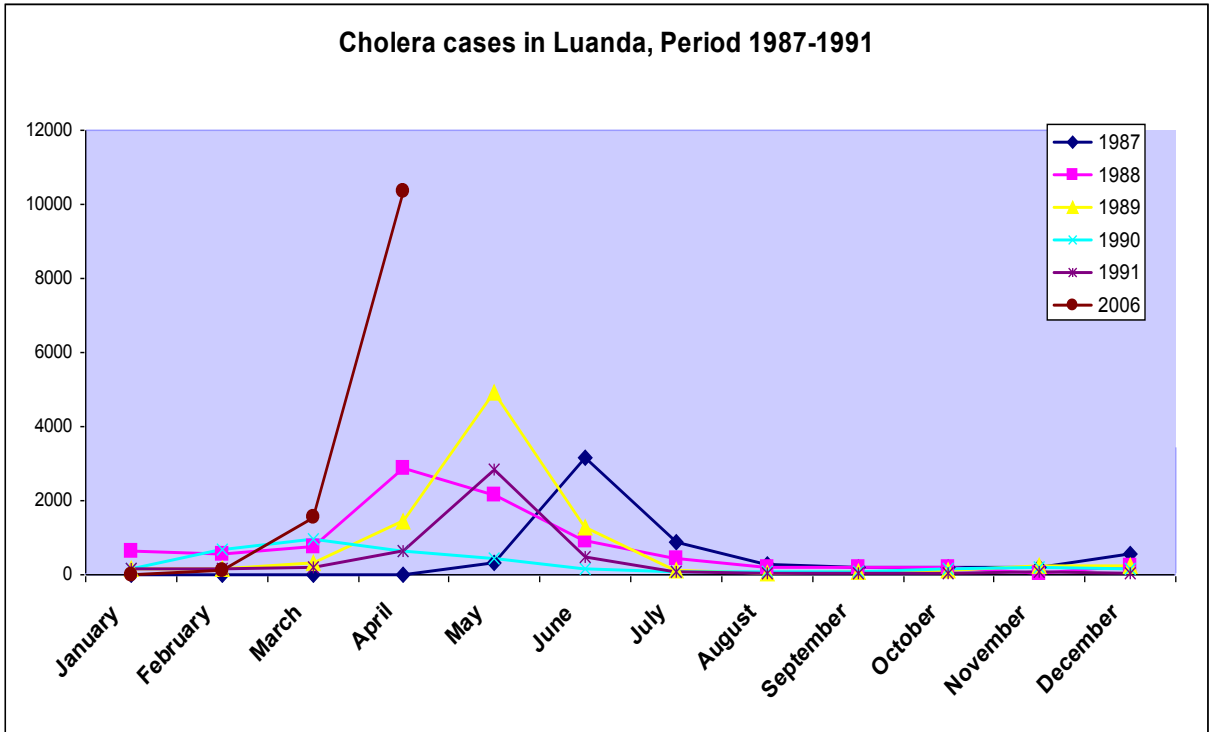
<sup>1</sup> After the kimbundo word for the sandy soil on which they are built

<sup>2</sup> depending on the sources. Estimates calculated on projections from the last census (1988) would indicate a total population of 4,5 million, according to vaccination records the population exceeds 5 million.

<sup>3</sup> The city is divided in 9 municipalities: Ingombotas, Maianga, Samba, Rangel, Sambizanga, Cazenga, Kilamba Kiayi, Cacuaco and Viana.

<sup>4</sup> meetings with different agencies and civil servants

<sup>5</sup> In urban settings, a case fatality rate >2% is considered indicative of poor/bad case management.



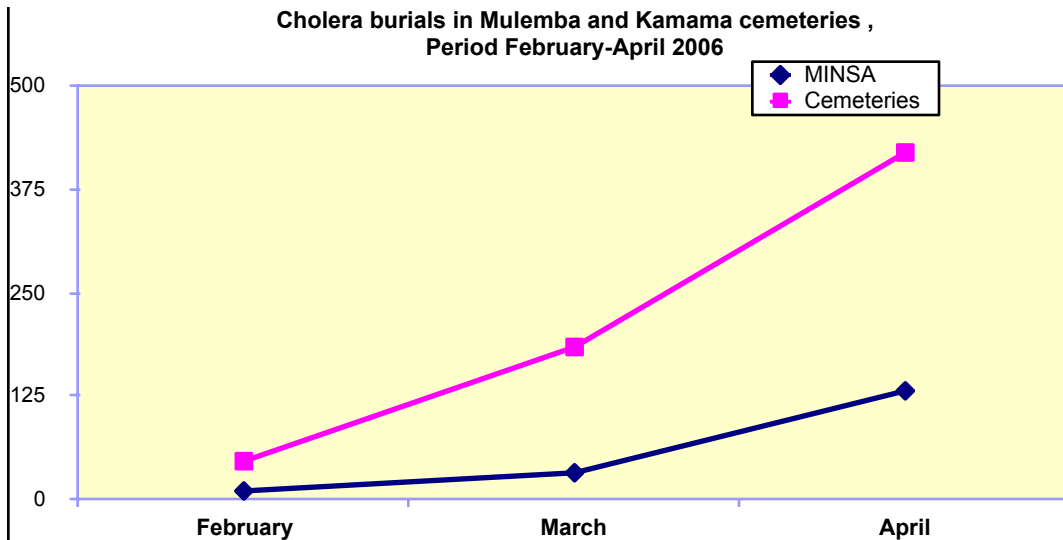
NB: 2006 cases up to 30 April

NB: this graph does not include the cases from 1994, as no official records were found

The first cases started in the area of Boa Vista (Ingombotas Municipality) and since then the cholera epidemic has reached all municipios of Luanda. After peaking in Boa Vista, the outbreak moved to Sambizanga and then Cacucaco. Looking at epidemiological data of the previous outbreak as well as the current evolution of cases, it was anticipated that Cazenga, Samba, Maianga and Viana municipios would soon see a sharp increase in the number of cases.

### Mortality

As mentioned above, there are serious concerns over epidemiological surveillance, and in particular the registration of deaths in the community. An assessment of the most affected municipios has revealed that there is not a standardised system to register and report deaths that occur outside a hospital structure; in some municipios there is simply no registration at all. In order to have a more realistic approximation of the real number of deaths, MSF consulted the register books of the 2 main cemeteries of Luanda where the majority of burials take place (Mulemba and Kamama). In only these 2 cemeteries the number of burials from 13<sup>th</sup> of February to 30<sup>th</sup> of April where the cause of death was registered as "cholera" totalled 437, compared to the 173 reported by the Ministry of Health (MINSa) for the same period.



For the same period in the same two cemeteries, there were also 211 burials where the cause of death was registered as “acute diarrhoea”. Given the very poor mechanisms to establish the cause of death for people that die at home, and given the fact that there is a cholera outbreak, it could be assumed, that at least part of these deaths may also be attributable to cholera.

Furthermore, as mentioned above, this data only reflects burials in two of the six official cemeteries in Luanda. While it is true that Mulemba and Kamama are the largest and where most of the burials take place (the others either being smaller or lacking space), there is an unofficial cemetery in Viana municipality (Mulenvos cemetery) where people are buried without an official death certificate. Assessment of the rest of the Luanda cemeteries, including Mulembos, will most likely reveal a higher number of deaths due to cholera.

### **Response to the outbreak**

The response to the outbreak has been very slow and the resources deployed largely insufficient. Given that it has been many years since the last epidemic, and in view of the disastrous water and sanitation conditions in most of the city, the risk of a major epidemic explosion should have been foreseen and massive resources should have been mobilised the moment the outbreak was declared. Instead, it took two and a half months for the national crisis committee to be activated, moment when Parliament allocated US\$ 5 million to the emergency response. Despite these measures, concrete action from ministries other than the Ministry of Health (MINSA) is still not apparent.

Médecins Sans Frontières has already set up ten cholera treatment structures in the most affected areas, and may open more in the coming weeks. Of the total 17,500 patients reported in Luanda since the beginning of the epidemic, more than 14,000 have been treated in MSF centres

Despite these efforts, much work remains to be done to ensure that patients are identified and referred timely to treatment structures (more treatment units, re-hydration points, increased referral capacity, active case finding).

But by far the most worrying aspect of the response is the very limited means dedicated to containing the outbreak. Massive resources need to be mobilised immediately to guarantee access to clean water free-of-charge in the *musseques*. Without sufficient quantities of water, it is impossible to ensure minimum hygienic measures. Telling people that they must wash their hands is not going to work if they barely have enough water to drink. Equally, efforts need to be stepped up to ensure that the key prevention activities mentioned above are implemented.

In a town where at least 70% of the people depend on a business of tanker trucks to get their water, an adequate response in terms of water provision would no doubt affect many private interests (see below section on water). This may explain the unacceptable delay in ensuring an emergency response to this very grave situation.

If pragmatic and efficient measures to increase the availability of water are not implemented urgently, the conditions are rife for this outbreak to last for months.



## Water and Sanitation in Luanda

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### Water

The water distribution network of Luanda has around 650 Km of pipe<sup>6</sup> and the provision of safe drinking water is done through 4 different systems<sup>7</sup>. When it leaves the treatment plant, the water provided from these systems is of good quality. Yet, the pipes have exceeded their life-span and there are parts that are seriously damaged, which increases the risk of contamination of water during transportation<sup>8</sup>.

This network mostly covers the “concrete city”, the wealthy part of Luanda, and has extensions to other municipalities mainly to service the few factories that are situated in the periphery. In the *musseques*, between 70 to 100 per cent of the population buy water from private vendors (DW, 1995).

According to a study conducted in 2002, 17% of the households in Luanda report a water connection, but only 10% have a direct connection to running water inside their household (DW, 2002:4). The rest of the population, in the absence of a public distribution network of water, pay high prices for water, often contaminated, from private suppliers who distribute water by tanker trucks to water vendors that own underground water tanks and who in turn sell water by the bucket to householders.

In areas that depend largely or exclusively on water trucking, people make do with dangerously low amounts of water. A specific study of the situation in two adjacent communes in the municipalities of Sambizanga and Cazenga in 2002 showed that the average consumption of water per person per day was 7,6 litres (all purposes: drinking, cooking, washing and cleaning), much below the internationally agreed-upon minimum standard of 20 litres per person per day. By comparison, the average consumption in western countries ranges between 200 and 600 litres per person per day.

In the slums of Luanda, no significant project has been completed in the last decades to improve availability of water in sufficient quantity and quality at a reasonable price. In fact, the situation has deteriorated<sup>9</sup>. In 1989 a water station was built in Mulemba, which was meant to become the second biggest treatment and distribution station of Luanda. But it never opened, as the project to build the distribution network was aborted<sup>10</sup>. Several large projects have been approved since 2003, but these are yet to

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<sup>6</sup> The the water production and distribution system in Luanda is managed by EPAL (Empresa Publica de Aguas de Luanda), which currently operates under a cost-recovery system.

<sup>7</sup> System I (built in 1953) and System II (built in 1971/81) which obtain the water from the Bengo River, and System III (built in 1998/2000) and Kikuxi (1985) which get it from the Kuanza River

<sup>8</sup> In addition, these damaged pipes, which are very close to the surface or even exposed, cross kilometres of musseques, with numerous rubbish fields where open air defecation is very common.

<sup>9</sup> To take the example of Cazenga, there are main pipes that bring water to a number of factories situated at the far south-eastern corner of the municipality. Next to two large factories is a school compound and next to it an old public tap stand. Today, the taps are closed despite the fact that the pipes beneath them continue to supply water to the factories. The school needs to buy its water from the trucks.

<sup>10</sup> The station is currently closed. It would be possible to obtain water, but it would need to rely on water trucks.

be realised. Therefore, despite existing plans, there is no concrete change for the millions of people that do not have access to running water and so, *“the poorest people use less water, use poorer quality water, boil or treat it less and spend more money and time obtaining it”* (Cain et al, 2002:11)

### **The water trucking business**

There are 7 points where water trucks can collect water in Luanda. The main one is Kifangondo, near the Bengo River, which fills around 450 tanker loads per day (5 million litres). Kikuxi is the second largest collection point and the raw water is drawn from the Kwanza River with an average capacity of 150 fills per day. The other 5 are smaller and draw already treated water from the EPAL network. These points see considerably less traffic as the whole process is slower.

It is currently estimated that there are around 330 tanker trucks in Luanda of which the great majority are privately owned. Most of these are organised in a cartel-like association and obtain their water from Kifangondo water treatment plant.

At the Kifangondo station, raw water from the Bengo River is pumped directly into the trucks. Tanker drivers, before leaving the station are supposed to go through a chlorination point. However, time is money, and in order to avoid queuing and thus gain time to do as many round trips as possible to get more water, many trucks leave the station without having been chlorinated.



When MSF assessed Kifangondo in April, well into the cholera outbreak, only 10% of the tanker trucks were being chlorinated. The river was visibly contaminated. Samples taken tested negative for the cholera vibrio yet the national laboratory declared that the water from the Bengo river was unfit for human consumption, yet not action was taken to ensure stricter control of chlorination. No further tests have been carried out since. As the outbreak expands and more and more contaminated waste is washed into the river with the sporadic heavy rains, the possibility that the river becomes contaminated with the cholera vibrio increases, and if that were the case, the trucks would be a medium spreading the disease. Since the 22<sup>nd</sup> of April, MSF has organised teams in Kifangondo to ensure that all 450 tanker loads collecting water at this point are adequately chlorinated.



## Water tanks in the community

Most of the tanks owned by the water vendors are built underground and are covered by ill-fitting or inadequate lids. Due to the dubious construction of some of the tanks and the fact that they are open and seldom cleaned, these water points are highly exposed to contamination. Equally at home, lack of adequate material and limited knowledge of basic hygiene result in unsafe practices, and the water is often kept in open containers and within reach of children. By the time the water is finally consumed, despite having paid a heavy price for safe drinking water, it may well be contaminated.

## Price of water

Ironically, the price of water, the most basic of commodities, decreases the closer one is to the wealthy parts of town. **Running water is up to 160 times cheaper than the potentially contaminated water from water trucks that poor people in the *musseques* depend on.**

	Price for 10 litres
Running water (EPAL)	0,24 kz
Water at Kifangondo (from the river to the trucks)	0,04 kz
From the trucks (what vendors with tanks pay to the tanker trucks)	1 kz (average)
From the tanks (what householders pay to the vendors)	Between 15-25 kz (although in moments of high demand it can rise to 40 kz)

Source: MSF field assessments

The final price of water is determined by market forces. Water prices are thus subject to speculation and can vary even on a daily basis depending on access (distance from the water collection point to the distribution point, and the conditions of the road that leads to the final distribution point) and demand (availability of water in nearby areas)

The private water sector, which responds to the needs of the majority of the population of Luanda, is clearly a highly profitable business, whereby both for the owners of the water trucks and the vendors that own tanks in the community benefit from large profit margins.

At the other end of the spectrum, the people in the *musseques*, survive in sometimes extreme poverty and limit their water consumption, not because of lack of water or because it is too far, but simply because they cannot afford to buy more.

## Sanitation

In the *musseques*, the sanitation conditions are disastrous. There are areas where people literally live on mountains of rubbish and it is estimated that about one-third of the population does not have or use sanitary facilities of any kind.



Many people take advantage of the night to defecate in the open areas, in the streets and on the rubbish dumps, even if defecation in public is considered as a very dirty habit. The lack of water seems to be the first reason for such practice. Development Workshop reports that many children do not frequently use latrines, and that even adults who have a latrine at home sometimes defecate in the open when they don't have enough water to use in a pour-flush type of latrine, or when their dry pit latrine is inundated with water after heavy rains.

An organised sewage & drainage system is non-existent in most of the *musseques*. When it exists, it rarely functions well. This situation creates huge problems during the rainy season, as houses and latrines are flooded, excreta and rubbish are washed away and pools of stagnant contaminated water abound.

This situation has a very negative effect on the overall health of the population all year round, and during a cholera outbreak it is a recipe for disaster.

### **Solid waste management**

Mountains of rubbish are a common sight as soon as one leaves the concrete city. While residents of the *musseques* usually keep their yards and houses scrupulously clean, they have nowhere to take their rubbish, nor is there an organised waste collection service that covers the area.

Without a regular rubbish collection system in the *musseques*, an ever-increasing volume of untreated, unmanaged waste is dumped in unofficial waste sites very close or right inside densely populated areas. These rotting heaps become quagmires during the rainy season and are all too often the only playground for the children.



In 1994 there were approximately 900 informal dumpsites across the city of Luanda covering a total area of 40 hectares with an estimated volume of around 170,000 m<sup>3</sup>. To eliminate this backlog would require ten dump trucks making three trips per day to the landfill, working seven days a week for a period of two years (Hailemichel, 2004).

## **CONCLUSION**

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Luanda is currently the scene of the largest cholera outbreak ever registered in the country. The epidemic has spread throughout the whole city like bush-fire and not a single corner of the vast capital has been spared. With more than 17,500 cases already reported and hundreds of people dead, there are currently no signs that the situation will improve in the coming weeks.

Whilst MSF has stepped up efforts to ensure that patients have access to treatment centres and plans to open new treatment centres to reach even more people, there is still a dramatic gap in the means dedicated to contain the outbreak.

The disastrous water and sanitation conditions described in the document create the perfect breeding ground for disease. Cholera is right in its element in the vast slums of Luanda.

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