

## Review Article

## Medical Waste Management in the District of Abidjan (Cote d'Ivoire)

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**Abstract:** This study analyses the mechanisms of dysfunction in the management of medical waste at the University Hospital Centre (CHU) of Cocody. The study was essentially qualitative, using appropriate survey techniques, namely documentary analysis, direct observation and semi directive interviews. This enabled us to arrive at the following results: The informal management of medical waste is linked to non-compliance with the normative framework issued by the Ministry of Health and Public Hygiene. In addition, there are the socio-economic issues surrounding medical waste, particularly the way in which contracts are awarded to service providers. Thus, the actor placed in the medical social field develops strategies outside the normative framework to preserve his interests from all points of view.

**Keywords:** Management, medical waste, Côte d'Ivoire.

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## INTRODUCTION

Like the West, Africa is also affected by the phenomenon of poor management of hospital waste and products. In June 2000, the vaccinia virus, a benign form of smallpox, was diagnosed in 6 children who had been playing with glass ampoules (acute radiation syndrome), and 28 other people suffered severe rabies burns. Similar accidents occurred in Algeria in 1978 and in Morocco in 1983 due to a lack of proper management of health care waste, which resulted in accidents as described below.

Medical waste comes from health care services, analysis laboratories, surgical services (human remains) and other ancillary services. The mismanagement of medical waste often leads to health problems such as nosocomial infections. Worldwide, an estimated 12 billion injections are given each year and not all the syringes and needles that come out of these are disposed of properly. Of the total waste generated by health care in sub-Saharan Africa, 20% is a threat to public health. This rate is generally constituted by infectious waste which represents 15% for anatomical parts (human remains), sharp objects at 1%, 3% of the percentage is assimilated to chemical products and finally 1% is estimated to be ecotoxic waste and radioactive products and heavy metals (WHO, 2011).

In August 2006, a survey led by Professor Soukchal, an epidemiologist at Benin Hospital, was

carried out in 59 hospitals; one out of three hospitals has no waste storage area; 29.4% have intermediate storage areas in the wards and 25% have storage areas outside the wards. For collection areas outside the wards, 68% of the health facilities put the waste bags on the floor; 23.3% in closed waste bins; 26.3% in open metal containers and 23.1% in closed metal containers, (Aline, 2009).

In addition, other figures indicate that 41% of hospitals have piles of waste on the ground and 12% group it outside; 26.3% have water points next to the grouping area; 25.2% do their dumping. The risk for anyone in contact with hospital waste is enormous. In 42% of Benin's wards, health care waste is stored in the wards, in other health centres on windowsills, behind the door or under the stairs. It was found that in 68% of hospitals, staff work with their bare hands (without gloves). This environment in which hospital waste is found constitutes a risk of Nosocomial Infections (NI) to patients who are particularly vulnerable to infection. These infections are recognised as major public health problems because of their frequency, cost and severity. A hospitalized patient has a 7% risk of contracting a nosocomial infection, but it is high at 30% in the intensive care unit, which occurs 48 hours after admission (Aline, idem). Most African countries are not interested in quantifying waste. Moreover, they do not report nosocomial infections as such for fear of guilt.

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Also in the Ivorian context and in order to harmonise the management of sanitary waste, the Ministry of Health has defined a policy to regulate it in the health establishments: It is the decree n° 131 MSHHP/CAB/DGHP/DRHP of June 3, 2009 on the regulation of the management of sanitary waste in Ivory Coast. Also an environmental code of law N°96-766 of 03 October 1996. The production figures for biomedical waste in public health structures are around 8750 kg/day, i.e. 3194 tonnes/year. For the cities of Abidjan, the production is estimated at 5156 kg/day, the university hospitals produce about 674 kg, the general hospitals 17.8 kg, the basic establishments 641 kg and the private structures 3823 kg. This waste is not always disposed of safely and often ends up in landfills. The handlers who find themselves there get pricked by the needles and sometimes contract HIV and hepatitis (Diby, 2005). (Diby, 2005).

In spite of this environmental code and this decree, waste management remains a problem at the CHU of Cocody. Indeed, when it opened in 1970, waste management was assigned to the boys and girls of the wards, who did not receive training in sanitary hygiene, so the waste produced by the hospitals was dumped in the Akouedo public dump. But in 2009, the State, aware of the risks linked to sanitary waste, passed a decree that sets the management standards. It is in application of this law that the CHU of Cocody was equipped with an incinerator and a purification station. The management of waste was then entrusted to service providers, with the creation of a hygiene department to supervise hygiene-related activities and train nursing staff and service providers in hospital hygiene. Thus, in 2010, several service providers such as Junel, Jandi, Gossanchim, Nesti and Eida were involved in the management of sanitary waste at the CHU of Cocody (Miezan, 2016).

After two years of operation, the treatment plant broke down. Since then, hospital liquid waste (wastewater, biological products, blood, detergents) has been discharged into the environment without being treated. The population is also exposed to risks of contamination of all kinds (HBV, HIV, typhoid fever, cholera) due to the continuous pollution of these discharges into nature.

Waste is not always sorted at the source of production. In fact, during our exploratory survey, it emerged that the service companies are selected through a call for tenders recorded in a set of specifications drawn up by the management of the University Hospital, which stipulates the clauses of the contracts for the management and removal of waste. Several types of waste are produced at the university hospital: household and similar waste (food scraps, papers), infectious waste (liquid waste, soft waste, anatomical waste, sharp waste) and chemical and pharmaceutical waste (leftover medicines and expired

medicines). And the sorting of this waste must be done as follows: household and similar waste must be thrown in black bins with black bags, soft infectious waste in bins with yellow bags, sharp waste in safety boxes and pharmaceutical/chemical waste must be destroyed by the pharmacy. Waste is sorted as soon as it is produced by the nursing staff. The packaging, pre-collection, collection and transport of waste is carried out by the service agents of Gossanchim. The elimination of infectious risk waste is done by the hygiene service through the handlers by incineration. The household and similar waste is removed by a service provider called EIDA (Entreprise Ivoirienne D'aide en Assainissement) for the landfill. For the same exploratory study carried out in the grouped emergencies and in the delivery room, we noted that despite the presence of different receptacles, the waste was not sorted.

Firstly, similar waste and infectious waste are in the same bin, placentas mixed with similar waste. Secondly, the safety boxes overflow and spill onto the care trolleys, and there is no shed for central waste storage. Finally, liquid water is not treated, syringes are deposited on the sinks. The failure to sort waste at source means that waste that is supposed to be destroyed is dumped, so the collectors put infectious waste in the box for similar and household waste.

These observations indicate a real problem of waste management and this exposes both the human and animal environment. This leads to a weakness from an institutional point of view in waste management, since the normative framework issued by the government remains inoperative and waste management practices at the CHU of Cocody seem more informal. This leads us to wonder about the persistence of this informal practice of hospital waste management in this health structure, from production to disposal. So what are the mechanisms of the dysfunction observed in the management of waste produced at the CHU of Cocody? What is the perception of the actors in terms of hospital waste management policy? What are the socio-economic issues related to hospital waste management?

### **I-Theoretical and methodological approach**

Based on the structuralism of Alpe et al (2007) which is a fundamental theoretical current of systemic analysis. This structural approach explains social phenomena on the basis of social networks. This makes it possible to decipher the relationships between actors, to understand the position of actors within the network and to study the general form of the network. It is a question of studying the structure where the actor is studied through the links he builds with the other actors. In other words, structural network analysis makes it possible to evaluate the structure of a network and to provide explanatory elements for the actor's behaviour. In the context of this study, structural analysis allowed us to identify the rules and norms that codify and guide

the behaviour and opinions of social actors in medical waste management. Indeed, the systemic approach also allowed us to identify the mechanisms of actors' approaches to health policy and ecological management of hospital waste at the Centre Hospitalier and Universitaire (CHU) de Cocody.

The management of hospital waste in Côte d'Ivoire is a major public health problem. It has been the subject of many scientific studies already carried out in the world and is currently the subject of a great deal of mobilisation on the part of political actors and the population to work towards a good health conscience. The reflection that this phenomenon of health policy and ecological management of hospital waste inspires us today at the University Hospital Centre (CHU) of Cocody appears to be of great interest and comes in addition to the scientific studies already carried out.

From a scientific point of view, we believe that the criticism of the management of clients in the emergency department would contribute to the enrichment of the field of sociology of the therapeutic itinerary and sustainable human development. For, health can be seen as a complete well-being without which the individual cannot carry out any activity in society.

The study was carried out in Abidjan. The survey took place over a month. The choice of the CHU of Cocody is due to the fact that this health institution houses a hospital waste management service. The resource persons involved in the survey were staff responsible for the production, collection, transport and disposal of hospital waste, patients' relatives, administrative staff and the hygiene department. The eligibility criteria for the resource persons interviewed were their status and their role in hospital waste management.

The method used was documentary research, direct observation, semi-directed interview and questionnaire. The data collection tools are the observation grid, the semi-structured interview guide, and the administration of the questionnaire. The interview guide is administered to administrative staff, the hygiene department and the questionnaire to health professionals, collectors, relatives of patients and those who dispose of waste.

## II-RESULTS

### II. -1- Perception of the actors on the health policy of hospital waste management

According to the survey data, almost all administrative staff are not aware of the principles of hospital waste management. For some, this is due to the fact that they do not receive these instructions in time. For those who do have a notion of these guidelines through self-training in the process of acquiring

information about the standards. This statement illustrates:

Since I have been here, I have only received documents from the Ministry of Health regarding waste management. But when I need something, I do research and with the development of computers, we can find everything today, so I did research to find out, but not for the ministry.

This lack of knowledge of standards by administrative staff leads us to question the decree of 03 June 2009 regulating hospital waste management in Côte d'Ivoire.

### II. -2- The decree of 03 June 2009 regulating the management of hospital waste in Côte d'Ivoire

At this stage, it should be noted that 67% of the actors claim to be aware of this decree, which is considered by some as the backbone of medical waste management in Côte d'Ivoire. And the respondent, M.C., who is in charge of the hygiene department, is not far behind.

I know that as far as hospital waste management is concerned, there are texts that exist for its regulation. When I took up my post, I received documents from the director, but until then I hadn't read them and that's why I left.

In addition to this lack of knowledge of the decree, there is also the question of the environmental code relating to waste management in Côte d'Ivoire. This code should be implemented in hospitals by the hygiene service. However, it appears that most of the staff in the hygiene department of the CHU-Cocody are uninterested in it, since the logic of appointing service providers is ensured by the general management, as the words of the respondent K.D. tell us

I only draw up requests for tenders. I only prepare requests for tenders, and the rest is done by the hygiene department, so we don't manage all that.

It is clear from this speech that the department in charge of hospital hygiene at CHU-Cocody is restrictive in applying the normative framework in accordance with the national policy on hospital waste management. And the elaboration of the specifications remains a responsibility of the general management.

### II-3-Hospital waste management mechanisms as a determinant of dysfunction in the management of waste produced at Cocody hospital

For the management of health care waste at the University Hospital of Cocody, we have identified the hygiene staff who develop the waste management tools, ensure their application, and provide training and awareness-raising as the primary actors. Next, the nursing staff who produce waste and who ensure that it

is sorted at the point of production. And finally, the parents of patients who produce waste and therefore need to be made aware of the need to dispose of waste in the appropriate receptacles.

Almost all of the hygiene staff affirmed that they were aware of health policies on hospital waste management, and that the material and financial support was insufficient, to the extent that the hygiene department designed tools to control hospital waste management in accordance with national standards, and its implementation often required financial resources. This is reflected in the words of respondent T.T:

We develop working tools but not everything is put into practice, for example, the purification station breaks down quickly due to a lack of financial resources, so it is not repaired and we cannot extend our working tools to this level.

### **II-3-1- Requirement of waste separation as a preventive factor in the accessibility of the waste collection network**

Hygiene service staff require waste sorting for health care staff as a means of preventing the risks of contamination and environmental pollution. This requirement is perceptible in the words of respondent H.K.:

We, the hygiene staff, demanded sorting insofar as sorting allows for good waste management, destruction, generates a lower cost of destruction because here the butane gas that we use at the incinerator for destruction and is expensive and also it allows for the avoidance of accidents with blood exposure.

The nursing staff asserted that they had access to the waste collection network set up by the hygiene service, both in terms of time and space. Indeed, this accessibility favours a better collection of waste which should lead to its evacuation to the treatment circuit provided for this purpose. This argument illustrates this point:

We put the containers with the different colour codes at the disposal of the nursing staff as they are the producers of waste, unfortunately they do not sort it. They mix all the waste that is assimilated as infectious.

Despite the accessibility of the collection network, some actors abandon waste in the hospital area. These are generally relatives of patients who turn the hospital environment into an open-air rubbish dump. However, each receptacle is colour-coded and depends on the waste to be received. All relatives of patients mix infectious waste with household waste. And they maintain that they cannot distinguish between the different colours of the receptacles. This is due to the lack of communication between the hygiene staff and

the people accompanying the patients. And the words of this respondent, M.H., edify us so well.

I have been mixing the waste since I came here, only one black bag is available. But if the people put the different bins with the different colours of bags and explain to us that we will use them. This is due to the lack of different receptacles at their disposal and the lack of awareness. As this respondent, K.S., pointed out I have been mixing waste since I came here, only one black bag is available to us. But if the people put the different bins with the different colours of bags and explain to us, we will use them.

## **III- DISCUSSION OF THE RESULTS**

This study reveals that, first of all, in terms of health policy, management officials are unaware of policies. 75% of the administrative staff at the CHU of Cocody are unaware of the directives on hospital waste management from the Ministry of Health. This has resulted in the non-rehabilitation of certain infrastructures that guarantee the health of the population, namely the liquid effluent treatment plant. This form of ignorance is also addressed by JUSTIN NDIE (2016) who maintains that at the policy level, 41.70% of health facilities do not have a hospital hygiene unit, 66.67% of health facilities did not have a reference document and no health facility produced hospital waste management activity reports. In terms of material resources, 50% of the health facilities had at least one incinerator that was more or less functional, and 91.70% of the health facilities had waste buckets despite their non-compliance. Financially, 91.70% of facilities did not receive government funding for hospital waste management. In total, 92% of the facilities had a low quality of hospital waste management. In general, this situation is explained by an overall lack of hospital waste management policy. Despite some efforts, the quality of hospital waste management in the health facilities of the North Region remains low. The implementation of an operational plan taking into account national guidelines and the identified problems is necessary, as it will improve the quality of hospital waste management in these facilities.

Secondly, for the hospital waste management mechanisms at the Treichville University Hospital, health professionals behave outside the norms set for waste management. 67% of health care staff at the CHU do not sort waste. They do not sort waste because sorting waste is not their business, as they are unaware of the consequences for themselves, visitors and the community, which are the source of all kinds of diseases such as HIV, hepatitis, typhoid fever and dysentery. This form of bad behaviour with regard to waste management is highlighted by CUENOT (2000) who maintains that 69% of health professionals consider their knowledge in terms of the obligation to eliminate their waste from health care activities to be incomplete or insufficient. The lack of information may

help to explain the discrepancy between the number of professionals who sort and those who have a contract with a collection company. If this explanation is accepted, it may be an element justifying information actions with health professionals. This is also addressed by BELKADI (2013) who supports the implementation of a sustainable management of pharmaceutical medical waste (PMW) at the University Hospital of Marrakech, which requires awareness raising and training on the dangers inherent in PMW in order to change behaviours, to establish a continuous improvement approach to the management of PMW at the level of health establishments, to develop specific PMW treatment channels, to establish compliance audits of PMW treatment units, and to set up a national plan and regional plans for PMW management Adon Kouadio Patrick (2011) points out that the stages of the management process are often not respected by certain structures. The most common methods of waste treatment are burning in pits and incineration. For him, there is a need to advocate for capacity building of waste managers and a more ecological environment for health centres and hospitals.

Finally, in terms of socio-economic issues related to waste management, the administrative staff does not attach any importance to waste management, to the extent that the wastewater treatment plant has been out of order for years and the budget allocated to waste management is insufficient. This is attested by Mohammed Abou Daoudi (2008) who states that the management of solid medical and pharmaceutical waste (SMWP) at the Hassan II Hospital in Agadir suffers from a number of human, material, financial and organisational constraints. The human constraints are reflected in a lack of DSMP collection agents, insufficient training and awareness of the various stakeholders in the waste management sector, and insufficient staff protection measures (gloves, vaccination, medical monitoring).

Material constraints are reflected in the lack of waste packaging material. In financial terms, the hospital allocates a small budget for waste management (less than 0.25% of the hospital's total operating budget, as recommended by the WHO). Organisational constraints include the lack of a clear hygiene programme, the absence of a waste management plan, and the lack of involvement of hospital managers, which results in insufficient supervision, monitoring and evaluation, and insufficient coordination between the hospital and the local authorities. All of the above constraints have resulted in the process of DSMP management at the hospital being deficient, despite the acquisition of a shredding/disinfection machine and the outsourcing of DSMP management. The improvement of DSMP management at the hospital level has inevitably involved the removal of constraints and the development of a rigorous plan that effectively engages all stakeholders in the DSMP management chain.

## CONCLUSION

The results showed that the overall absence of a policy and non-compliance with reference documents, the lack of financial resources allocated to waste management and the weak institutional organisation of the hospital waste management system, and the behaviour of nursing staff in not sorting waste are determining factors in the poor quality of waste management at Treichville University Hospital. This study also shows that the effective implementation of a hospital waste management system at Treichville University Hospital requires concerted collective efforts to reduce health risks and environmental pollution.

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