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**THE MOST IMPORTANT NEEDS TO START THE USE OF ICT IN
THE HEALTH PROMOTION AND CARE IN ZAMBIA**

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ABSTRACT

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The thesis was written for academic purposes to fulfill the requirement of the bachelor's degree course. The thesis aimed to address the ICT use in the health sectors of Zambia. The country is still struggling to implement reliable health care system to a better condition. Therefore, the whole country depends on only one medical institution for complicated health cases.

The health care system in Zambia lacks new technology, hence in this thesis work I tried to identify some of the solutions that the health sector can take in order to improve the delivery of reliable and good practice of health care delivery.

According to the findings during my research, I learnt that improving the communication greatly helps to sensitize the people about disease outbreaks like Cholera, measles which have been a concern in the past years. Improved communication can also help medical personnel to have access to quick remedies. By having good communication with other members of the medical and health communities, good communication and information dissemination, the public can find support from other people in similar situations, and affect or reinforce attitudes. In today's world it is important to learn from what other countries are doing to tackle similar situations. This in turn can help prevent or tackle the problem when it occurs.

There are many ways through which health care problems could be dealt with, improving the health care systems of Zambia can be done through many other aspects, improving communication is simply one aspect that can be used. I have only dealt with the issue of communication in my thesis work as one of the ways that could help improve the health care system through improved communication among the health care entities.

Keywords: Health care, Zambia, Health promotion, Health knowledge.

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1 INTRODUCTION

Improving the health sector of Zambia has been a high priority for the Government in many years. It has prompted many researches to find out means and ways to improve the health care system to address many epidemics being faced across the country.

Zambia has continued to lag behind in the health system despite the efforts being put across. Many projects have been initiated and developed to curb the rising poor health practices and standards in the country. Besides the efforts and plans being developed, very little has been achieved, and hence the idea to incorporate other aspects into the running of the health institutions have to be adopted such as Information communication technology to help facilitate the fight against poor health standards and practices.

It is for this reason that I think information technology can help in the research, administering and improvement of the health care system. The health care system in Zambia has not adopted the new trends being used in most developed countries hence the health standards are still below par in the country.

The follow of the health information is not adequate and does not reach the intended people at the right time because of poor communication means in place. There are no quicker means of reaching the remote places to educate the people about the best health practices. Some programmes have been developed and used in the recent years but they have not been effective enough hence the need to start the use of technology to help solve some of the impending problems.

Therefore, improving the communication of health care institution will help prevent many epidemics and the health care services throughout the country if these institutions have to work together. The boards that were formed in the

early 1990s have not worked effectively due to poor communication channels and hence the need to improve to deliver quality health service to the poor and ordinary people of Zambia.

The aim for my thesis is to find out the needs to start the use of ICT in the health sectors of Zambia. This thesis will describe the major problems currently being faced that must prompt the adoption of information communication technology in hospitals of the republic of Zambia. After discussing the needs, recommendations will be made in regards to the needs, and give examples of developing countries that are using ICT and how it has helped those particular countries to solve certain problems in their health sector. I am also going to look at what technologies have been used that can best be used in Zambia today in consideration with the current infrastructure in the Zambian health sector and the whole country at large. According to the infrastructure in Zambia, not all kinds of Technology can be used and I will try to find out the most favorable that can best be used.

For the purposes of my thesis, ICT will be defined as a mode of communication through electronic means. Communication through different media, for example emails, VoIP, emails intranet, keeping data in Databases, using information for statistical purpose and analysis. The following could also be used, cameras, the Internet, and other electronic devices that maybe used in the area of communication as a whole.

1.1 Health care in Africa

The Government provides health care service on a large scale and the private sector on small scale provides the health care in Zambia. In Zambia like many other African governments have health care centers ranging from Main hospitals to clinics that offer health services at a fee and others without a fee. In many government owned health centers, patients pay some fees to be attended to in many cases.

Whereas in the private sector it is mandatory to pay large sums of money which most ordinary citizens do not afford to. Therefore, the private sector has more advantage over the government owned health institutions as they provide the more advanced services. People today would rather go to private health centers because they are assured that they will receive the expected treatment or service despite it being expensive.

There is a growing demand of better health care solutions in Zambia. This in turn has led to an influx of many private health centers being opened every now and then in many parts of the country. The private owned health centers provide better health solutions compared to the government owned institutions. This has mainly led to the private sector taking a center role in providing health care services. This has been so because the business in the health industry is so demanding and hence many investors have a keen interest to have private Hospitals and Clinics in many parts of Africa.

Many African Governments are struggling to keep very good standards of the health sector, so as to save many lives at very low costs, but this has not been very easy for many African governments due to policy issues and lack of financial and other resources.

According to the Africa Business pages, the health sector in Africa is improving at a slow pace as the quality of hospitals are being improved and more qualified doctors and other health professionals are available now (<http://www.africa-businesspages.com>)

1.1.1 According to the World Health Organization

Therefore, all the countries in Africa work hand in hand with the WHO to insure the attainment of the millennium development goals. The world Health Organization main goal in developing countries is to insure that poverty is eradicated and people have access to good health, clean water etc, Africa has the millennium development goal that they each country has to meet at a

Strengthening international mechanisms for the implementation in the five areas of Health

- Education
- Agriculture
- Food security
- Infrastructure and statistical systems

The World Health Organization formed a group called MDG Africa Steering Group which has identified a list of concrete opportunities to implement and scale-up interventions in support of the MDGs.

The evidence surveyed by the Steering Group shows that if fully implemented the recommendations will produce verifiable development results that can serve to monitor progress and ensure the effective use of domestic and external resources. In combination with sound economic policies to promote private sector development and increased participation in trade, these results will reduce barriers to progress, take countries closer to achieving the MDGs and lay the foundation for robust economic growth. (<http://www.who.int/country.zmb>) Namibia is one country in Africa whose Health care system has improved in the last few years. The Namibian government has greatly improved its health sector with the help of the donors' countries and communities such as the Finnish government that has been carrying out many projects in Namibia.

The Finish government has been providing financial support, material, and technical support to many areas of different projects in the health sectors of Namibia under the Health and Social Sector Support Programme, which began in 2000. "healthsystems.org/publications/Country_health/Namibia.pdf"

These kinds of projects have a great influence in the advancing of ICT use in the health sectors of developing countries as they are aimed to bring new technology and development in the remote and underdeveloped places.

Some of the projects they carried out were making management teams in each region and making them strong. They did this by introducing trainings of health workers and making new policies to tackle issues affecting the health and also

put in structures to for each department such as infrastructure maintaining, supplies and logistics services.

The help from developed countries being received in various sectors of society, many developing countries are in the process of improving their health care systems by adopting and shaping the health system similar of those in developed countries. Usually donor's countries in conjunction with African governments, start projects aimed at improving the health system as seen in Namibia. There are similar cases being taken into operation in East Africa (Kenya, Uganda and Tanzania) where many countries are working together with local organization in improving the health care systems. Such projects are aimed at Strengthening Health Management Information System. (WHO report 2005 (PDF))

1.1.2 In Zambia and Health Care System

Zambia is a country situated in southern African and is a member of the Southern Africa Development Community (SADC) region. Zambia has eight neighboring countries among them are Zimbabwe, Botswana, Angola, Democratic Republic of Congo, Tanzania, Malawi, Mozambique and Namibia.

Zambia is a former British colony, which got its independence on 24 October 1964 and changed its name from its colonial name Northern Rhodesia to Zambia a name derived from the Zambezi River, which is the longest river in the country.

Zambia currently has a population of approximately 11 million people and most of the people live in Lusaka. Therefore, Lusaka the capital city of Zambia has the highest population in the whole country and also Copperbelt regions, which have the highest copper mining activity in Africa.

Zambia like many developing countries lacks good health services and many people live in abject poverty with the per capital income estimated at \$1150 by the World Bank (World Bank 2008). "<http://en.wikipedia.org/wiki/Zambia>"

In Zambia today the health system is very poor and the Zambian Government entirely depends on the donor community for most of its funding. The Health systems ranges from Public to Private sectors and the private take a center role today as they provide the most and better health services, which are very expensive for an ordinary citizen.

Due to the fact that the health system is poor and entirely depends on the donor community, it is very hard for the Zambian people to develop the health care system because the funds are never enough and the ministry of health budget is never accounted for properly. The major problems being faced are the shortage of vital drugs such as the Tuberculosis drugs; AIDS drugs (Anti Retroviral Drugs). Due to the dependence syndrome and attitude, very few have been done to the health system.

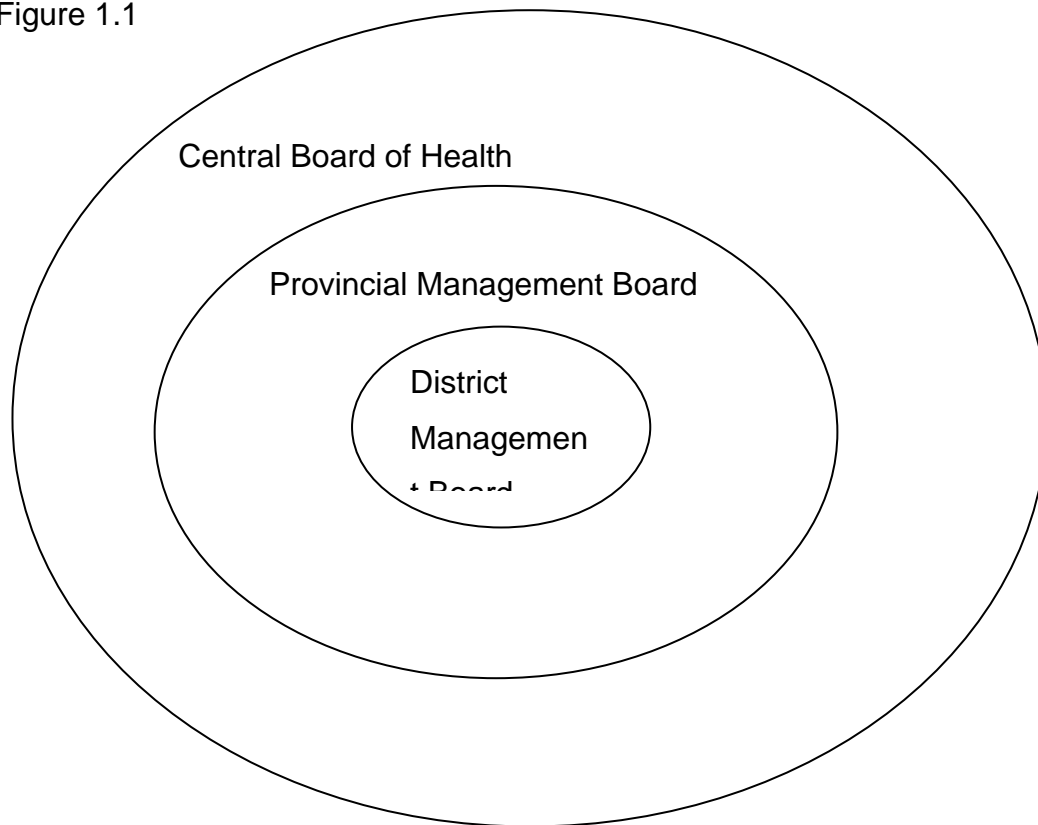
In the early 1990s when the Zambia changed its government from United Independent Party (UNIP), which was at the time a one party state, to Movement for Multi-party Democracy (MMD) in 1991. The new government introduced boards in the health sector to look at the best way of improving the health care system in the country.

During this period, many organs where created to take charge and running of the health institutions among others.

Central Board of Health was one such organ that was created. The duties of the board were to facilitate and monitor the business of all the health institutions in the country. The central board of health made came up with new policies that would govern the way the hospitals and clinics would run in the country. This helped a lot compared to the time when only the ministry of health had to everything.

Structure of the Central board of Health in Zambia

Figure 1.1



The monitoring and other businesses relating to the health care system in the country is divided into three parts. The central board of health carried its mandate at national level.

The central board of health also made small units in every district to monitor health centers at provincial and district level. These are called district health boards. Each province reports to the central board of health based in the capital city Lusaka.

Generally Zambia has nine provinces and each province has its own districts. It is for this reason that the provincial health boards were established to improve the health care systems at provincial level. Then the province has subdivided the provinces into districts that each district reports to the provincial health board which in turn reports to the central board of health. In this way it is easy to monitor the welfare of the health institutions across the country, and making it possible to make policies at district level. The power is actually given to the people to decide how the health institutions should work. This has also helped

to allocate a few resources that the country has depending on the different requirements per health institution.

In Zambia, every province has its own special cases that it can focus on. Due to many different factors affecting the people in the country, health cases are also different depending on each province and area. For example, in Lusaka province, the most common health problems are HIV and AIDS, Cholera and Tuberculosis. This is so because of the place having a very big number of people, and has also many slums around the city making. This makes it very difficult to have a good and reliable drainage system. This too is the case in the Copper Belt province where the population is high due to the mining industry in the province.

The cases have never been taken seriously by the health institutions hence they are reoccurring each coming year, and no concrete measures have been put in place to curb the pandemics. For example, Cholera is one deadly pandemic that occurs every year around the same time of the year. For the past ten years plus, cholera has continued to strike and causing many deaths in the concentrated or over crowded places mainly in Lusaka and the Copperbelt provinces of Zambia.

The Central board of health through the provincial and district boards introduced fees in the hospitals and other small health institutions around the country. In the past, Zambians never paid for the health services when they attended or visited the health institutions. But with the introduction of boards, things changed dramatically and there was an outcry among many Zambians from all walks of life concerning the introduction of fees in the health institutions.

But the government and the central board of health were quick to defend their decisions claiming that the fees were meant to help the people have better services. These fees were called schemes where people had to pay for a hospital card and every time they visited the hospitals they would show the card but still they had to pay other fees if they were referred to the laboratory and other departments of the hospitals or clinic.

Later the fees were changed that only people between the age of 6 years and 65 years would be paying for those services but the rest would get them for free. This did not mean they would get the health services freely but they still had to pay for the services.

The introduction of fees in the hospital led to the mushrooming of the private hospitals and clinics. Many professionals took advantage of this. Since people were willing to pay for even the poor services in government owned health institutions, then they would surely be willing to pay for the better services in the private sectors which was actually true as many people who are rich in Zambia never use the public health institutions but just rely on the private health institutions which are quite many today in Lusaka and Copperbelt provinces.

Needs and Use of ICT

The uses of ICT in Zambia have not fully been adopted in the Health sector. This has been the case with many other developing countries in Africa as a whole. There are currently many projects being under taken to start the use of ICT in the health sector of Africa by many agencies and governments.

Therefore, there is great need to adopt the use of Information and Communication Technology. There are plans to create and provide health information for the general public in electronic format, in order to improve the services and effectively care for the patients and this could result in saving many lives. The patients' information is very important and must be guarded effectively so that it can only be used by authorized people in the hospitals, clinics and doctors' offices.

Healthcare centres should always have a clean record of information about the patients. The information is very important as it is used to monitor the patients' conditions from time to time. It is for this reason that patients' information must be carefully kept and stored. Therefore, Laboratories and Pharmaceuticals must also have adequate and correct information when carrying out tests and dispensing drugs. With the use of electronic media to access information from other departments, health worker would have enough time to do their work and

carry out significant jobs in appropriate time because they would be able to have all the patients' information right at their finger tips.

With this kind of system being used it may save a lot of time and it reduces fatal errors that maybe be caused due to physical hand writing of the patient's information. Data may also be stored and kept with very little chance of being lost in a case of fire and other accidents. When information of a patient is stored on a database, it reduces the activity of moving from one department to another by a patient collecting his/her own file as this is the case in the Zambian hospitals and clinics.

Patients are always seen carrying their information around with them and there is a risk of the information being lost by a patient or even being distorted.

Hospital workers are always on the move from ward to ward or theatre and offices within the health institution making it very difficult to carry out their duties in good time. Because doctors have to move from point to point to get information, there is a danger that wrong medication could be given to a wrong patient as there is a tendency of carry many patients' documents when the doctors do their round in the wards and meeting patients. This is so because the doctors may have no any other information to correspond to the information they are carrying around. If there is need to clarify that kind of information, then the doctor has to physically go to the office where many of these documents are kept.

But in a situation where doctors use electronically stored information or records of patients; it would make the work very easy and quick. With the very few doctors that Zambia has, introducing ICT in the health sector would greatly improve the health service delivery and many people would be attended to in a short time.

Errors are other major concerns that need to be eradicated in the health service delivery. With the introduction of wireless pen based computers such as tablets or PDAs and the databases that could store huge amounts of patients' records

that are critical to the doctors to carry out their work. It would greatly be very vital to implement ICT projects in the health sectors of developing countries.

Keeping the records of patients and it is also very easy to track the patients' recovery from day to day by simply going through their records. But in a case where doctors have to go through non electronic documents, it would take them many hours going through the papers to find the actual information they are looking for. But in a case where the information is stored in an electronic format, it would only take seconds to locate the document and carry on the work, hence improving on the service delivery.

Pharmaceuticals and laboratories are other major departments in the hospital that need to use ICT in order to carry out their duties effectively. Having the correct information about every detail of the laboratory makes the work easy and reliable. These two departments must have no room for errors as this could cost someone's life if an error occurred. Therefore, ICT helps to eradicate chances of erring

1.2 Patients

Patients will be rest assured that their information is protected and does not risk being lost or destroyed. With the use of ICT, it may be easy for patients to communicate with the doctors effectively as the doctor responsible for them may have access to their (patients) information and can be readily available every time they (Doctors) attend to the patients. It is also for easy for monitoring the patient.

The patients will have less hustle to carry their details every time they visit the clinic. For example, in Zambia clinic which have no capacity to deal with the patients case, they always refer the patient for example to the provincial hospitals. In such cases the patient has to carry his files from the clinic and travel many kilometers to the provincial hospital to have the illness or case checked by a doctor.

As it stands today, there is no communication of any kind between the clinics in the remote areas of Zambia with the main hospital in the urban areas. This leads to the referred patient carrying his/her own medical files to the main hospitals every time they (patients) are referred to the main hospitals.

If the ICT are introduced in the health sector, many patients will have a clear record of their medical information. Patients have difficulty when moving with the hospitals from one department to another with their files which may risk being destroyed and lost. There is also a risk of the medical documents being altered as they pass from many people before they are attended to by the right person.

1.3 Doctors and Nurses

These professionals will have their work load reduced as they spend a lot of time moving around the hospital reading the patients' medical files and they spend many hours doing that work as they do not have an easy access to the patients' information readily available due to the manual way of doing the work. But if there is a database which keeps the records of patients, this may help the doctors and nurses monitor the conditions of the patient and monitor them easily. But this has not been the case as they have to move from ward to ward to physically see the patients' medical files.

Nurses equally have a huge task to see to it that they collect information from each patient every now and then and physically hand write it, this is not a safe way to take the patients' data as it can be mixed or lost as they move from one place to the other and medicines can be given to a wrong patient due to poorly written documents. But if all this is written using computers it is easy to see errors and correct them.

With ICT incorporated in hospitals, it would also make easier work for both the nurses and doctors as they would be well prepared enough to know which patients they are meeting on each particular day and in case of an emergency, where the doctor has an accident, it would be easy to allocate another doctor to

the expected patients as the communication maybe greatly improved in that manner.

1.4 Pharmacists

Pharmacists may have a less hard work when dispensing the medicines to the patients. In Zambia the doctors always write a piece of paper for the patient to take to the pharmacy so that the patient can collect the medicine. This is not a good practice, instead there should be communication between the doctor and the pharmacists so that it is easy for the pharmacists to dispense the drugs, this is important in case the patient loses the prescription, it maybe a hassle for the doctor to write again and also the prescription maybe altered by some patients. On the other hand it is easy for the doctors to ask if the kind of drug they would like to give to the patient is available by just having direct contact with the pharmacist department. The pharmacist will be able to also advise the supply department when they are running out of stock. This is one part were hospitals run out of drugs without realizing in good time to make new orders. With databases installed to check the availability of drugs in the hospitals, it would save time and lives as in many cases the patients are turned away from the hospital pharmacy being told that they have run out of stock and therefore they should go and get a prescription from the doctor so they can go and buy from private pharmaceutical companies (pharmacies) or drug stores.

1.5 Authorities & Administration

Policy makers and government institutions may also have it easy to collaborate with external agencies to monitor the performance of the health institutions since they too would have improved communication with the health institutions. Researchers, policy makers and government need to work together to insure their work is valid and relevant to the promotion of good and quality health of the country. This would also in turn help to educate the masses about the best practices of health care systems especially for those vying to be health worker.

Governments' may have a good and reliable source of statistics as it is easy to access information from the databases unlike getting hand written documents that may not be readily available. With information saved in an electronic format and incorporated in the health sector, it will provide efficient communication in health institution and between hospitals and health centers (clinics).

With this kind of system in place, authorities and the administration will have an easy job to know when to make supplies of whatever material the clinics and hospitals may need and it would provide for accountability in the health system altogether. This is so because there would be transparent in the manner the services would be delivered.

On the hand, the Administration may have a good record of monitoring the workers in the hospitals and clinics at all time. This so because they will be able to know where more staffs are needed and what kind of specialty is required in different health centers. Many clinics have no doctors yet they receive different kinds of cases that require the attention of doctors. These are usually referred to the main hospitals and patients end up spending huge sums of money to get to hospitals. Once there is good and effective communication between the hospitals and small health centers (clinics), it would be easy to allocate doctors who can visit these places in time to time so patients are not made to always go the main hospitals for reviews and for cases that may not need urgent attention of special doctors.

Therefore, the administration and authority's role of ensuring that hospitals and clinics have the necessary equipment and staff required would be realized in insuring that these services are delivered and served on time as communication is improved across the health sectors in the whole country.

1.5.1 Research Analysts

These may also have a good working environment if communication is improved greatly. The communication would help the research analyst to research

new ideas and compare with the existing ones to come up with better results and ways of dealing with certain or particular health issues and conditions. Many cases have not been researched adequately because researchers do not have enough communication and in many cases data is usually lost before conclusive results are found. Therefore, it is important to improve the communication for the purpose of quality research and analysis.

This is all done to help come up with solutions to health problems and challenges that continuously affect the general public. Research is a continuous process that needs to be upheld by health institutions in order to deliver quality services to the people. It is important to carry out researches and make analyses for statistical purposes and for improvements

2 PROBLEMS AND CHALLENGES

The biggest problems and challenges that the Zambian authorities have to be sure that citizen receive and have access to good health care. Many serious epidemics have claimed many lives such as AIDS, Malaria, and Tuberculosis etc. These are some of the serious problems that Zambia faces and how to tackle these diseases is another challenge on the part of the government, as it has to find latest ways and means of addressing these problems in order to reduce the epidemics.

The other challenge is to prepare the medical professionals, both current and future professionals for them to change the behavior towards patient who are using the internet more and may seem to understand the nature of their disease than the professionals themselves. Besides this, the medical students have difficulties in accessing information in different media as this makes them aware of the new trends in the ICT with health care.

Once the use of ICT has improved massively, it is easy for the government to disseminate information to many different societies and communities around the country. ICT use must be introduced in the health care studies to make student more eloquent with the new imaging trends.

Other challenges that the governments needs to embark on is to educate the masses and professionals on how to avoid these epidemics and how to handle them when confronted by them. In the recent years, both the government and non - governmental organization have been carrying out mass campaigns to educate the masses on the ways to improve their health. The projects have not been very successful due to poor communication between the urban and rural areas. Most of the campaigns are carried out on Televisions and most rural areas have got no access to Television signals unlike urban areas that easily have access to it though they are required to pay for it.

Zambia has today the challenge of improving communication in the health sector in order to disseminate information to the masses and between health institutions across the country. Firstly, the challenge would be to improve the communication from district level; it would serve a great purpose for health centers to have a reliable communication within the district so as to tackle many problems at the district level. In every district, many health centers and one district hospital serve as the main hospital for the entire district. Therefore, it would be very possible and profitable to link all the small health centers to the main hospital. In this way, the district hospital may have sufficient and reliable information on how the health institutions are operating and what further improvements need to be taken in consideration.

Apart from this, the allocation of resources by District Health Boards would be quick in every district as the channels of communications are improved. In most cases, the small health centers are overshadowed by the main hospitals and never supplied with the required resources on time due to poor communication between them.

The challenge is to develop a culture of constant use of data. While the ICT may be developed and designed as tools that may enhance communication, health workers would be trained in accordance with internationally documented practices, a technically sound system, in and of it, does not mean that data are incorporated routinely into the decision-making process. What people often call the health management information system is really just an information pipeline. But, in fact, the system, in the broader sense, is the interaction of information consumers with the pipeline. In Zambia, the pipeline has maybe built, and the emphasis needs to be on the people using the information. Therefore, the objective would be to strengthen managers of the health centers, doctors, nurses, pharmacists, and other members of the administration' skills and improve data through strong feedback loops.

The evolution of health reform policy has strongly influenced the health management information system. In brief, the Ministry of Health has rethought its reform strategy several times since late 1997. Since then, the national Central Board of Health has restructured twice, and the intermediate

administration province been redefined and relocated. During the several administrative restructures, the health management information system's institutional home has also changed. In other words, while district and facilities have remained fairly stable, the upper support lines, at the provincial and national levels, have changed several times. Therefore, it is highly recommended that communication is improved amongst the entire districts, provincial officers, while identifying and disseminating best practices in district and facility information use.

Staffing patterns throughout the Central Board of Health are quite lean, including the health management information system unit. No one is responsible for supervising/stimulating management use of the information. Two documentation specialists have several responsibilities, including dissemination of health management information system information, and an information technology specialist's numerous responsibilities include support of the health management information system.

This staffing pattern is not adequate for the tasks, so several partners provide assistance in the form of local consultants and long-term advisers with health management information system responsibilities in their portfolios. Generally, staffing at provincial, district, and facility levels has gone down by about 10%–15% in recent years due to voluntary separation, transfers or altered responsibilities, deaths, and many staffs leaving to go abroad to work where there are better conditions of services as compared with those offered by the government.

It has not been possible yet to incorporate health management information system training into per-service curricula or to establish in service health management information system training. High staff turnover, combined with the absence of ongoing training mechanisms, means that new staff may not have the basic skills needed to use the health management information system. (<http://www.cboh.gov.zm>)

2.1 Corruption

Corruption is another challenge that hinders the reliable delivery of quality health services in the Zambia. Most of the health programmes in Zambia are sponsored by the International donor community in conjunction with the ministry of health. Challenges in underdeveloped countries are that there is so much interference in the programmes run by the donors by the politicians who refuse to show accountability of how the money being given by the donors is being spent.

Health is one of the biggest challenges that many developing countries face today and shall continue facing unless proper measures are put in place. These measure are improving the communication systems, doing more research to learn on how to avoid and cure pandemics that usually affect the masses. Due to these challenges there is a threat that developing countries may not be able to come out of poverty due to poor social and economical policies by the African governments.

Government is the biggest stakeholders of the health sector and hence they need to show and put more efforts in combating health related problems. Accountability is one way that the government needs to work on to improve the health services in the county. For as long as there is no accountability, our health system will continue to lag behind. The government has a role to insure that they use the resources well and according to the budget.

The donors also have a responsibility to monitor the programmes they are sponsoring to ensure that the required results are realized and achieved according to plan. Therefore, the donors have the right to question how the governments use the money and how it is allocated and to which programmes or areas.

2.2 Illiteracy

Illiteracy is another challenge that Africa or rather developing countries perpetually encounter. This has and continually affects the development of new ideas to tackle the current situation. High illiteracy levels in developing countries are barriers that hinder development in many aspects of the societies. Therefore, people with low literacy levels have a difficult to reading and understanding health information there lagging behind to know what kind of health information is available to them and what health practices can be practices in their communities. Such people are usually undermined and intimidated by the health professionals and institutions.

2.3 Special Problems in Zambia

In Zambia, the sole responsibility of providing the citizens with good health solely lays in the hands of the Zambian authorities. From time to time, the government tries to come up with new health plans to curb the falling health standards and health practices.

AIDS, is the most worrying epidemic that the Government is trying to address, is a big problem that has left mass problems for the country. With a very few doctors in the Zambian hospitals, it has been very difficult to address the problem openly for a long time.

Apart from the government, there are many nongovernmental organizations that have taken a lead role in the fight against AIDS and its related diseases. The NGOs are actually doing well in this fight as they are more funded than the government. There is also more trust in the NGOs with the use of donor funds than in the government which may have problems auditing them. NGOs can be audited at any time and made to account for the money they have been given but with the government there is too much protocol and procedures prior to the auditing especially by the donors as they cannot be easily given access to the government offices and resources.

Previously, it was even hard to address the issue of AIDS as the culture forbade discussing about AIDS related activities and the manner in which one can contract it. This led to many people getting sick, as there were not enough information about AIDS and how it can be prevented or avoided. Today things have changed and in most chiefdom, many people are talking about AIDS and are changing the life style, though it is actually affecting the culture in many different ways.

Other than AIDS and its related diseases, Zambia has major health problems such as Malaria, tuberculosis and cholera that is quite common during the rainy season. These diseases are so common that they need agency and new measure to deal with them.

Malaria has been there for a very long and very little has been done to curb the virus which has caused many deaths among the Zambia populace. With the use of ICT, such diseases can be controlled. ICT has the capacity to measure and monitor the impact of these diseases and hence to the need to adopt the use of new trends and even develop new trends of approaching these pandemics that have characterized the livelihood of amongst the Zambian remote place and congested areas of Lusaka such as Kanyama, Kuku George compounds.

These above mentioned diseases are some of the places that are prone to Aids, Tuberculosis, Malaria and cholera because the residents of these places have no access to good sanitation which is a highest contributor to the spread of water-borne diseases. Cholera, Malaria and Tuberculosis are water borne and air borne diseases.

With all these kind of problems, the Zambian people are in an urgent need of good health system. The health system has been declining with the increase in population. The hospitals are under stocked with medicines and usually people are turned away to buy their own medicine once they have been diagnosed.

3 THE MOST IMPORTANT NEEDS TO USE ICT IN HEALTH PROMOTION AND CARE

There are many cases and reasons to why health sectors needs to use ICT in the health promotion and care today. Therefore healthcare sectors needs to start thinning serious in investing and increasing the use of ICT awareness and skills of healthcare professionals (Doctors, Nurses and pharmacists), executives and administration. Furthermore, it is important that health care organizations formulate their own level of ambition for Information Communication Technology, develop a common future perspective and strategy with regard to e-health and Information Communication Technology, and join forces to implement these ideas into practice.

3.1 Health management information systems

Managing the information of the health system is one need to start the use of Information Communication Technology in the health sector. The information has to be managed in order to provide quality services to the public. Information Communication Technology can to be used to develop good practicing measures in health delivery managing the health care system. Information Communication Technology and health information could help develop the information system that could be used to by many health institutions within the country. This kind of system can be at a disposal of many health professionals who have a hard time to find and locate information.

Managing information for the health institution is a very important aspect of development in any society. The use of Information Communication Technology can help link up many health centers to the main health centers in the country. When this is done, it may be easy to access patient's records from any health center around the country. This reduces the danger of losing information and helps to manage the information of the health centers.

3.2 Improved Communication

ICT have shown that they have capacity to improve information dissemination. Therefore with this is another important need to start the use of ICT in the health sector Communication is an important factor that can influence the delivery of health services.

There would be need to have facilitation and collaboration of many cooperating collaborates in the delivery of health services. Therefore, the use of ICT can enhance this cause and there would be easy and quick access to information for the health workers to dwell on during different situations. Health workers will have an easy way of sharing information during and after trainings. This is very important because health information needs to be circulated thoroughly among the workers and the management of the health centers across the board for better and quality service delivery.

3.2.1 Improving Access to Information

Accessing information by the health practitioners is very important for the easy and quick response towards the delivery of health care services around the country. With the ICT put in place, there would be fewer hiccups in the delivery of services. In most developing , there is a constraint that there is no reliable and readily available such that most health professionals have no access to the internet. A few places in the urban areas may have access to internet, but the rural areas have no access at all and this hinders development and access to latest health practices.

4 DISCUSSION OF ICT AS A SOLUTION TO THE NEEDS

The solutions to start the use of ICT in the health sector is adopt new measure that insure that information is easily accessed by the both the health workers and general members of the communities to combat pandemics. In many cases, information is very vital and has to be accessed by every concerned member of the society or communicate.

The importance of adopting ICT would improve the health delivery services in the country. As it is the services are so poor and the information for patients is not well managed or rather poorly managed by the health sectors which makes it so difficult to make follow ups on certain diseases and assess the impact that such diseases may cause in due course.

Therefore, once ICT has been adopted to improve communication in the health sector, many services would be so improved even in the manner that in which the services are delivered to societies and communities.

Patients' information must be protected and secured at all times hence the need to start the use of ICT as it has the capacity to keep this kind of information and can only be accessed by authorized people such as doctors and nurses dealing with that particular patient can have access to the patient's information in the database.

The current methods being used to store patients' information is so poor that in many cases patients information is lost which puts the patients' life at more risk as the history of the patients' sickness may not be known and what kind of drugs the patient has used in the past. It is very important to guard and protect the information of patients from damage, being lost or seen by unauthorized people.

Patient's information must be kept where only authorized people can access it for private reasons. The health of every individual is private and must not let to be seen by unauthorized individuals. Therefore, with the use of ICT, this can be improved and prevented.

4.1 Security

There must be security in the manner information travels among the health worker for efficiency purposes. The hospitals being highly mobile and congested places, there is a great need to have serious security measures put in place to protect the patients and the workers of the health centers.

Movements of people who come and leave the hospitals must be monitored at all the time. This is very important as it can help to locate unscrupulous behavior and activities in the hospital or health center areas. Many are the times when crimes are committed in the hospital vicinity without any trace whatsoever because of the poor security of such environments.

With the help of modern technology, this can be prevented by installing surveillance cameras around and inside the hospitals. This is very important because it can also reduce thefts of hospital equipments and drugs that have characterized the behavior of many drug dispensers around the health centers in Zambia.

In health centers like big hospitals, video surveillance cameras are effective tools that can help regulate and monitor the work and behavior of both the visitors to the hospitals and even the worker. In Zambia, there have been many cases where patients have been mistreated by the workers but there has never been proof to prove this kind of unwanted behavior. Therefore, security would also be enhanced if the health institutions' environment.

The use of surveillance cameras has many benefits to both the patients and the employees of the hospitals. They increase the overall security and safety throughout the health center to can prevent criminal activities since the cameras

would be monitoring the area and screen unauthorized visitors and check that restricted areas are not visited by unauthorized people at any given time.

The presence of cameras in the working environment helps to improve worker productivity through improved communication between the hospital departments and in the process allowing for heightened productivity amongst the health workers.

In Zambia, many are the times when the hospital run out of drugs for the simple reason that they were either not supplied by the medical stores or would be suppliers or some people have taken the drugs and channeled them to other places where they would be sold etc. This is hence the reason why in many cases patients are turned away by the pharmacists telling them there are no drugs and they instead advise them to go to a particular drug store to buy drugs. One wonders how possible it is for the individuals who won drug stores manage to have stocks of drugs when the Government owned institutions do not have the drugs or are not able to get them.

The presence of CCTV in these institutions would greatly help monitor the movements of drugs and workers in the premises to insure people do not gain access to places where they have no proper authorization to be. With the help of new technology, it would be also improve to monitor the individual that visits the hospital and other important areas and departments of the health institutions.

4.2 Improved communication for health promotion

Improving the communication for health promotion is a cornerstone to good health and practices. Improving the communication of the health sector can cause to improve the wellbeing of the people generally.

Hospitals being very mobile places for many professionals such as doctors, nurses, pharmacists and the general public, there is a very urgent need to have a very good communication around the hospital and amongst the workers at the

hospitals in order to give quality services to the public at an accurate time. This helps to save a lot of time spent on one patient.

Due to poor organization of patients' information, the few doctors and nurses that work in most Zambia's hospital hospitals, they tend to spend a lot of time trying to find one patients' information and before attending to other patients. But with improved communication, all this may be done in a short time making it easy for the workers in the to serve many patients in short time as their information could be easily accessed.

Improving the communication can also result in the improved awareness of health risks, outbreaks and solutions to the risks and outbreaks. Improved communication can also provide the motivation and skills needed to reduce these risks because with good communication and information dissemination, the public can learn from other people's experiences. For example, the health problems and challenges being faced in Zambia are similar to those of other countries in the region like, Zimbabwe, Mozambique, and Malawi, etc.

Therefore, Zambia could learn from these countries how to deal with some pandemics if faced with the similar situation. There was a time Uganda had the highest cases of HIV and AIDS, they brought about good measures among them where sensitizing the people in that country about the dangers of HIV and AIDS and how it can be contracted and avoided. The sensitizations had a great impact on the people and today the situation is different. Other countries could learn this strategy and initiative which was taken by the Ugandans to try and reduce the cases of HIV and AIDS.

Taking the knowledge to the people and make it available to the magnitude greatly helps to sensitize the people and giving them adequate information. The cases of Cholera for example, have been there for a very long time. Every year people expect an outbreak of cholera at a certain time of the year, but nothing has been about it or to prevent the cholera outbreak because the information does not reach the people. Therefore, with the help of ICT, sensitization can be

achieved and even reach many people on how to prevent the outbreak of the disease.

Therefore to improve the communication of the health sectors, the solution is to integrate Information Technology Communication in the health care system of Zambia. In this regard, the hospital professionals should start changing from the physical traditional way collecting data from patients. This is in a manner were they are collecting the patient's information on a piece of paper and keep in a physical fill in the patients details. This is a great threat to the patient's information as it can be accessed by anyone and can be easily altered.

4.2.1 Connectivity

There is a great need to have all the institution in the country to be connected so they can service and run effectively. In this case, this can be done by connecting the health institutions in each province. Since Health institutions are in run on three levels in Zambia. It would be very important to start connecting the hospitals from the grassroots levels and advancing to the higher level of operations.

Health Information Communication Technology can be used to improve the effectiveness and quality of health care that patients receive. Many people have health conditions that require them to visit several different doctors. For example, one person may have a primary care physician, and also regularly visit a Dentist specialist. With Health ICT, both the physician and the dentist would have access to the complete treatment chart, so each would see what the other was doing and would not duplicate their efforts. The chances of one doctor prescribing a drug that would interact unfavourably with a drug that the other doctor prescribed would be virtually zero. And if such a person was to get in an accident and end up in an emergency room, the hospital would also be able to access the medical records, so they could treat the person more rapidly and effectively.

Since Health ICT would be a national database system that is interlinked and regularly backed up, patient records would be safe even in the face of natural disasters like floods. Many crucial medical records would be lost in these terrible natural disasters, because they keep information in files on paper that would be destroyed in the flooding. Also, people who become ill while travelling would not have to suffer because the hospital in Kasama, for example, (Northern Province of Zambia) cannot reach their primary care physician in Lusaka University Teaching Hospital. Their patient records would be available and instantly transmittable electronically.

Health insurance information could also be linked to Health ICT records. Imagine walking into a doctor's office and not having to fill out 17 gazillion insurance forms. With a swipe of a card, your medical records and health insurance information would be instantly transmitted to the provider. This would make your life easier, and it would help your doctor's administrative staff – they would immediately know which procedures your insurance policy covers and what your copy would be if any.

This connectivity of health institutions is very important as it can help to easily serve the public effectively regardless of which health institution they visit in the province. This would reduce the risk by the patients and the hospital to lose the information for the patients and other important information that are used by the health centres.

4.2.2 Departmental Connectivity

The solution in this regard is to connect to health centres together with the main hospitals at district level, province and national level to improve communication. The hospital also has to be connected within the departments. The hospitals have many departments that need to be connected for efficiency and quick delivery services. Therefore with so many departments in the hospitals, there is an urgent need to have all the departments to be connected for many other particular reasons.

When the departments are connected it would be so easy for the hospital staff to deliver the services to the people with wasting time. This can help people making or reserving time to see a doctor. As the case is in Zambia, people do not reserve time to see the doctor, they simply go to the hospital and do it right there and start waiting for many hours until such a doctor or nurse is available. This way of working causes a lot of congestion in the hospitals which is not good health practice for the environment and the people around it as people may contract unwanted diseases caused by congestion such as airborne diseases. Therefore, the solution to this problem would be to introduce a system where people would call the hospital to arrange time when they can be attended to at a particular and good time without wasting time and to also avoid inconveniences.

This would be a great starting point for taking up a project to integrate ICT into the health care system of the republic of Zambia. The process has to start from each health centre where the system can be changed by integrating ICT into all the department to enhance communication, when this is successful then move on to the process of connecting the health institutions and health centres in each district in the similar manner where all the small health centres are connected to the main health centre in the district which is usually the district hospital as is the case in Zambia.

When the ICT has been integrated at local and district level, then it is now possible to connect to the provincial hospital. In this way, all the hospitals in the province will be connected to the main hospital in the province. For example in the central province of Zambia there are many districts with district hospitals but for special cases all the districts refer the cases to Kabwe general hospital which is the biggest hospital in the province.

Therefore, with this kind of current system, there is need to have an important reliable communication between the small health centres with big health centres for effectively running and delivering health care services to the public. The process of this system is shown in the diagram below.

4.2.3 Type of Connections

There are many types of connections that can be used to link up or integrate ICT in the health sector today. Wireless is one kind of technology that could be used to connect many health centres in each province. Therefore, the kind of technology that could use as a good solution to all the needs elaborated earlier is Fibre Optic technology that has been used in many parts of integration solutions.

Fibre Optic has more advantage than using copper wire connection. Copper wires need to be replaced from time-time and they are very expensive to buy and maintain. There is also a threat with copper wires because they can be easily vandalized by the public for many purposes. Therefore, optic fibre remains the best choice to be used in ICT integration in the health systems.

4.2.4 Fibre-optic communication

Fibre Optic is a new technology that is used to transmit information from one place to the other using pulses of light through an Optical fibre. Fibre Optic is quite more reliable compared to the copper wired transmission has it reduces the risk of vandalism. It is also cheap to use though it is very expensive to put it up at the very start. But once it has been installed the costs are less compared to the copper wires which usually wear out and need constant changes to keep them working.

Using fibre optic would be very effective as it has been used before in other parts of the world. Therefore, this would work well by first integrating each district. In Zambia, each district has a district main hospital with a number of small health centres that depend on the main hospital which is at district level. Therefore, this would be an easy way to start connecting the health centres with the main hospitals. When this is worked it would be easy therefore to connect the entire district to other district in the province.

Fibre Optic has many advantages as compared to copper. When using copper networks, LAN copper is more susceptible to damage due to tension limit while fibre is stronger than LAN copper cables and may have a better pull strength, there is a lot of signal frequency loss and High Data rates increase power loss resulting in a decrease in transmission distances. While in fibre optic network loss does not change the signal frequency.

Copper easily gets interference from electrical waves which makes it have shocks and not good for use when integrating institutions like health centres because these institutions do not need disruptions at anytime which copper cables are prone to. Therefore, Fibre is ideal for high Data Rate systems such as Gigabit Ethernet, Asynchronous Transfer Mode (ATM), Synchronous Optical Networking (SONET), Fibre Channel, or other networks that demand high Bandwidth over long distances. Fibre also has complete immunity to electrical interference.

Putting fibre optic in use will greatly help the hospitals to have access to internet, telephone and other forms of easy communication that they may need to use in their daily work of servicing the public. Fibre optic technology is reliable and has the capacity to improve the communication once installed in the health system sector of Zambia. The infrastructure in Zambia may not support the use of copper wire networks, hence the use of fibre optic make the right choice considering the infrastructure. Fibre optic may be less expensive as compared to copper.

Fibre Optic has more advantages such as;

- Environmental friendliness
- Cheap to maintain once installed
- Can cover many areas at a low cost
- Does not need the use of wires over the areas

Some of the disadvantages that come with Fibre Optic are;

- Very expensive to put up such a facility as this is still a very new technology that has not been widely used at the moment.
(http://computers.kosmix.com/topic/Fiber_optic_communication)

5 IMPROVED HEALTH KNOWLEDGE FOR BETTER CARE

Improving the knowledge of the health workers for better health care is an important aspect of every community. Therefore, the improving of knowledge for the professionals will have an impact on the delivery of services to by the health professionals. This is important as they will have more information on their disposal at every time.

Knowledge has to be improved to meet the required demands of the country's health care system. Knowledge has proved to help in solving many problems that have been left unsolved. With the right knowledge at hand many problems may be solved and hence the need to improve it.

Knowledge has an important role on how the society see issues related to health matters and hence knowledge can influence the decisions made by many different stake holders in communities. In Zambia, there is a strong cultural background especially in health matters and issues that still exist among many Zambians. It is very important to make the health knowledge available to many masses in Zambia so as to eradicate certain epidemics like HIV and AIDS that have continued to spread across the country because knowledge is limited only to a certain class and society of people.

To improve the health delivery care system in Zambia knowledge has to be improved to the extent were people can freely and openly discuss issues related to their health and communities at large. Culture has continued to bloke information from reaching people in certain societies or communities across the country.

Across the country, especially in rural areas there is need to improve the knowledge of the residents so they can desist from the old and traditional way of dealing with health matter as this can hamper the progress of trying to wipe out unwanted epidemics in the communities. Residents have to learn the

modern way of practicing quality healthcare around their families and communities.

5.1 Improved health education for health professionals

Improving health education for health professionals is a very important aspect of health workers which has to be revised every now and then. It is very important that Health professionals improve their education from time to time to improve the health care services and keep the good standard at all levels of the health institutions.

There have been many new trends in the health sectors and new ones keeps coming and being introduced, therefore it is important that the health workers continue improving their health skills and knowledge throughout their working life. Healthcare workers have a great duty to save many masses and lives hence they have to be equipped with latest knowledge to be able to deliver quality and reliable services to the people. They must have enough knowledge to surpass the ordinary people that they attend to in order to bring back confidence back to the people where they can be entrusted to carry out many activities without being prejudiced in any way.

In Zambia very few people have confidence in the health practitioners due to lack of the latest technology, that has resurfaced in the neighboring countries like Namibia and South Africa where most prominent people rush to for medical or health solutions. This famous trend by the government officials has caused the ordinary people to lose faith in the local health sector which is seen as not serving its purpose due to its poor delivery of services.

Therefore, to restore the confidence back in the people, there is need to have the health professionals which include, doctors, nurses, pharmacists, dental practitioners, and administrators etc. to have frequent workshops where they learn new trends in their respective fields or professions to insure that they are up to date to date with their professions. These workshops are very important

as they allow the participants to brainstorm and learn new ideas from each other and also from specialists.

With improved knowledge at their disposal, health workers will have more confidence in their work as they frequently get involved in the workshops organized by for example non government organizations, the government and other interested stakeholders in improving the quality of health delivery services in the country.

When the knowledge of health professional is improved, there would be quality delivery of services in the health sector. This may in the process reduce the pandemics as the professionals will have knowledge adequate to tackle the pandemics and ways in which to reduce them. The importance of having professionals with adequate information at hand helps the community to get well informed information from the health professionals and health centers for quick delivery of services in their communities. Improving the knowledge of health workers will also enhance development in the communities from the grassroots levels in a systematic and more reliable manner.

Health Professionals requires having up to date information about their field in order to deliver quality services to the general public. The general public requires to have confidence in the health care practitioners, and hence the need to have the health professionals to upgrade their knowledge frequently in order to be up to date with their and changing trends that surround their work. There are new health trends in the health sectors across the globe hence the need for them to have or get involved with other health sectors abroad to help the local broaden their knowledge through the experience of other nations and they too can learn a great deal on what trends are being introduced and used.

With the great emergency of technology, there has been quite challenging trends being used and adopted and therefore it would greatly benefit the local professionals to learn from the outside world and not entirely depend on the traditional methods that have been in use for over forty years (those trends which were used before the country got independent), the trends have to be

changed to suite the current situation and modern health care system. This may in turn greatly improve the delivery of health care services in the country and may reduce the cost of sending citizens abroad for specialist medical treatments and examinations.

5.2 Improved delivery of services for health care

Improving the delivery of health care service in the country would bring about much benefit to the country such as meeting the Millennium Development Goals (MDGs) set by the World Health Organization (WHO). The world health organization has put up millennium development goals that have to be met at a certain given time. Improving the health care sector is one such goal that needs to be achieved and therefore it is an important aspect as it addresses the issue of poverty reduction in developing countries.

Accountability will be seen as the health care system is improved. Better accountability improves health care system performance. Strengthening of the relationships and channels of communication between citizens, health care service providers (Health workers) and policy-makers involves mechanisms through which citizens' or the general public can voice their concerns, such as oversight committees, patients' rights charters and complaints systems. However, the existence of such mechanisms has not necessarily may led to the improvement of accountability and service delivery.

Therefore, there is need for accountability in order to make the health workers to be accountable for the actions they take during the time they are working as they meet different kinds of patient and they need to practice their professionalism during the time of their service delivery. There have been cases were some people have complained of being abused verbally by the nurses or other health workers, and such cases must be checked to insure accountability. (WHO report 2005).

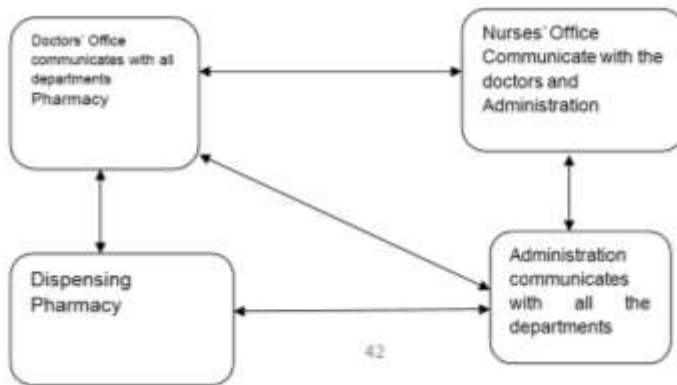
5.2.1 Doctors, Nurses and Pharmacists

With the improved health services and the manner in which the services are handled, Doctors and nurses will have fewer problems in their daily delivery of services to the patients and other people who visit the hospital as it would be easy to communicate among themselves effectively. Communication is an important aspect in the delivery of health service and once these are improved they will greatly enhance development in the health sector and health centres including health institutions.

Pharmacists play an important role in the health service delivery and hence once the health services need to be improved reduce errors. Therefore, pharmacists work in a hospital pharmacy service primarily within the public sector. They are responsible for ensuring the safe, appropriate and cost-effective use of medicines. Hospital pharmacists use their specialist knowledge to dispense drugs and advise patients about the medicines they have been prescribed. They work collaboratively with other health care professionals to devise the most appropriate drug treatment for patients. Some pharmacists are also involved in manufacturing required drug treatments.

The role of the hospital pharmacist sometimes extends outside the hospital, with responsibility for medicines in health centres and nursing homes. Due to the nature of their job, there has to be reliable communication between the pharmacists and the doctor and nurses. There would also be reliable flow of information between the pharmacists and the supplier of medicines and drugs to the hospital or health centres to insure that these institutions or centres do not run out of drugs and receive their supply at the appropriate time. The pharmacists may also be involved in teaching, both within the pharmacy department and more widely within the hospital. In teaching hospitals, this may include lecturing clinical staff on various aspects of drug treatment.

Figure 1.2



The figure above shows the flow of communication and information amongst the health department in the Zambian hospitals. The nurse receives and collects information from the patients and allocates them to free and appropriate doctor and giving the doctor the whole information about the patient. In this way the doctor knows and expects the patients at a particular time. But due to poor communication between the doctors and nurses, most patients have to wait a very long time to see the doctor.

When **patient** finally meets the doctor and all the business is done, the doctor usually prescribe the drugs that the patient goes to collect from the dispensing pharmacy within the hospital.

It is also at this moment that things get complicated because there is no proper communication between the doctors and pharmacists. Initially doctor should be able to find out in advance if the medicine they need to give the patient in available and if not an alternative drug be given. This wastes a lot of time for all the involved parties in turn. www.asksource.info/pdf/framework2.pdf

5.2.2 Administrators

The people who manage and support the work of Doctors, nurses, pharmacists, and other professionals need to be supported in order for them to effectively deliver quality services to the people. Professionals such as managers, technology people, secretaries and accountants make the work of the health

workers more flexible by providing them all the essential needs and requirements that they need to do their work. It is for this reason that communication needs to be improved and established between these entities. There is need for coordination in the process through which information is shared.

Hospital administrators oversee the various activities conducted in hospitals. This includes hiring staff and coordinating the hospital's business and support functions. In a small hospital, the administrator may directly coordinate most functions. In a larger hospital as in a case of the University Teaching Hospital in Zambia (UTH), a chief administrator may supervise several assistants or other managers who in turn administer various specific departments or functions in the Hospital.

When the Information Communication Technology is well implemented in the hospitals, administrators will have easy work to collect data and information to monitor how the operations of the health centers or hospital are being conducted and for analytical, statistical purposes and planning budgets and other important uses of information once the health care services are improved.

6 CONCLUSION

In conclusion, we have seen that the aims of the Thesis work were is to find out the most important needs to start the use of Information Communication Technology in the health sectors of Zambia. My thesis will describe major problems currently being faced that must prompt the adoption of Information Communication Technology use in the health sector. I will also make recommendations after making known the needs, and give examples of developing countries that are using Information Communication Technology and how it has helped the countries to solve certain problems. I am also going to look at what technologies have been used that can best be used in Zambia today in consideration with the current infrastructure in the Zambian health sector. According to the infrastructure in Zambia, not all kinds of Technology can be used and I will try to find out the most favorable that can best be used.

According to the finding during my research I learnt that improving the communication can also result in the improved awareness of health risks, outbreaks and solutions to the risks and outbreaks. Improved communication can also provide the motivation and skills needed to reduce these risks because with good communication and information dissemination, the public can find support from other people in similar situations, and affect or reinforce attitudes. Fibre optic communication is the major solution that I found that can be best used in the health facilities of Zambia after considering the current infrastructure and the current state of the economy. The fibre optic solution maybe expensive to put up but in the long run it would be proved to be the best and the cheapest compared to the copper wire connections which are bound to be vandalised by the scrupulous dealers of copper in the country.

Connecting the health centres is one important aspect that can greatly improve the health care service delivery by the health institutions and may result in them working together to tackle many epidemics. Constant workshops for health professional may also improve health care services as the professional will

learn new trends that could be used instead of relying on the old ones. It would greatly improve their calibre of working standards and help eradicate many diseases and have enough information to educate the masses for awareness purposes.

Security measures were also learnt to the needs to start the use of Information Communication Technology in the health sectors. The health institutions need to store and keep patients' information very safe and away from an authorized people and from damage. With Information Communication Technology being put in use it possible to have this kind of information to be kept safe, and able to keep it from being lost in case of a flood or fire. The information could be kept in electronic form making it possible to retrieve it even after a catastrophe. Therefore, electronic storage of information is more secure than the traditional way of storing information in physical file that can be easily destroyed by fire or floods, and even stolen.

The work of health workers is so hard and there are many risks involved, with improved communication, their job would be much easier and motivating. Communication is very important if health workers have to perform their duties adequately and to achieve the desired results of promoting and encouraging good healthcare services to the people.

Zambia has continually been left out in the technology development in many industries especially the health care industry. It is due to this that I really encourage the adoption of ICT in the health care industry, for the sole purpose of improving communication in the health care sector.

Therefore, ICT must not be seen as the only solution to the health care system in Zambia, but as instrument and tool that would help facilitate the improvement of the delivery of quality health care system.

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