

KEY INFORMANT INTERVIEW TRANSCRIPTS

Interview with Clinician in Kalomo

Researcher: Good morning, thank for taking time to talk with us, my name are Edgar kaango, and am doing a research on behalf of the University of Zambia, public health, we are looking on trying get your perspective and views of using biometrics to identify patients in health care settings. We want to know what you think of the current method of keeping of medical records, what do you think should be changed, what you think about the idea of using biometric to identify patients and what causes you concern? We having discussions like this with several key informants here in southern province and also in Lusaka.

To start with, Sir what are your names?

Clinician: My name is Clement Kaira.

Researcher: Mr. Clement Kaira for how long have you worked here at Naluja?

Clinician: About 6 to 7 months now.

Researcher: About 6 to 7 months, have you worked anywhere else apart from this clinic Naluja?

Clinician: Yes, I worked at Minasoko military hospital before i was employed by the government. I was doing voluntary work at Minasoko military hospital.

Researcher: So you have only worked here in two places that is?

Clinician: I was at Mazabuka correction facility for about a month.

Researcher: We are actually interested about knowing what can be used to identify a patient that walks in a clinic and our research is basically focus on biometrics, biometrics are simply personal features that are used to identify an individual. Take for instance finger prints or face recognition or anything that is part of the body that can be used to identify a patient like I mentioned earlier on. We need to under your own experience about what we want to ask you Mr. Clement. So what are your personal experiences with biometric tools? Have you ever had any personal experience with biometric tools?

Clinician: No

Researcher: You have never used any of them, finger prints?

Clinician: Apart from the one for my phone.

Researcher: For your phone?

Clinician: Yes

Researcher: Even the one for your phone, what are your experiences about it?

• Clinician: I think it is just okay.

Researcher: In terms of what, when you say it's okay?

Clinician: In terms of protection and privacy.

Researcher: In terms of privacy, when you talk of privacy, how do you related biometric tool that we want to bring at the clinic, maybe for identifying patients?

Clinician: As in privacy, let's say for instance, nowadays we use cards, if someone comes to the clinic, lets you misplace your card at home and maybe someone gets your card, then that person can come here at the clinic and access you information, because he or she has your, we will not say no, as long as they have your card, they present your card, we will pull out the file and give them.

Researcher: So the cards used at smart care, they do not have personal identification figures?

Clinician: Not smart care, us here we don't have electricity as you see it is a rural set up, no electricity, no computers so we just write cards for them.

Researcher: Are there any biometric tools used in health facilities that you know?

Clinician: No.

Researcher: You don't know of any type that are used at the health facilities at the moment?

Clinician: Aaaah No, Biometrics there is nothing only smart care.

Researcher: There is nothing?

Clinician: No

Researcher: Our research is around the use of similar types of biometric systems to identify a patient that walks into the clinic, even the ear can be used like I mentioned to identify someone. So we actually have the current programmes running at Chawama and we also have it here. Now we want to get into knowing your exact perspective., what do you think can be the advantages and disadvantages of using biometric identifiers in a health care set up, when doing health care service delivery, like I mentioned using the ear as a biometric tool, what do you think are the advantages of using a biometric tool in health care.

Clinician: I think one of the major advantage will be confidentiality and privacy.

Researcher: When you talk about privacy, how is this going to help the patients?

Clinician: It will help the patients in such a way that it will only be the health provider and the patient who will be able to access the patient's information, nobody else.

Researcher: Does that mean the current system that is working has little bit of some porousness in confidentiality and maybe keeping secrets in one way or the other, is there anyway some can access a person's information with the current system that is working?

Clinician: Yes, some they can, I just said earlier, with card, it's not everyone that is good in keeping cards, some will come, they may find they don't have money for books and they may find someone's card, they get it and go use it and am not talking about smart care cards.

Researcher: Yes I know, you are talking about cards you write for patients, so do you have any other advantages that can actually serve in using biometric tools?

Clinician: I think another advantage will be that, it will easy to help the patient when he or she come to the clinic.

Researcher: ok

Clinician: Yes, in case they have lost their cards, but with this tool that you are about to bring in, it will be easy because they will be need to carry anything, they will just come.

Researcher: Do you think this system will be better than the system that is currently working?

Clinician: I think it will be better yes.

Researcher: Any disadvantages that you think can actually occur in using biometric tools, any disadvantages. like what do you think the reaction of the patients will be maybe, how do you think patients would react to it when they just come to the clinic and you tell them to say, let get a scan of your ear so that I access your information, do you think this thing is going to have any advantages like you mentioned the advantages, any disadvantages? Are we going to have hesitation of patients or maybe what do you think will be the disadvantages of using biometric tools?

Clinician: Let me say if you haven't oriented the patient, he or she doesn't know what is happening, you can be having difficulties because they will be asking a lot of questions, like why do you want to do this, how is this possible but otherwise I don't think of any disadvantages.

Researcher: So you mean the patients would need orientation?

Clinician: Yes, So long you orient them on what will be happening, they will be just fine.

Researcher: Having been working here for seven months or so, how long do you think it will take for this sensitization of the biometric tools to the patients and the community at large?

Clinician: I think with the help of the SMAGS, I think it will just take a month or two.

Researcher: With the help of?

Clinician: The SMAGS.

Researcher: So, having talked about the advantages and disadvantages that you think can actually occur in delivering health services, do you think using ear identifying, ear identifier as a tool, using the gadget that I have just shown you, how do you think this kind of identification compared to other markers such as iris scan or a finger print, can you try to compare the difference or can you do a comparison of the two?

Clinician: The ear, an eye scanner or the thumb print?

Researcher: Or thumb print yes.

Researcher: Maybe you can talk about how they relate, which one would be more good than the others, would you think using the ear would be more complex or do you think maybe using finger prints would be easier or which one do you think would be easier as compared the others, let's say ear scan, maybe an iris scan or finger print?

Clinician: I think ear is just fine as compared to the thumb print.

Researcher: Why do you say so?

Clinician: Because the will be just a direct thing, just get the machine, place it the ear then you have what you want as compared to the thumb because, with thumb, let's say for instance am from touching water, I need to wipe it thoroughly for it to work but for the ear it will be much easier.

Researcher: Ok, so the ear can do better that these other parts of the body, is that what you mean?

Clinician: Yes.

Researcher: Ok, so what do you think are some of the barriers that can occur in using biometric tools, in particular in this community, what challenges can we face in implementing this too to work?

Clinician: Challenges?

Researcher: What challenges do you think we will face in having people to accept the biometric tools to identify them as they come to the clinic, using biometric tools as identifiers for the patients, what do you think will be the challenges in introducing this tool?

Clinician: I think at this clinic the only challenge which will be there will be computers and power. We don't have computers, there is no power.

Researcher: There is no power?

Clinician: Yes, the solar system that we have, even the fridge that we use to keep vaccines, we are a bit a challenge to charge it properly.

Researcher: Any other challenge that we can actually face relating to the patients?

Clinician: I don't think there will be any challenges.

Researcher: You don't think there will be any challenges?

Clinician: No.

Researcher: The patients here will respond positively to it?

Clinician: Yes they will respond positively.

Researcher: They will not hesitate in any way?

Clinician: No, because sometimes they just come, they don't have money, they don't have cards, we just write on papers for them, but with this it will be much easier.

Researcher: So how do you imagine that the end-users like the clinicians, the children, parents might react to the use of the biometric system, imagine where a person come at the clinic, this is their first time of coming to the clinic, and the only thing you ask before you even ask them what they are sick of, before you even touch them as a clinician, as a nurse, what do you think would be

their reaction you just tell them bring your ear, I want to scan your ear? Do you think it is going to be easy?

Clinician: No, unless you explain to them, that is when they can allow you.

Researcher: So does that bring the point that we need enough time for sensitization about this?

Clinician: Yes, as I said with the help of the SMAGS it will take 1 to 2 months.

Researcher: So, the SMAGS are the ones you use to sensitize any programme that come here?

Clinician: They are the ones that help us in the villages, when we are given something to do, we inform them then they go out in the villages to inform people what is happening.

Researcher: For this community will have had issues where people come to distribute maize, maybe people give out certain food materials or anything, how has been the acceptability of people, how has been the response of people to such things?

Clinician: That one ever since I came here, I haven't had that experience in this community.

Researcher: If a project came. Maybe have you ever had any experience of a project that was brought in this community?

Clinician: Apart from the one for the bohole.

Researcher: How was the response from the people? Was it accepted?

Clinician: It was accepted.

Researcher: It was accepted?

Clinician: Yes

Researcher: So the levels of accepting are very high in this community?

Clinician: Yes

Researcher: The community is not hesitant?

Clinician: Aah no, as long as it will be beneficial for them it is fine.

Researcher: Now, we are also interested in knowing more about under-five care and how the under-five card is currently used to coordinate care, taking for instance under-five visits, the under-five card is used. For example maybe when a mother comes to the clinic to get vaccination for her child, she presents the under-five card and the vaccination is given, now, how often do you see a mother forgetting their child's under-five card? Have you had instances where a mother comes to the clinic, and then they tell you that I have forgotten the under-five card and meanwhile this mother was bringing an under-five child to the clinic, have you ever had such incidences?

Clinician: Yes, more especially when they are sick not during the vaccination period. When the child is sick, they just come without the under-five card.

Researcher: How often have you experienced this?

Clinician: A lot.

Researcher: A lot?

Clinician: Yes.

Researcher: Are you able to approximate maybe how many times in a month?

Clinician: In a month maybe, let's say 10 to 15 times.

Researcher: 10 to 15 times?

Clinician: Yes

Researcher: When these mothers forget their cards, what is their reaction when they forget their cards? And what is your reaction? So start with their reaction, what do they do? How do they react when you tell them you cannot treat their child unless they show the under-five card?

Clinician: First of all we don't tell them we will not treat the child unless they provide the under-five card, we ask what wrong with the child, then we see how we can help and ask the woman to bring the under-five.

Researcher: So in that process of asking to woman to bring the under-five card, how do they react? Does it affect them in any way? How do they feel when they realize that they have forgotten the under-five card?

Clinician: They feel bad because, once they forget it and you ask for it, their thought is we would ask them to go back and get it and when you look at this place, some of them stay very far from here so that would be like a burden for them to start going back and coming back here.

Researcher: And what's your reaction if a person forgets their child's under-five card?

Clinician: For us it will be difficult to know which vaccines the child has received from the time this child was born to the time that this child has come to the clinic, so it will be difficult in such a way that we will start maybe guessing what has this child received and what hasn't this child received? So the best is when they say this child is complaining of this and that, the best is if you see that the child has got fever, the best way is, we keep them then ask the woman, maybe to call the husband to bring the card.

Researcher: In what kind of situations do care givers or mothers tend to forget to bring the under-five cards?

Clinician: Like I said earlier on, when the child is sick.

Researcher: When they are sick they tend to forget the under-five cards?

Clinician: Yes, but during under-five, child health week, they usually bring them.

Researcher: But when the time the child is sick they tend to forget them?

Clinician: They forget them.

Researcher: When does this occur and how does it affect service care delivery, let's say for instance a person has forgotten the card, what are the impacts on the delivery of care? Let's say for instance from your side, like I mentioned a person forgets the card, what measures do you in trying to deliver the service to them? Does it get complicated for you?

Clinician: Aaah No, like I said, we admit them then follow up the card later, we provide the care that is needed, we assess the problem of the child first and then ask for the card later on.

Researcher: When you say you admit them, is it the condition of them forgetting the card that makes them to be admitted or maybe it's the condition of the child?

Clinician: The condition of the child.

Researcher: In an instance that the child's condition does not need you to admit them?

Clinician: Let's say maybe they come and the child has got diahorrea, we will ask when did this start, how many times has this child passed out stool, if they tell us maybe starting today he has gone to the toilet maybe 7 times, then we have to keep their child.

Researcher: Ok.

Clinician: Yes

Researcher: My question is having known that this mother has left the card and the condition of this child does not allow you to admit the child so that you can have that procedure where you ask them to send someone get the card from home, how do you do about it?

Clinician: There we just treat the child.

Researcher: ok.

Clinician: Yes and ask the mother to observe the child for about a day or two, if anything doesn't change, they should bring the child back.

Researcher: Are you able to site specific examples where maybe a missing card interfered with the way child care was given to a child that was sick, by the attendants, clinicians, and the nurses, have you cases where you are unable to trace really the cause of the disease because you are not able to see the card? Have you ever had complications where maybe because of the missing card, you are unable to diagnose the patient, like the child?

Clinician: no, I have never experienced that.

Researcher: In general terms what are the consequences when the under-five cards are lost or degraded?

Clinician: When it's lost, before he/she is fully vaccinated?

Researcher: Yes when the card is still in use

Clinician: That is hard, he or she may not be fully vaccinated because we won't know like how many vaccines are remaining for him/her to be fully vaccinated, because if you asked the mothers, some of them they don't know like how times the child received which vaccines, so it will be very difficult for us to work if it is lost.

Researcher: In what ways does lack subject to identifying pose a barrier to delivery of care in your experience, let's say for instance, here is a child that comes and you are unable to trace their files, or maybe a person comes to the clinic and you fail to trace their files because you do not have anything that you can use to identify the patient, maybe to get history to the date that the patient has come to the clinic, what are the barriers to giving the health care services?

Clinician: Sorry?

Researcher: In what ways does lack of subject to identify the patient, maybe the patients comes and they don't have a card and you are unable to identify them, how does it bring a barrier to the delivery of health care services according to your experience?

Clinician: I think that brings a barrier in a sense that we will have to start the process all over again, instead of starting where that clinician stopped from, we will have to start from the beginning and we won't know that which treatment this patient was given.

Researcher: Ok.

Clinician: Yes

Researcher: Now I want you to imagine a scenario where we instead use biometric system in a health care, and the scenario would be that when you come to the clinic, the clerk takes a picture your ear like I was showing you and when that picture of that ear is taken or a finger print, we will be able to pull out the file or the under-five file, now thinking of individuals like you, how do you think health care worker would react to the use of biometrics to support clinical care?

Clinician: I think it will be a welcomed move, in a sense that it will be much faster to access the information that we want about the patient.

Researcher: Ok

Clinician: Yes.

Researcher: Having answered that question, what factors influence biometric technology acceptance attitude amongst health workers and the community. What do you think would influence the acceptability of this biometric technology among the health workers and the community? What do you think would either increase the rate at which people would accept this technology or maybe something that would delay the acceptance of this technology among health workers and the community.

Clinician: i think with the health workers, I think there will be no any delay, as compared to the community because for the community.....,

Researcher: Influence, what do you think would make the community people to easily be influenced to like this technology?

Clinician: Liking the technology?

Researcher: Yes or maybe what would delay them to maybe like or accept the technology?

Clinician: What will influence them to like the technology is, it will be cheap because they won't have to spend anything they just have to come to the clinic, just bringing their body to the clinic that's all, so to them it be just fine.

Researcher: Any negative influence that you think can actually delay the acceptability of this technology?

Clinician: I don't think there is any.

Researcher: So what factors affect biometric implementation intention in health facilities, let's say for instance, if this thing had to be brought, what do you think will affect its implementation in health services?

Clinician: As I said here and other places i think it will just be power.

Researcher: It will just be power?

Clinician: Yes

Researcher: Ok, what kind of advantages do you see might come from biometrics in health care from a perspective of a health care provider, what do you think are the advantages that may come from this biometric technology, how would it help you in giving care to the patients?

Clinician: It will help us in such a way that we will access the information faster.

Researcher: Faster?

Clinician: Yes faster.

Researcher: Anything else?

Clinician: And knowing the type care you can give to the patient.

Researcher: Do you think there might be any disadvantages that might come from biometrics in health care from a perspective of care recipients/patients? Any disadvantages that you see from this technology that you see will affect the recipients, the patients

Clinician: I think so.

Researcher: Thinking of people in your community, what kind of concern do you imagine people might have in the use of biometrics, you know there ethics in the community, we have people believing that there are certain norms, certain things that should not be done on a person, what do you think will be the concerns of people to this technology? Where a person comes in, you demand to scan their ear, what do you think will be the concerns of the community?

Clinician: I think if they have not been sensitized, it will be very difficult for them because they will be thinking like you want to use their ear for something else and not to give them the treatment that they want, it will be very difficult for them to understand.

Researcher: what kind of ethical values might be there in the use of biometrics? Are there any ethical barriers that might actually come in, in the use of biometrics, where maybe the scanning of the ear, maybe asking a patient to use the finger prints, do you think there any ethical barriers according to maybe the norms of the community, the tradition of the community, do you think there are any barriers that may actually exist to actually hinder the use of biometrics in health care facilities?

Clinician: I don't think there any.

Researcher: Ok, you don't think of any ethical concerns, where maybe a husband can say it is not ethical for someone to scan their wife's ear, or maybe a mother would say it is not ethical to scan their child's ear, is there anything like that?

Clinician: No, as long as you have explained to them, and they are well aware of what is happening, why you need to scan their ear.

Researcher: So you mean the concern about this tool is sensitization, is that what you mean?

Clinician: Yes.

Researcher: Ok

Clinician: If they are well informed then it is just fine with them.

Researcher: Having known the community of Naluja, having attended to several patients for the time that you have been here, do you think there any barriers that can occur in accepting the use of biometrics in this community?

Clinician: I don't think there is any, but for me I think it will be just language.

Researcher: What do you mean language?

Clinician: In communicating with them.

Researcher: Telling them the use of the tool?

Clinician: Unless there is someone who speaks Tonga because for me that's one thing I can think of, language barrier.

Researcher: Ok, so if someone was to explain this to them, there will be no problem about it?

Clinician: In a language which they will understand?

Researcher: Yes

Clinician: Yes

Researcher: Ok, what are the barriers to biometric adoption in health facilities among workers or maybe among the people working at the clinic, do you think there any barriers that can actually lead to a delay of adopting biometric tools in health facilities? Delaying the acceptance of people at a facility. Let's take for instance here at Naluja, do you think there are any barriers that would lead to a delay of the adoption of this biometric system here?

Clinician: Among the health workers?

Researcher: No, as long as they are well oriented.

Researcher: Any barriers you think can come out of the perspective of the patients in adopting this tool?

Clinician: Aaah no, there will be none.

Researcher: What are some of the advantages do you see to this type of system to identify patients compared to the old system? So we have the old system where you need to pull out cards, you need to start searching for files, what do you think are the advantages if this system that is existing was to be replaced or maybe set aside so we bring in the biometric system, what do you think are the advantages that are going to be there?

Clinician: There will be less work, as compared to the one that we have now.

Researcher: What do you mean less work?

Clinician: Less work as in, when someone comes with a card you start looking for files, some of them you find that the files are misplaced but with this tool, it will be just that the patient comes, they just sit there, you just get the machine you scan them and you have what you are looking for.

Researcher: What do you think are the disadvantages that you see in this type of a system to identify patients compared to the old system?

Clinician: I think the disadvantage will be there for some patients, let's say who are disabled and some who are very sick, because most of the times, let's take for instance an epileptic patient, you

just find the mother will just come to collect the drug for that patient and that patient won't be with her, maybe she will just say, the child is not feeling well, he/she cannot manage to come here.

Researcher: In an instance that maybe that patient has had a file, ooh ok i get it, so you mean people that cannot manage to come to the clinic, there is nothing that can show as evidence that this is the patient that they are representing because they can't carry the ear?

Clinician: yes.

Researcher: I get it, thank you so much. What do you think would actually lead to the delay for the community to actually accept the new technology such as this, the biometric technology, what do you think would cause hesitation or the delay to accept it?

Clinician: I think what will cause the delay is that, if they haven't seen it, they haven't see how it works, that can cause a delay, because they will have hard time to believe in what others will be telling them.

Researcher: Do you have any suggestions to what can be used to actually help them see, understand, and actually for them to accept this technology?

Clinician: I think when they are sensitized and come to the clinic, and see what they have been told about, maybe that can be fast for them to believe.

Researcher: Ok,

Clinician: They say seeing is believing, as they see it and see how it works.

Researcher: So you mean the implementers of this should come with things that patients can see, saying this is how it works, do the demonstration maybe or what's your suggestion?

Clinician: Yes, they come with tool and demonstrate, explain to the community how it works, then it will be that simple.

Researcher: What kind of features do you think the biometric system should have to improve its acceptance in the communities, like i have shown you, don't you think of any features that the biometric system should have to increase the acceptance in the community, what is it that you think should actually be done to this tool for people to accept it in the communities.

Clinician: Like apart from the ear?

Researcher: Yah, maybe you can suggest a part that can be used or an easy part that people will not hesitate to give away for a scan, what do we need to improve on the gadget, like i showed you the ear scanner, what do you think should be improved on it? Or what is it that should be improved about the system itself.

Clinician: I think for now the ear is fine because we haven't tried it and the people haven't put out their views.

Researcher: So any improvement to the system itself or maybe what should be done to the ear scanner itself, should it be of a certain size or maybe anything that can affect the acceptability of people to this system, anything that we can improve on?

Clinician: I think nothing.

Researcher: Nothing?

Clinician: No.

Researcher: ok, thank you so much Mr. Clement, we have come to the end of the interview, thank you for being cooperative, and we appreciate your time.

Clinician: Thank you

Researcher: welcome

Interview with Nurse in Charge in Kalomo

Researcher: Good afternoon, thanks for taking time to speak with us, with me is the nurse in charge at Naluja, my names are Edgar Kaango, am doing a research on behalf of the University of Zambia school of public health, we are looking at trying to get your perspective and views on the use of biometric tools to identify a patient who walks in on a health set up. We want to know what you think about the current method of keeping truck of medical records, what you think should be changed and what you think about the idea of using biometric tools to identify patients and what causes you concern. We are actually having such discussions with several key informants here in southern province and we also have the same projects currently running in Lusaka.

Madam good afternoon and what are your names?

Nurse in charge: Good afternoon, my names are Loola Siamaimbo Munansangu and am the midwife here at Naluja rural health center and am the Nurse in charge

Researcher: Madam, for how long have you worked here?

Nurse in charge: 6 years now

Researcher: that is quite a long time, am sure you will be able to give me the experience am looking for, have you work anywhere else apart from this center here?

Nurse in charge: yes

Researcher: where?

Nurse in charge: I have worked in another rural health center under Kalomo DHO in Siabulile

Researcher: we are interested in knowing what can actually be used to identify a patient that walks into a clinic and our research is basically focused on the biometric, and biometrics are simply personal features of a person that we can use to identify an individual. Now, take for instance finger prints, face recognition or an Iris scan, these are examples of biometrics that we can actually use, other examples are things like, when you go to the airport or when to the police station, or when voting people use all those things. We want to get your perspective, your views about the biometrics in a clinical set up, at a hospital maybe. We want to look at how are the people you have interacted with, what you think will be their perspective of accepting this kind of a tool.

According to your experience with biometric tools, we want to ask questions, to start with what are your personal experience with biometric tools, have you ever interacted with any of them, have you ever used any of the biometric features as a recognition anywhere?

Nurse in charge: No, I have never used, other than maybe going to visit some place where I will just lead my finger prints and the smart card care for the smart care system, those are the only two things that I have used.

Researcher: Have they been helpful to you?

Nurse in charge: They have been but there are times when you forget your card, and feel ill and then you want to go to the clinic or maybe a hospital, so sometimes they would ask you for that card and you don't have it. Which in my view I see, it's a challenge sometimes to give these patients that come here to give them something which they have to come with them when they fall ill at some point.

Researcher: Have you had complications where a person walks in at a center, they don't have any card, and they don't have anything to use to identify them?

Nurse in charge: Several times, but they want to be attended to, and they will tell you I have my card I have just left it home, I want treatment.

Researcher: so how do you deal with such scenarios?

Nurse in charge: it is very difficult, unless you get back to our OPD and explain to them and you put a remark on that person's name in the register.

Researcher: ok, are there any biometric tools used in health facilities that you know?

Nurse in charge: No, I don't know anything

Researcher: You don't know anything?

Nurse in charge: NO

Researcher: Our researcher basically focused on the similar type of a system that we want to be using to identify patients that walk in a clinic, this is where we may intend to be using the ear as one of the biometric feature we may be using to identify a person, from a health care perspective, what do you think are the advantages of using biometrics in a health care center?

Nurse in charge: I think the advantages could be many (1) This patient can access health services anywhere without paying anything, imagine maybe the person is coming from Naluja, it means they have bought a file right?

Researcher: yes

Nurse in charge: If it comes to using any of the body features, that person will not be required to pay anything because it will be very easy to identify that person

Researcher: Do you think this system can work here?

Nurse in charge: I think it can work because most of the times there will be nothing like i have forgotten the card, it go lost, and there won't be such issues

Researcher: With your experience with the people that you have interacted with here at this clinic or anywhere else where you have worked, do you think it can be easy for people to accept to have their ear captured or any body part to be captured?

Nurse in charge: I think they can accept it especially when you tell them they won't be carrying along with cards because the issue of forgetting and losing them will not be there.

Researcher: From a health care provider perspective, do you think there any disadvantages with this tool?

Nurse in charge: well, I think disadvantages could as well be there, looking at the era, the time which we have lived in, others would want to say no, maybe they want to take me for Satanism, and literacy levels of this place are quite low. People here capture anything whether true or not true, but otherwise I feel disadvantages are few compared to disadvantages

Researcher: Apart from people thinking maybe it is going to be used for other purposes, is there anything that you think people can give as an excuse about what this system will be?

Nurse in charge: I don't think of anything anywhere

Researcher: ok, that's good, so how does using ears to identify a patient compared with using of other markers such as an iris scan or a finger print, comparing the two which one do you think would be feasible for the people in the community? Should we use the ears? Should we use the finger prints or maybe an iris scan? Which one do you think will be feasible for the people in the community?

Nurse in charge: I think the Oracle, the ear itself I think it's okay, because for the finger prints, others have heard about police, they will think maybe you are taking them to police because illiteracy is on a higher percentage, so they have never heard of the ear system, maybe it will be easier

Researcher: So the ear system would be easier?

Nurse in charge: yes

Researcher: so what do you think could be the barriers of accepting these biometric tools, especially in the community/district? What barriers could hinder the rate at which this system could be adopted and accepted in the communities?

Nurse in charge: The advantage with our community, once you educate them, the whole population, there is no problem, so I don't really think that there will be any barriers, as long as

we introduce the whole system to them as we start working, we have introduced it to a larger number of people other than just starting it. So I feel it is good have some kind of a meeting, Know we are starting to use this on so that many of them here it at the same time, so I don't expect any barriers

Researcher: You are saying we need to teach them, what system do you think can actually work to teach these people?

Nurse in charge: community meetings

Researcher: Do you think they can need specific people or we can bring anyone that we feel can teach?

Nurse in charge: Anyone can teach, like we have zones where we do our UCI programs, as we go for UCI maybe we go along with this person, we teach them , we teach each community, am sure they can accept it

Researcher: How do you imagine that the end-users, the clinicians, the parents, people like you, the children, how do you think could be their reaction to this system knowing that there have been this system of books and all of a sudden you bring in a new system, what do you think would be their reaction both the people that you work with (the clinicians, nurses) and what would be the reaction of the community at large?

Nurse in charge: With the facilities staffs I think there won't be much of a problem because right now if had to take to our registry we have plenty of books, when this person comes, even if they have numbers, it takes time for you to pick that number. So at least for the health providers there isn't much of work, it will be actually very easy because we are not going to be struggling, we won't think about where do we put these books because they are so many and files. And again to the community there will not be any problem because these people won't be carrying anything.

Researcher: Now we want to look at the under-five care, we are so much interested about knowing more on under-five care and how the under-five card is currently used to coordinate care. Taking for example the under-five visits, the under-five card is used, for example when a mother comes to the clinic to get vaccination for the child, she presents the under-five card the vaccination is given and recorded, Now, how often do mothers come to the clinic forgetting the under-five card?

Nurse in charge: Rarely, not really forgetting, you know we have mothers that cannot read, what usually happens is instead of pulling the under-five card for this baby, she would pull another by mistake or sometimes we don't have cards we use exercise books and it happens that the same mother used an exercise book during pregnancy for antenatal so she will pull an antenatal book instead of an under-five book and those are the common mistakes that we go through.

Researcher: Approximately in a month, in a week, how many time do you get to have such instances?

Nurse in charge: At least once or twice

Researcher: Once or twice in a month or in a week?

Nurse in charge: in a month, I would say, it's not so common but it happens.

Researcher: Ok, so it is not common but it happens?

Nurse in charge: Yes

Researcher: How do you suspect this makes the mothers feel?

Nurse in charge: It feels bad, so what we just do is, instead of me sending back this woman, i will write the whole information about that particular patient and advise her next time when she comes to the clinic, let her bring the under-five card so we can transfer the information to that page

Researcher: But doesn't that complicate your work?

Nurse in charge: it does, because maybe it was under-five and the finds you busy with antenatal, you have to stop, it is inconveniencing

Researcher: In what kind of situations do these mother/care givers tend to forget their under-five cards?

Nurse in charge: Like during Vitamin A exercises which we have annually, sometimes she would say me i have just brought the child, the mother has gone out for the funeral I don't know where she keeps the book but i want this child to be vaccinated against this, so when we have a common exercise like child health week, usually other lose or forget the card

Researcher: so on the under-five cards if such an instance occurs, what is the impact on the delivery of the care, the service?

Nurse in charge: It is very difficult to make sure that, that information is transferred to the right book because sometimes they may not come back at all, and it is not even indicated on that card which is left home, so next time when we have child health week you find a blank, you ask was this child vaccinated previously, they would tell you yes but it is not indicated.

Researcher: are you able to site any specific example where a missing card interfered with the health care service you needed to give a child?

Nurse in charge: like, I have refereed it to antenatal anywhere, but is similar, like if this child is due for a vaccination, like at one year six months a child is supposed to be given measles vaccine, the mother does have the card, you want to make sure that you indicate, you give and write somewhere so that you can transfer the information, the following time she does not come , and you miss to transfer that information, she comes maybe after three months or 4 months and they find a different person who was not there. That person might not even remember because he was not there, so you find that this child has missed this vaccination. The same issue of illiteracy that I have been talking about, another person meets this baby and would say was this child vaccinated? They will simply say no, and a colleague vaccinates, and this child will be given double vaccine, even if there is no harm just because the mother didn't carry the card with them.

Researcher: ok, that sounds so interesting, in general terms what are the consequences when under-five cards are lost or degraded?

Nurse in charge: It is very difficult to know what this child has received before, it is very difficult. Because this time we give two vaccines every visit of the first one month, the following month two vaccines, the following month two vaccines making six right?

Researcher: yes

Nurse in charge: Now you ask the mother how many vaccines have this child received, she would say, just received once, what about the other thigh? She would say I have forgotten, so you won't know, it is very difficult.

Researcher: ok, so in what way does subject to identification cause a barrier to delivery care in you experience, maybe let's say for instances in which you are unable to identify who the person is, or maybe you are unable to pull out the file because they have lost the identity that you can actually use to access the file, in what way does it actually bring a barrier to service delivery?

Nurse in charge: Actually it is very bad, where you just assume this baby has received everything, meanwhile this baby has not been covered with all the vaccinations, so it is not good just thinking that this baby has received everything.

Researcher: Now I want you to imagine a scenario where were to instead use a biometric system , the scenario that would be that you come to the clinic or a person comes to the clinic and they get to the clerk (the secretary) and they just get a picture of the ear, maybe just a snap of the ear or a finger print that would be able to help them to actually access the under-five card, think of

individuals like you, how do you think the health workers would react to the use of biometrics to support clinical care?

Nurse in charge: I think in the beginning initially it will be a bit confusing when you think about the so many services we offer to these people, (1) we are talking about technology here, meaning the staff has to be oriented on that one, imagine you to retrieve all the information until you reach at that particular service that the individual has come for, so it needs a lot of training to the health workers.

Researcher: But what would be their reaction, would they accept the system?

Nurse in charge: of course they will just have to accept the system because there are a lot of changes that are happening.

Researcher: On every aspect that is new, on every technology that is new, there some factors that would influence that technology, now what factors do you think would influence biometric technology acceptance attitude among health workers and the community at large?

Nurse in charge: like what?

Researcher: Maybe we would say what would influence them to positively accept or negatively fail to accept the system?

Nurse in charge: Less writing there, there will be less writing, you know when they come to get their files, they go there to be entered, you write manually, you take them to that point you write manually but with this that we are talking about, I feel there will be less writing.

Researcher: what would influence the community to either positively accept it or maybe negatively fail to accept?

Nurse in charge: You know when there is new thing people would want to go and see, so even this time some can be home, they are sited, they are sick but they don't have money to buy a file, but when such a thing comes they are not paying anything, they know that after all am not going to pay anything, let me just go and be seen. After all there is this new system, let me go and see what happens. So I think positively maybe patients will be influenced coming to the facility because it's nothing like buying.

Researcher: ok, do you think this kind of a system is compatible in the community? Can it fit in, in the community?

Nurse in charge: I think it can, like this time, you there is hunger. Someone is sick with toothache but they can't go to the clinic, can you go to the clinic, they will tell you I don't have K1 to buy a book, but now someone tells them this time it is free, they just get a picture of your ear, that patient will rush, it will bring a lot of patients.

Researcher: ok, now there are factors that affect any new innovation that comes in, what factors do you think would affect biometric implementation intention in the health facilities? What do you think would actually hinder its rate of implementation? What would slow the rate of implementation of this system in health care facilities?

Nurse in charge: Actually what I think will happen is in the beginning there will be few people coming to the clinic because of fear but after some time when they see that there are no negative outcomes of it, they will be coming in numbers, but in the beginning I know very well that they will be few.

Researcher: To start with, what do you think would be the rate of acceptance by the community? Within what period do you think this thing would be common if it had to be used?

Nurse in charge: I think it is just a period of months 1-3 months

Researcher: 1-3months?

Nurse in charge: Yes 1-3 months

Researcher: People can actually accept it?

Nurse in charge: Yes

Researcher: What kind of advantages do you see might come the use of biometric tools in health centers from the perspective of a health care provider? What do you think will be the advantages of using such a tool in health care facilities?

Nurse in charge: I think the advantages as I have mentioned earlier on that (1) with technology, everything is faster done than writing.

Researcher: ok

Nurse in charge: Yes, the system will be fast. Then (2) it doesn't need a lot of writing

Researcher: ok

Nurse in charge: Yes, I think that is what I can say.

Researcher: Now, biometric technology is a new technology that is coming in, there are factors that would influence the acceptance among health workers and the community, what do you could be those factors that would influence the acceptance of the same technology to the workers and acceptance of the same technology to the community because we are looking at the workers where this tool will be used at and then we are looking at the recipients of the tool, so what do you think will be the factors to influence it? Like the attitude of accepting, what do you think will be those factors?

Nurse in charge: I don't see much problems with the health workers, health workers understand things faster.

Researcher: ok

Nurse in charge: So for the health workers I don't see any much harm, but with the community as I have said, the area where we are, levels of illiteracy my dear are very high, so it will take a bit of time. It just needs to be spoken about.

Researcher: Now the recipients of this biometric tool, the community, what kind of disadvantages do you see might come from the use of biometric tools?

Nurse in charge: I think there is just the issue of misconception

Researcher: misconception?

Nurse in charge: yes misconception, not really capturing the whole meaning about the system in the beginning, of course that will be cleared after time.

Researcher: What would be the quickest or maybe the best way we can clear misconception among the community people.

Nurse in charge: I have already mentioned, the issue of teaching the community

Researcher: teaching the community?

Nurse in charge: Yes before the system is started, unlike you start the system and then go along explaining or teaching the community about it, I feel if the community can be made aware of it before it starts.

Researcher: ok

Nurse in charge: yes

Researcher: Thinking of people in your community, what kind of concerns do you imagine people might have about the use if biometrics, you know people have different concerns because of different ethic, different norms, what do you think are the concerns that would rise from the community on biometric tools.

Nurse in charge: So the questions are keeping twisting themselves, I have already said, here in the communities' people pick anything that they hear, they have heard about Satanism, ask them about Satanism, they would not tell you, they don't know anything. Even this being a new thing, they

would say maybe it is related to satanism but even if you ask them about what satanism is, they would not tell you but up to a time they see that there is no harm. Actually there is no harm, this one took the baby to the clinic, the baby is here, actually myself I went there, and there is no problem. Again they come back in the same track.

Researcher: Now there are ethical barriers that exist in every community and usually ethical values people do not tend to put them away so easily. Do you think of any ethical barriers that might actually arise from the use of biometric tool?

Nurse in charge: No, I don't think any around this community.

Researcher: Not around this community?

Nurse in charge: No

Researcher: not anywhere you have worked from?

Nurse in charge: no

Researcher: ok, are there ways that you think one can design a system against ethical concerns, if any ethical concerns had to arise?

Nurse in charge: You mean any what?

Researcher: Are there anyways someone could design a system against ethical concerns because eventually other may develop ethical concerns. We may think there are not there now but eventually someone may develop those ethical concerns. Do you think of anyways that we can actually try to protect their values as we use the tool?

Nurse in charge: Maybe in the same sensitization that am talking about, it has to be mentioned from the beginning that it does not affect anyone's beliefs.

Researcher: Apart from ethical values, ethical barriers, what else do you think could be a barrier to accepting the biometric tool in the community?

Nurse in charge: I don't think of anything.

Researcher: with your perspective the way you have dealt with these people, can we call it done deal if this thing had to be implemented?

Nurse in charge: Yes, the community is the community is very cooperative, as long as you have told them what it is about, the community is very cooperative unless otherwise.

Researcher: Now, barriers of adoption come in several ways and one of them would actually from the health facility itself. Do you think of any barriers that would actually be hindering the rate of adoption at health facilities?

Nurse in charge: like what?

Researcher: Let's say for instance, can there be any un comfortability of health workers in actually using this type of a tool?

Nurse in charge: I don't think so.

Researcher: You don't think so?

Nurse in charge: No

Researcher: so can there be barriers of biometric adoption at a health center facility?

Nurse in charge: No

Researcher: Not here but anywhere else according to your experience?

Nurse in charge: No

Researcher: What are some of the advantages that you see in this type of a system to identify patients compared to the old system where you give cards, numbers? What do you think are the advantages of using biometric tools over using the old system?

Nurse in charge: As I said earlier, its faster, being linked with technology, it's faster. Then maybe the other is, there is nothing like I forgot to write in the register, everything is recorded in the system.

Researcher: What are some of the advantages that you see, maybe let me put it this way, if technology would be faster, how would it help you as a facility?

Nurse in charge: Like during the cold season, we have a lot of patients at the clinic, plenty of patients at the clinic, so technology being faster, it will help us to clear the lines faster, we will clear the patients faster. Their time of stay at the clinic would be reduced.

Researcher: You mean would this system increase efficiency?

Nurse in charge: Yes

Researcher: ok, what do you think would delay or make the community to accept the new technology such as this, biometric technology, what would be the factors that would lead to the delay in accepting the technology itself?

Nurse in charge: If maybe the community is not made aware of it on time, it will delay, like they just here it from the people in the community, it will take time. If talked about it in advance " you know, we are expecting such a thing, where they ask questions such that when you have the system in place, you just tell them this is the thing we have been talking about, it would be faster.

Researcher: Have you had any experience where you were implementing something and you had to teach the community about it.

Nurse in charge: Not really.

Researcher: Or maybe an organization came to teach the women in the community, how was their response?

Nurse in charge: I will put an example of BU students that have been coming here. They came to teach us on the use of water filters, you know, they have gone round to teach the people on bio-filters but it took time pick it. Others have never even tried to use it even if it was for their benefits because it was a bit complicated. This one, the patient himself or herself doesn't do anything to be entered in the system. You get what am saying?

Researcher: sure

Nurse in charge: but where they need to take part in doing it that is where I see a bit of a challenge.

Researcher: Ok, to end with, what can of features do you think the biometric system should have to improve its acceptance, having looked at its structure, how it is used, how it would work, what features do you think we should improve on?

Nurse in charge: So that they can be included in the system?

Researcher: Yes included in the system or maybe to actually improve its acceptability in the community?

Nurse in charge: But I think it is okay the way it is because we are just picking the ear and that is the end, we are not including any other features, we are just picking the ear and that's all.

Researcher: Ok, so the way it is?

Nurse in charge: I think its fine.

Researcher: Last but not the least, should this thing be implemented? Should we bring it? Should we try it? Can it actually fit in the community and at the health facility? Is it a good thing to do with? Is it something that is complicated?

Is it easy to use?

Nurse in charge: You know we are living in a world of change, personally I feel its better we try it.

Researcher: ok

Nurse in charge: yes, am expecting it to start.

Researcher: We are looking forward to start it.

Thank you so much madam.

Nurse in charge: You are most welcome

Researcher: God bless you and this is where we come to the end of the interview.

Nurse in charge: Know we wish you well, we will be looking forward to having it.

Researcher: Thank you so much.

Interview with District Health Officer in Kalomo

Researcher: Good afternoon, my name is Edgar Kaango, I am coming from the University of Zambia, and am a researcher at the University of Zambia in corroboration with school of public health, and we are intending to know your perception on the use of Biometric tools to identify patients.

What are your names? And for how long have you worked here?

Answer: Habasimbi Bryan, I have worked here in Kalomo for two years.

Researcher: have you worked anywhere else?

DHO: yes

Researcher: where?

DHO: I have worked in Pempa and I have worked in Gwembe

Researcher: for how long have you worked in Gwembe and Pemba

DHO: A combination of five (5) years

Researcher: we interested in knowing what can be used to identify patients in clinics and our research is basically focused on the use of biometric tools. As you know, biometric tools are simplify a personal features that can be used to identify an individual. Just a feature to identify an individual, you have heard about FSIP, people going to the police station getting finger prints, all those things. That is what basically our research is based on, but our focus is on the ear.

With your experience, what is your experience about biometric tools?

DHO: for patient identification, I don't have any experience

Researcher: But have you ever used it personally anywhere?

DHO: no

Researcher: not even at voting, not anywhere to identify yourself as an individual?

DHO: I thought you were asking on patients

Researcher: no, not on patients

DHO: in an individual setting, finger prints have been used for voting

Researcher: Are there any biometric tools used in clinics that you know?

DHO: for patient identification no, or for any other issues?

Researcher: for any other issues,

DHO: apart from finger prints, eyes

Researcher: so for what purpose are you using the eyes?

DHO: there situations in which, for example the similar manner to finger prints, suggestions have been made, of course this is something I have just heard about not necessarily that it is being used here in a certain area.

Researcher: so, our research is all around using similar types of biometric systems that you know to identify a patient that walk at the clinic, even the ear can be used to identify someone, now there a project currently running in Lusaka, we also actually running it here, people are in Lusaka asking the same questions, am also doing it here.

What factors do you think affect biometric technology acceptance attitude among health workers and the community, (what factor do you think affect the acceptance of this system among health workers and the community at large)?

DHO: so I think some of the factors would be that, if can be able to use biometric features for patient interaction, I think it will much easier because record keeping has been quite poor and our community is quite ambulant, quite mobile. So what would be nice is that even without carrying anything, we can have patients getting identified, search the data base, then patients will be able to be seen from whatever point that they show up and that can influence continuity of care.

Researcher: any negative influence from health workers or maybe the community, which would act as a barrier to this system?

DHO: am not thinking of any, but what would be important is before this feature's usage is disseminated, education to the people can be done, if people have an understanding, I think acceptance will be very good.

Researcher: what factors affect biometric implementation intention? (What factors would actually affect the intention of implementing biometric systems in health facilities, do you think of any?)

DHO: maybe the technology, because am sure that is linked to technology, for example, the feature will be able to take be it fingerprint, be it the ear, we will need to have that technology and that technology should be able to be user friendly and also be able to be easy maintain in the different facilities where that will be implemented.

Researcher: are there factors that will negatively affect its implementation?

DHO: not at all, as long as people are sensitized and made aware about it through the different community structures

Researcher: having heard how this system will be working, in your own opinion, what do you think are the advantages of this system if it had to be implemented?

DHO: the most important advantage is that there will be continuity of care, why, because like I mentioned, record keeping is poor, if for example the patient is already in the system, with the medical history already entered, at whatever point someone seeks to be attended to, we will easily be able to have access to the data base, the background medically. It will be easy to administer treatment and also make sure to say such things like side effects and drug reactions the patient have had for the past, we can be able to access it even if the patient is not literate enough to remember such kind of a situation would be able to have a bearing on the current attention they are receiving.

Researcher: any disadvantages of using biometric tools in health care services, do you think of any disadvantages that may occur?

DHO: not at all

Researcher: I want you to do a comparison, we have talked of using the ear, a thumb or maybe an iris scan, comparing these other parts of the body to the ear, which one do you think will be compatible to use, acceptable in the community and at the health facilities? Is it feasible to use the ear? Which one do you think would work out?

DHO: DHO: I think using either of them would be okay, I don't have any particular preference but I think any of them can work.

Researcher: would you suggest any preference for the community?

DHO: no

Researcher: what kind of advantages do you see might come from the use of biometrics in health care from a perspective of a health care provider? *(how would this system be actually of advantage to the health care providers)?

DHO: in terms of retrieval of data for patients, because usually our set up is in such a manner that patients have files at the different areas where they seek attention especially in their area of residence, so when a patient comes, I think most of the time, a good part of the time is lost trying to retrieve the file, so now if we can be able to use biometric I know that once, for example a child is taken, and iris scan is done or a finger print, then it automatically reaches the data base, so it will reduce the waiting time the clients to be attended to, at the same time it would also provide information at the finger tips for a health care provider to have a back ground to this patient they are attending to.

Researcher: what kind of disadvantages do you see might come in health care from a perspective of the care recipients, the patients, any disadvantages that can come from this system?

DHO: not any I can think of

Researcher: ok

researcher: imagine you live in a community, in the province and this system is actually implemented, as we are trying to implement it, what do you predict are some of the barriers to accepting the use of biometrics in this particular community, in this district, what do you think will the barriers of accepting this kind of a system?

DHO: ok, so since it does not involve the drawing of any samples from the patient, i think acceptance would be quite good. Like I mentioned earlier, I think as long as prior to implementation of this, the community is sensitized. we have different platforms in which we can do that, we use traditional leaders, churches, schools and the like, so what people are skeptical of is getting samples from them, things like just taking a picture, I don't think that they would have a problem

Researcher: how do you imagine that the end user (the clinicians, parents, children) might react to the use of biometric system, what would be their reaction, this thing comes as a new technology, a person walk at the clinic, they just find that you need to get a picture of the ear, what do you think would be the reaction?

DHO: of course people would be skeptical at first, although that can be attended to by making sure people are educated, because already we are using smart care cards and in certain quarters where people used paper or book files when cards be used, when the cards came in, people were skeptical but in the end they accepted. It would even be more advantageous in my view, why, because at the end of the day a card is something that can be lost in the case of smart care but for biometrics, it is something that is part and parcel of someone's being, so that would improve patient's file keeping and then people would not necessarily have to worry about whether the card has remained at home as they go to the hospital.

Researcher: do we expect any reaction from the health workers, clinicians to this system, how would their reaction be?

DHO: not at all, it would actually improve patient care, in the sense that they would have access to information about the patients at the finger tips, it would reduce the time patients spend on the line waiting for the files to be called.

Researcher: I want us to go to a section where we look at the under-five care, under five card, patient registration (identity), we are also interested in knowing more about under five care and how the under-five is currently being used to coordinate care, taking for example the under-five visits, a parent brings their child for vaccination, an under five card is used.

How often is it reported that an under five card go missing or maybe get damaged, how often do you get those reports?

DHO: very often, on a scale of 1-10 I would say maybe up to six (6). Many are times as a health care system we have had to replace those cards either because they have gotten damaged or they have gone missing completely or maybe the child has relocated and where they previously lived the card has remained.

Researcher: how do you deal with those situations where a child relocates? What are the implications on health care service delivery?

DHO: so the implication is that we un able to identify the services already received because for example vaccines, if the child is supposed to receive a number of vaccines for them to be fully protected, in the absence of that information, we unable to make that assessment

Researcher: how often is it reported that the under five cards are out of stock at the clinics? Do you have instances of that kind?

DHO: yes we do, these are cards that we prepare as an institution, we buy, so they are subjected to availability of funds, if at a particular time we don't have funds which means we are un able to replace and have in stock

Researcher: so in a month, how often do you get reports that a certain clinic has run out of stock?

DHO: it may not be in a month per say, but what would happen is that once we have resources, we will buy the cards in bulk and distribute to the clinics depending on the number of under five children that they have in that particular community, upon consumption of those, if we don't have any replenishment from the back storage, which means for a good period of time, people will have to go without using cards and they will use just alternatively books

Researcher: so when this happens, how are the clinics expected to proceed with under five care? What else do they use? Is there anything they use in place of cards?

DHO: mothers / caregivers will asked to buy note books in which the services provided will be entered, but also at the facilities we have under-five registers where the services provided for each particular child are entered and then we are able to retrieve that information as we are doing monthly activities.

Researcher: I want you to imagine a situation where instead we begin to use a biometric system and the scenario would be that the mother would come to the clinic and the clerk takes a picture of a child that would the clerk to pull out the file for the child.

What are the perceptions on the use of biometric tools a child identification in place of child's health card, what would be the perception?

DHO: my take is that, I think the care givers would be receptive to that idea, because many times like i had said, cards are spoiled, sometimes have gotten lost, so am sure it is something that would be a relief to the care givers because (1) they will not have to look for a missing card or for a damaged card to come to the clinic. Immediately they come to the clinic they will be able to have the child access the service and (2) the health care system will be able to know how much services the under-five child has received.

Researcher: would the system (biometric) generate any value for patients?

DHO: I think so

Researcher: How?

DHO: Value for patients?

Researcher: yes, would there be any benefits for patients?

DHO: yes it would, in the sense that, services that may not have been provided regardless of the health center. For example, a child has a particular service provided or has a particular service not provided but maybe an entry is done on the card, so you would take it that because an entry has been made on a card, the child has received the service, so there will be that despite in terms of

what a patient has actually benefited and what is recorded because there are data errors that we experience in a number of ways as we provide the services, so in that system I think we will have up to date information because the system will be able to pick whether the service was provided. An under-five card today will be brought and next time the mother will come without an under-five, they will be able to write on a piece of paper and then that information will not be transferred to the card and when you look at the card against what the child has actually been given, you may not be able to tell, so in this case, i think we will be able to have accurate data because it does not depend on any document that is either available or not available at a particular time.

Researcher: will the system have any value to the health workers? Would there be any benefits that health workers would get from this system?

DHO: I think so, in the sense that, most importantly we will do away with the data errors most of which come as a result of fatigue, documentations not being available stationary at a particular time. If we are going to use biometric, I want to believe the entry will be done in the system, where we are able to make reports evenly. For example if we are using hard copies like a card, it means that information will have to be transferred to a summary sheet which will generate information, but if we are going to use biometric, I want to believe it will work in a similar manner like smart care so that in real time we will be attending to patients, information is accumulating and at the end of that we are going to print records, so for report production I think it will be much easier, there will be less errors incurred during the process and then also the statio admit which sometimes is a problem subject to availability of funds will be attended to.

Researcher: Having had time to interact with the community, having worked with the community, what are the levels accepting new ideas, Innovations in these communities around.

DHO: The communities are very receptive, the only key is the levels you get of engagement prior to production, once people have the understanding, it will not be much of the problem.

Researcher: So what system do you suggest can be used to actually educate the communities?

DHO: Depending on the community specifics, if you talk about remote areas, I think entry through the traditional leadership has proved to be very key, and when talking about town set up, we have had use of radios and also community meetings

Researcher: coming to the conclusion, what improvement would you recommend for the biometric tools, having looked at it, having seen it, having known how this system is going to work, any recommendations on the improvements that we can work on the biometric tool?

DHO: I think once those are introduced, what would be nice is to make, for example in the different set up, if the information will be transferred to tablets, there issues of charging system, because power is not available everywhere. We have had challenges with the systems that we are using where, you would have a gadget that is able to facilitate such an endeavor but then you have limitations in terms of charging, repair works so that at the end of the day once this system is just being used, tomorrow people will not start being asked to bring cards or any other back up that maybe required. For example in smart care we have had situations where, you are using smart care system quite okay, and it goes down for two days, you are unable to repair it for one reason or the other, and you go to paper based as usual, so there is distortion of information including continuity of patient information

Researcher: What other things do you think could be done to improve patient identification in health care delivery services? (Would you suggest anything that would be used to improve patient identification in health facilities?)

DHO: No, not any that I have in mind

Researcher: we have come to the end of the interview, thank you for according us time to speak and discuss with you and may God bless you

DHO: welcome and thank you.

Interview with Information Officer in Kalomo

Researcher: Good afternoon, thank you for taking time to speak with us, my names are Edgar Kaango, I am a researcher in collaboration with The University of Zambia School of public health, and we are actually looking to get your views and perception on using biometric tools to identify patients in health setting. We want to know what you think of the current method of keeping track of the medical reports, all the records that you keep for patients, what you think of about the idea of using biometric identification as a tool that we can be using in identify patients that come to the health facilities. So we are having such discussions with several key informants, we have done this in Lusaka, now we are here in Kalomo. So to start with sir Good afternoon and what are your names?

Information Officer: Good afternoon and my name is Kelvin Munkwemu?

Researcher: What position do you hold here?

Information Officer: Health information officer for the district.

Researcher: For how long have you worked here?

Information Officer: I have been here for the past 6 years.

Researcher: for the past 6 years?

Information Officer: yes

Researcher: have you worked elsewhere?

Information Officer: No, just on part time basis before I got in full time employment in government.

Researcher: Where did you work from?

Information Officer: I taught first at a place called Kessy Technologies and then I worked for national fund agency as a temporal employee.

Researcher: We are actually interested in know what can be used to identify a patient that walks in a clinic or maybe a person that visits a hospital, so our research is basically based on biometrics. Biometric is simply a personal feature that can be used to identify an individual, take for instance, the use face recognition, iris scanning all those example are examples of biometrics. No people have been introducing new programs to farmers, there is FSIP, and people have actually used these biometric tools through voting and voting registration, at the police station. Now, to get an understanding of your own experience, we want to find out.

Have you ever had any experience with biometric tools?

Information Officer: yes, just the use of thumb prints, like what happens with the national registration, but then also facial identification, there is a program that we are running here in southern province, it has to do with immunization where a child's face is captured and then uploaded in the system.

Researcher: Ok, so are there any biometric tools that are actually being used in health facilities that you know?

Information Officer: yes, like the facial identification like I have mentioned, that is what we are using.

Researcher: So for what purpose are you using this facial recognition?

Information Officer: For immunization program for the children.

Researcher: Our research is basically all around the similar type of biometric tools that you actually know and those that you have used, what factors do you think would actually influence biometric technology acceptance attitude amongst the health workers and the community, you when this innovation comes to the people in the community and the health workers, do you think of any factors that would actually influence the acceptance and the attitude among health workers and the community.

Information Officer: I should think there could be some factors, for example if you picked the use of face, it is something that people are very familiar with. If someone thought of the thumb prints, it is something that people are very familiar with even in communities where literate levels are quite low, you don't expect to be faced with antagonism on part of the community because much sensitization around that has been done and a good number of people who understand why those issues are used or why should the face be captured, why people will ask for thumb print and the like.

Researcher: Any negative factors that you think would actually influence the acceptance of the system?

Information Officer: Lack of knowledge about what we are discussing, especially for communities where literacy levels are quite low, sometimes just take a great deal to make them understand and just see sense and value in what you are talking about. If it is something that will look like it is so alien to them probably in the initial stage you would expect a bit of resistance from the communities, although this doesn't apply in all the communities but at least that is something that you may expect.

Researcher: Any negative attitude that is expected from the health workers about this new technology about its acceptance?

Information officer: Negative attitudes may usually come if maybe, for example the program that has come is heavily loaded because already there are a lot of things that staffs are doing but looking at how new programmes have come in health, especially here in Kalomo, it does take a great deal for health staffs to accept the program. Rarely do we face negative attitude to these different programs by our facility staffs. So I don't expect that there will be so much negative attitude of such.

Researcher: Thank you for the response, what factors will actually affect biometric implementation intention, if this system had to be accepted by the end-user who are the health workers, clinicians, children, the mothers and people that you actually interact with, are there factors that would actually affect the implementation of this in health facilities?

Information officer: I think so, to start with, if the gadget that has to be used is to be maintained by the district, that definitely suggests a cost implication with sometimes limitations, you find that sometimes gadgets would break down, you don't have resources to work on them. Also I have seen, you have shown me the smart phone, some facilities you find that they are challenged with source of energy or power source, so it may have some sort of a challenge. If it is something that would require connectivity to internet or being within network connectivity by any of our mobile service providers, a number of our facilities do get cut off, so you may find that if that is linked to network connectivity, that would be a that would definitely affect. If the technology embedded in it, or developed for it is a bit complicated, that is also a factor we would expect can affect the acceptance or later on the full utilization of the system.

Researcher: In your opinion, what do you think would be the advantages of biometric tools in health care facilities?

Information officer: yes, the system has to be simple, easy to use, if the developed system is a bit complicated and there is no any other way to go around it, firstly people have to be trained in the use of that system and may they are given a grace period in which to, for lack of a better term experiment with the system. You say maybe let's see how it is working for two months or so then you go full trotter in terms of implementation.

Researcher: So do you think this kind of a system can be of any advantage to the health worker and the community?

Information officer: Yes it can, we talked of the issue of identification, especially in this era where people are contributing for health insurance so definitely it will make it easy for institutions for example to easily identify someone to say this person is seeking this service and he/she needs to be given this service. I highlight the issue of insurance and the like, someone will easily access the service, and they are easily identified. Someone would even suggest that this if goes on and it proves that it's a good system to use, we can as well link to people that are contributing to health insurance and those that are not, so that the identification of who is paying and who is not paying can be easily established, but I have understood the overall issue is about identifying an individual whether they contribute or not.

Researcher: Ok, do you think there will be any disadvantages of this system in health care service delivery?

Information officer: There could be yes, we have seen where some programs where they have not run effectively, that is one of the disadvantages. I gave an example of the gadget, if the gadget has to be run by the maybe districts at some point, managed by the districts at some point and the cost implication is quite high, you definitely expect the program not to thrive well, if the implementation will depend on a lot of factors, especially those that are outside the influence sphere of government departments like mobile service provision. Those things will definitely affect the program and it may receive a negative response from the health staffs.

Researcher: Given a chance to choose, between the ears, we to compare the part that has been chosen as the ear, given a chance to choose, which one would you think would be compatible in the health center, between the ear, an iris scan, thumb print, which one do you think would be effective? Which one do you think the community can actually prefer?

Information officer: As for me I think these things we have spoken about, definitely to be honest with you, in communities there is low literacy levels like I mentioned are quite low, we expect that the face will easily be accepted, you have talked about the issue of identification, so here we are simply talking about the system identifying an individual, maybe the beauty in that one before I make an outright position on that one, maybe the beauty is we are letting a system identifier an individual and somehow that may pose a possibility of upholding confidentiality of on this individual not being known by people, he or she maybe not interested, she may not want to know, may not want that they know him or her. If you asked me what could be the best I will still go for facial identification,

Researcher: Face identification, don't you think that would lose confidentiality, every person that opens their file the face appears, don't you think it would in some way affect confidentiality of the system.

Information officer: yes, when you talk of the health facility staff set up only and hospital set up only, yes i wouldn't go for the face, I was highlighting the issue the face for the community, am looking at something that doesn't look so alien to them. Someone might be wondering but the ear, the ear, the ear, who may not understand that we are talking about systems here. If we were to

restrict it to the health facility set up alone, clinic, hospital, and yes a feature that would not identify an individual by looking would be much more preferred.

Researcher: Ok, having talked about that, what kind of advantages do you see might come from biometrics from a health care provider?

Information officer: I think it is one thing that we have already talked about here, easy identification, I see it as a major merit.

Researcher: And what kind of disadvantages do you see might come from biometrics in health care from a perspective of care recipients, the patients?

Researcher: System failures, it is the biggest issue that we can talk about, if the system that you have developed and the gadgets are failing, cannot easily be utilized, the system cannot be trusted, maybe it's on and off, on and off, maybe it would need a consultant, it will need an expert, so if that expert is not there, maybe four days, the system is down at the facility, it tends to erode confidence. System failure is the issue I can talk about and the issue of sustainability, you have shown me this gadget, it might look simple but I believe there are some cost implication to it. So, if the sustainability aspect of it is not something that doesn't sound good it will definitely also affect the implementation.

Researcher: ok, Imagine you live in a community in this province that is implementing this system, what do you predict are some of barriers to accepting the use of biometrics in this particular community or district at large?

Information officer: Of course if something comes up abruptly, people are not well informed about it, it tend to rout suspicions, like what is happening in the health sector today, these programs that are community based, you know disgruntled individuals start spreading false rumors in the community and that becomes a very big challenge, so if this system is just for identifying an individual unique as they are, people in the first place need to be aware of this. You explain to them benefits, benefits associated with the system so if the community is not made aware of this, that is what we expect.

Researcher: You talked about informing the community, educating the community, what major system do you think we can actually use if we had to implement this to actually educate the community and the health workers?

Information officer: One major approach cannot be prescribed for communities, so you need to understand the community you are dealing with, for example in communities where you know a radio station can work, messages can be running on the radio station, others will get the message others will not, how many accepts, you look at the community, the coverage for the community. The best approach especially in areas where you have got low literacy levels, use of community agents is the best because this is a person who is known best in the community and if he/ or she is used to deliver that message, you expect that the levels of acceptance will be very high because the person is coming from their community or the individuals are coming from their community, so if this person you realize because of the technical issues involved cannot manage to unpack the message, it needs other people, that is where the issue of blending with the community comes in. The community will part take this and we will take this part that can be done in different ways. There are community meetings that called by village headmen and women, sometimes we have a lot of people who come to facilities on a day you are doing immunization or children weighing, you can integrate you message into that, if we are talking about issues of health sector and then in peri-urban areas and urban areas even just mounting the speakers , the PS-system on a vehicle, you go round the community and make an announcement, if that message will be appropriate for that, it is also an important approach. Of course drummer, drummer performances especially on

important days that people already know, although this may need it one day, but there are days that are known for certain activities for example on labor day, you talk of youth day, those public holidays you can see how you can integrate these things because sometimes it becomes hard to bring these community people together.

Researcher: Here is a new technology that comes in, let's look at the reaction, what do you think would be the reaction of the end-users, the clinicians, parents and children, how do you think they would react to such a system? Especially at its early stage of implementation?

Information officer: You know, programs that look fractionating like this one, the acceptance tend to be quite good but it forms part and parcel of the delivery expected of a health worker. Usually such programs start very well but it only become disappointing if the process was not well thought out, as how you would sustain it, when you start noticing fatigue on the part of the end users, what are the strategies to put in place.

Researcher: So, on the care recipient, what do you think would be the reaction? The patients themselves to the new system.

Information officer: I wouldn't say outright good or bad, I think they would receive it with mixed feelings because people have got there way of thinking about things. I personally kept on asking why the ear? It looks so alien to the conventional that we have been associated with, so I would say probably there will be a response of mixed feelings. As we will be very anxious of seeing what next, others will be highly suspicious and later on others will simply tell you this I cannot do, cultural factors come in, religious issues may come in and just that aspect of uncertainty, that is what i believe in.

Researcher: Having understood the community that you have worked in, what are the levels of accepting new innovations?

Information officer: Within the health sector I would actually say the levels of acceptance have been quite good referring specifically to the smart care system where you need to issue a smart card to them and explain how it works. In few instances we have had very funny individuals who have been claiming to say they get your details, they keep you, they will always be looking at you that is why they are asking you to get the card at home, the books have always been working, why they are abandoning books. But those have been very few circumstances and usually things have been corrected.

Researcher: Now, let's come to the under-five care, the under-five card, registration of the patient ID. We are also interested in knowing about under-five care and how the under-five card is currently used to coordinate care. Taking for instance, the under-five visits, and the under-five card is used. For example when the mother comes to the clinic to get vaccination for the child, the under-five card is given and the child is given a vaccination and recorded. Now, how often is it reported that under-five cards go missing or maybe are damaged? How often is that?

Information officer: That is something that is usually recorded, we have a case or two where under-five cards have been missed and sometimes also where under-five cards have not been supplied, so people tend to improvise, but cases of losing under-five cards have always been there.

Researcher: Improvising, when you improvise, how does it affect health care delivery to the patient?

Information officer: If a person who has improvised that doesn't pay particular attention to the data has to flow, so you find that, a child may miss an antigen. You may not know if the child received all the antigens up to a particular stage. For example, the measles second dose when a child has to be fully immunized, so if the record system is not okay, you may assume an individual

received the second dose, or you may assume the second dose was not given and then you make a mistake of second giving. Also it breaks continuity of care.

Researcher: would such kind of a system, a biometric system, would it be a good replacement when it comes to health care record keeping?

Information officer: No, I wouldn't say it will be a good replacement, I have not seen the entire package that is in it because when you look at the under-five card, and it is a compressive package of the services that are given to infants up to the time when she/he turns five. We are talking about weighing, we are talking about immunizations, and the trend the child is taking in terms of weight, has the child gone down, and has the child gone up and the like? So it is a package, it's a package that come with the under-five card. If this system has got the same things as the under-five card, it would be good to look at it and make comparisons to what is happening right now, then one can say ok it can be a good replacement or it cannot be a good replacement. That is what I would say for now.

Researcher: So you mentioned of not being supplied with under-five cards, how often is it reported that under-five cards are out of stock at the clinics?

Information officer: I wouldn't be categorical on that one, there are just times when that is done, in six months and the like but there sometimes cases where maybe the central level has not supplied the under-five cards because previously they are the one who were printing the cards.

Researcher: In an instance that maybe a certain clinic has not been supplied with cards, they are out of stock, when that happens, how are the clinic actually expected to proceed with the under-five care?

Information officer: They will proceed with under-five care because at the facilities we have registers where that data is being entered. For facilities that use smart care, they are going to enter the record in the smart care system. For example in the under-five registers now, between 24, 25 to 59 months, a child is weighed, you indicate, except for Z-calls where you where you just put on the tally sheets. Those tally sheets are there, the registers are there. You remember the child is this one, the ID number is this, the parent is this one, the child bares weight 2.5 kg, 4kg, 10kg, 9kg, the child has been given this type of antigens, is it BCG? is it penta-parent, is PCV?, second dose of measles or first dose of measles, so these things will be documented in the register or entered in the electronic system smart. At the point when other tools that depend on it are available, they are easily updated but on smart care you can easily print the under-five card.

Researcher: So does this whole procedure complicate the work of a health personnel?

Information officer: Not complicating really because it has a methodical way of doing it, if only people are oriented on, but when you talk of adding on to work load, i would agree. Adding on to work load but not complicating. In the health sector there are so much that is done as work does come easily.

Researcher: Now i want you to imagine a scenario where instead we begin to use the biometric system, the scenario will be that the mother comes into the clinic and the clerk takes a picture of the ear of a child and that would be able to actually allow the clerk to pull out the card or collect the child's under-five card from the system. What are your perceptions on the use of biometric tools for a child's identification in place of a child's under-five card?

Information officer: What you need to realize sir is like I mentioned, the under-five doesn't just identify a child, and it identifies a child and then tells what services the child has received.

Researcher: This is a system that links that ear of a child (picture) to identifying the exact child of that ear, so the system is actually linking the identity which is the ear and it is linking it to the file, in an instance where you had to compare with this kind of identification, what would be your

perception on biometric tools in getting the identification in place of a child's health card? What would be your perception about it if at all it is introduced?

Information officer: Maybe we are missing one another here, we are rather missing each other here, I tried to explain that the under-five card here does not only identify the client or a child, so that basis I may not out rightly say the biometric tool ultimately replaces the under-five card. I submitted that it will be good to look at what it will come with, the package that it will come with, if its only it is a system that will only identify and it ends there, it may not carry substance in itself because there are a number identification methods that are used. So why do we even have to labor taking the picture of the ear, eye, where cost implication have been noticed. If we are basically talking about identification, for me it may not carry so much substance unless we have understood a situation where identification of clients is something that has proved to be extremely difficult such that we are failing to identify these clients one would say this system will be the perfect replacement, why do i say so? in the era of using just the OPD system , just a card they right a number there, we would simply go to the facility, present to the registry clerk, the clerk will simply look at the number written on the card and he or she will know where that book is, they will simply go to that lot and pick that book, so I see this being very useful in facilities where we are using computerized system where the data base has been created and records have been inputted into that system, then you say ok for us to be able to pull out the file for this person who is already in the system, then this becomes a very useful system, you simply click on the ear, whatever in which way the system will be designed. The ear pops up and then it brings everything about that client, I would not out rightly say this will be the perfect replacement because even in the simple ways we are doing the identification of clients, the identification has been done easily especially in facilities where smart care is being implemented, an individual is assigned what is called a nupin that is national unique patient identification number. It looks like an NRC, so if punch on the nupin, all the record information in the system will just appear on the click of the button, will come out. If not a defective system you want to sort out in terms of identification then I would say this will be a very good replacement.

Researcher: Would a system such as biometrics generate any value for the patients, for health care workers, would it generate value?

Information officer: Yes it generate value in that (1) the care giver or the service provider will have to spend less time in attending to the client, also on the part of the client you don't expect to spend so much time at the facility, especially if clients have been spending too much time at the registry where identification is problematic given in an instance that we have such problems, it would improve on the time the client would spend at the clinic, the time spent by the care giver in making sure that the service is provided and (2) ultimately that adds value to a service you providing and they will have time to do other things and probably if they are not admitted but they are not feeling well, they will spend less time at the facility, go back home quickly to rest.

Researcher: Ok, so what other concerns do you think we should actually anticipate and how might we mitigate these to design the biometric system. Am sure you may have concerns, you may have certain things that we must actually anticipate from this system and how you may suggest that we try to mitigate them, in the sense that we are trying to implement and design this system.

Information officer: One thing that you should actually anticipate is that communities receive these new ideas differently, you need to start with the local institution to understand the community so that you have an insight of how that community is and how you are able to penetrate and make sure the system is accepted. Secondly is the point I alluded to, system failures, issues of

sustainability, these are very important points that you should put in place. If this introduced and there is donor who comes on board, and maybe this project has to run for five years, what is the plan for five years? people are engaged in at the initial stage, the cost that is being met on implementing the premade, how sustainable will it be if the donor had to pull out, remember that the donor will come with the narrow way of thinking because they have got one small programme that they are running, but coming to the institution, they have a wide range of programmes, those are competing needs for the same resources that are there, so we have seen programmes where even the donor has not yet folded the activities, limping because there was no well thought out plan or process on how certain problems will be sorted out, the system was not well designed, taking long in responding to the system problems raised by the end-users, in fact that the major thing that makes programmes fail, people are enthusiastic about implementing this new programme, then system problems identified by the end users and they are not responded to in good time and anticipated by the end-users, you expect problems.

Researcher: Coming to the summary of it all, what improvements do you recommend that should be on the biometric tools, having looked at the gadget?

Information officer: Maybe let me not make crude conclusions , let me not be quick in making a conclusion rest I make a crude one, you simply showed me the gadget, there is a smart phone there, you take a picture, I don't know if it goes beyond that, so let me not make a conclusion saying improve there, improve here, improve here, I would not make such a conclusion because I have not interacted with the system, but if you tell me this system is only ending at capturing the ear and the phone will be used throughout at the facility, one would say look for a much bigger smart phone that will keep a lot of information because there are a lot of people that come to the facilities. There are facilities where in a week, they see an excess of 500 OPD cases, so if you have got 52 weeks in a year, they multiply that with 500, what are you going to get? It's a lot of records, so if you have got a system that is not able to store a lot of information, one would say that needs to be put in place, am just speculating here because I don't know how the system works, so to a conclusion that improve it here, improve it there, I will lie, I don't know it.

Researcher: But from the perspective of the system identifying a patient that walks in a hospital, at a clinic, just with what you have seen with the gadget, do you think it may look complicated for the patients? Do you think it would be feasible? Would it be it apply in the community?

Information officer: There are two questions there, feasible, complicated, feasibility is there but, if you talk about complicated, it's not complicated but the ear sounds so alien why don't you also probably go for the thumb, just get a picture of the thumb. People are used to using a thumb when they go for registration, faces. If you are talking about identifying an individual maybe we could have talked of using thumb, get a picture of the thumb. I may not have a problem with ear but I just to think it sounds so alien, you know.

Researcher: Ok, so what other things do you think could be done to improve patient identification in health care delivery?

Information officer: Developing systems that can be useful in identifying that are user friendly, and less labor demanding systems, maybe computerized systems, where an individual just says my NRC is, my a name is this and this then the system brings out their details to identify unlike the issue of just counting on the hard copy tools maybe you find that this registry has more than 1000 books and the registry is not order or nicely arranged, looking for one particular book may take a lot of time or where you find your system is okay but for some reason or the other, someone misfiled the hard copy document, I think it is developing systems that are user friendly

and we are talking smart these days, so electronic systems that are user friendly in this era is something someone would always go for.

Researcher: Just to wrap up, can the system work in hospitals, can it work in the communities, can the community accept it, is it acceptable, and is it community compatible?

Information officer: It will depend on a number of factors like I have highlighted, chances of acceptance are there and chances of non-acceptance are there, so it is how you have packaged your product, that will determine if it will be accepted well or not but chance of acceptability are there and chances of not being accepted are there. So this will vary according to the communities.

Researcher: Ok, thank you so much we have come to the end of the interview, thank you so much for you time, God bless you.

Information officer: Thank, you are welcome.

Interview with Railways Clinic Clinician in Lusaka

Interviewer: The time now is 14:23 hours and I am at Railways Clinic Lusaka and I'm talking a Clinician at Railways clinic. My (Names) a student at Ridgeway doing Masters of Public Health and ehh... what are your names madam

Respondent: My names are (name) a clinician at Railway clinic

Interviewer: Alright, so how long have you worked here?

Respondent: I have worked her for closer to three years but in the medical field I have been here for 19 to 20 years

Interviewer: you have that vast experience (both laughing), have you worked else were in the health field besides Railways?

Respondent: I have worked in Matero Referral which is the first level hospital now, I have worked at Chaisa Clinic yes, Kamwala, I had gone to Kalomo then came back here and now am at Railway Clinic

Interviewer: Oh! I should just conduct an interview in Tonga right.....

Respondent: In Tonga ahh..... (Laughing)

Interviewer: Now looking at biometrics itself and try to understand it ahh.... we are interested in knowing what can be used to identify a patient that walks into the clinic, and our research is focused in biometrics. Biometrics are personal features used to identify an individual. Take for instance fingerprints, face recognition, iris scanning, these are all examples of biometrics. Other examples where biometrics systems are used are at the airport, with the police, sometimes fingerprinting is used to identify. Even to open a phone, a fingerprint is used to identify and unlock the phone-this is also an example of a biometric system. To get an understanding of your own experience, we want to ask you:

Interviewer: What are your personal experience with biometric tools?

Respondent: Biometric tools are very good actually they are quicker we are able to see clients firster, they come they do not need to walk in with the file or the card they just have to walk in

themselves then.... after putting the fingers on the biometric we are able to secure all the information in the system so they so they..... I think is a very nice tool that is coming up

Interviewer: I have heard say that you have one here which you're using currently, ahh.... what do you call the biometric tool which you're using?

Respondent: we are using a fingerprint one

Interviewer: ok

Respondent: it was moved from the card and then we are using the one which we need to use the fingerprint one

Interviewer: for what purpose?

Respondent: for purpose of all the medical services that we are offering because we are offering a lot of ehh..... an integrated clinic where by there is ART, and OPD, for those who come for OPD cases and ART we are able to use the same biometric fingerprint

Interviewer: and our research is basically on the acceptability of the same system in whatever situation maybe when someone walks into a facility, then we just want to understand the acceptability part were we look at the relative advantage of the new technology and the old technology, we are looking at the Compatibility of the system, the trailability like how do they perceive in your position as a clinician.

Interviewer: From the provider's perspective, what do you think are the advantages and disadvantages to using biometrics in healthcare service delivery? I know you have told me a bit but maybe you can highlight more

Respondent: Yeah on the advantages of the biometrics yah.... we are able to see a person physically unlike were we were using these other tools it was very difficult to see probably the client himself, but for this because it is a fingerprint for them to access all the information you have to put on the fingerprint of a person. But on the disadvantage is that you know our setup like our setup sometimes electricity is not there the whole system is down so you find all those problems on a... a electricity. Then the other problem that we can say is that when we have a very sick person whose unable to sit and put a fingerprint there on the same tool that we are using we find it a challenge

Interviewer: Now I want you to compare between the use of the ear and the fingerprint, ahh... how does using ears to identify a patient compare with the use of other marker, such as an Iris scan or a fingerprint?

Respondent: currently now I think the fingerprint is better

Interviewer: you can't imagine of the ear because it is suspended often are times it is not tempered, as you said often when someone is very ill and cannot put their thumb nor their finger there

Respondent: if it is combined we use the same biometric for the fingerprint and the ear it is fine since we are moving with technology because there is nothing we can do, we need to move with technology

Interviewer: ok, so... what do you think are some barriers to accepting the use of biometrics in this particular community? more especially that you are centrally positioned where some people are just on transit others maybe are just from nearby and marketers who just come here because it's a nearest clinic, so what do you think are some of the barriers of accepting the same system

Respondent: umm.... I think the barriers are Minimal especially that these people are coming in and going but the only barrier I can think of these clients some of them are just trans in because of the way the clinic is situated, it is just near intercity bus station so you would find they will come in they register we do all the..... we give all the services but at the end of it when they go to other facilities where they are not using this it becomes also a difficult here will remain with the

information but were they are going they cannot access it they need to go back to the some old system. So if it was centrally pushed on so that everywhere they can access it would be fine

Interviewer: ok, how do you imagine that end-users like you a clinician, parents and the children might react to the use of biometric? Like when they come for under-five clinic might react to the biometric system

Respondent: ummm as a parent it is good but you know we have these cultures were by somebody would be saying when you put your finger there you will have another disease you acquire another disease such kind of things, these things that the whites are bring inning probably they just want to kill us you know (laughing.....) those are the perceptions

Interviewer: now we look at the under-five I know you're not often there at MCH but you know something about the under-five being a clinician we imagine a situation where a mother walks into the clinic with an under-five with all the vaccinations are given. So the following questions boarder around the under-five card.

How often do you see a mother forgetting their child's under five card? (For example, on a weekly basis, how many times)

Respondent: forgetting or losing them there are some of the cases that we find, especially that this is a trans in clinic you would find that a mother came with the baby just for business purposes then they left the under-five somewhere else, so if they come..... if this was also integrated into on the under-five I think access to it, it will be okay but if its currently since it will be just like I said earlier on that it's not integrated in other centers whereby if they come for business they will not access those information, so I think for the under-five card like this it will be very difficult for them to access the information that is in the system, (someone knocking)

Interviewer: you were saying something

Respondent: yes, I was saying that for children for them forgetting, losing them I think it will be somehow a barrier, no it will be a good thing for them if they had to loss a card the baby will just put the finger there and the information will be accessed and to see what vaccines that they had been given, so it is a very nice thing for the babies

Interviewer: yeh... so how do you suspect this makes the mother feel when they loss a card or under-five card then they just walk into the clinic without that card?

Respondent: I think now it would be better now that they use both, the under-five and the biometric

Interviewer: In what kinds of situations do caregivers tend to forget to bring their under-five cards?

Respondent: In so many cases especially when I talk of Railway clinic just being the intercity some can just came for business then they will remember oh! They have come with the baby Oh! this baby wants vaccines or weight they want to check for the weight the under had remind probably in Kapiri or somewhere else, so they will come here explaining themselves you can't refuse to give them those access so if the biometric was centrally or within the whole system, its decentralized so that all districts or provinces gets it will be good because it will be easily access the information even without the under-five card

Interviewer: now when this does occur, what is the impact on delivery of care? Like when a mother or caregiver walks into the clinic without the under-five

Respondent: we do deliver services

Interviewer: so there isn't any negative outcome on the delivery of care?

Respondent: No

Interviewer: Now in general terms, what are the consequences when under-five cards are lost/degraded?

Respondent: the consequences how do you mean?

Interviewer: like a mother would walk in with a degraded under-five or maybe it is wet and everything is deleted?

Respondent: if it is wet you provide another one and copy all the information that was on the previous one

Interviewer: there is nothing like probably charging the mother for doing that or kind of hostility coming from the nurses

Respondent: for now we are not charging

Interviewer: now in what ways does lack of subject identification pose a barrier to delivery of care in your experience?

Respondent: (laughing) the barrier if a mother loses a card, the barriers will be there because like accessibility of the services, we would put that mother first on the wait and see those who got the cards first

Interviewer: Imagine the scenario where we were to instead use a biometric system, the scenario would be that you come into the clinic, and the clerk takes a picture of your child's ear, or a fingerprint, and would be able to pull up your under-five card.

Interviewer: Thinking of individuals like you, how do you imagine healthcare workers might react to the use of biometrics to support clinical care?

Respondent: it is fine in my experience in my view because the way I have seen it the few days that we have used it it is quicker, easy, because somebody will just go there and say put..... if he is already registered they will just put a fingerprint then they will record the date that, that person has come to access the services and access the service. So it is on the faster side of things

Interviewer: So how do you imagine other end users like you would probably hesitate and not like the system at all?

Respondent: No they wouldn't hesitate because we are moving with technology unless those who were born before computers (laughing)

Interviewer: what factors influence biometric technology acceptance attitude amongst health workers and the community?

Respondent: ummm..... I think for health workers it isn't much of a challenge unless for the community there is perception of saying no using your fingers to detect your identity will say no what it is for maybe there being used for other Satanism or ritual kind of practice

Interviewer: the common perception

Respondent: yes the common perception which ahh... the community has,

Interviewer: Ok

Respondent: I think that's the challenge which we have but for health workers I think we are accepting it something which we know will step out

Interviewer: ok

Respondent: yes

Interviewer: now what would affect its implementation?

Respondent: in health facilities?

Interviewer: in the facility

Respondent: aah..... sometimes we have had instances were by in the back up its failing us too so in that perception the client doesn't have a card, they just come hoping that we will just use the identity to scan but maybe we wouldn't have power that time so which means all their past records to pick up from it will not be available, so in that case we are just forced to use a temporal card, a new card and which will take more time and need to start probing from the history of the patient and the likes

Interviewer: ok, yah ahh... we just go to another question, my questions they seem similar, I hope you are able to pick them. What kinds of advantages do you see might come from biometrics in health care from the perspective of care providers?

Respondent: Advantage will be many because you will be able to access the previous information, the history, the background of that person who is an well who has come to access services, you are able to access the previous information of illness, because some they tend to cheat they had this condition they come back they will talk about another condition but with biometric I think we are able to access the information

Interviewer: Now are there any disadvantages you might see come from biometrics in health care from the perspective of care recipients?

Respondent: Disadvantages just like we said in terms of logistics, issues of power, and when the system fails sometimes it not be power but even the system themselves they fail so that's they were challenging, so that is disadvantages

Interviewer: Now we all come from communities' yah now thinking of people in the community or in the communities, what kind of concerns do you imagine people might have about the use of biometrics?

Respondent: It came at a wrong time when there is this program of Satanists..... Satanism and the gassing (laughing), the ritual issues, yes but otherwise it is a good thing as we are giving them information those who are coming to the facilities are able to adapt. A lot of our clients are appreciating the system

Interviewer: what kinds of ethical barriers might there be to the use of biometrics?

Respondent: Ethical barriers.....

Interviewer: Ok take for instance consenting, do the people consent when they come to use the biometrics or you just advise them to say there is this technology or innovation which has come on board you just have to follow in or there is a system for you accord the people time to choose?

Respondent: I think for that information you can get it from registry

Interviewer: Ok, so you don't think there are any ethical barriers which would arise?

Respondent: But for more information you just get from the registry to see if people are consent or they are not consenting or we are just forcing them, them are able to tell since us we are just receiving the clients here not knowing if they have accepted from registry part of it or not

Interviewer: Ok, as we are almost concluding, what do you think would delay or make the community hesitate to accept a new technology such as this? (and I want you to put it into perspective as per say since individuals are different, others adopt quickly, there are those who come late like the Laggards in that instance, what do you think will or might delay or make the community hesitate the technology such as this one we are talking about now?)

Respondent: I think on that one would be interest levels because they are a lot of people maybe they are an educated and are not up to date with the technologies and how things go about so we need more time to explain to the clients or the patients on how the system works because same it might take time to accept and they might even go in various communities even Spreading rumors, force, or negative perception about the biometric but I think the levels of illiteracy they are the ones which might delay the implementation or spread of the new biometric system. If people are more educated it is easy to understand the security Features in which the biometrics offers and the social advantage it offer to the clients

Interviewer: Ok, now as we conclude, are there any features you think should be put on this gadget or the way you think should have been designed. Is there a way you think as an individual that this should have been designed in this way?

Respondent: the way I think they didn't consider of those, although we have just heard about the ear, they never considered about those who are Amputated, yes, there are people who come with amputations if it was to be held out in UTH where in casualties there you will find somebody an arm was amputated so what would you use if it's both arms what are you going to use? Cause I only saw the right and the left. Even those who are born with defects (disabilities) in terms of the limbs probably they don't have so since you're talking of the ear then they can use the ear but even if the ear... even others they don't have this (laughing.....) then now you consider using the eye then there are other people who don't have eyes (continued laughing.....)

Interviewer: So it all borders around integrations

Respondent: yes

Interviewer: So for it to be accepted, what features do you think we can include on or the gadget you think should be used and would be easily acceptable by the people in terms of color (if it is black), so what do you think when it comes to acceptance to the community?

Respondent: You can change the color of the biometric tool to white or green ehh..... because black is always associated with African traditions (laughing.....)

Interviewer: What is that tradition?

Respondent: The tradition is that black is also associated with spiritual things yes

Interviewer: Is there anything you might want to add on acceptability of biometrics as a tool for child survival health promotion, is anything you can add on or subtract?

Respondent: Actually it is a good system and I feel it should continue for me it offers a good security probably information of the client, the one for smart care card anyone can get it and come with it but that one there is an assurance that the actual individual is the one here, because the fingerprint are the ones which will determine if the file is for the particular individual and it is a good move I wouldn't think of anything ahh.... negative or to subtract about it, I think the best is to roll it quickly to all parts of the country so that if am registered here today I can go to Shang'ombo the next day and my information will be accessed from there

Interviewer: So it all borders around it being centrally positioned so that people will be able to access healthcare in whichever point of our country they might be.

Respondent: Yes

Interviewer: Alright, thank you very much for according me this time

Interview with Nursing Officer in Chawama

Interviewer: My names are Arnold Muyamba Hamapa ahh... our research is basically aimed at biometrics we want to see is we can find any part of human being which can be used to identify individual in a health setup, and there are a set of question which I would like you to answer. Today is the 17th of February, 2020 and I'm talking to the Nurse in Charge (yes). So, maybe, just briefly you may tell me how long you have worked here?

Respondent: Ok, my names are Idah Zulu the nursing officer for Chawama level one hospital I have worked at Chawama since January 2017 to date

Interviewer: Have you worked elsewhere in the health field besides these place?

Respondent: Yes, I have worked in different areas, I have worked in different areas, I first worked at Lewanika urban health center and is in Mongu from 1997, and then I moved to Matero level one hospital where I was an in-charge from 2007 as a nurse in charge, and then I went in Chaisa 2012 then I was still a nurse in-charge in 2017 and still nurse in-charge

Interviewer: while you have quite vast experience, yes like I said that we are interested in knowing what can be used to identify a patient that walks into the clinic, and our research is focused in biometrics. Biometrics in itself is a personal features used to identify an individual. Take for instance fingerprint, face recognition, iris scanning, these are all examples of biometrics. Other examples where biometrics system are used are at the airport, with the police, sometimes fingerprinting is used to identify. Even to open a phone, a fingerprint is used to identify and unlock the phone-this is also an example of a biometric system. To get understand of your own experiences, we want to ask you: What are your personal experiences with biometric tools if you have ever used any?

Respondent: I personally, I have not used any, what I would say I will relate to ahh..... maybe it would be easy for you to elaborate..... what I know you are doing it's ahh.... dealing with the ear where you're able to ahh..... I have been involved in different researches and this one looks to be one of the new things that I have encountered

Interviewer: ok which is kind of unique

Respondent: unique on its own

Interviewer: yes when I say biometrics ahh.... all what we are trying to say is that these are personal features like your ear, yeh even your eyes, your fingerprints even your face can be used to identify someone. Others have gone feather to use the step like the way someone walks, so any feature that can be used to identify an individual as they walk in an institution

Respondent: ok

Interviewer: yes, so when we talk about biometrics that what we are inferring to and when we talk about a tool, is a gadget which we use which we use to extract data of biometric. So what we are doing basically is..... we want to understand how the ear grows and then eventually when we are done with identification or knowing how the ear grows up to what stage then we take it that know if it can be used to identify the individual as they walk into the hospital, so if I may ask again, like here you have SmartCare, you have a telephone where you use your fingerprint, so maybe you may tell me briefly about your experience

Respondent: using a phone.....

Interviewer: yes like a phone, use of SmartCare

Respondent: Maybe when I start with SmartCare, SmartCare how we are using it, SmartCare you have to enter a persons' history, persons' biographical data ok, so meaning you are going to identify a patient by the NRC, by the sex, and the age, because when you look at the name alone it does not identify patient in SmartCare because if you say Jean Zulu, they maybe about fifteen Jean Zulu that will come so what will identify a patient in SmartCare it would be the NRC if they have, the age, residential area, so they're things that you may look at which may be different from other people otherwise just the name is very difficult to identify a patient

Interviewer: Ok, do you have any kind of such ahh.... biometric tools here at Chawama?

Respondent: Which like the one that you're using?

Interviewer: Yes

Respondent: Where we have to asses like take one part of the body and then asses

Interviewer: no like you have SmartCare

Respondent: Yes we have SmartCare, yes, yes we have SmartCare in all departments we are using SmartCare, we are e-first,

Interviewer: ok e-first is good and is faster

Respondent: yes

Interviewer: from a provider perspective, what do you think are the advantages and disadvantages to using biometrics in healthcare service delivery?

Respondent: ahh..... advantages is ahh..... it will help us to see..... it will help us to to to deal with the individual you're dealing with cause you will be dealing with the exact person, yes that's one advantage cause it is like like the way you are doing, you will be, that one will identify an individual you're not going to deal with, at times in our health sector we have had just like using cards somebody can present the card which is not theirs' that has been. So there is no much confusion of dealing with another person, we have had times when patients have dead and they used a different card which was not theirs' and at the end of the day they do go for swearing they do a lot, so that is the disadvantage of not using a proper gadget for us to identify an individual

Interviewer: and some of the disadvantages you may think about?

Respondent: ehh..... Disadvantage of using the gadget?

Interviewer: using the biometrics?

Respondent: ummm maybe disadvantage are if one person is not trained to use it, that is the disadvantage, they may not do it correctly. Then the other thing that I have seen as a disadvantage it takes time when you look at SmartCare, SmartCare takes a lot of time and when one worry that we have have with SmartCare is the data, ever since SmartCare was introduced data has not been good. I found that when you talk about ART I found that patients that were three thirteen thousand as am talking to you now we are at nine thousand it loses data, so meaning it does not tell you the exact work that you are doing, like even the total number of patients in the departments it's not known and when you look at the patients who is in OPD, they are referred to In-patient when a doctor in In-patient opens their page it is blank, when they are sent to physio when they open the page is blank, so to me those are disadvantages because it is like we are losing a lot of data

Interviewer: So much is desired to

Respondent: yes much is left to be desired

Interviewer: so how does using the ear, while at list you have heard about the ear to identify they patient compare with using other markers such as an iris scan or a fingerprint, if we are to use an ear to identify an individual, how does it compare with an iris or your face, your fingerprint which definitely are used at the airport or a bank setup all those are used?

Respondent: I feel ahh.....the ear will be too much exact you see what I mean ahh it's like but that the part which is never used much of the times so it's like it will also give the exact thing that you are looking for cause we don't use the ear most of the times so to me that's how I feel and when you look at the iris there is a lot of damage but when you look into the ear, there is rear damage to it yah

Interviewer: So what do you think are some of the barriers to accepting the use of biometrics in this particular community/district?

Respondent: One thing is culture people have not gotten used to using gadgets to be identified so you will find that you need to give more information before you start evening doing it, because to them what you're doing maybe related to other is it ritual why are they doing this to me and so forth, there is this issue linking to ritual and its irrespective of where we are

Interviewer: so it about the setup of where we are so there is really need to sensitize people even before you even begin to use such instruments?

Respondent: yes

Interviewer: Now how do you imagine that end-users (clinicians, parents and children) might react to the use of biometric system? When they walk into the facility and they find that those things are there and even clinicians who are handling them

Respondent: yeh, for clinicians who are handling patients being introduced to a new thing usually there is that reaction or rejection, people don't want to startup a new thing, they want to use the thing that they have been using they will react to it and it would take time for them to accept to be there, and for the patients who have not been subject to it they do not understand also they will be that why? They will ask why today? Why not the normal way?

Interviewer: Now we just look at the under-five card, we are also interested to knowing about under-five care, and how the under-five card is currently used to coordinate care. Taking for example under-five visits, the under-five card is used. For example, when a mother comes to the clinic to get a vaccination for her child, she presents the under-five card and the vaccination is given and recorded. How often do you see a mother forgetting their child under-five card?

Respondent: Most of the times,

Interviewer: you mean most of the time?

Respondent: yes most of the times mothers do not come with them and we just manage patients, because remember when a mother comes, our focus in on a child who is feeling sick so are not going to focus much on the under-five card. At times they used to chase them back you go and it brought a lot of confusion because others were dying, I don't have others don't even have so it is very very common to have a mother who comes in for care without an under-five card

Interviewer: While, that is interesting, ahh..... Now I want you to imagine of a mother who had left or probably had lost the under-five, how do you suspect this makes the mother feel?

Respondent: The mother feels so bad because it is like the they won't manage to go back to how the child was managed and if maybe she did not even understand the number what they ehh..... The vaccine was given to the child, so to me it is really it's critical

Interviewer: Yeah so, in what kinds of situations do you think, like, I know you have given me one where a mother just rash into the hospital, now are there any other instances where a mother would be forced or made to forget the under-five card

Respondent: ehh..... one way when a child is very critical they not even for the under-five card and ehh..... at times is the way they keep their things, yes, the child is sick they can't find it, it is the what they keep their things they may forget, they may come with it

Interviewer: ok

Respondent: yes

Interviewer: Now ahh..... When this does occur, what is the impact of delivery of care? Please cite specific examples of where a missing card interfered with care

Respondent: The impact is that one you may not understand if the child is malnourished, you may not even understand when did the child start stunting cause you need to understand about that stunting, then also vaccinations we would want to know at what stage does child received so far but if the under-five card is not their it is very difficult because you start assuming yes....

Interviewer: Now having been in this system for a long time with that vast experience, I just want you to pick one scenario where a mother walked into a facility and had forgotten the under-five card, what really happened?

Respondent: I remember because I like doing the IMC eye screening that is IMC integrated medical care of child illness, so now this mother came in the child was burnt so just rushed because the child was burnt the whole body, so now remember whatever care that we want to do we also want to relate what is the weight of a child at a time before we even weigh the child after the child the..... we couldn't get the under-five card but what it is, is that we looked at the burnt child and so we had to prioritize the baby, so we had to weigh the mother first, then weigh the mother together with the baby so that is what we are subjected to have the actual weight that we are looking

for for the child but understanding how the weight had been it was very quiet difficult and but the child was still managed but the mother was encouraged to make insure that the under-five comes

Interviewer: Alright that was good, in like general terms, what are the consequences when under-five cards are lost/degraded?

Respondent: yeh... the consequences are that the mothers.... imagine the mother could have just received.... the baby could have just received maybe remember that we give BCG, we give the PENTA the one we give at six weeks then after six weeks we do at a month, so a mother who might loss it maybe after receiving a child's three..... without even receiving measles may end up staying home and saying how do I do it and you know the difficulty of getting a new under-five card there are times when we do not have under-five cards becomes a challenge, so you may find that the impact could be the children being vaccinated between they won't vaccinate to finish because we supposed to finish at 18 months. Then also the other impact is to if they're malnourished to understand how the child had been fearing, babies could still be looked to the disease they have now or the child has been stunting for a longer time, it would be difficult for you to understand cause you start assuming

Interviewer: So, in what ways does lack of subject identification pose a barrier to delivery of care in your experience?

Respondent: like the under-five card?

Interviewer: yes

Respondent: it is a challenge, when we don't have or just using it?

Interviewer: like anything to use on identifying an individual when they walk in the clinic

Respondent: It's a challenge because if somebody comes like maybe a child has just been picked brought to the hospital, with no identification it is very difficult this were we have ended up taking some the hospital mortuary with any identification and they are an clamed bodies at the end of the day, because there is no identification, because there is no one, at times you may find that if these are a bit grown it would be difficult to trace

Interviewer: Like what SDA a did yesterday where they buried about 25 an clamed bodies from UTH

Respondent: yes

Interviewer: so those are the effects of lack of identification

Respondent: Those are effects cause you end up being an clamed because no one is going to trace, there is no trace at all, because there is no card, there is no anything to delay but if there was anything to identify this patient you just do like the gadget it may be easier, we may be able to link the patient to somewhere

Interviewer: ok, now I want to imagine a scenario where we were to instead use a biometric system, the scenario would be that you come into the clinic, and the clerk takes a picture of your child's ear, or fingerprint, and would be able to pull up your under-five card. Thinking of individuals like you, how do you imagine healthcare workers might react to the use of biometrics to support clinical care?

Respondent: At first without the information they might react to it but after the healthcare workers have been oriented to understand the importance it it it they may support the venture, because one they may realize ehh.... those that come without IDs it will be easy for you to identify by just using a gadget but that will only go on with orientations, understanding. Remember when someone does not understand anything they may just react and also reject the thing, now that can't just work. I have done a lot of things in our facility were people have told me that can't work. Remember we were doing ahh..... ummm in postnatal ward the they were keeping mothers, the the the mothers

who come from Caesar they were being ehh..... what was happening the mothers from Caesar they were having a bed sider so now when I said that we do not need bed siders what happened was they reacted, they said no it can't work then what did I do? I told them it will work but then I gave them like let's see what happens from today on wards we not going to have a bed sider. So what happened was we never had a bed sider and the following morning I went there, how was it then they said it was okay and tell me the mother who used to workup after three days they are now working up after 8 hours they are seated. So they realized the importance so it is like we have to allow the healthcare workers to participate, to be part and parcel of the biometric to understand the importance that they will see and they will love to have it (yes)

Interviewer: Now, what factors influence biometric technology acceptance attitude amongst health workers and the community?

Respondent: When they themselves are trained they do it. The factor is to do and understand what is happening that's it, that is the only factor because the factor is to understand the importance of doing it, then understand how to do it they become part and parcel of it the sense of ownership and belonging

Interviewer: Now when it comes to implementation of biometrics in a health facility what factors do you think would help to speed up the implementation intention in health facilities?

Respondent: One is the management like we have the senior management we are about six who are at senior management if we are buying in, senior management buys in the process that is what helps things cause if the management rejects what has come in it becomes a problem but if management accepts and be part and parcel of doing the implementation it works. I know what it means when there are even workshops like today people have gone for a workshop, they were not involved the other time no body was at a workshop but today the whole team has gone, because we were fully involved to be part and parcel of the process

Interviewer: No, thinking of people in your community, what kinds of concerns do you imagine people might have about the use of biometrics?

Respondent: The concerns could be you know most of the times when anything has started they refer it to ritual killing the ritual so the concern would be why now today we are now using this other than the, thing that is what I was saying they ask why? Why? Why not just a card? Why not just a thing.... and now we are using the ear why? So that is a concern to say why? And if people have been informed then it becomes a different issue

Interviewer: Now would do you think there are any ethical barriers to the use of biometrics?

Respondent: There are no much, there are no ethical barriers in using ahh..... biometric because it does one you're not removing blood right, you're not doing anything but is just attaching trying to use the ear and there is no anything that is changing, what is changing is to understand, you're trying to learn how do we know that this is Idah, using the gadget

Interviewer: Now, in the whole system like health sector, when it comes to adoption, what can be done for it to be adopted quickly?

Respondent: What can be done for it to be adopted its ahh..... the we need to pilot like you're piloting Chawama, you scale up again for the pilot, you done one facility then you get about we are six level hospitals right, with Chawama you also take up maybe few or just from Chawama pilot if it can start presentations on what has happened and what is happening that's the only way. Chawama can be a pilot and start having meetings with other facilities to understand what is happening. But that should start with Chawama first cause you may ask a person from Chawama what about this? ahh.... me I don't know, so it has to be the whole Chawama then to buy in, need

to be part and parcel then you start scaling up, scaling up meaning to just have meetings with different to say this the new way of doing things (yes)

Interviewer: so, yes, what are some of the advantages you see to this type of system to identify patients compared to the old system? I know they have been systems before.

Respondent: One advantage is ahh..... to me one advantage what I see is easy and quicker way of knowing whom am I dealing with, it is too quickie although people might think because we are using a gadget because issues of gadgets can be a challenge and so forth but to me is a quicker way of identifying a person.

Interviewer: Ahh... you have mentioned a challenge, but could there be disadvantages if we were to remove the old system?

Respondent: yeah that is what I usually tell people when you're bringing in a new gadget we shouldn't wean off the old things that we have, why? The gadget might not work at that particular time so if we had removed all the things that we have what happens. So that's what we did with SmartCare people removed registers and what has happened with no data what do you do? Because you have to count from the registers to see what we are doing, so we can do parallel until a time where people feel now we are now stumble that's how you can do it

Interviewer: Ahh... even as we are getting close to the end, I just want you to tell me something because I know definitely in the community or at a facility, you discover that people accept anything or any innovation differently and at different stages while in this setup, how do people take up like?

Respondent: Ahh.... what I have realized us because we have used the neighborhood health committees they tend to take things easily cause like I can give you an example: we do not have a mortuary now but we had to push this information to the neighborhood health committee who sat with the larger community and already people came to do a survey to say the CDF is going to work on the mortuary. So to me they take up things so easily, quicker, they are not so like reluctant but if you use the correct channels, you can use the chair person, neighborhood committees you inform them then they are going to inform the larger community

Interviewer: So even as we are closing now I just want you to imagine, I don't know if you have seen our gadget the one we are using

Respondent: I saw it when it was being introduced

Interviewer: from what you saw, what improvement do you think can be done to that gadget for it to be accepted quickly?

Respondent: The way I saw it, it looked a little beat bigger if it can also be just made a small one to be easier so that somebody doesn't feel like threatened like you know how children get threatened they would cry just looking at the thing that is coming to them, so yes if it is made up smaller you can just do that I think that is the better way

Interviewer: so it has to be very compatible

Respondent: yes

Interviewer: Are there anything that you think you would like to add?

Respondent: To me what I would want to say is innovation is the best way to do, unlike just sticking to doing things we have been doing is not a better way to do it but to improve the health system we need consented efforts, we need everybody to bring in and also buying in the ideas that come to change what we are doing is also the best way to do because it assists in us to improve the.... whatever we are doing and also to reduce the issues that are happening, burring the an clamed bodies we are doing that so to me is the better way. So we need to bring in everybody on the table, allow everybody to participate, late everybody be the driver. So the people bringing in the

innovation should not be the drivers, allow the people on the ground to be the part and parcel of the driving on the driving wile

Interviewer: Now to just sum-up, do you think there is need for patient or client when they walk into the facility to be able to consent before their biometric is taken?

Respondent: I don't think so, the biometric is not very complicated that it needs like you're removing blood you're doing this for because even removing blood for HB and for anything you don't need to consent. So what more of just attaching to the ear, what consent do people need, so it's just people understand ahh.... to me there is no need of a consent

Interviewer: Thank you very much for according me this time and my apology for taking your time

Respondent: No problem no problem that is why I am here, thank you very much, I was worried I thought it was a very difficult interview.

Interview with Nurse in Charge at Railways Clinic in Lusaka

Interviewer: Good afternoon madam

Respondent: Good afternoon Sir

Interviewer: My names are (name) I'm a master student at Ridgeway doing MPH in Health promotion and Education, and I am curing out a research on Acceptability of biometrics as a tool for child survival health promotion strategies in cross cultural settings in Kalomo and Lusaka districts. it is in collaboration with Boston University were we a trying to understand the growth of the ear and if it can be used for human identification in a health setup therefore, i have a set of question which i would like you to answer, depending on the way you understand them you may give me your own view, your perception and your thoughts on how the community looks on this biometric and the biometric tools. Because a biometric is a human part which can be used for to identify an individual while a biometric tool is ahh..... is a gadget which help to extract that ehh..... Biometric which would be used as an identifier, ahh..... just to begin with:

Respondent: how long have you worked here at Railways Clinic?

Interviewer: ummmm my names are (Modline Simango) and a health center in Charge and I came to Railway clinic in August 2018 so in August I think I will be two years

Respondent: like you side in August, where else have you worked in the health field?

Interviewer: I worked at Chainda, Kalingalinga, Mutendele, my first posting was also at UTH

Interviewer: ok

Respondent: ummm

Interviewer Alright, we are interested to know what can be used to identify a patient that walks into the clinic such as this one where they don't come with anything but when they come just themselves and we have something to identify them unlike the numbers and other ways of identify people currently. So, what are your personal experiences with biometric tools?

Respondent: From the time it was introduced I think this the second week were people are just using their finger prints the ring finger and the index finger ahh.... I can say so far so good people have accepted it and after.... because every morning we give them health education we just trying to tell them the new system which has come! The advantages of the some system

Interviewer: so like, would you tell me the name of the tool or probably you're not yet acquainted with the tool the one which is being used here?

Respondent: (laughing) ehh..... I just know it as biometric where we take the fingers ehh.... the finger print

Interviewer: So what is the purpose of taking those finger prints?

Respondent: ehh..... the purpose is that (1) it will reduce on..... duplication and even where clients maybe will say no I lost my card with biometrics will be no need because per once the finger prints are captured will still find the information for the client

Interviewer: Alright our research is around the use of similar types of biometrics system to identify a patient that walks into the clinic. Even the ear can be used to identify someone. There is currently a project running at Chawama Clinic in Lusaka using this some gadget called the donate. Therefore we like to understand from a provider's perspective, what do you think are the advantages and disadvantages to using biometrics in healthcare delivery?

Respondent: (someone knocking at the door) the advantages is (1) umm..... you can reduce on duplication, (2) as at ehh..... (Someone walked in)

Interviewer: You were talking on advantages

Respondent: Yes I was talking on advantages, I think the way I said we want to reduce on the ehh..... duplication the number of duplications of records of clients, yes then also its also adventurers ahh.... advantages in a way that ehh..... that there is improved data quality and we also want to have just ehh... that unique identification for each client

Interviewer: Ok, and any disadvantages that you think may arise as a result of the use of that system

Respondent: ummm..... maybe the only disadvantage which can be there if for example if you have ummm..... someone who is disabled since you are using fingers, in case of disability or in a situation whereby you are using finger print like this we are almost at the end of..... almost in that period of elections maybe some people will start thinking otherwise to say maybe they want to get our fingers so that they use them maybe for voting or the other disadvantage is maybe people can fail to accept it if you are not giving them enough information

Interviewer: Alright, now I just you to compare between the use of the ear as an identifier and other markers, such as an iris scan or a fingerprint, how do you compare them?

Respondent: Ear and the Iris?

Interviewer: Yes

Respondent: ummm for the ear just the way I said it (laughing)..... the ear depending on what stage you take the some biometrics if you take it at an early stage maybe less than one year that person will come maybe after a year or two maybe it will give a different (I don't know how I can call it) a different idea or view

Interviewer: Or probably it may not be able to identify

Respondent: to identify the client because it would be like a different person now since the ear grows

Interviewer: Alright,

Respondent: then for the iris maybe in teams of age or disease it will still be different again

Interviewer: Ok, what do you think are some barriers to accepting the use of biometrics in this particular community/district or let's take for instance Lusaka as a whole, would be the barriers to acceptance?

Respondent: Are they not just the same as disadvantages?

Interviewer: No, what would stop it from being accepted?

Respondent: from being accepted by the community, just the way i said, if people do not have enough information so we need to sensitize people just the way we do every morning before we start we always give health education and we always mention about it and we haven't faced any problems so if people are given that information and the reasons why we have resorted to using that than the cards and people understand they will be no problem but if people are lacking that information or they ignorant about it they will refuse

Interviewer: Ok, yeh now I want you to just put it into perspective like the community of those who come here they are taught but they are others who by the time it has been rolled countrywide they may never have walked into the clinic and now they just walk into the clinic and they happen to find that..... how do you imagine that end-users (clinicians, parents, and children) might react to the use of biometrics and those who come for under five?

Respondent: meaning they have not heard about it

Interviewer: they have not heard about it.... I want to imagine how they would react

Respondent: just the way I said it, if people are lacking information they will not always accept something especially were they are using fingerprints others maybe would think especially if someone is maybe is..... I will give you an example of a criminal they will think maybe by getting their fingerprints is one way of wanting to us wanting maybe to catch them or to report them to the police so it depends how someone can take it

Interviewer: now I want us to look at the under-five card, registry (patient ID)

Respondent: for a baby

Interviewer: yes

Respondent: we are also interested in knowing more about under five care, and how the under-five card is currently used to coordinate care. Taking for example under five visits, the under-five card is used. For example, when a mother comes to the clinic to get a vaccination for her child, she presents the under-five card and the vaccination is given and recorded.

Interviewer: How often do you see a mother forgetting their under-five card? (For example, on a weekly basis, how many times?)

Respondent: ummm on rear cases because most of the times they are told to say when you come here without an under-five card, it's either because of late sometimes there are shortages of under-five cards, it's either that person was not given or other will say it was stolen ehh..... Some will just say ummm.... maybe it's damaged but it is very rear because they know that when they come to the clinic they have to come with an under-five card because for doctors to give you drugs they have to look at the weight of that baby

Interviewer: Now I want to imagine ahh.. or how do you suspect this makes the mother feel when they forget the under-five card or lost or probably it is damaged ?

Respondent: (1) they feel bad (2) they feel scared due to that maybe at they clinic people will start saying you're careless or what

Interviewer: In what kinds of situations do caregivers tend to forget to bring their under-five cards? it is almost similar question as above but in what kinds of situations do caregivers tend to forget?

Respondent: ehh.... for example ehh... in an emergence for example this woman is a marketers she is in town with a baby meaning the the under-five is at home if the baby is sick while she is in town maybe she will just come here with the under-five card

Interviewer: Ok, when this does occur, what is the impact on delivery of care?

Respondent: the child will be attended to maybe they get a new weight and then attend to the child will not say maybe because you didn't bring the card you have to go back and get it will attend to that child

Interviewer: is there an example you can cite where mother walked into the facility, at least you can cite any examples of where a missing card interfered with care

Respondent: ok like here since we are in town just the example I have given most of these people we see around here it's either they are marketers of they are just selling something just around here

or they were just in town the baby is sick they will come to Railways clinic being the clinic which is in town then they will come to the clinic

Interviewer: Ok, are there any consequences when the under five cards are lost/degraded?

Respondent: ummm..... maybe the only consequence is that you loss for example some of the information for the baby like it will be difficult to follow, for example if you give a new card you will not be able to write the other weights that were done before because you only start from where you.... from that day but like consequence like maybe taken to the police or what we don't we just issue maybe a new one if we have

Interviewer: there is nothing like you charge them or sending them back home

Respondent: we don't charge them but others will just maybe just buy from somewhere, because some chemistry they sell maybe she will come with an under-five bought from somewhere, but if we have them at the clinic we give them for free

Interviewer: In what ways does lack of subject identification pose a barrier to delivery of care in your experience?

Respondent: the under-five....

Interviewer: Yes any as long as is used as an identifier in a facility

Respondent: Just the way I said that they will be no barrier because will attend to that child but will just issue new document (laughing) just the way I said there is no barrier will still issue a new document

Interviewer: Imagine the scenario where we were to instead use a biometric system, the scenario would be that you come into the clinic, and the clerk takes a picture of your child's ear, or fingerprint, and would be able to pull up your under five card.

Interviewer: Now, thinking of individuals like you, how do you imagine healthcare workers might react to the use of biometrics to support clinical care? (I don't know if you picked the question or should I repeat myself)

Respondent: You may repeat

Interviewer: thinking of individuals like you, how do you imagine healthcare workers might react to the use of biometrics to support clinical care?

Respondent: I think like here, I think people are very happy because we no longer have a situation where by we start making those called TC like temporal cards, those if someone's fingers were captured it means will just straight away just go into the system and will find that client.

Interviewer: what factors influence biometric technology acceptance attitude amongst health workers and the community?

Respondent: the factors that will influence.....

Interviewer: yes

Respondent: ummm..... one we need to educate people, health education is really important, even sensitization in the community to our stakeholders so that ehh.... people know even when they come here that there is this thing the biometrics they introduced at the clinic

Interviewer: what factors affect biometric implementation intention in health facilities?

Respondent: the factors that will influence when it comes to implementation....or what will hinder

Interviewer: yes like what will hinder or speed its adoption

Respondent: let say the use or acceptability

Interviewer: yes

Respondent: just the way i said health education, sensitization yes

Interviewer: Alright when comes to barriers to adoption (I am just changing a few words when it comes to adoption, what barriers do you for see)

Respondent: on the part of the community or the health workers?

Interviewer: While just the health workers at a facility like this one

Respondent: on the issues of barriers like here we are just using fingerprints maybe if someone is disabled that could be a barrier or if someone is disabled, or lack of..... people who are Ignorant it can also be a barrier then in a case of some people like criminals, I think they will Hastert to get their finger prints because they know that maybe that us being in town and we near the police they would think maybe is one way of handing them over to the police (laughing) like you want to crucify them so it can also be a barrier so we need a lot of sensitization and a lot of education to the people so that they understand

Interviewer: what are some advantages that you see to this type of system to identify patients compared to the old system?

Respondent: the advantages ehh.... the advantages are the same as the benefits

Interviewer: yes

Respondent: Just the way I said ummm.... will avoid on duplication of information or some clients to be appearing in the system so many times then it will also improve on our data quality on the retention for example those patients on..... patients with HIV then we are also going to identify clients as a unique.... clients will be identified in a unique way because we have different fingerprints, even the ear obvious when we start using the ear obvious it will have every person will have his or her own ear

Interviewer: What do you think will delay the community hesitate to accept a new technology such as this? now I want you to look at it in this dimension, they are different people in the community the way or the rate at which they accept something, others might take it upon just hearing about it others would follow while others would be on the middle and others would be like laggard or they will delay hence in that regard I want you to look at that in answering to this question.

Respondent: what will make people or what will make that they fail the biometric.....?

Interviewer: to delay!

Respondent: Oh! To delay in acceptability

Interviewer: to delay in accepting a new technology

Respondent: while if maybe if if we are using that thing for example you get my finger like fingers fingers this time then the next time when I come, the next time if you are not capturing the right ehh..... or we loss what we capture then the next time clients will come maybe they will refuse to say even last time you did the same but maybe we could not find my information but if you're doing the right thing and we capture our clients Properly will won't have any problems

Interviewer: use of ear biometric in health field- summary of opinion, what kind of features do you think a biometric system should have to improve acceptance?

Respondent: the features?

Interviewer: yes at least you have an experience of one which is being used here

Respondent: the fingers.....

Interviewer: yes now when you looked at that tool

Respondent: so maybe there are some advantages for like the disabled....

Interviewer: you can look at it in all dimensions because you have seen that gadget which is being used to take a fingerprint then when you look at that, when you yourself think should have been done or improvements or subtractions so that it will accommodated all kinds of people. Then people would accept it or people would not have any ill feeling about it

Respondent: umm.... maybe ummmm..... maybe adding other features like the ear, since I said maybe it would be not maybe it would be difficult for people who are disabled but maybe the ear is just okay, maybe the people, the clinicians can be taught on how to use the ear also or the iris depending on what can be available (laughing) than just using the fingers. Suppose someone has no fingers it would be difficult so if they have no fingers maybe you can use an alternative maybe the ear or the eye

Interviewer: While, thank you very much it were a very good interview and thank you for welcoming me to your beautiful office and ehh..... the time is 14:09 hours, thank you once more.

Respondent: Thank you and you're welcome