USING ART TO ENGAGE THE PUBLIC IN HYGIENE AND SANITATION RESEARCH

Kiagho Kilonzo[1]

Abstract

The twentieth century saw a huge increase worldwide in the presence of the arts in organisations and institutions involved in healthcare activities, including public health care research conducted in various countries. This article shows the impact of using art to engage literate and non-literate people in the pro-active translation of research outcomes into their own cultural practices and their personal decisions affecting their health status. The study demonstrates that art can be of use in changing social behaviour and therefore to improve public health records in statistically significant ways. This work also demonstrates that the term 'art' refers to more than a means of entertainment and passive appreciation of aesthetics; the effectiveness of art is tangible and its impact is measurable as a mode of education, and as providing a deeply needed instructive incentive for hygienic and sanitation transformation.

Keywords: *public health, art-driven social engineering, behavioural change, hygiene and sanitation research*

Introduction

Most Africans and other societies in developing countries have been facing severe health problems for a very long time, including infectious diseases (malaria, sleeping sickness, tuberculosis (TB), typhoid fever, relapsing fever, cholera, plague and leprosy) which according to Yoshikawa (2009) account for over one-third of the deaths in the world. Other scholars including Magombedze (2006), Garira (2006), Mwenje (2006), North (2004) and Yu-Jin (2004) emphasise that although there has been development of effective therapy, for instance to cure TB, the Mycobacterium tuberculosis remains virulently fatal at high rates especially in developing countries, with sub-Saharan African countries having the highest incidence per capita (Okuonghae and Korobeinikov 2013: 79). Transmission of tuberculosis might

[1] Department of Creative Arts, University of Dar es Salaam, Tanzania

have transferred from domestic animals to humans during the early agricultural settlements.

Regardless of its original source, however, and despite the presence of well-established means of prevention and control, TB and other infectious diseases remain rampant and even endemic in many developing countries, including Tanzania.

Several health campaigns such as *Mtu ni Afya* and *Chakula ni Uhai* have been established to fight against chronic contagions in Tanzania, but the conditions exacerbating poor public health and easy transmission of air-borne and water-borne pathogens are still the norm. The epidemiological reports remain consistently grim over the last two decades, as specified by Magombedze (2006), Garira (2006), Mwenje (2006), Schluger (1998) and Rom (1998). Currently, the total number of people annually infected with actively contagious diseases in Tanzania ranges from eight to twelve million, leading to 3 million deaths annually,

Many economic, socio-cultural, and educational factors are responsible for the long-term and world-wide persistence of public health threats through contagious disease especially in the global South.

The focus of this paper is the importance of public health education campaigning; for all of these factors prevent the dissemination of knowledge about conditions that undermine good health, as much as the conditions facilitate transmission of the pathogens. A quick survey shows that knowledge about contagious disease prevention is defeated most often by the severe obstacles and many limitations to community participation in programmes aimed at controlling and preventing a range of preventable contagious disease. For instance, in Tanzania there are irregular or severely restricted home visits of health personnel in most areas affected by high incidence of contagious disease. Most often, inappropriate methods of teaching are used in the provision of health education from central points of dissemination to the general public. The research presented here addresses this particular problem.

In Tanzania, the areas most badly affected by chronic contagions are located in remote sites, as observed in this study. Four villages (Visiga, Bembeza, Mianzi and Msanga) were the sites chosen for this research, located in the Kisarawe District, about sixty-four kilometres southwest of the major commercial city in Tanzania, Dar es Salaam. Infrastructure including the road systems to and from these villages is in poor condition, and this discourages health personnel from visiting homes frequently and regularly. The limited

community participation in health programmes has also been a partial factor in perpetuating conditions conducive to the spread of infectious disease.

In these specified communities, one key to the difficulty of building and sustaining public health has been the failure to convey effectively the required health education to the community. On many occasions, such education has been offered through health education programmes, by using formal methods in seminars and lectures in classrooms. This approach has been fairly ineffective for the target beneficiaries, most of whom are non-literate and absorbed in work schedules and child care, which prohibit taking time off from daily schedules to attend workshops and training sessions. Those who attend these sessions fail to grasp the information because of the way it is supplied. As such it is very likely that most members of the community are not exposed to such health information in the way it needs to absorbed to affect behaviour; and for those who have been exposed to the training, the information has not been well understood. For lack of understanding, basic measures to improve conditions have not been adhered to by the majority of community members. Hence the problem of public health has persisted to date; and the problem of chronic contagions and endemic disease is still substantial.

The key to public health education is to impact the social factors that inhibit good sanitation and preventative hygiene practices. Social factors include individual behaviour patterns and habits. For instance, it is widely recognised in most portions of the population of G-8 countries that people should always boil water before drinking, in order to kill water-borne pathogens such as those responsible for amoebic dysentery, typhoid and cholera. Yet this rule of thumb is not universally recognised. Many people in economically developing countries have the habit of drinking water directly from taps, springs, rivulets, ponds, lagoons, rivers, lakes and wells in the rural areas without boiling, thus being infected potentially with fatal water-borne diseases.

Other culturally embedded routines and customs carry tangibly negative effects for public health. This is because social conditioning, good manners, individual daily habits and proper personal grooming are deeply influenced by taboos as well as spiritual beliefs, some of which, in turn, facilitate transmission of various contagious diseases.

In some societies, for instance, children are forbidden to know if and when elders defecate. This cultural norm indirectly facilitates transmission of infectious diseases of the gastro-intestinal tract and related fatal contagions. These taboos discourage families from building toilet facilities. The priority is to protect elders (especially males) from being seen by children when visiting

such facilities. In some societies, having a toilet facility in the household would result in breaking the taboo, since youngsters would see elders using toilets, an occurrence which would give justifiable cause for mocking or cursing the elders. With no toilet facilities in households, elders sneak into bushes for defecation. And yet diarrhoea, by far the world's most dangerous threat to the life of children under five, is caused by this widespread practice of open defecation – since every rainy season, faecal matter in surface soil is mixed together into the general public drinking supply through rain run-off.[2]

When a child inquires about the move of a male authority into the bush, he or she would be told that the father went to the bush to find some medicines, a notion that reflects a familiar fact for most living in African societies. It is known that most of the African indigenous medical preparations come from the bush, through tree leaves, barks, and roots.[3] For example, in Nigeria, Bever (1986) discusses the role of biodiversity in the development of local medicaments as well as the manner in which individuals seek medical attention when they are ill. Bever distinguishes three categories of indigenous medical experts in West African Yoruba speaking communities: herbalists, *ifas*, and *juju* men. The herbalists provide the public in great quantity a variety of essentially effective medicines based directly on plants, which are often sold in the market to people who search for cures. These plants grow in the bushes; and some of them in the local neighbourhood surroundings, though not everyone knows which familiar plants have medicinal properties and what they cure; this requires expertise. The *ifa* use the appropriate plants, which they believe possess the spirits that are stronger than the disease caused by bad spirits. This group of doctors and their patients believe that the spiritual power of a particular species of plant, or the soul of the medicine, is functionless until the healer speaks the appropriate incantation over the plant. On the other side, the *juju* men usually get the support of the gods directly through magic and tribal rituals to treat various problems affecting their applicants. Apart from treating diseases, they are also required to be rainmakers. Therefore, the two healing activities of the first two groups (herbalists and *ifas*) to a large extent depend upon wild trees, found in the bush and in huge forests.

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[2] Dr. Phyllis Mary Antwi, University of Ghana School of Public Health, and is Honorary Secretary of the Faculty of Public Health in the Ghana College of Doctors and Surgeons, May 2012, in conversation.

[3] In Ghana, as most of West Africa, over sixty per cent of the population relies successfully on local herbal preparations for curing chronic contagions and the most prevalent illnesses. Professor A.B. Akosa, former Director General of the Ghana Health Service, in his Fellow's Inaugural Lecture "Thinking forward, moving forward: the future of Ghana's health care delivery," delivered to the Ghana Academy of Arts and Sciences, November 11, 2010.

As noted already, in many societies the standard reliance upon workshops and seminars to disseminate facts and to promote health education throughout the general public has proven to be of little value. Therefore it is clearly worth testing the efficacy of alternative methods for educating communities about preventative health care through their everyday activities. Such education, which aims to translate the outcomes and recommendations from well-established research on public health matters, must be delivered appropriately if it is to be clearly understood by the target audience. The alternative method that was proposed and tested in this study was the use of simple and clearly illustrated images. This study explored systematically whether and how people can be educated on health matters by using simple drawings. It was discovered that the contextual perception of illustrated images is indeed educative and persuasive to both literates and non-literates. Pictorial demonstrations can persuade people to change very deeply ingrained behaviour patterns and habits that pose great health risks, such as defecating in bushes, improper hand washing before eating, and drinking water before boiling it.

Drawings convey knowledge

Art has been used by humans as a means of instruction since pre-historic times. In central Tanzania for example, most pre-historic dwellers in Iramba, Kondoa and Mbulu districts in the regions of Singida, Dodoma and Manyara, respectively as can be seen in figure1, communicated through artworks which were drawn, painted or engraved on stone surfaces (the widely acclaimed rock art). Visitors from all over the world come to admire Tananzia's heritage of rock art. According to Anati (1986: 24), there is some evidence which suggests that the pre-historic communities, mostly comprised of hunters, gatherers, pastoralists and farmers, developed graphic symbols that were intended to communicate specific messages to their particular colleagues. These were the first public warning posters and Fact Sheets issued in the history of mankind. Although these people had never been formally educated, they used their artwork to effectively communicate to their community at large. According to Mwenesi (2006: 101), "[t]he precise depiction of human beings and animals such as elands, elephants, giraffes, rhinoceros, lions, and cheetahs help us to visualise the type of environment these people lived in, and struggled against."

Mwenesi and Anati, therefore, testify that art has been used as a means of communication and promulgating knowledge from one generation to another since time immemorial. However, there are scholars who go further than positing the role of the earliest communication before writing. They suggest that art has always been part and parcel of human existence. As

Kilonzo (2017) quotes Masao (2003), a good example is illustrated by the rock art in Tanzania, which is believed to be the oldest art that the world has ever seen, created more than 40,000 years ago in the central plateau of Tanzania. These world-acclaimed archaeological findings give sufficient evidence that art is co-existence with human welfare and survival strategies, because it has been directly associated with social and cultural aspects of those societies responsible for the art remains discovered at these sites.

Reflecting on the reasons why the very first art was ever produced in the first place gives a clear understanding of why the existence of art and the successful perpetuation of humankind can never be accurately isolated from each other. Various reasons can be described (Kilonzo 2017) why rock art, directly associated with human nature and existence, was produced initially. One reason may be just the human propensity to create attractive things, as contemporary humans engage in a hobby; whereby artists responded to their environment by producing representations and designs in the way depicted by the familiar phrase 'art for art's sake'.

Another reason proposed for the production of pre-historic cave drawings has been associated with ancestral worship. Artists were commissioned to paint on the rock surfaces the images of sacrificial animals slaughtered at worshiping sites when rituals were performed in the pursuit of rainfall, health, and good harvests. Some theorists have conjectured a belief that the intensity of a sacrifice's efficacy would depend upon how long the painted image of the sacrificed sacred animal would remain visible. The trick was, therefore, to paint by using materials that last forever. Such materials included blood and fat that came from game animals, which were mixed to produce a paint colour. Plant oil and dung from the bodies of cow and hyrax were mixed with urine, fat or water in the process of preparing such working materials (Kilonzo 2017, Masao 2003). Rock art was also produced to glorify the chiefs by painting the images associated with heads of clans on the rocks.

Again, rock art was used to motivate hunters and to lure animals of prey when hunting. Artists were asked to draw animals on the rocks, believing that the success of hunting expeditions would depend upon how much the painted image resembled a real animal. It was, therefore a kind of sympathetic magic, preparing the motivation of participants risking their lives, before the team went out for the hunt. Such techniques are taught to this day by motivational speakers and cognitive behavioural therapists, who teach athletes, salespeople, musicians, singers, and surgeons, to envision in their mind's eye as vividly as possible a successful performance.

Rock artistry also preserved important information and cultural memory. These paintings were archives; they were the permanently kept records of animals and other creatures that existed at the time.

All these reasons for the production of the earliest artistic drawings known to humanity are directly associated with the onset of civilisation and to our collective motivation for ensuring survival. This seals in evidence the basis for claiming that art has been part and parcel of the success of our species since our evolution as homo sapiens began.

Artworks as textbooks

Artists have a unique way of using their artwork to proliferate knowledge, to motivate and persuade viewers to change their outlook and even their style of living, to abandon the familiar and to try the new, prompted by visual inspiration. Various scholars and social scientists have studied in depth the power of artistic works to change people's intentional behaviour from one way to another; thus the impact of artistic expression has proved to be effective in disseminating useful information to people.

Fig 1: *Map of Tanzania - Areas with the greatest concentration of rock art in central Tanzania*
Source: *Mapafrica/map/tanzania.svg*

A good example is a study, which was conducted by Makukula (2013) in the Makete district of Iringa Region in Tanzania, where the Human Immunodeficiency Virus infection and Acquired Immune Deficiency Syndrome (HIV/AIDS) infection rates were purportedly very high. In this study, the author found that visual images placed in strategic places, where they could be easily seen by most people, played an important role as a medium of communication to their target audience. Out of sixty people who were interviewed, forty-five (75 per cent) responded that they got useful information from these pictorial sources.

Another example is a study by Heller (1999: 154), who observed how traders use artwork to communicate to customers and thereby to publicise their business. The adage that a picture speaks louder than words constitutes the foundation of the entire marketing industry. Heller observes that the high-pitched scream of the vocal consumer sales pitch is nothing other than sheer noise. In a world where there is too much information attacking the ears, the role of artistic design provides an effective instrument for communication, motivation and persuasion in public domains.

Indeed artistic drawings make easy and effective communication among people of different cultural backgrounds as well as languages. Consider the signage doors of most public toilets; the male and female images distinguish such facilities flawlessly. All humans are able to navigate by directions issued through arrows drawn in long corridors and tall buildings and international airports. According to Gilbert and McCarter (1985: 267), these simple sign messages can deliver universally quite complete information in context, such as 'This way to the elevators' (or … rest rooms, or the exit, or the newsstand …)' and countless other messages.

Furthermore, the use of simple drawings as road signs has been an effective means of communication and directions for motor vehicle drivers who do not know the language used in-country.

According to Ades (1986: 63), the power of images can also be witnessed through revolutionary movements, such as in Russia when visual art was used to communicate to people who shared a common cause for which they were prepared to die, even though they had no language in common and in many cases were not literate. According to Rowley (2008), picture postcards helped to legitimise the overthrow of the monarchy and to construct the Revolution as an event. Very recently in the Middle East, illustrations were used as a political weapon and to visualise a common goal during the Arab Spring; drawings can unite people in their political struggle, serving as a catalyst to take extraordinary and unprecedented action (Khatib 2012).

Training trainers to train using artwork in situ

Cavalier community interventions can have counterproductive effects. Many times, people get suspicious or affronted by the very act of being interviewed or trained by other people that they are not used to seeing around. Strangers are usually not trusted with important information which is regarded as tacit knowledge within a community. This has been established by research projects that ended unsuccessfully because they failed to appeal to the community's good will and consent through their participation, involving the people living in the research sites from the outset of the project.

The Antiquities Division of Tanzania's Conservation Project of 1965, conducted at Kololo-Kisese rock art site (Antiquities Division 1965, Bwasiri 2011), stands out as a prime example of this truism.[4] According to Mapunda (2013), the project failed because of insufficient engagement with those dwelling in the area. This project involved construction of cages of wire mesh on a timber framework resting on a stone foundation,[5] thus allowing people to see and photograph rock art without entering the shelters (Mturi 1996). The structures suffered heavily from vandalism by members of the local community. Government technicians went to the site, reconstructed the cages; finally, after completing the rehabilitation, they instructed the local people on what to do and what not to do, and off they went.

Because of this disregard for the subjective agency and option to consent or dissent of people in their own cultural and physical living space, it transpired that within a decade the wire mesh, nuts, timber and locks that had been used by the project team to construct these cages had been dissembled entirely, and used to repair residential houses around the area. The local people could not afford, and indeed refused to tolerate, such expensive commodities to be left in the bush to rust and decay, without their consultation and approval, only to protect rocks which were not a priority for them. They had neither been involved nor enlightened about the purpose of the project (Mapunda 2013). They had not been provided any opportunity to evaluate and thereby reason its importance.

Our project demanded the appreciation and full cooperation of the people living in the villages in which improper hygienic practices were previously observed. These practices included improper washing of hands prior to eating, non-use of toilets, non-boiling of drinking water, and not

[4] In 2004, the Kondoa Rock Art Site won a Nomination of Properties for inclusion on the World Heritage List. United Republic of Tanzania (URT) Antiquities Division, Dar es Salaam.
[5] Ibid.

covering food prior to cooking or eating, allowing for contamination. Figure 2 depicts the four villages in Eastern Tanzania where the trainees were inducted as respondents and from whom our data were collected.

The small group of local trainers had some formal education, were of various ages, different religions and marital status, who initially participated as trainees, and were now themselves going to train other people from their own community who were not literate. Table 1 below depicts the categories of our sixty randomly selected respondents.

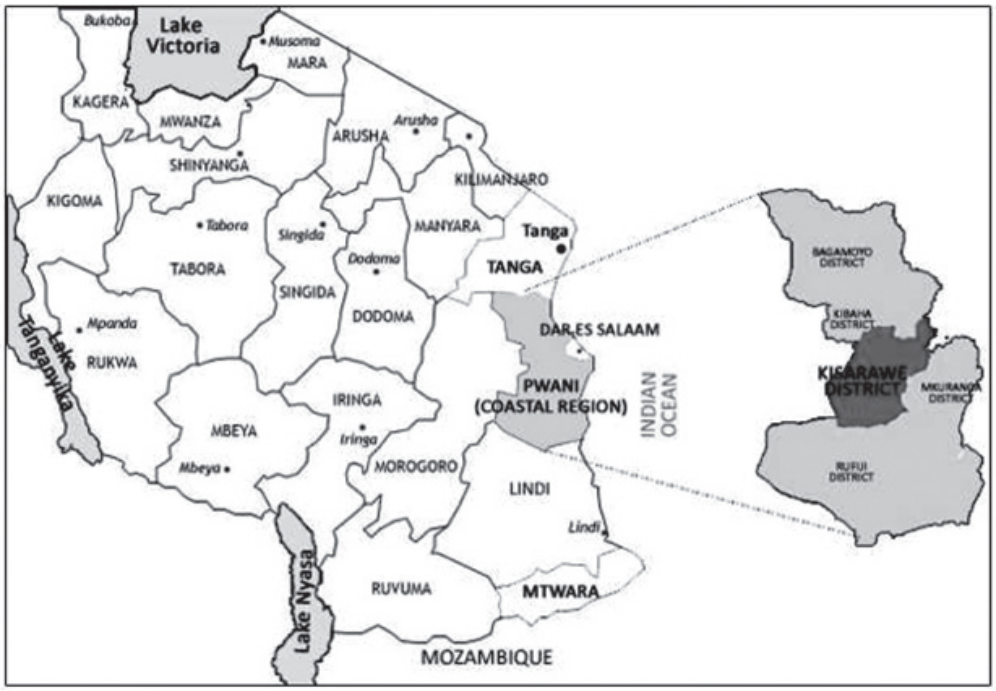


Figure 2: *Map of Tanzania showing five districts (Bagamoyo, Kibaha, Mkuranga, Rufiji and Kisarawe) in the Coastal Region where the research was carried out. (Source :https://www.google.co.tz/politicalmapoftanzania)*

Table 1: Numbers and personal characteristics of respondents

Age (years)	Gender		Religion		Marital Status	
	Males	Females	Christians	Muslims	Married	Single
10-25	5	7	4	8	5	7
26-40	10	17	12	15	20	7
41-75	9	12	4	17	19	2
Sub-Total	24	36	20	40	44	16
Total	60		60		60	

The research was carried out through personal observation and participation in discussion groups of less than a dozen people. Simple drawings were presented and discussion ensued. the facilitators briefly introduced the theme of the drawings, such as *using toilets* for the drawings showing human behavioural aspects in using toilets or *washing hands* for the drawings showing human behavioural aspects in washing hands before eating. These briefs did not intend to ease translations of the drawings, but just gave general ideas of each subject in question. The idea was to make sure the respondents did not get sidetracked, since the images very simple sketches without three dimensional depth, shading, or highlights. The following questions that were asked in the local language:

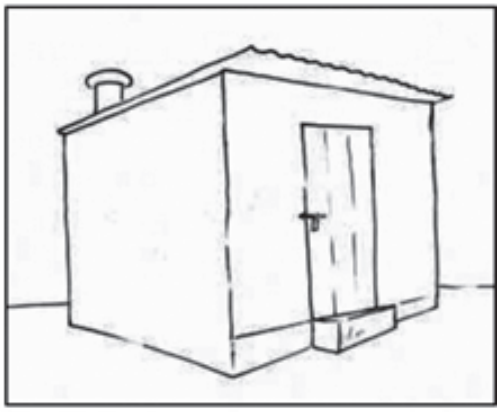
- W*hat do you see in the image?*
- *What does the drawn image tell you?*
- *Does the drawing express a good or bad behaviour?*
- *If it is a good behaviour, why do you think so?*
- *If it is a bad behaviour, why do you think so?*
- *Does such behaviour exist in your village?*
- *Do you think your society can avoid this behaviour and adopt another one?*
- *If it is a bad behaviour, how long do you think the society needs to stop it?*

The questions were prepared in the locally used language, in order to enable the respondents, all of whom were fluent speakers of Kiswahili, to answer them with ease. This enabled the researcher to know if the drawings were well understood and if the image was properly communicating its intended message to the respondents. Figures 3, 4, 5 and 6 depict the behaviour patterns in focus.

Each cluster of drawings represented one aspect of hygiene. The two drawings presenting each aspect of hygiene were placed against each other in rows.

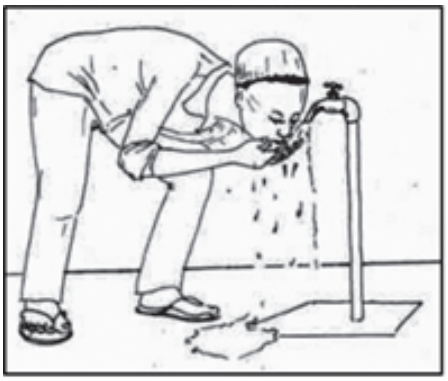
The corresponding captions for each drawing as seen above, which indicated *bad behaviour* that facilitated transmission of diseases, in contrast with *good behaviour* that discouraged transmission of disease, were not initially displayed during the discussion, purposely to let the participating respondents identify the two categories for themselves. The participants were asked first to say if the behaviour represented by the drawings existed in their

Bad behaviour:
Defecating in an open area

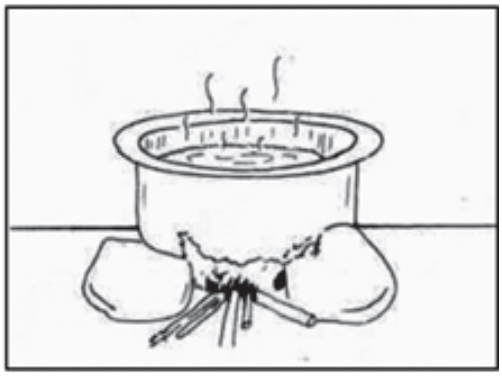


Good behaviour:
A toilet facility

Figures 3: *Drawings showing human behavioural aspects in using toilets*

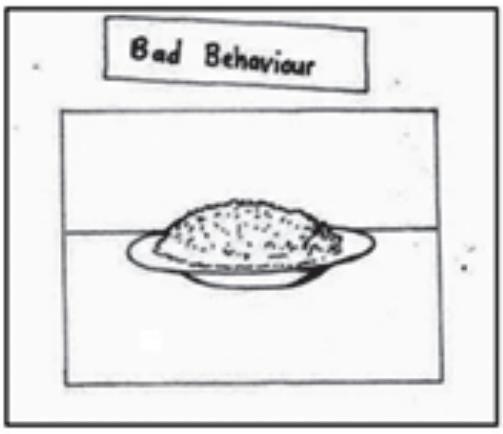


Bad behaviour



Good behaviour

Figures 4: *Drawings showing human behavioural aspects in drinking water*



Bad behaviour

Good behaviour

Figures 5: *Drawings showing human behavioural aspects in protection of food just before eating*

Bad behaviour Good behaviour

Figures 6: *Drawings showing human behavioural aspects in washing hands before eating*

societies, and then to put a tick against each cluster of drawings that presented an aspect of hygiene, to show if they agreed or disagreed with the message presented by such drawings. A cluster in figure 3, for instance, presents the aspect of toilet use; the drawing on the left showed a person defecating in an open area to reflect a bad behaviour of not using toilets while the drawing on the right showed a toilet facility to demonstrate a good behaviour of using a toilet facility with a ventilated roof. The respondents who thought that to defecate in an open area was a good practice, put ticks against the drawing of a person defecating in an open area. Those who disapproved of such behaviour put a tick instead against the drawing of a toilet facility to show they approved of using toilets. Prior to this, they were asked to say whether the specific behaviour depicted in each drawing existed in their society or not. Generally, their answers were considered to reflect their understanding of the drawings as messages of hygienic and sanitary prevention of contagious disease.

The training outcomes

The interpretations of the messages in the drawings were categorised according to respondents' areas of residence and their gender, as shown in Tables 2 and 3 below. Table 4 then summarises the information from tables 2 and 3 by showing all the respondents who understood the contents, against those who did not understand the intended contents in the drawings on figures 2, 3, 4 and 5, based on their gender. The researcher used the terms 'engaged' and 'not engaged' in Table 4 to show the number of respondents who were able or who chose, and those who were not able or did not choose, to grasp the intended message from the drawings.

As it can be seen in table 4 below, there were about 10 people out of 60 who did not understand the concept from the images. Of the 60 respondents, 50 were able to grasp the content, and that suggests they clearly understood the

intended message. These people constitute 83 per cent of all the participants whose responses comprised the data collected in this study, against 17 per cent of those that could not or chose not to convey their understanding of the intended message from the images.

Discussion of the results

This study did demonstrate the efficacy of using art to engage the public in translating some hygiene and sanitation research outcomes. It showed that simple and clear line drawings may be an educative and persuasive method for both literates and non-literates to understand the importance of changing habits and patterns of behaviour. Consequently, this method of information dissemination may be beneficial in facilitating changes in behaviour and social norms that have direct effects on the public health throughout a community. Fifty of the sixty participants in the training experiment (83 per cent) were able to interpret the messages in the drawings. This suggests that the majority of people in this area can be educated about sanitation and hygiene practices using simple design drawings.

The notion that people can do art only for art's sake alone is therefore an invalid diminution of the value that professional artistic work carries for social transformation and the national development agenda. This study opens a chapter for health sectors, especially for those providing health care and preventative health education messaging to people without formal education and living in economically compromised living conditions – be they in the advanced technocracies or the 'developing' world. These results suggest the potential importance of including artists in health education campaign strategies where contagious diseases pose the greatest threat to human lives. It would be worthwhile in future to return to these villages to see if this health education training session had a demonstrable impact on the accepted practices surrounding toilet use, potability of drinking water in use, hand washing, and handling of food prior to ingestion in the long term.

There is an intense desire of many artists to be included in development programming, including in health sectors; these creative minds should be resourced to find the most appropriate artistic techniques for engaging the public in the results of research work, with the aim of providing education to both literates and non-literates. This study has just explored this potential for facilitating hygiene and sanitation transformation through clear and accessible methods of knowledge dissemination.

The urge to engage in protecting the community through artistic expression has been with us since the dawn of humankind. The rock art

Table 2: Number of respondents who were able to interpret the images on figures 2, 3, 4 and 5

(Area) Villages of:	Fig. 3 *use of toilets*		Fig. 4 *use of safe water*		Fig. 5 *food protection*		Fig. 6 *proper washing of hands before eating*	
	Male	Female	Male	Female	Male	Female	Male	Female
Visiga	7	6	5	3	4	7	4	8
Bembeza	7	12	8	8	5	13	7	9
Mianzi	7	10	6	8	3	10	6	6
Msanga	3	5	4	3	1	6	3	4

Table 3: Numbers of respondents who were not able to interpret the images on figures 2, 3, 4 and 5

(Area) Villages of:	Fig. 3 *use of toilets*		Fig. 4 *use of safe water*		Fig. 5 *food protection*		Fig. 6 *proper washing of hands before eating*	
	Male	Female	Male	Female	Male	Female	Male	Female
Visiga	0	1	2	3	2	1	2	0
Bembeza	0	1	2	2	0	2	2	2
Mianzi	0	0	2	2	3	1	3	2
Msanga	1	0	2	0	2	0	1	1
Total	1	2	8	7	7	4	8	5

Table 4: Summary of respondents who understood the contents against those who did not understand the contents in the drawings

Respondents who were:	**Fig. 3**		**Fig. 4**		**Fig. 5**		**Fig. 6**		**Average**	**Percent**
	Male	Female	Male	Female	Male	Female	Male	Female		
ENGAGED	24	33	23	22	13	36	20	27		
Sub-total	57		45		49		47		**49.5**	**82.5%**
NOT ENGAGED	1	2	8	7	7	4	8	5		
Sub-total	3		15		11		13		**10.5**	**17.5%**

discoveries celebrated worldwide demonstrates how acculturation and education through visual design has been part and parcel of human survival for millennia, perhaps the earliest demonstration of our collective survival strategies discovered to date.

Although this article discussed simple drawings as a medium of public education, it is worth noting that the very act of engaging in artistic expression is itself a well-recognised mode of therapy. Jones (2005) emphasises that the American Art Therapy Association grounds its approach to psychotherapy in the conviction that the creative process involved in the making of art is healing and life-enhancing. We should not overlook the possibility that the very training process, if it engaged communities in creating their own artistic designs for the dissemination of training the public in sanitation and hygiene practices, might be a measurably positive contribution to social transformation in the way Tanzanians, literate and non-literate, view chronic contagious diseases in their communities.

In this vein, great African leaders and as we noted revolutionary leaders throughout history, have used art and culture in the liberation and advancement of their people. We can see from this study another basis for concluding that art is unduly side-lined from large portions of the development agenda within the Tanzanian community, given its demonstrable potential to assist in promoting public health through education which may directly impact behavioural norms.

Concluding recommendations

The considerations drawn together here highlight the need for community participation in health education programmes, since a major source of behavioural change is the socio-cultural influences that shape people's everyday activities, habits, grooming and public manners. If properly used, artists have potential as conduits of public information, to empower government in these very important areas of social reform, to function as transformative agents for the good of society. Researchers, non-governmental and community-based organisers (NGOs and CBOs) and health practitioners and public health administrators, should be pulling together with the higher learning sector of art students and scholars, to revamp the health education campaign industry. These publicly responsible elites are, in fact, the key beneficiaries of this paper.

This study recommends that institutions and organisations affiliated with healthcare in the country should develop a new standard, that of using artists to engage the public in research activities, in order to discover the most appropriate translation and dissemination modules for health education.

The joint aim of government administrators and artists should be to target the general population, especially those living in rural areas where there is a huge number of people without any formal education or whose level of formal education is low or incomplete (Mingat, Ledoux, and Rakotomalala 2010).

If the visual arts and healthcare institutions have been in collaboration through art therapy throughout the global North, then Tanzania should also see the wisdom of this innovative alliance as the way forward in our health sector's education campaigns. Art associations operating in Tanzania, East Africa and beyond, such as the East Africa Art Biennale Association (EASTAFAB), together with higher learning art institutions such as the Department of Creative Arts of the University of Dar es Salaam, the Bagamoyo Art Institute, and the Bugando Teachers College, should be tasked to come up with various artistic approaches and programmes to engage the general public, not only in translating hygiene and sanitation research outcomes, but also in initiating re-education in other areas which are culturally sensitive and have big impacts upon the welfare of society at large. Such a national campaign exercise can be expected to bring rapid and measurable benefits to the public health status of the society overall.

Apart from the model employed in this case study, one strategy would be to organise youth art competitions focused on various health issues. This approach, which also appears youth-friendly, supportive of indigenous talent, and encourages individual initiative and self-confidence talented young artists, will fully engage the public throughout the whole process. Through orientation meetings involving coordinators, health consultants and target groups, all social levels and sectors of society will be brought together, to discuss the subject of inherently shared concern. Through invitations of the media to these meetings, the motivation will reach a wider range of individuals nationwide, and create awareness not only of the existing health threats, but of the active role each citizen can play in eradicating these threats. Seminars and workshops, such as those used platforms used in the past, should not be entirely neglected. But the quality of the methods used in knowledge transfer will be far more effective, as a result of these public art-for-public health collaborations.

On the basis of the current findings, it is recommended that artists should be included routinely as a means of facilitating positive change in different aspects of socio-economic development. It should be well appreciated that development programming is most effective through bottom-up, community-engaged and culturally sensitive planning. It is also widely understood that societies are dynamic rather than static, and that members of the general public do respond to calls for behavioural change when they know how and know why they should do so.

References

Ades, D. 1986. *Photomontage*. London: Thames and Hudson.

Anati, E. 1986. The state of research in rock art: The rock art of Tanzania and the East African sequence. *Centro comuno di studi preistorici* XXIII: 15-68.

Antiquities Division. United Republic of Tanzania. 1965. *Annual Report of the Antiquities Division for the Year 1965*. Dar es Salaam, Antiquities Division.

Bever, B, O. 1986. *Early Traditional Medicine West Africa. Medicinal plants in Tropical West Africa*. London: Cambridge University Press.

Bwasiri, Emmanuel J. 2011. The Implications of the Management of Indigenous Living Heritage: The Case Study of the Mongomi wa Kolo Rock Paintings World Heritage Site, Central Tanzania. *South African Archaeological Bulletin* 66(193): 60-66.

Gilbert, R and McCarter, W. 1985. *Living With Art.* Second edition. New York: Alfred Knopf.

Heller, Steven. 1999. *Looking Closer 3: Classic writings on graphic design.* New York: Allworth Press.

Khatib, Lina. 2012. Image Politics in the Middle East: The Role of the Visual in the Political Struggle. London: I.B. Tauris & Co.

Kilonzo, K. 2017. Rock Art and Tourism in Tanzania: In search for innovations. *Academica Touristica* 10(1): 69-82.

Magombedze, G., Garira, W., Mwenje, E. 2006. Modelling the human immune response mechanisms to Mycobacterium tuberculosis infection in the lungs. *Mathematical Biosciences and Engineering* 3(4): 661-682.

Makukula, D. 2013. The Role of Billboards and Posters in Creating HIV/ AIDS Awareness in Makete District. Unpublished MA dissertation. University of Dar es Salaam, Tanzania.

Mapunda, B.B.B. 2013. Get Off my Land! Towards mutual understanding in archaeological field conflicts. *AP: Online Journal in Public Archaeology* 3: 74-96.

Masao, F. T. 2003. The prehistoric rock paintings of Tanzania mainland. In *East Africa art biennale.* Ed. Y. Goscinny. Dar es Salaam, Tanzania: La Petite Galerie, pp. 20-36.

Mingat, A., Ledoux, B. and Rakotomalala, R. 2010. *Developing Post-Primary Education in Sub-Saharan Africa: Assessing the Financial Sustainability of Alternative Pathways.* Washington, DC. The World Bank.

Mturi, Amin. 1996. Whose Cultural Heritage? Conflicts and Contradictions in the Conservation of Historic Structures, Towns, and Rock Art in Tanzania. In: *Plundering Africa's Past.* Eds. P.R. Schmidt and R.J. McIntosh. London: James Currey, pp. 170-190.

Mwenesi, L. C. 2006. Rock art and the national curriculum in Tanzania. *Utafiti: Journal of the Faculty of Arts and Social Sciences* 7.1: 100-108.

North, R.J., and Yu-Jin, J. 2004. Immunity to tuberculosis. *Annual Review of Immunology* 22: 599-623.

Okuonghae, D and Korobeinikov, A. 2013. Dynamics of Tuberculosis in a Developing Country: Nigeria as a Case Study. In: *Dynamic Models of Infectious Diseases* Volume 2. Eds. V. Sree Hari Rao and Ravi Durvasula. New York: Springer, pp. 113-128.

Jones, Phil. 2005. The Arts Therapies: A revolution in healthcare. New York: Brunner-Routledge.

Rowley, Alison. 2008. Popular Culture and Visual Narrative of Revolution: Russian Postcards 1905-1922. *Revolutionary Russia* 21. Available at http://www.tandfonline.com/doi/full/10.1080/09546540802085495. Accessed 24 October, 2015.

Schluger, N.W. and Rom, W.N. 1998. The host immune response to tuberculosis. *American Journal of Respiratory and Critical Care Medicine* 157: 679-691.

Yoshikawa, T, T. and Norman, D, C. Eds. 2009. *Infectious Diseases in the Aging. A Clinical Handbook.* Second edition. New York: Humana Press|Springer Science and Business Media.