

**Illustrating Birth: The Creation of an Illustrated Resource Manual
For the Health Extension Workers in the Oromia Region of Southwestern Ethiopia.**

By:

Kat Hartman

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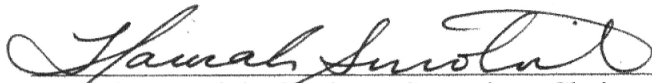
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School of Art & Design
University of Michigan
Ann Arbor, Michigan

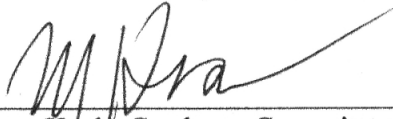
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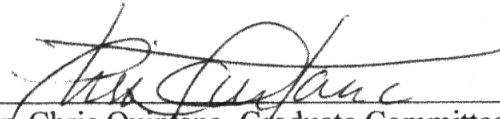
Joe Trumpey, Graduate Committee Chair
(Committee Chair's Signature)



Hannah Smotrich, Graduate Committee Chair
(Committee Member's Signature)



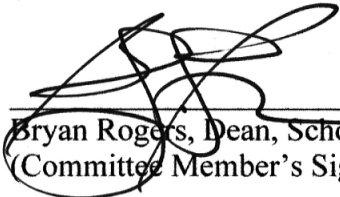
Dr. Margaret Kruk, Graduate Committee Chair
(Committee Member's Signature)



Dr. Chris Quintana, Graduate Committee Chair
(Committee Member's Signature)



Brad Smith, Associate Dean for Graduate Education
(Committee Member's Signature)



Bryan Rogers, Dean, School of Art & Design
(Committee Member's Signature)

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Abstract

This paper will provide justification for the creation of my thesis project: the creation of a childbirth and family planning resource for the Health Extension Workers of the Oromia Region of Ethiopia. Building on knowledge of visual literacy studies, health education trends and my own interviews with Health Extension Workers in the Oromia Region, it is my suggestion that focusing on the education of community based health workers, by providing them with custom designed health education materials, is a legitimate and cost effective strategy for improving health worker performance, increasing populace utilization of health system services and better educating the populace at large.

Illustrated health education materials can improve retention of key health message in semi-literate communities and illustrated reference materials can be valuable to community health workers who may have little formal training. Such materials are an essential input into the work of Health Extension Workers (HEWs) in Ethiopia—a new category of health workers that has recently been introduced by the government to provide health education and preventative care in rural populations. We carried out a preliminary survey of 60 HEWs in Jimma region in southwestern Ethiopia to investigate the appropriateness of illustrated health messages in materials commonly available to the workers. We found that HEWs had difficulty understanding locally available illustrated health messages and using them in their health education work because these materials were not relevant to regional health, language and culture.

Within the Ethiopian framework, the Health Extension Worker and her community will additionally benefit from a childbirth and family planning resource manual for reasons relating both to country health indicators, and national political frameworks. There is an inherent need to design an educational material not simply produce it, especially with respect to a highly technical manual on childbirth. The design strategy employed with this project utilizes the assumption that a useful language will provide HEWs with a relevant verbal context for understanding included visual aids. Because they are literate, HEWs are likely to be able to understand a more technical manual, especially if it is illustrated.

Table of Contents

2	Abstract
4	Introduction
7	Structure of Paper
10	Overview of Ethiopia's Health and Health System
13	Overview of Health Extension Worker Program
16	Review of Precedent Relating to Subject Matter
20	Review of Precedent Relating to Creation of Illustrated Health Information
24	Review of Precedent Relating to the Design of an Illustrated Health Resource
47	Conclusion
51	Works Cited

Introduction

I am an artist by default. It was not until I was asked to participate in a panel of senior artists my last year in undergrad, that I was able to articulate this conclusion. The conclusion was a result of another question that was asked—the subject of the panel: Why Make Art? It is a simple question, yet I had never before really followed through, never reached all the way, to the end of my own motivation.

And so what became clear as I prepared for this discussion, and as I proceeded to disclose to those around me during the presentation, was that I was an artist by default. I had never been one to believe that art had much power to shape society and systems—rather I believed that art itself was shaped. This is of course a generalization, and thus a somewhat shallow statement. In many cases a quite false statement. But yet still valid to me when it is motivated by my gut and my emotion...and this is what my gut felt.

I am of the opinion that art—as it relates to the institution, to the gallery, academia and the ‘scene’—is more helpful as an indicator of a society that is, at the very least, getting a few things right. That a nation, a population might decide that creativity and beauty are worthy components of the system; that they should be carved out places, spaces and employment opportunities—that is commendable. It is remarkable really, regardless of all else that goes on in that social system—one thing is right. For me this is a fact, a simple one, which continues to mean a lot. So life as an artist is to be a meaningful one, in that you serve as a living indicator of the best parts of the system. You represent possibility...

...but as I see it still inherently dependent on the system....

So by accepting this self-assumed pending dependency, what do I default on? I remember clearly one evening as a first-year in college, looking out from my dorm room while speaking to my grandparents on the telephone, telling them I wanted to be an organizer. In the political sense of the word—a political organizer. As I saw it then, someone who does actively shape society and systems. I went about this, about becoming this organizer. I was very very serious about it. But still even with all that heart... I failed miserably at it. I lacked considerably the personality with which to motivate and encourage other people into directed and focused action.

Still...what besides this perceived failure had pushed me into the aesthetic nether regions of expression? Probably growing up a leftist in a conservative, dry village in rural Ohio. High school art class was still a space in which it was acceptable to be different, in fact encouraged. Maybe I confused politics with aesthetics, as they

seemingly were the same thing in an area that lacked so much of both—it was perhaps hard to tell the difference. And according to that small isolated community I was then in, I was pretty good at it, at art that is... whatever it is and may be.

But yet I did and do remain here, in the institution of art now pursuing its version of a terminal degree. And I do sometimes wonder why... There was the logical externality such as never having to take the GRE—I do not test well, an incredible cop-out I know. And then the reality that I do indeed deeply enjoy such things as layout, font, color, etc. But...I enjoy most things really... and I suppose therein lies the answer. Art, of all the disciplines in which I dallied during college, was the discipline most open and eager to the influence of other areas of study. I have taken the concept of liberal arts to heart. The interdisciplinary approach to education, whatever it means here at the University of Michigan and elsewhere, has always seemed the most clean and pure within the realm of the fine arts. Perhaps this is due to the abstract, messy and self-directed nature of creative work, but either way this infrastructure has allowed me to pursue all my interests with the least fear of reprisal. This freedom from fear was initially what allowed me to live in Ethiopia for a year after undergrad and then...subsequently... to also realize that a possible intersection of my interests and intentions lay in the area of public health education in developing countries.

When I first went to Ethiopia in 2003, I was essentially still a small town public school kid ...but with a new chip on my shoulder—this after the recent stint at the private college. A little angry at a perceived unfairness, I remained hung up on the prevalence of those who vacationed where I could not. I had been invited to Ethiopia by my former economics professor to assist in writing and illustrating a manual on participatory planning, monitoring and evaluation for the Amhara region's Bureau of Finance and Economic Development. I accepted. But I did not have a real sense of what this meant. I did not have a real sense about what a lot of things meant.

A year in Ethiopia turned many of my perceptions on their head, most of these related to perceived entitlement. I went from working class to upper class during the course of the 16-hour flight, and my head is still spinning from the ramifications of the distance covered. There is now a peace that is mine that was not there before; I can rub shoulders with those whose finances are more than mine and not hate them. But more importantly a fire into the belly had been injected. Inequality has always angered me and motivated my life's

direction...but seeing in person the vastness of global inequality simultaneously grounded me and set me off running.

It is a relatively new trend within economic development strategies deployed in the developing world, to acknowledge the value of health: a healthy population is likely to be a more productive population. Regardless, attention to industry and GDP are still often the focus of many development agendas, approaches that can easily ignore and even disrupt a nation's health. And so it may be true that I am angered by poverty, class inequality and the mechanism of global economies... However the clearest intervention I can see, one that directly confronts the most negative aspects of dire poverty, is one that seeks to improve a population's health.

The most disturbing aspect of so many health afflictions in poor countries is how easily they can be treated, as well as avoided altogether. Education of both the populace and health workers seems to be an obvious area for interventions. Being that large numbers of the population in poorer countries are often illiterate or low-literate, intelligent and culturally appropriate use of visual aids seemingly becomes relevant. This is my logic. This is my course. It is here where my interest in being a designer, comicbook artist, and illustrator simultaneously....this is where all these interests are allowed to interact, I feel most effectively, with my other interest in being an organizer.

This past summer, the summer of 2007, I returned to Ethiopia for the third time. Later in the summer I was joined by my co-investigator Heather Lanthorn MPH, and we moved into a borrowed house in Jimma, the regional capital for the Oromia region in the southwest of Ethiopia. While in Jimma we interviewed 60 community based health workers about their daily activities. We did this in an attempt to determine how much of their time is spent on health education and how useful and applicable currently available visual aids are to their work.

During my last week in Ethiopia I was able to make a contact within the Oromia Regional Health Bureau in Addis Ababa. I was able to volunteer my services to the region and offer them a health worker resource manual based on our recent research done in and around Jimma, the capital of the Oromia region. This paper is the compilation of those influences and issues encountered during the summarizing of our research as well as during their direct application in the form of an educational tool.

Structure of Paper

This paper will provide justification for the creation of my thesis project: the creation of a childbirth and family planning resource for the Health Extension Workers of the Oromia Region of Ethiopia. Building on knowledge of visual literacy studies, health education trends and my own research it is my suggestion that focusing on the education of community based health workers, by providing them with custom designed health education materials, is a legitimate strategy for improving health worker performance, increasing populace utilization of health system services and better educating the populace at large. Within the Ethiopian framework, the Health Extension Worker and her community will additionally benefit from a childbirth and family planning resource manual for reasons relating both to country health indicators, and national political frameworks.

After a brief summary of the health system in Ethiopia, this paper will seek to justify this project by summarizing my research in respect to three issues: the creation of a health worker manual in general, the specific choice of subject matter as childbirth and family planning and also the particular design environment as it relates to the intended audience. It is my hope to articulate the variety of intersections that exist between the disciplines of public health education and information design and how they might best support work in resource poor settings.

The subject matter of the manual has been chosen in order to respect the role of the Health Extension Worker Program, as defined by the Ethiopian government, and also a current challenge facing the Ethiopian health system. Ethiopia has one of the world's highest Maternal Mortality Ratios. The presence of a skilled birth attendant(SBA) during childbirth is acknowledged by the Ethiopian government and the international community as one of the most viable ways to improve maternal and child health. Additionally family planning education is an essential component to reducing unwanted pregnancies: women who have children too young or too often are more likely to die during childbirth.

The second section of this paper outlines the precedence supporting creation of an illustrated manual for community based health workers. It draws on precedence particular to the public health community with a focus on health workers operating within resource poor settings. Within this specific environment having resource manuals available to health workers allows them better access to the details of proper care. This improved access improves their knowledge retention and performance quality. The improved performance of health workers has

the potential to spill out and affect their community; if the community believes in the skill and ability of their health professionals, they are more likely to utilize their services. Additionally patients also benefit from having access to illustrated health information. Patient retention rates increase further if they have the opportunity to receive verbal reinforcement on illustrated health messages from a trained health professional. The design of the Health Extension Worker Program already allows the community quality verbal interaction with trained HEWs on a regular basis; an illustrated manual will complement current health education activities employed by HEWs.

The last section, which focuses on the design of the manual, expands the scope of the previous section allowing the creation of the manual to be influenced by current information design theories. This section also briefly summarizes popular strategies to health education and adult education and how these have been influenced by visualization techniques. The intersections between health education and information design are further contextualized by a summary of a visual and health literacy survey conducted with HEWs during August of 2007 of which I was the principal investigator. The design environment of this manual is then summarized as it relates to our survey results, information design theories, past visual literacy studies and resource constraints.

These three sections will be followed by a brief conclusion that summarizes the most essential intersections between health education, information design and the specific needs within the Ethiopian context relating to audience, subject matter and resource constraints in respect to this specific project. The introduction to this entire process will be counterbalanced by an epilogue.



Source: <http://www.issafrica.org/AF/profiles/ethiopia/index.htm>

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Overview of Ethiopia's Health and Health System

Ethiopia has one of the lowest health statuses in the world. The country of Ethiopia is working to amend this health crisis, which is primarily caused by communicable diseases, high maternal and neonatal mortality, poverty, poor nutrition, high-population growth and lack of access to health services and health information.[1] It is estimated that 75% of the population suffers from some type of communicable disease and malnutrition.[2] Additionally a health policy was only introduced to the country in the 1960's.[2] In order to tackle these health issues, mainly shouldered by the rural population, the Ethiopian government has recently reorganized the nation's health system.

Though the median health status within Ethiopia is low, the divide between rural and urban areas however is much more severe. A few essential indicators tend to describe this divide. Rural households tend to have larger families, an average of 5.2 people per household compared with urban families at 4.2.[2] Contraceptive prevalence is over 4 times as high in urban areas compared with rural(47% versus 11%).[2] Additionally only 11% of women and 8% of men interviewed during Ethiopia's 2005 Demographic and Health(EDHS) survey knew when a woman is most likely to conceive.[2] In 2005 44.6% of women in urban areas had a SBA assist with their birth, while only 2% of rural women had a professional assist their birth. [2]

According the 2005 EDHS only 42% of males and 27% of females in rural areas have had some sort of education, compared with 83% of males and 69% of females in urban areas.[2] In urban areas 50% of the female population has gone to secondary school or higher while only 3.5% of women have in rural areas.[2] Additionally 78% of female rural inhabitants can not read at all, while in the urban areas the rate is 26% for women.[2] Rural households have very little access to media, especially women: only 10% are able to listen to a radio once a week or more.[2] 40% of women in urban areas are able to access a radio at least once a week. Access to both television and newspapers are significantly lower than radio access in rural areas.[2] 56% of rural households do have access to an improved source of drinking water, though urban areas have 94% access.[2] However 62% of all Ethiopian households do not have a toilet facility.[2] 70% of rural households tend to use

bushes and fields as a facility, 12% in urban areas.[2] 90% of rural households use wood to create fires for cooking, 48.5% in urban areas do the same.[2]

Ethiopia's health crisis is paralleled by a similar crisis in a lack of human resources for health. There are only .03 physicians per 1000 in the population.[3] Nurses are slightly higher at a rate of .2 per 1000. In 2003 there were only 93 dentists, 1,343 pharmacists and 1,274 midwives available to serve a population estimated then at 67 million.[3] Currently the population is estimated to be over 75 million people and the country is continually plagued by medical professionals emigrating to other countries for better pay. The rural population is estimated to be 84% of the total population.(UNDP) In the 2005 EDHS 82% of rural women were concerned there would be no provider available to them at health facilities; this was listed as a major problem for them when seeking treatment for a sickness.[2] 76% were also concerned that there would not be a female provider available. Additionally 75% of rural women were discouraged by the distance to the nearest health facility and 80% felt money was a serious problem prohibiting them from accessing the health system when they were sick.[2]

The Ethiopian Health System is a recently decentralized system in hopes of better reaching this isolated rural population. Government decentralization is seen as a way to more adequately implement democracy; it is a trend, currently being implemented in many sub-Saharan countries, which hopes to foster development by empowering the local levels of government. This often involves a shifting of resources and responsibilities down the administrative ladder in hopes to encourage participation and ownership at all levels. In Ethiopia's health system decentralization is characterized by four-tiers for health service delivery.[1] The first level is the primary health care unit (PHCU) that is comprised of a health center with five satellite health posts. The PHCU serves 25,000 people with each health post attending to a population scope of 5,000. Above the PHCU is the district hospital, and then the zonal hospital, serving 250, 000 and 1,000,000 respectively. The Health Sector Development Program (HSDP) is the roadmap of the newly decentralized system "...designed explicitly to respond to the health care needs of the rural population who constitute 85% of the total population." [1] The Ethiopian government's focus on health characterizes a recent trend in economic development approaches, which understands that improved population health will likely increase economic productivity.[4]

This HSPD consists of two phases, the first launched in 1998 and the second in 2003. The second phase (HSDPII) initiated the Health Extension Program (HEP) and its defining feature, the Health Extension Worker Program (HEWP).[1] At full capacity, the HEWP aims to place two primary health care providers or Health Extension Workers (HEWs) at each kebele health post: a total of nearly 30,000 new primary health care workers by 2009.[1] The scope of the HEP is enormous. It will more than double health service positions in a period of less than five years—thus doubling the number of original positions that were initially created within the span of 5 decades.(16) The possibilities for improved standards of living are as exciting as the administrative challenges are daunting.

The Ethiopian population is administered to at the national level, the regional level, the zonal level, the *woreda*, or district level, and the *kebele*, or town and neighborhood level. Health system management and administration corresponds with these divisions: the national level overseen by the Ministry of Health(MoH), the regional level overseen by the Regional Health Bureau(RHB), the *woreda* level overseen by the *Woreda* Health Office(WoHO) and at the kebele level overseen by the HEW and those stationed at the Health Center. As part of the decentralization process the regional level of government is being phased out in favor of the *woreda* level of administration.[1] This is also seen as a strategy to encourage a more participatory democracy, an increased level of health competition and a feeling of ownership at local levels of administration.[1]



Health Extension Workers are young women hired by the Ethiopian government to provide preventative medicine to the country's rural population.

Photo Source: Center for National Health Development in Ethiopia

Overview of the Health Extension Worker Program

The HEWP aims to improve rural health in Ethiopia by improving rural access to health services. The main objective of the HEW, as an implement of the HEP, “is to improve access and equity to preventative essential health interventions through community/kebele based health services with a strong focus on sustained preventative health actions and increased health awareness.”[1] The focus on preventative care is an important one as curative care, outside of basic first-aid, is strictly disallowed to the HEW.[5][1] The Ministry of Health expresses concern that curative medicine might distract this new cadre of health workers from their intended focus.[4][5]

Originally the HEWP was to employ 75% women, but while in the program’s fifth year, no men are currently employed as HEWs and the program remains 100% female.[1][5] The intention of the program is to employ younger single women who reside in the kebele they serve as health workers. These factors have the potential to insure higher retention rates. [5] Each woman is required to finish high school as well as complete a

yearlong HEW training overseen and organized through the infrastructure provided by Technical and Vocational Educational Institutes.[5] HEWs are paid between 381 to 426 Ethiopian Birr(ETB) a month which is between 42 and 47 USD.[6]

The HEWs we spoke with were all women aged 18-30, with 88.33% of women between the ages of 18 and 22. All women had completed the 10th grade. Most women(66%) had been out of school for either 2 or 3 years not counting their yearlong HEW training. Over a quarter(26.6%) of these HEWs were born in Dedo, the capital of one of the nearest woredas to Jimma. Combined the respondents represented 40 different kebele health posts in the Oromia region. Each woreda oversees roughly 20 kebeles; we interviewed women from 3 including Dedo, Yebu and Serbo.¹ Of the HEWs 91% could read Oromifa, 76% English and 65% Amharic. Those who could read aloud all three languages constituted 51% of the sample. The HEWs we spoke with did vary slightly from HEWs surveyed in other studies. The Earth Institute found in their survey of 60 HEWs across all regions, all could read and write Amharic.[6] Additionally all could read English, though only 50% claimed they were able to speak it. Similarly most were young with only 1 over 30 and all had completed the 10th grade.[6] According to the Earth Institute most HEWs came from the larger urban area in the region rather than the kebele in which they worked; yet many had just recently moved from one of the more rural kebeles to the city. [6]

Most of the HEWs we interviewed split their time doing health education in the community and seeing patients at the health post. The time doing health education is routinely referred to as “house-to-house”, which consists of visiting, educating and counseling families on various health issues including environmental and personal hygiene, latrine construction, HIV/Aids, malaria and family planning. In addition two to three days are usually spent at the kebele health post tending to paperwork and seeing patients. While in the health post most patient related activities consist of dispensing malaria medication, oral rehydration salts, immunizations, and birth control. These activities fall in line with the expectations and curriculum outlined by the implementation guideline for the HEP. This also coincides with similar health education activities that are also being done in the Tigray and Amhara regions according to a review of HEW working conditions done by the Center for National Health Development in Ethiopia.[6] HEWs are also responsible for attending and assisting with childbirth and

¹ These woredas are also sometimes known as Dedo, Kersa, and Mana.

referral.[6] The respondents we spoke with did appear to spend the majority of their time doing health education. All of them mentioned health education as a characteristic of an average workday.

More specifically 95% of the women we spoke with mentioned “house-to-house” as a primary weekly activity. House-house, according to these HEWs, consists of meeting with 5-10 different families each day and counseling them on various health issues. These families are initially chosen by the HEW and then repeatedly visited; the families are often rewarded with certificates for improvement of health conditions within the home. When families reach a certain level of health education, they are “graduated” and the HEW chooses a new family to add into the rotation. In the Oromia Region, according to the women we spoke with, most spend 3 days each week going “house-to-house.” When asked who they were most often providing health education to in their community the respondents mentioned women and mothers 43% of the time, men and fathers 32%, children and students 23% and other groups 2% of the time.

Respondents were also asked what health topics they routinely taught. The topics most oft mentioned included: environmental sanitation, family planning & malaria. Second to these the most oft mentioned topics were vaccinations, latrine construction and use, personal hygiene and HIV/AIDS. When asked what illnesses they most often saw, they mentioned malaria, diarrhea and typhoid most often.²

The HEWs we spoke with seem similar in both their demographics and daily activities as compared with findings drawn from recent studies as well as the Ethiopian’s government’s expectations of the program. This will hopefully allow some of the less regional specific observations we made, as well as the manual itself, to provide support for and insight into the program at the national level. Because of their place within the system, HEWs have the potential to affect innumerable lives in the oft ignored rural population of Ethiopia. The HEWP is an exciting and extensive outreach program deserving of energy and interest, especially considering the scope of the potential effect.

² It should be noted that interviews took place during the month of July, which falls within one of the prime malaria seasons in Ethiopia

Review of Precedent Relating to Subject Matter

The decision to create a manual that incorporates information on childbirth as well as family planning is supported by several factors. The initial decision in including a flipchart on the topic of family planning is relatively clear as it respects our research; family planning was mentioned the third most often as a topic taught most frequently by HEWs. In addition it also provides a natural partner to the subject of childbirth. Family planning, in terms of HEW activities, relates both to house-to-house and health post responsibilities; a flipchart on this subject could conceivably then provide support to HEWs on a daily basis. However, the decision to create a HEW manual on the subject of childbirth rather than one more routinely mentioned as an education priority by HEWs is less obvious from our research, but is moreover supported by several important factors. These factors relate to the characteristics of Ethiopia's health crisis, current trends in health development strategies and the government's decision to limit HEWs to preventative care. Improved performance on delivery services will also help to improve utilization of health services further validating the HEWP. What also becomes apparent is both childbirth and family planning are subjects integral to the health development of Ethiopia; they are also two areas of population health innately tied to one another.

Ethiopia has one of the highest maternal mortality ratio(MRR) in the world. This indicator, the ratio of maternal deaths per 100,000, live births is one of the most oft used indicators in describing the health of a population. Ethiopia's is estimated to be between 870-1000 per 100,000. A high MRR is linked heavily to poverty and lack of access to the health system; over 99% of all global maternal deaths occur in poor countries. [7]Additionally "Complications that result in maternal mortality and morbidity also contribute to the majority of newborn mortality and morbidity." [7] It is likely that a reduction in maternal mortality, will result in less infant mortality. Currently there is a concern that many of the Millennium Development Goals, including the reduction of MRR and under-5 mortality, may not be met in the region of sub-Saharan Africa. [8] As a result both the Ethiopian government and the MDGs are in agreement in terms of placing a priority on childbirth and family planning activities. [8][1]

Professionally attended births are seen by both the Ethiopian Government and many international development bodies as a viable, cost-effective and strategic way to reduce maternal mortality. [6] Community

health workers in this resolve are seen as an important component to achieving the reduction in MRR.[8] The Earth Institute also sees HEWs as a strategy for combating Ethiopia's high MRR and working towards the related MDG.[6] Globally there is also a renewed interest in community health workers; they are again considered a cost-effective alternative to the expensive burden of training doctors and nurses.[8]

Currently Ethiopia is in a severe shortage of SBAs, a gap that could be filled by well-trained HEWs. The Ethiopian Ministry of Finance and Economic Development in the Poverty Reduction Strategy Papers (PRSP) described midwives and frontline health workers as "key professionals" of which there was a considerable lack.[4] According to a survey in southern Ethiopia, only 1.2% of births in rural areas were attended by a birth professional. Additionally 63% of all neonatal deaths in Ethiopia are caused by tetanus.[9] The most common cause of neonatal tetanus is an infection of the umbilical stump particularly when the cord is cut with a non-sterile instrument, a complication that could easily be avoided with a trained professional. The major focus of the HSDPII, the program that created the HEWP, has a family health target of increasing the proportion of deliveries assisted by trained health workers from the present level to 25%.[1] 2/3 of the major target indicators and overall goals cited in the PRSP section on health development would be supported by a resource manual centered on maternal health and family planning.[4] HEWs trained in obstetrics and the management of routinely seen obstetric complications falls in line with both Ethiopian and International agendas, especially in terms of the role CHWs might play in the reduction of MRR.

The combination of a family planning and childbirth resource also acknowledges the relationship between high population growth and a high MRR. Ethiopia's population is a considerably young population; 43.5% of the population is 15 years old or younger.[2] Ethiopia has a population growth rate of 3%, one of the highest in the world.[10] AT Beekle, in a study on family planning determinants in Jimma asserts that, "High fertility and rapid population growth have an impact on the overall socio-economic development of the country in general and maternal and child health in particular." [10] Beekle also underlines that, "There is evidence to suggest that up to 1000,000 maternal deaths could be avoided each year [in Ethiopia] if women who did not want children used effective contraception." [10] In 2000 the total fertility rate in Ethiopia was 5.9 children per woman; the contraceptive prevalence was only 8%.[10]

The decision to create a resource manual on childbirth specifically seeks to respect the Ethiopian government's description of the HEWP as a program centered on preventative care, while still pushing the program to fulfill the needs and wants of the population. The Earth Institute acknowledges that in general the public tends to prefer curative care over preventative care.[6] They assert that all complaints from the Ethiopian public about the HEWP included a concern over the lack of curative care.[6] It is suggested that eventually it would be wise to allow HEWs to practice some forms of curative care, as it will validate them as competent health workers within their kebele, opening the door to public utilization of services in general.[6] This likely could lead to the use of the more preventative types of care, which are currently not of high priority to the population but are essential to overall health development and are also the focus of the HEWP. It may be that the HSDPII's focus on preventative care will only be realized if it is done in tandem with curative care.[10] There is a possibility that limiting the responsibilities of HEWs to preventative only, will essentially undercut the goals of the program.[6]

Because of the government's decision to limit HEWs role to a provider of preventative care, childbirth is one of the most technically complicated responsibilities left to these women. This along with a growing preference for HEWs as birth assistants could serve to validate the program even without the inclusion of curative care. According to an initial assessment of the working conditions for the first batch of HEWs, When the HEWP began childbirth was rarely done by HEWs.[6] The Earth Institute hypothesized that this might be due to competition from TBAs as well as low confidence on the part of HEWs because of limited training. Currently however, it has been found that HEWs are now preferred over Traditional Birth Assistants(TBAs) for delivery and labor assistance in the Tigray Region of Ethiopia.[11] HEWs are also considered helpful to their communities[11], suggesting that they are also being integrated into their communities. Within many countries TBAs are preferred by rural dwellers, so it is somewhat and exciting surprising that HEWs are now receiving preference.[11] An overview from the WHO on strategic use of SBAs for reduction of MMRs also suggests that poor performance on delivery services will lead to lower utilization of the health system in general.[7] The fact that utilization of HEWs as birth attendants has seemingly increased since the program's introduction is exciting and should be seized as an opportunity to further validate the health system by improving on HEWs performance.

Distance is a common issue discouraging women in the Guji Zone in the southern portion of the Oromia region from seeking SBAs.[12][13] This obstacle can be compounded by rough terrain, lack of communications transport and unreliable health services.[13] The HEWP's house-to-house structure that seeks to bring health care directly into people's homes suggests that it might help confront this problem.[11] Women in poor countries are just as likely as women in developed countries to choose the most skilled attendant if they are "available, accessible and affordable." [7] Of these constraints, accessibility is likely the major one discouraging the use of HEWs as SBAs, as they are supposed to serve a rural population of 2,500-5,000 without any form of transportation. However within the Ethiopian health system, they are often the most accessible cadre of health worker available to the rural populations. The HEW's relative accessibility within the health system will likely be capitalized on further by the public if the public views her as a competent birth attendant.

The preference for HEWs over TBAs offers up a window for strategic planning within the preventative care context. It seems that if HEWs are able to provide quality birth assistance, they have the opportunity to not only improve utilization of the health system, of preventative services and validate themselves within their communities, but it also seems that they could validate themselves further in the eyes of the Ethiopian government.

Review of Precedent Relating to Creation of Illustrated Health Information

The creation of a resource manual for the HEWs of Ethiopia is an intervention designed to strategically address several issues. This section draws on several studies as precedence to suggest how performance rates of CHWs might be improved upon by access to reference materials. Their performance rates are affected by such externalities as job satisfaction and knowledge retention. Additionally, performance of CHWs has been linked to the quality of training as well the retention rates of health workers. Poor performance on the part of CHWs can contribute to under-utilization of primary health services. Quality resource materials, that extend the retention rates from prior trainings, are one way to help insure education initiatives have a lasting impact and reduce the number of repetitive and costly trainings. Additionally reference materials that contain visual aids have been found to improve knowledge retention rates in both patients and health workers. In addition to improving retention rates of both patients and health workers, illustrated resource materials may also contribute to raising morale among workers by making them feel self confident and valued by their health system. A supportive health system, which provides valued and useful resources to its health workers, can help to insure quality performance.

Currently there may be gaps in HEWs knowledge base that may affect their performance. The yearlong required HEW worker training and the current HEW training materials have been criticized for their quality.[5] Women who are now working in health posts are likely to have experienced questionable training according to reports from the Center for National Health Development in Ethiopia in the Earth Institute at Columbia University. Inadequacies included classes which were taught in English rather than local languages, overcrowded classrooms, little or no training materials, too few chairs, unsanitary latrines and instructors limiting subject matter to theory only.[5] The Earth Institute acknowledges that currently “The curriculum and teaching materials have been developed on the basis of limited experience from the pilot projects...”[5] They also stressed that though the training program was to be 90% practical education, the education was actually 70% theory.[5] One study also cited that HEWs shy away from attending births because of low-confidence levels.[6]

Often the only reference materials that a HEW was likely to leave her yearlong training with included the notes she taken from the board in English[5]. In one review of HEWs it was found that though all HEWs could read English, only 50% felt that they were able to speak English.[6] In our study 76% of HEWs were able to read

English, yet this number is likely quite misleading³ Even if the curriculum is now taught in more appropriate languages, there are still HEWs employed currently who received training that was not as useful as it could have been due to a language barrier. Citing this and a significant lack of health materials available to HEWs in general, the Earth Institute recommends that, “It is therefore important to provide health posts with simple practical reference materials in the most important fields preferably in the local language or in Amharic.”[5]

Job satisfaction has also been linked to health worker performance. HEWs are currently enthusiastic about their job; 78% of the women we spoke with said they enjoyed their job “very much” and an additional 13% said they enjoyed their job “a lot.” It is important to capitalize on this as soon as possible in order to avoid the fate of other health workers in Ethiopia who are often characterized by low morale, poor performance and corruption.[14] Poor performance has been described as a coping mechanism for health workers who feel unsupported by their health system.[14][15] 44% of HEWs we spoke to acknowledged that they had no resources available to support them in their role as health educator; this is their major role within their communities. Rectifying this absence and improving manual quality was one of the Earth Institute’s major recommendations for improving support to the HEWP.[6]

A resource material utilizing visual aids, when incorporated into a quality training, has the potential to increase retention rates and insure that the training is as cost-effective as possible. In a Home Based Living Saving Skills(HBLSS) training done with TBAs in the Guji zone of the southern portion of the Oromia Region, pictorial Take Action Cards, which summarized visually the most essential aspects of managing obstetric complications, were given to the women. The pictorial cards were initially used as teaching aids, but were self-contained in such a way to insure they could be used daily by the TBAs during delivery as memory aids. These visual aids were one of the most appreciated aspects of the training.[13] One TBA stated:

“There are other trainings for which we are trained more than 8 to 10 days . We trained repeatedly. But nothing is in our mind like this training that we trained for only three days. Why...because we see the pictures. We see the pictures and we remember what we forgot.” [13]

³ Actual comprehension of English was likely much lower, as a significant portion of the survey included unchanged health materials which all carried their original message in English. Comprehension of English seemed considerably low within the group who could speak English when compared to average scores on our survey. There was no significant correlation between correct answers on selected questions and English speakers; and there was no significant correlation for scores on the survey as whole.

Another TBA added, “The Take Action Card helps us to remember what we learned. We are illiterate and cannot read or write. When we see the Take Action Card, we remember what we learned in training.”[12] Besides serving as a memory aid, a teaching tool and a diagnostic reference the Take Action Cards were also seen by women as a status symbol, objects they were proud to have earned through the training.[13] The Take Action Cards were also linked to the TBAs improved performance. Women who had gone through the HBLSS training managed post-partum hemorrhage, the leading cause of maternal death worldwide, better than untrained attendants who had not been given the cards.[13] The average level of retention for those women who went through the HBLSS training rate after one year was 70%.[13]

HOME BASED LIFE SAVING SKILLS



Community Meeting 5
Bleeding Too Much

This illustration used in the training of Traditional Birth Assistants in the Southern Oromia Region, details ways to manage post-partum hemorrhage, a common cause of maternal mortality.

Picture Source: L. Sibley et al., “Home based life saving skills: promoting safe motherhood through innovative community-based interventions,” *Journal of midwifery & women's health*, vol. 46, pp. 258-66.

There are additional examples of how CHWs have benefited from resource materials. In Indonesia, the Department of Health's Control of Diarrhoeal Disease (CDD) Program recently carried out an extensive research and development effort to produce effective job aids for the CHWs in CDD and a training program to teach their use. The trained health workers were able to diagnose diarrhoea and mix ORS correctly 83% of the time compared to 68% for the untrained CHWs.[16] In a study on clinical competency of CHWs in Papua New

Guinea, a resource manual on standard treatment was referred to by most CHWs which “...insured that adequate treatment was provided,” even when clinical competency and knowledge were somewhat low.[17] Before being released into the field, these CHWs were trained on how to use the standard treatment manual.[17] In Michigan a simple five point checklist drastically improved the quality of catheter insertion in intensive care patients, resulting in as high as 66% drop in infection rates.[18][19] In the first 18 months this checklist was able to save the participating hospitals 175 million dollars in treatment costs as well as an estimated 1500 lives.[18] These successes have continued for four years running.[18]

Reference materials and visual aids have also been found to help patients understand and retain medical information both in literate and low-literate audiences. In a study done in South Africa the inclusion of pictorial instructions on medicine labels “...was found to contribute positively to both understanding of instructions and adherence [in patients].”[20] Prescription instructions, without visual aids, though usually written in simplistic and straightforward language, still “revealed an unacceptable degree of misinterpretation which is exacerbated when dealing with low literate audiences”[20] Additionally, within the South African sample, both literate and non-literate respondents were equally excited about the inclusion of illustrates prescription instructions. Both groups felt visuals would help them to better remember the directions .[20] Within what is assumed to be a fairly literate sampling of rheumatology patients in Britain, “exposure to illustrated booklets [on rheumatology information] led to higher questionnaire scores than exposure to unillustrated[sic] booklets...”[21] Additionally “...patients exposed to booklets scored significantly higher marks than control subjects not exposed to a booklet.”[21] Conclusions were drawn that instructional booklets improve recall of medical facts, and illustrated books are better than non illustrated booklets. Additionally scores for the rheumatology patients improved the more times the booklet was read suggesting that materials that can be reused for reference are beneficial.[21]

Health workers see continuing education opportunities to improve their knowledge and skills as a sign of support from their health system; a lack of such opportunities has also been linked to poor performance in other cadres of health workers within the Ethiopian health system(12,7). Though not to argue against training initiatives for HEWs, it is also clear that “the often unseen consequences of these initiatives are that there are several competing demands.... This can mean that health workers are removed from their post for long periods, resulting

in an increased burden for those remaining...[15]” A thread that has run throughout this section tends to suggest that when a context for visual aids is provided, their success rates are often higher. Context is most likely realized by a training session explaining the meaning of the visual aids as well as the health information they illustrate. However it is additionally important to insure that trainings remain as cost effective as possible. This is especially applicable to the HEWs who would likely benefit from a training with this manual, but is a responsibility that extends past my own. A quality manual will hopefully make the most of whatever context the Oromia Regional Government is financially allowed when they introduce this manual to their HEWs.

HEWs can become a living context for the manual and flipchart within the context of their responsibility as health educators. As suggested in the South Africa study with illustrated prescription labels:

“...it is generally acknowledged that pictograms should not be used as the sole source of communication as certain studies have shown that they convey insufficient detail for proper comprehension.... Their use should always be accompanied by training and verbal reinforcement by the health care provider.”[20]

There is the potential for a healthy cycle of reciprocity; as the HEW reinforces a visual aid during her health education activities, the visual aid will in turn reinforce her health messages. Knowledge of health education strategies is also a gap within many HEWs’ knowledge base. It has been recognized by other studies, as well as our own, that HEWs spend the majority of their time as health educators. Worrisome though is the fact that health education compromised only 2.2% of the first batch of HEWs yearlong training.[5] Considering the positive ways in which both patients and health workers have benefited from illustrated health information, it seems a well-structured and focused flipchart could simultaneously introduce HEWs to basic health education strategies as well as afford them a valuable resource material at the same time.⁴ Additionally, a well designed resource has the potential to positively affect HEWs knowledge retention as well as their job satisfaction. This has the potential to increase HEW performance, which has the potential to increase utilization of services by community members.

⁴ Likewise a proficient resource manual on childbirth will hopefully be shared with mothers-to-be. Cycles of reciprocity will be apparent in the complimentary subjects contained within the manual/flipchart, the visual aids and the messages they support and the relationship between the HEW and her community. These relationships are threaded together largely through the design of the manual both as an educational tool and a visual aid. These elements will be further addressed in the section on the manual’s design. Literacy will also be further explored.

Review of Precedent Relating to the Design of an Illustrated Health Resource

The design of this manual has been influenced by several factors. These influences relate to the variable uses for the manual and then the users themselves. It is assumed that the manual will be used two ways, one as a resource for HEWs and the other as a teaching tool to be used by HEWs when educating their community. In this way the HEWs become the primary users; the design of the manual seeks to support their comprehension first and foremost. For if they can comprehend the material, then it is likely that they will be better able to effectively communicate the messages to their intended audiences.⁵ It should also be understood that comprehension of illustrated health information is not limited only to pictorial comprehension, which can be termed as visual literacy, but also literacy, health literacy and cultural factors as well. Literacy, visual literacy, health literacy and cultural relevancy are complex factors; each component affects one's ability to understand illustrated health messages. In order to define the design environment this section will draw on theories of information design and adult educational approaches, previous studies in visual literacy and conclusions from our survey with 60 HEWs.

Popular Approaches to Health Education & Adult Education

Some insight into the design environment for the resource manual can be garnered from various approaches to health education and visual literacy. For example the participatory approach is one that has influenced most attitudes and processes relating to current international development work, including education material design. This approach generally calls for active participation from those who are the scheduled recipients of a specific development program. In terms of image design this approach stresses the importance of testing potential materials with the target audience. This has also been taken even further; some approaches suggest that the target audience should create their own materials altogether. Focus groups and interviews, with community members and relevant stakeholders at all levels are a staple of the process. The process seeks to garner local knowledge and needs to inform the program design; both in order to create a more relevant program and also to empower local community members. The employed interviewing methodologies tend to have a focus on the visual. Mapping, ranking, matrices, diagrams and other visualization exercises are used in discussions

⁵ This builds on support established in the previous section, specifically relating to the ability of patients to understand illustrated health information when it is accompanied by verbal reinforcement from a trained health worker.

rather than more traditional survey techniques, because “visual media being independent of alphabetic literacy and near universal, are argued to empower the weak and disadvantaged.”(10) A dissolution of hierarchies and power structures is the intention of these visualization techniques and the participatory approach in general.

Both the participatory approach and its heavy use of visualization exercises are inspired by the work of renowned educator Paulo Friere. Friere was responsible for outlining a new approach to adult education in Brazil, which sought to teach critical thinking skills alongside literacy.[22] In this format the teacher becomes facilitator, traditional hierarchies are questioned, and knowledge results from discussion rather than lectures. Images of situations were used to spur and kindle critical discussions about the social structures that shaped Brazilian society.[23] Friere ultimately saw this approach as a way to empower the Brazilian rural working class, instil in them a critical consciousness and thus eventually promote a peasant powered revolution.[22][23] This approach is assumedly more radical than the World Bank’s recent adaptation of participation, yet this more recent wave of certainly claims Friere in its foundation.citation Whether Freire would appreciate this or not, as well as the actual success of participatory approaches, is a matter being heavily debated at the moment.[24][25]



*Paulo Freire used illustrations to spur critical thought and discussions, while teaching Brazilian adults in the rural areas to read and write. Source: Paulo Freire, *Education for Critical Consciousness*, New York: Continuum, 2005.*

During the 1980's and about 20 years on, much discourse was produced about the creation of education materials utilizing visual aids within a resource-poor settings. Most of this literature incorporates or addresses a participatory approach to image creation. Significantly less time is spent on how to incorporate local languages. This is likely because at the time, much of the literature focused on the illiterate poor population; images were seen as a way to transcend the written word and reach out directly to the poorest of the poor. .citation Additionally, some have criticized literacy campaigns entirely, suggesting instead that education messages should be simplified to reach the illiterate at their current level.[26] Unfortunately it would seem that pictures, accompanied by limited text, are also highly limited in their ability to communicate complicated and technically advanced public health information, unless there is an available health professional on hand to explain them. Bob Linney, an illustrator and well-known voice within development education communities, has one of the more extreme approaches. He advocates that the entire notion of a target audience be abandoned and the 'People' encouraged to create all their own educational visuals.[27] His is an admittedly reactionary response to the development of social marketing⁶ techniques in the 1980's, which he describes as 'authoritarian.'[27]

Social marketing techniques take cues from corporate advertising in the creation of public health messages. Social marketing strategies, in both developed and developing contexts, do take a more nuanced consideration of their target audience when creating public health messages just as corporate ad campaigns do; however these campaigns are usually limited in scope.[28] They encourage behavioral change, often in areas where the target audience may already know the correct health behavior but chooses to disregard their knowledge often due to overriding social or cultural motivations.[28] As a result social marketing often utilizes emotional persuasion more so than education. This is certainly not a weakness, but simply describes a different set of priorities and health concerns.

My interests lie heavily in when and how participatory and social marketing approaches must be intersected, adapted or ignored altogether in order to insure the best delivery of a specific skill set to an intended audience. A study with CHWs in Papua New Guinea study also stressed the importance of creating a manual specific to the cadre of health worker that would be the intended audience in order to insure its utility.[17] My

⁶ Examples in the United States would include the anti-tobacco Truth campaign or "This is your brain on drugs" campaign.

audience however, the inexperienced but literate health worker who is largely working in an isolated and rural environment and educating a rural audience, is rarely sufficiently addressed by either social marketing or participatory approaches to health education. What I have been able to determine from my research into health education and adult education in developing settings, is that my intended audience, an inexperienced, but professionally trained and a literate audience, is rarely overtly addressed by the available literature. There are of course many lessons to take from the precedence found in both participatory and social marketing approaches as it relates to my intended audience. However these lessons are best understood when their context is broadened both by our survey with HEWs and the basic theories that inform information design.

Overview of Survey Results

The American National Standards Institute defines comprehensibility of pictorial symbols at 85%, the International Standards Organization determines it to be at 65%.^[29] This criterion can help guide researchers in determining the utility and acceptability of visual aids; however considering the importance of health, above 80% seems preferable. On our entire survey only four women scored 65% or higher. The highest score overall, received by only one woman, was 75%. However it is important to differentiate between potential factors that may have positively or negatively affected these scores. The survey itself was not simply a measure of pictorial comprehension. Determining the affect subject matter, literacy and cultural influences might have had on the results is essential to understanding them. A closer examination of the survey results will reveal certain trends, which can illuminate the manual and flipchart's required design.

The images used in this study were taken from health materials currently available in Ethiopia and on which the women had received no explicit prior training. We were interested in responses and interpretations of images that were novel, and supposedly accessible to a large audience. The introduction of new materials was felt to represent a scenario that is often likely to occur in a health system that is strained in terms of human and financial resource; training might not always be a viable option. Our objective was determining the design parameters for a successful material, which, if necessary, can be introduced without the aid of a training.

Each semi-structured interview took between 1 hour and 1 hour and 30 minutes to complete and was conducted in office space at one of the three Health Centers serving the three sampled woredas. We worked with

translators who spoke both Amharic and Oromiffa as well as English, and had previously done similar work for another health survey. We received IRB approval from the University of Michigan. Our study also was supported by Jimma University in Jimma Ethiopia.

The visual section of the survey, preceded by a brief literacy test, was comprised of both tests of preference and tests of comprehension. Preference was tested by asking which color women preferred most and why, and which family of 9 culturally and/or aesthetically variable families was their preferred and why. The visual comprehension sections was comprised of 19 isolated images, 2 images dealing with perspective, 9 images depicting specific health messages, 2 narratives utilizing sequential panels and 2 examples of time abstracted into a linear and symbolic format. On 7 of the 9 health messages women were asked about their preference for the image. The survey overlapped on itself in a multiple of other ways as well. For example the narratives tested on both understanding of symbolic imagery as well as the intended message. Though it proved to be difficult we attempted to break down comprehension into its fundamental elements whenever possible; this was supplemented with qualitative questions to offer further insight. What follows is a brief summary of interesting and relevant trends.



This family was part of an educational campaign by the Aids Resource Center. Out of the nine families included in the survey, this one was consistently preferred. Source: Aids Resource Center. Addis Ababa, Ethiopia.

Across the board, preference choices among images of families centered on family planning. One or two child families were preferred, as well as images in which the height of the children indicated good family spacing. After probing further, it was revealed that the HEWs also preferred families who appeared happy, pictures that showed the families as physically close together and families in which the father appeared to have an active role in child rearing. Photographs and very realistic drawings were preferred over more stylized or cartoonish images. Some HEWs questioned whether the more cartoon-like images represented real people. Among the most-liked family images, all were intended to represent Ethiopian families. Preference was fairly evenly mixed between the coloured and the black & white version of different images. Similarly, a picture of a family wearing limited clothing was largely rejected because it reflected ‘bad culture’ and the unhygienic practice of wearing limited clothing. Even though the picture represented members of an Ethiopian cultural group – the Hammar - this cultural touch was rarely well-taken. Finally, images of families that did not reflect family planning – regardless of the actual message – were largely rejected. Even though big families remain the norm in Ethiopia, the inclusion of more than two or three children – or families with limited space between their children – were labelled as ‘bad’ or ‘very bad.’

While some color preferences we found are probably idiosyncratic, a few patterns did emerge. There was a preference for the colors white and green. White was associated with cleanliness and peace and was identified as a colour often worn by Muslim women. Green was associated with the local agriculture as well as Islam. Though not universally disliked, many HEWs identified red and black as their least favourite colours. Red was taken to be a sign of danger, HIV and menstruation. Some HEWs also noted that they did not like to wear red and that a red card was negative during a football match (a point which was also noted for yellow, which some associated with making mistakes). Among those who did not like black, they associated the color with death, a bleak future outlook, ignorance, danger, unhappiness, and, unfortunately, the color of the respondents.

Some images showed to the HEWs were easily recognized, while others were unfamiliar or produced disparate answers. Some isolated images shown to the HEWs easily recognized some images(a cow (100%), a landline telephone (100%), the female reproductive system (92%), a woman carrying water (90%) the elements of

a place setting (plate, spoon, cup, etc) (95%)⁷, a handshake (82%), a papaya tree (73%), and a red AIDS ribbon (67%). One of the most striking examples was that not one respondent recognized the image of the prescription bottle, labelled ‘Rx.’^{8 9} Images of both a ‘modern,’ flush toilet and a latrine also both proved difficult, with 25% and 17% accuracy, respectively. The flush toilet was often mistaken for a small cooking pot while the latrine simply could not be identified, even when the relevant ‘house materials’ surrounding the image were correctly labelled. Considering that this type of latrine was seen at most health centers we visited, this might be explained by the relatively abstract nature of the latrine. It is likely that if the latrine was depicted while in use, confusion would be minimized. This theory is supported by D. Werner’s work, where he concluded that the incorporation of the human figure into more technical visual explanations was clearer than those without a human figure.

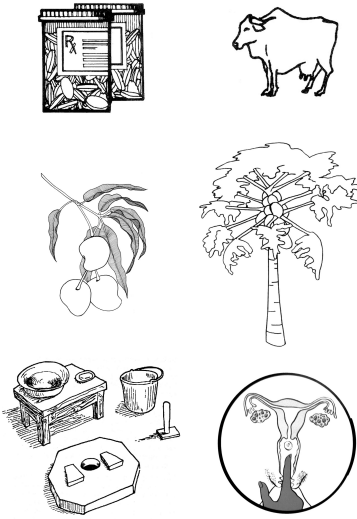
Another confusing image was one that intended to show a husband and wife, which was seen as such only 49% of the time. This was often interpreted as two male friends(41%), fitting with the norm of same-sex public displays of friendship and the taboo on such displays by romantic partners. In this circumstance it should be underlined that the image failed more due to cultural restrictions rather than a lack of visual literacy on the part of the respondents. Many difficult images were “near” interpretations. Additionally the image of a husband and wife was often interpreted as simply two people (60%). Fifty-two percent of respondents did not recognize an image meant to be an avocado, although it is a popular fruit in Ethiopia. But of these, 93% described it as a different type of plant or, simply, as ‘a plant.’ Similarly, of the 57% who did not identify the image meant to represent a mosquito, 65% identified it as another type of insect.

For isolated object questions, respondents indicated the size of the object represented in the image with their hands to determine how scale translated. Of those who identified the mosquito as such, 65% described the size accurately. Of those who described the mosquito as another insect, 55% described the size accurately. Of all the women surveyed, 61% of those who identified the mosquito as a type of insect accurately indicated its size.

⁷ Interestingly the place setting was never described as a whole, but rather by the sum of its parts: cup, glass, fork spoon and knife. We found a similar trend when we asked respondents to describe what they saw when shown a picture of an agricultural landscape. Here also the respondents pointed out livestock, gardens, people, cars, etc, only one HEW described it as landscape. Again visual literacy was clearly apparent, only not as the original image was necessarily intended to be read.

⁸ To be sure that we did not simply have a poor image of a medicine bottle, we showed it to a pharmacist at one of the *woreda* Health Centres, who immediately identified the image as a medicine bottle.

⁹ This is in line with the findings by R Dowse and MS Ehlers in their study in South Africa[29][20], and is logical given that most medicines are distributed in blister packs in Africa.



Here is one example page of isolated objects from the survey. Comprehensibility: Prescription Bottle(0%), Cow(100%), Mango(37%), Papaya(73%), Latrine(17%) and Uterus(92%).

Perspective was also a difficult feature of images, leading to some disparate interpretation of images. In particular, one image included a family of four at a market filled with many other people, we asked specifically about perspective. Only 44% of participants correctly identified which person in the picture seemed to be closest to them. Interestingly it was one of the larger members of the family that was often described as being closest to the viewer when the correct child was not chosen. This was similar to the trend we noticed when we asked HEWs a series of questions about perspective within the landscape image. HEWs had a very difficult time determining which of the same sized color spots might be interpreted closer or further away, however they were noticeably better at discerning which set of houses would be furthest from them. Size was the discerning factor suggesting that size differentiation in objects may be the clearest way to suggest perspective and distance.

Again, there were often “near” interpretations of health messages. Of those not able to interpret the child/crop-spacing material as intended, most women were able to infer a message related to family planning (78% of all respondents.) Of those who interpreted the spermicide message differently, 74% understood that it was about the insertion of an object used to prevent pregnancy and aid in family planning. This material included

an inlay of the internal female reproductive organs; this image was the same uterus used in the isolated object section where it was correctly identified 92% of the time.

One of our questions indicated that a single image representing different points in time, is more accessible than a story divided into different cells in terms of formal narrative mechanisms. 55% of HEWs were able to interpret an image detailing cause and contraction of schistosomiasis. The image showed a boy urinating into a body of water and another boy washing in the same body of water. Arrows and numbers indicated that the urine that left the first boy was contaminated, entered snails, which then infected the boy who was washing. The two boys shown were interpreted to be different boys 86% of the time and the same boy 11% of the time; this seemed to have little impact on the understanding of the message.

In another question, we asked respondents to complete a comic-style story that had the four middle cells removed. The respondent was asked to put these four images into the correct order in the middle of the story. Before asking them to do this we told them the narrative and intended message of the story. Twenty-nine percent of the respondents put the story in the complete correct order. By far, the first cell was most often put in the correct position (60% of the time). Though this was not made explicit, we suspect that this was in part because of the tracks left by a dog entering the last given cell and entering the cell placed in the first position. This aspect of using the sequence of images to understand the story is similar to the concept of Sequencing introduced to us by B Cook's study in Papua New Guinea[30]. His results on sequencing were similar to our own, if tending to be a little higher. The narratives he used tended to be much simpler in that they always depicted the human form as a whole. Another study done by Unicef in Nepal found that illustrations of hands, not attached to any body, were not understood. Similarly with this comic, the third panel, which contained 2 unattached hands, was placed incorrectly the most often. One woman asked us overtly who these hands belonged to.

In another question, HEWs were asked to look at a story that contained seven cells and interpret the story. The story was about two boys, and they, as is a custom in comics, wore the same clothing throughout the story. However, when asked, 51% of HEWs identified more than two boys in the story (up to a total of eleven boys). Of the 48% that correctly identified two boys, most said that they were able to tell because of the clothing and faces of the boys. Another interesting finding was the non-recognition of speech bubbles in this comic-strip. The same story was shown, and participants were asked to identify who, if anyone, in the story was speaking. Respondents

most often identified the people in an image where the body language suggested speaking. The individuals with speech and thought bubbles were rarely chosen and only once did the respondent say that they made this decision based on the presence of speech bubbles. Speech was more often explained in relation to the body positions of the images chosen. What was clearly apparent was each respondent's ability to project feelings and actions onto these figures. Also interesting was the fact that neither of the narratives containing separate cells, were chosen by a respondent as the most difficult question. Though HEWs were unable to interpret the narrative's codes in terms of panels and speech bubbles, it seems they still felt unthreatened by this manner of communication. Narratives are perhaps seen as more open-ended; open to each viewer's interpretation. Additionally, an inability to decode certain aspects the comic's symbolism, did not seem to inhibit HEWs from understanding the intended message in its entirety.



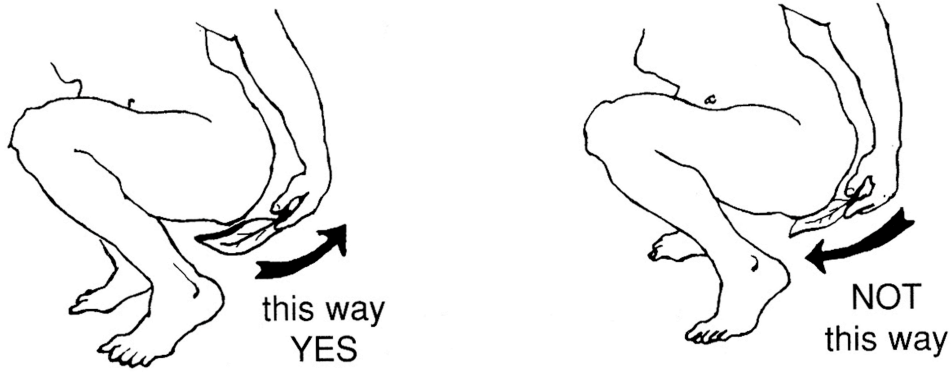
The act of speech was often projected onto this boy in the red pants, rather than the intended child using a speech bubble earlier in the comic. Reasons given for this boy being the speaker included his posture and his role in the story.

One implicit theme that emerged from our interviews was a desire to have the images match the reality of the *kebele* – so long as that reality was not detrimental to health. For example, in response to a picture that showed how to mix ORS at home, five HEWs mentioned that the picture would only be somewhat useful because the bottles, spoons and sugar shown in the picture were not readily available in their *kebeles*. Even while

recognizing that spoons were an important part of food hygiene, it seemed evident that, in this case, it would have been preferable to show a hygienic way of mixing ORS using one's hands. Moreover, ORS in Ethiopia is most often available in pre-mixed packets, which may have contributed to the fact that only 46% of HEWs interviewed identified this image as relating to ORS (20% said that it was about food hygiene or hygienic ways of mixing medicines). Other images deemed of limited utility included difficult-to-get items such as glucose and needles and family planning drugs that were not accessible or acceptable.

Scenes familiar to everyday Ethiopian culture were identified more successfully than unfamiliar images as seen by results of the isolated object questionnaire. What's more is the significantly increased level of success that HEW's had in identifying overall health messages correctly when images were of common rural Ethiopian images such as the family planning image using crops. This image was cited as the one that would be the most helpful to the HEW's we interviewed while they presented health education materials. This infers a key relationship; health messages appear to be more clearly understood when individual objects within the image are familiar and common.

However, some images were deemed 'bad' or 'very bad' because of the 'realistic' touches they included. For example, one image aimed to teach that after defecation, women should wipe themselves from front to back rather than back to front to avoid infection. The image, likely in an effort to be locally relevant, depicted a person defecating and using a leaf for wiping. Even though the out of doors was not overtly referenced some respondents (30%) interpreted the message as indicating not to go to the bathroom in a field or to avoid using a leaf for wiping – the point about the direction of wiping was largely missed. It was also noted that in Muslim communities (which predominate in the south of Ethiopia), water would be used after defecation rather than wiping. A few respondents also pointed out that this image would be improved if hand-washing was included after the images about defecation. In this case, the attempt to be locally relevant included negative health behaviours, which led to misinterpretation and rejection of the image.



The HEWs were enthusiastic about the prospect of having access to more and better health materials. They currently report having few or no materials. Perhaps as a consequence, they tended to rate many materials as highly useful. Even the material on defecation hygiene, understood as intended by only 3.3% of respondents, was described as “very useful” by 48% of respondents. When asked to suggest improvements, some elaborating respondents pointed out that the Oromia region is primarily Muslim and Muslim women in this region use water after defecation rather than toilet paper. Source: Where there is No Doctor (Hesperian: 1977)

All of these examples convey that it is critical to keep all the details in an image in line with public health norms, regardless of the specific message being conveyed. People will try to extract some message from most images, so it is wise to be sure that everything can be construed as an example of positive behaviour. Additionally, an ‘unhealthy’ detail can cause the entire material to be misinterpreted or rejected. Interestingly this places the context of successful health images in a largely grey area. It seems that while visual images might benefit from quoting cultural norms, too accurate and they might prove even less successful than materials made without the local culture in mind.

In the section articulating the reasons for the manual’s creation, we were able to attest that images, when relevant, were helpful both in literate and illiterate audiences. However a relevant question is do the same images become more relevant when accompanied by a more appropriate language? Creating a manual in Oromiffa seems to be inherent to the success of a material, however we were unable to overtly isolate this as a factor in our study due to an oversight in our literacy test. Perhaps there is still useful information that might be inferred. 91% of women were able to read Oromiffa, compared with 65% who were able to read Amharic. Many images in our survey contained their intended message overtly in English. Thus those who were able to read English should have been able to score considerably higher than those who were not proficient in English. 76% of the women we spoke with were able to read English, however this was not positively linked with higher scores on the survey. A

likely explanation of this disparate relationship can be attributed to the fact that Oromiffa utilizes the same alphabet and phonetics as English. Women who were able to read English easily, could have accomplished this with little or no actual comprehension due to the structure of Oromiffa.

The Oromiffa literacy rates among the HEWs are likely accurate, though certainly somewhat problematic in terms of our methodology and the lack of certainty surrounding English literacy rates. However, what becomes especially interesting is then how much text and image, when in the appropriate language, contributes to comprehension of an intended message. Though our survey did not overtly address this issue, it does indirectly suggest that manuals created in English or Amharic for HEW in the Oromia region will likely be less successful than those translated into Oromiffa. The Earth Institute also came to a similar conclusion after their overview of the HEWs' training, where they urged subsequent materials be produced in local languages.[5] Additionally within the South African context, R Dowse and MS Ehlers determined that there was a significant relationship between literacy and comprehension of pictorial prescription instructions, but their tested materials included relevant local languages.[20] These instructions utilized no images that could be called culturally specific to South African culture, but utilized two local languages.[20] Several images were considerably similar to one of our questions which also centered on prescription instructions. Within the South African study, respondents who were able to understand 91-100% message constituted 71.7% of the whole[20], compared to 43% of the HEWs we spoke with. What this could suggest is that, though the importance of culturally relevant images should not be discounted, culturally relevant languages are equally, if not more important in aiding comprehension when addressing a literate audience. A reciprocal relationship has seemingly been found: the addition relevant of images improves understanding of text and text in an appropriate language improves understanding of pictures.

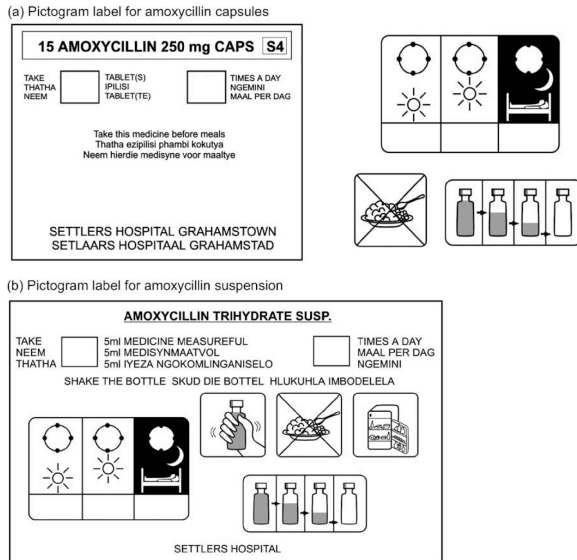
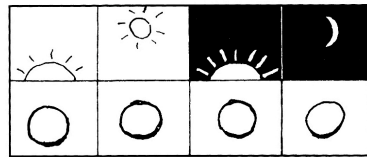


Fig. 1. Examples of labels incorporating pictograms.

Within the South African study, respondents who were able to understand 91-100% of a prescription direction message constituted 71.7% of the whole[20]

This means 1 tablet 4 times a day, 1 at sunrise, 1 at noon, 1 at sunset, 1 in the middle of the night.



Compared to 43% of the HEWs we spoke with. Source: Where There is No Doctor (Hesperian: 1977)

If we trust the literacy rates for Oromiffa garnered from our study, HEWs at a 91% literacy rate are considerably more literate than the population they serve. Ethiopia as whole has a literacy rate of 42.7%.[2] This number hides the disparity between rural and urban areas; in rural areas, where the HEWs are employed, it is estimated at 21.8%[2]. HEWs could seemingly serve as a useful bridge between the health messages originating from the MOH and the rural population it seeks to serve with its HEWP. Complicated health messages, which are difficult to communicate in pictures alone, would seemingly be more accessible to HEWs; they could then verbally pass these messages on to their intended audience. A HEW's increased accessibility to health information, as compared to the rural population, is seemingly a resource to be capitalized on. However this will only happen if HEWs are regularly supplied with information in a language they can understand and with accurate and relevant visual aids.

Though our survey is a jumble of information relating to the surveyed HEWs' visual, linguistic and health literacy as well as cultural and aesthetic preferences, what becomes clear is that none of these aspects of comprehension are inherently more important than any other. Rather what we should understand is that each of these is capable of contributing to and influencing the level of comprehension among HEWs. The correct balance of all these as they would relate to information design is something that will change depending on the type and purpose of the information to be designed.

Theories of Information Design

Information design is a broad and somewhat undefined process that can easily encompass any type of designed information including ads, websites, graphs, subway maps book covers, student worksheets, condom instructions etc. Because of this it can draw on an incredibly diverse set of theoretical precedence including constructivism, cognitive psychology, typography, aesthetics, human computer interaction, graphic design, visual literacy etc.[31] To narrow the scope in order that it may be relevant to my project, theories of information design as they relate to designed combinations of text and image in service of instruction will be highlighted in this section. Information design expert Rune Pettersson clarifies that “An information designer (or infographer) needs to have skills in writing comprehensible, clear and consistent texts, in creating clear illustrations and in creating clear, transparent typography and layout that aids understanding and learning.[32]” Here I will address my project's information design as it relates to my chosen text, image and layout and their interaction to facilitate knowledge retention. These, in addition to relevant information garnered from past visual literacy surveys in developing countries, will be summarized. Additionally the medium in which this information will be presented—small black and white print media pamphlets—will further define the design parameters. The dual nature of the manual, in that it includes a section for the HEW and another section for her to use when speaking with her community, helps highlight the way the design of health information might shift and adapt to best suit a given context.

Text

The text, outside of the subject matter covered in its respective section within this paper, is simplistic and lacks the use of highly technical medical jargon. A basic of information design is the understanding that “People have no difficulty in reading the jargon used in professional languages but understanding the concepts the words represent may be difficult for the non professional.” One example is my omission of technical names for the various fetal positions that might be present at birth. The position of the baby is very important for determining how complicated the birth might be. In some instances a cesarean section will likely be the only way to remove the child from the mother’s womb safely. A HEW is not able or allowed to perform this type of surgery, thus the sooner the HEW can determine the presentation of the child, the sooner she will be able to make a referral to a hospital if necessary. The medical terminology used to describe the positions the baby might present at birth is somewhat confusing and is more simply explained by illustrations. As Pettersson summarizes “It may take only 2-3 seconds to recognize the content in an image, but 20-30 seconds to read a verbal description of the same image.[32]” Considering the audience’s relatively short training period and limited education background in general, it seems best to limit complex vocabulary by incorporating clear and concise images instead. Simple language infused with illustrations that make technical language voluntarily obsolete in many instances and allows for the text to remain unthreatening and relevant.

The strategy of simplified language is encouraged as well as utilized by two seminal texts from the participatory genre concerned with the education of low-level health workers: *Where There is No Doctor*[33] and *Teaching and Learning with Visual Aids*[34]. However these two texts, as popular as they seem to be in terms of repeated printings, are limited by their volume and breadth. Though they certainly cover a wide range of essential topics their thickness, ranging between 300-600 pages, makes both translation and printing a considerable financial concern. *Where there is No Doctor* has been translated into Amharic, however in terms of average the Ethiopian income, it is still quite pricey at 25ETB. I also have only seen it in limited bookstores in the country’s capital. By keeping my text brief and limited to one essential subject, I seek to make translation and printing more financially feasible for the Oromia government. My text will be translated in Oromiffa under the direction of the Oromia Regional Health Bureau within Ethiopia. Printing will also occur in Ethiopia and will be overseen by the health bureau. This will help keep translation and printing costs down to a minimum and allow local

officials to edit the manual further, before it heads to press. It is my hope that a small success with a smaller manual will inspire further investment in quality materials.

Translation, an aspect of the manual that remains largely outside of my control, will likely contribute to significant complications regardless of the considerable amount of time I have spent making the language of my manual simple and accessible. Poor translation of the text is a distinct possibility considering the lack of qualified Oromiffa-English interpreters and the price of translation. A brief published by *Hablamos Juntos*, an organization concerned with language policy and practice in healthcare, underlines that the most difficult health information to translate is receiver(or user) oriented information intended to educate the receiver. The difficulty with this type of information is that it requires an interpreter that understands, in two languages, the technical information presented as well the cultural context of the audience. Word-for-word translation is the most common type of translation employed in health information because of the lack of skilled interpreters; this type has a real potential to lose original and intended meaning. There are additional complications that might arise through the process of translation.

While I was working in Bahir Dar Ethiopia in 2004 on a educational billboard about soil conservation intended for a low literate farming population, I had a difficult time getting my text translated as I had intended. Similar to the strategy employed in this manual, I utilized very basic English and simplistic descriptions to describe highly technical approaches to soil conservation. However when I released my text to members of my NGO's office to be translated, they insisted on increasing the amount of text considerably and restoring it to the jargon-heavy style of the manuals I had just spent significant time interpreting into accessible English. Due to my low status within the organization, this inaccurate translation was accepted. As a result the billboard's impact was likely limited. Additionally, because of the excessive amount of text added to the billboard design, printing became difficult and in terms of opportunity cost, more expensive. The increased amount of text required a large printer with considerable resolution. There was no printer large enough and capable of this level of detail within Ethiopia; the design had to be shipped to Kenya for printing. Eight months later the billboard was finally finished, it then had to spend an additional month in customs waiting for clearance. Though I cannot say for sure why the office translators chose to ignore the style of language I had produced, I initially felt that it was a question of ego. Simplifying an expert's knowledge may have been culturally seen as an affront; my disrespect to

their knowledge status and skill. Additionally I imagine that using a jargon-based language with which they were comfortable had the ability to cut down significantly on translation time; actual interpretation of my intentions would likely have taken much longer. While working in various offices in Bahir Dar, I was struck by the tendency for the few skilled experts available to an organization to be excessively overworked, this to the point where the quality of their work suffered. What I have taken from my time working in Ethiopia as an illustrator and researcher is that a tendency to dismiss, for whatever reason, the importance of quality translation as it relates to the intended audience is a major barrier to the success of foreign produced educational materials.

Image

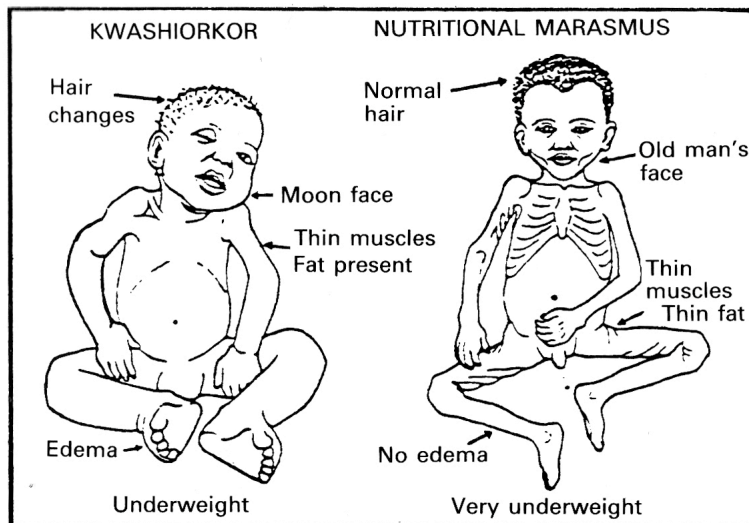
As outlined in the section on the justification for creation of an illustrated HEW manual, pictures have the ability to clarify text so that its intended message is more quickly accessed and retained. The precedence in that section drew largely on studies within the public health community; additionally information design theories draw to similar conclusions. As Pettersson summarizes, “Probably no other instructional device leads to more consistently beneficial results than does adding pictures to a text. There can be no doubt that pictures combined with texts can produce strong facilitative effects on retention and learning.[32]”

The realistic, pen and ink style of illustration employed in my manual respects relevant theories of information design as well as resource limitations. Scaffolding is a staple of cognitive psychology and educational theory. It suggests that when a student is learning a new concept, they will benefit from information that is structured in a way to introduce new ideas by building off of previously understood concepts. To place this within the realm of illustration, and also the participatory approach as suggested in D Werner’s *Helping Health Workers Learn*[35], pictures and visual aids that are as literal as possible are more accessible than highly stylized drawings to learners who have had limited experience either with pictures or a given subject matter. Photographs would then seemingly be the most literal approach to illustration, however they are limited in ability to introduce certain concepts often because of their realistic and literal nature. Though photographs were often preferred by HEWs, illustrations are assumed to be a better device in respect to learning theory and resource limitations.

Illustrations can subsequently do what many photos cannot, which is to provide views of an object or action that are essentially unrealistic, but helpful to a learner trying to visualize this object or action within a given

context. Within the realm of public health these would include visualizations of internal organs. Illustrations are as literal as possible while still being malleable enough to introduce theoretical concepts. Photographs may have additional weaknesses. One study cited in Path's Developing Materials on HIV/AIDS for Low-Literate Audiences, describes how a photograph is more difficult to interpret[36]. A Unicef study done in Nepal supports this; its findings suggest that a photograph that lacks a background is more clearly understood than its unedited version[37]. This would suggest that it might be difficult for a learner to determine what is the essential information to glean from a photograph in which everything, including unessential objects, are present and in focus. Additionally it was found that a realistic pen and ink drawing with a limited background was understood best. Cook's study in Papua New Guinea supports similar findings. In this way illustration can be also interpreted as a type of scaffolding in that it can focus the viewer's attention onto certain essential details while remaining in a known and accessible medium.

Illustration within the manual as a whole is also inspired by the reality of limited financial resources. Photographs are more difficult to print, and thus more expensive to reproduce. Within a resource poor setting, the flexibility of a visual aid is essential to its success. Currently some HEW training manuals produced by the Ethiopian government employ photographs. It is clear from their poor quality that they have been photocopied and then reprinted by a process not intended for the reproduction of photographs. Pen and ink illustrations have the ability to hold onto significant amounts of details even at severe reductions in scale on a photocopier. Additionally they will retain their clarity when scale is significantly increased where, photographs have the tendency to become grainy and lose needed contrast.



*Illustrations are often far superior to photographs when reproduced on photocopier or facsimile.
 Above Source: Teaching and Learning with Visual Aids, Chapel Hill: Macmillan, 1987.
 Below Source: Ethiopia Ministry of Health. HEW training material on Nutrition.*



A child suffering from Kwashiorkor



A marasmic child

There is an inherent need to design an educational material, not simply produce it. Especially with respect to a highly technical manual on childbirth, The photos employed within the current HEW training manuals have the look and feel of clip art, isolated objects, largely independent of the text they are seeking to illustrate. These photos, besides being largely illegible due to the poor reproduction, have also been reduced in size considerably—further disrupting their ability to communicate. It seems likely that HEW manuals were designed by someone who was not a trained designer, or by one so overworked that time was too limited to give adequate

thought to design. Many of these manuals look as though they were designed in a word-processing program at an A4 size, without thought on how the 75% reduction might affect the legibility of the included clipart. Moreover the purpose of including visual aids should then be questioned; if the illustration does not overtly illustrate the text, then what is the point of its inclusion? As Pettersson summarizes, “When illustrations are not relevant to prose content they can have a negative effect.[32]” Clipart as an aesthetic is not an inherently disruptive tool, suggested by the success of illustrations lacking in background, but when it is employed without reference to its context, comprehension additional problems might easily arise. For a visual aid to be successful as a learning aid it is essential that both text and image work together to illuminate the information.

My critique of some aspects of participatory design runs counter to certain ideas suggested in participatory approaches to illustration. In general it seems that many participatory approaches in health education fall short of providing illustrations that detail technical skills that are also attractive and accessible. Bob Linney, in his book *Pictures, People and Power*, suggests locally made images designed by un-professionals are the most empowering and insure cultural acceptance[27]. These images produced during his workshops in developing countries often have the look of a novice; beautiful in their own way, they are also simplistic and stylized. Though he might critique my assertion as neo-colonial, fore-mentioned visual literacy studies found highly stylized drawings to be ineffective with low literate audiences. Additionally K & G Tomaselli point out that an unprofessionally designed poster & illustration on diarrhea treatment in South Africa failed with the intended audience[38]. This because the design failed to present the information successfully to the intended illiterate audience; they also found the illustration to be ugly. These illustrations were remarkably similar to the style utilized in the celebrated *Where There is no Doctor*. Social marketing techniques suggest that people prefer to learn from images that depict people slightly more attractive and financially successful than them[28]. Our survey also infers this when looking at which families were chosen by the HEWs most often. Linney has also created a book of clip art for development that, though created by professionals, is meant to be manipulated by local development workers to suit their local environment[39]. In this instance, in hopes of being highly malleable, the illustrations are excessively general and lack any technical specificity. Nothing in the manual would be useful to health worker learning how to assist with childbirth for example. The clip art images seem

more appropriate for materials discussing basic behavioral change with a lay-audience. Many of these illustrations are rudimentary and stylized.

In defense of stylized drawings, Bob Linney suggests that people are capable of acquiring visual literacy quickly if new images and styles of illustration are introduced within a context or training. Verbal reinforcement is key. This belief is supported by many of the articles previously mentioned including the use of prescription instructions in South Africa and the Take Action Cards employed in Southern Ethiopia[20][13]. Additionally the Unicef study in Nepal found that though respondents were best able to understand new images if they were drawn in a realistic manner, many were able to understand a highly abstract image of person's lungs, and list off facts about TB, because of it being introduced during an earlier training with a trained health worker[37]. Again verbal reinforcement was seen as necessary to the success of retention, and images had the ability to understanding of verbal information.

The design strategy employed with this project utilizes the assumption that a useful language will provide HEWs with a relevant verbal context for understanding included visual aids. Because they are literate, HEWs are likely to be able to understand a more technical manual, especially if it is illustrated. Their literacy, when supported by a quality translation, allows considerably more freedom in the range of image styles that might be understood. This is further supported by the fact that the HEWs we spoke to were able to read most of the images in our survey fairly accurately, if not always the intended message. They are visually literate, even if English literacy levels still seem fairly low. As long as the language is relevant and accessible, it is assumed that the images I have created will most be understood. But because a training on this new manual is not insured, I have chosen an illustration style and technique that respects most of the information garnered from our survey and from visual literacy surveys. My illustrative methodology operates within a slightly gray area in that seeks to challenge the HEWs to learn new and complicated information, but also does not ignore precedence found in previous visual literacy studies. The pictures and information introduced via the pictures may be new, but the style of illustration remains traditionally accessible in respect to visual literacy studies and information design theories. Additionally my style strives to respect cultural norms as much possible without undermining public health messages. Any unintentional ignorance of cultural influences on my part will likely be overcome if the manual is successfully translated.

Conclusion

To support HEWs, the Ministry of Health recommends that the country “develop appropriate health education materials that can be used for health education, [including] teaching manuals, materials, audiovisuals, leaflets and posters, which are adapted to local conditions.”[4]. Although Health Education & Communication is considered a major part of their training curriculum and vocation, the first 2400 HEWs, trained in 2004, only spent 2% of their yearlong training on health education strategies.[5] Classes were often taught in English rather than local languages, in overcrowded classrooms with little or no training materials, too few chairs and unsanitary conditions[5]. Though the training program was to be 90% practical education, in practice only 30% moved beyond theory to practical education[5].

Our study supports that the importance of local adaptation of health education materials. When materials aligned closely with HEWs’ scope of work and reflected locally available items, HEWs were much more likely to correctly identify the intended health messages. As Ethiopia has a population diverse both in culture and access to resources, regional and sub-regional approaches to health material creation are needed. Given that most HEWs are posted to their areas of birth, their involvement in the adaptation of design for local needs could be valuable in ensuring interpretability.

The HEWs were enthusiastic about the prospect of having access to more and better health materials. They currently report having few or no materials. Perhaps as a consequence, they tended to rate many materials as highly useful. Even the material on defecation hygiene, understood as intended by only 3.3% of respondents, was described as “very useful” by 48% of respondents. This suggests that health educational materials are a valued input in HEWs’ community outreach and that HEWs would likely readily incorporate such materials into their work.

In conclusion, HEWs have the potential to serve as a valuable bridge between the rural population and the rest of the health system in relaying complex health information and acting as the first and main point of contact for crucial public health prevention activities—if they are adequately resourced. Recent studies suggest that other cadres of Ethiopian health workers - public and private - suffer from low motivation, corruption and lack of job satisfaction.[14] This has been linked to poor salaries and support, lack of continuing education opportunities, and lack of drugs and supplies. However, the HEWs we interviewed were enthusiastic about their job as health educators and reported that their communities could benefit from their services. Readily

understandable health education and reference materials are important to the work of the HEWs, especially given the lack of regular supervision and continuing education in many remote areas where HEWs are posted.

Providing HEWs with the adequate range of locally appropriate health education materials would be one small but important demonstration of the government's support for this critical cadre of health workers.

Within the Ethiopian context, this manual seeks to strategically support the HEWs in the Oromia region while still respecting the Ethiopian government's decision to limit their role to preventative care. In respect to preventative care, childbirth is then the most complicated procedure that lies within the HEWs realm of responsibilities. Currently in the Tigray region of Ethiopia, HEWs are being utilized for birth assistance by the populace more often than TBAs. With improved performance in birth assistance, the Oromia HEWs will likely enjoy the same respect in their communities. The improved performance of HEWs has the potential to increase health system utilization in other health areas at the level of the health post—a primary goal of the HEWP and HSDP. Ethiopia currently has one of the highest rates of maternal mortality in the world; the brunt of this statistic is more heavily carried by the women in the rural areas. This is where the HEW lives and works. Quality birth assistance and family planning education are two key ways to reverse this trend. An improved maternal mortality ratio supports not only the goals of the Ethiopian government, but also the objective of the international development community, typified in the Millennium Development Goal focused on a 2/5 reduction in MRR worldwide.[1]

The design strategy employed with this project utilizes the assumption that a useful language will provide HEWs with a relevant verbal context for understanding included visual aids. Because they are literate, HEWs are likely to be able to understand a more technical manual, especially if it is illustrated. Their literacy, when supported by a quality translation, allows considerably more freedom in the range of image styles that might be understood. This is further supported by the fact that the HEWs we spoke to were able to read most of the images in our survey fairly accurately, if not always the intended message. They are visually literate, even if English literacy levels still seem fairly low. As long as the language is relevant and accessible, it is assumed that the images I have created will most be understood. But because a training on this new manual is not insured, I have chosen an illustration style and technique that respects most of the information garnered from our survey and from visual literacy surveys. My illustrative methodology operates within a slightly gray area in that seeks to challenge the HEWs to learn new and complicated information, but also does not ignore precedence found in previous visual literacy studies. The pictures and information introduced via the pictures may be new, but the

style of illustration remains traditionally accessible in respect to visual literacy studies and information design theories. Additionally I my style strives to respect cultural norms as much possible without undermining public health messages. Any unintentional ignorance of cultural influences on my part will likely be overcome if the manual is successfully translated.

For this specific project I have placed more importance on visual and linguistic literacy for the childbirth manual, however for the family planning flip chart I have placed emphasis on cultural appropriateness. The childbirth portion of the material will be highly technical and will likely introduce HEWs to a significant amount of new information. Clear and concise pictures and language will support this best. Cultural appropriateness is important in that the manual and pictures should be aware of local resource restrictions, however concern over how nudity might embarrass some HEWs is somewhat irrelevant as respecting this could easily inhibit the effectiveness of the manual. The opposite is somewhat true for the family planning manual, as it not only seeks to educate an audience, but also to convince an audience to change its behavior. The images should likely be kept as respectful as possible, since the ideas contained within the family planning chart subversively question so many traditional behaviors. Accessible non-threatening pictures will seemingly allow the touted behavior change to seem possible. These assumptions are not only based on our survey results, but also on precedence within health education strategies and other visual literacy studies.

The HEWs themselves will then serve as the verbal context for delivering the visual aids within the family planning section to their community, thus it is essential that all illustrations are accessible first and foremost to them. Quite often it is the low-literate lay audience that is the focus of visual literacy studies and health education campaigns. They are often found to have excessively low-visual literacy rates, making quality material creation a significant challenge. However if the HEWs are supplied with a manual that is accessible to them, they will be able to insure the successful transfer of knowledge to their community. Because the HEWs are based within the community, they have a similar cultural background as well as the essential and relevant language skills to provide sensitive and accurate health education. HEWs can serve as a unique and valuable bridge between the system and the rural population it seeks to serve, if the system supports them. The manual I have created is simply an intervention. The manual seeks to illustrate, as a metaphoric visual aid, some of the issues related to the difficulties in health education in low-resource settings and provide one small aspect of a solution. The HEWs unique role within the system suggests that when adequately trained and supported, these women will be able to save innumerable lives.

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